



EESTI TEADUSTE AKADEEMIA

IN WORDS  
AND IMAGES

2018

# CONTENT

4	TIME TO CELEBRATE THE BIG ANNIVERSARY YEAR	64	NAVIGATING THE MINEFIELD OF ADVISING THE STATE. PART II
5	Expecting the World to be More Efficiently Saved	64	Energy Production and Supply in Estonia
9	<i>Fellows become friends</i>	65	Reflections to Plan S
10	FRAMES	66	OTHERS ABOUT US
10	Numbers of Academy Members Set	66	Top of the World
14	Life Bends Frames and Paints them Black	66	Estonia's Most Influential
18	THE FESTIVE ROUTINE	68	Estonian Society of Human Genetics Lifelong Achievement Award
18	Annual General Assembly, 20 April 2018	68	Honorary Doctors
20	<i>Postal Stationery Estonian Academy of Sciences 80</i>	71	Honorary Citizen
24	Members of the Academy: From the Monograph to the Tweet	72	TRIPLES
26	The General Assembly, 5 December 2018	73	Three Autumn Days, Three Rectors
30	<i>The New Members of the Academy</i>	74	<i>Shadowing Rector Jaak Aaviksoo</i>
32	<i>More Hands at Work</i>	80	<i>Shadowing Rector Toomas Asser</i>
34	NATIONAL RESEARCH AWARDS	86	<i>Shadowing Rector Mart Kalm</i>
38	INTERNATIONAL RELATIONS	92	Three Legacies
38	Summer Moments in France	92	<i>The Legacy of Academy Member Friedebert Tuglas</i>
38	Partnerships	94	<i>The Legacy of Academy Member Arvo Pärt</i>
41	<i>Research Exchange and Science Diplomacy</i>	96	<i>The Legacy of Academy Member Anu Raud</i>
41	<i>Research Careers in the European Research Area</i>	98	Three Minute Lectures Winter Training
42	The Advisory Role of Academies in the Information-Rich Society	102	ODDS AND ENDS
44	<i>The Possibility of Scientific Advice During Politicide</i>	102	Our Member Organised the Global Forum in Toulouse
46	<i>Giving People the Means to Protect Their Minds</i>	102	Enough of Experts?
47	FuturICT 2.0 in Tallinn	103	The Academy's Publications and its Members' Writings
48	BIG INTERVIEW: SCIENTIFIC LANGUAGE CONNECTS	105	Students' Science Festival
54	NEW BEGINNINGS	105	Π-prizes
54	In Collaboration with the Poska Academy	108	The Science Day of the Education and Culture Congress at The Academy
56	Life After Google	109	News from Scientific and Learned Societies
58	Research Professors' Conference	112	THE PRESIDENTS OF THE ACADEMY
60	Prospective Academy Members' Conference	119	POLARISED REFLECTIONS
63	The Constitutional Law Endowment		

# FOREWORD

The year 2018 was a multiple anniversary year. The Republic of Estonia turned 100 years old and the Academy of Sciences 80 years old. Thus, many of the year's events and undertakings had a festive feel. Even a major part of the Academy's symbol - the infinity sign, or sideways figure eight – “stood up for the year”, yet also appeared in its customary form on the Republic of Latvia 100 logo.

The Estonian postal service joined the Academy's 80<sup>th</sup> anniversary celebrations by releasing commemorative postal stationery whole items. It is like being in a song: if you're on a postage stamp, you exist in the eyes of the whole society. Member of the Academy Karl Ernst von Baer, for instance, likely owes some of his renown among Estonians to appearing on the two-kroon note.

For the first time ever, the Academy awarded friendship certificates to some of its allies. One of them has been tireless in representing academic values and promoting them throughout her work, another has made outstanding contributions to the Academy's new forms of work and has offered excellent ideas for facilitating scientists' cross-border movements, and a third has developed ideas born in the Academy into popular public events and has tirelessly motivated scientists to present their unpublicised thoughts to the broader public.

The final noteworthy happening of the year was a joint declaration by the main political parties, scientists and higher education institutions, along with employers and representatives of private businesses, about increasing science funding significantly. The discussions around the implementation of this declaration are likely to be complex and stretch through a large part of 2019. But it is clear that what has worked so far may not be enough in the future. If we want to reach a better position in international value chains, the current science funding paradigm has to change. The state doing its share will not be enough if private enterprises stand idly by. Competitive research done in the private sector benefits not just the development of a modern business and economic environment, but also academia and the entire country.

This collection brings together some reflections on the Academy's routine, this time with a festive flair, with the near-obligatory descriptions of major events and some aspects of everyday work. The rectors of three major universities, all Academy members, allowed us access to their working lives, behind the scenes. A retrospective on the Academy illuminates its legacy in modern times. A somewhat unusual travelogue casts light on unexpected aspects of certain countries. The facts, figures, and technical details of the Academy's and our partners' activities are covered in the classic white yearbook.

*28. February 2019*  
*Tarmo Soomere*

# TIME TO CELEBRATE THE BIG ANNIVERSARY YEAR

---

The Republic of Estonia became 100 years old in 2018 while the Estonian Academy of Sciences reached its 80 years anniversary. For the Academy, January 1938 was the most important month of its ponderous birth. The process started on 28 January 1938, when President-Regent Konstantin Päts signed Decision no. 35 of the Estonian Academy of Sciences Act. The law entered into force on 2 February 1938 upon its publication in the Riigi Teataja.

Therefore, it seemed fully appropriate to start celebration of the anniversary at the end of January. A full day event on 31 January 2018 started from a festive convention in the conference hall of the Riigikogu and continued with

a grand reception in the festively decorated Great Hall of the Academy.

The welcoming speech of President of Estonia Kersti Kaljulaid (see the next page) was complemented by addresses from the speaker of the Riigikogu Eiki Nestor and the chair of the Cultural Affairs Committee of the Riigikogu Prof. Aadu Must. The convention continues with keynote speeches on the onset of contemporary science in Estonia by Erki Tammiksaar, on the interrelations of the Estonian language and science by the Academy Member Karl Pajusalu and on how the research community could contribute to social cohesion of society by the President of the Academy Tarmo Soomere.



The conference hall the Riigikogu was  
chuck-full of eminent guests.



# EXPECTING THE WORLD TO BE MORE EFFICIENTLY SAVED

## *Welcoming Speech by President of the Republic of Estonia Kersti Kaljulaid*

H appy Anniversary!

When the Estonian Academy of Sciences was founded, eighty years ago, the Academy of Sciences was defined as an association of highly qualified scientists established by law and tasked with developing and representing Estonian science, advancing the application of scientific results in the interests of Estonia and promoting science and scientific thought in Estonia.

This definition is still appropriate. Current issues have always been the motivating force of any society. Resolving serious problems, of course, is possible only by relying on scientific thought.

Late last year, I read a text written by a machine. It was obvious that the author was a clever, eloquent, witty and well-read machine. But it was equally obvious that the text was not written by a human. A person possessing such a vocabulary and such factual knowledge would write such a text only if suffering from a severe mental illness.

The experiment was interesting. An economics magazine had trained the machine using decades of texts published in magazines and then tasked it with creating an opinion piece. The results were unsurprising. My first reaction was relief. I realised that we humans cannot yet be taken out of the chain of producing and noting down logical thought. If the text I read was any sign, this won't happen any time soon.

Some time later, around Christmas, when I had time to reflect on things, a completely different thought troubled me. How many ordinary people, native English speakers with an average level of education, would have realised that this was something other than a complex piece of writing in a journal dedicated to complex thought? At least half of the people who read it to the end would probably have realised that something was not quite right, because the text genuinely lacked a point. But how many people would have stopped reading halfway through? The text was intricate, full of erudite phrases and messages. If something of its ilk were posted without a special warning on, say, the website of The Guardian, the lion's share of the readers would probably not have finished it. Many of



President Kersti Kaljulaid expects increasingly effective action from the Academy.

them would probably not dare to express any doubts they might have had, at the risk of looking like they did not comprehend it.

Perhaps I underestimate the functional reading skills of the majority of humanity, but the thought disturbed me. What is happening with humankind if some of us can no longer tell a human from a machine? Machines themselves can tell the difference by making us decipher words in funny fonts and transcribe them into ordinary writing. How about the reverse, though? How can humans tell unerring machines from other humans? How long will we be able to insist that any intelligent person can do it?

More likely than not, every passing year adds to the ranks of those whom increasingly intelligent machines can deceive, because fewer and fewer of us are able to personally think through the thoughts necessary to navigate our lives. A strong memory, systematically built up through the constant need to memorise things, is becoming a thing of the past. It is hard to find your way somewhere without help from a machine. Google can come up with suitable quotations for any topic and thus substitute for being well read. I use its help, too. And machines determine the online reading fare of many people. To some extent, this applies to all of us.

Learning machines learn about us and funnel us into categories where they expect people who think like we do will be comfortable. They convince us that we are right by showing us thoughts that resemble ours. In this information environment, how does scientific thought reach the ordinary person? Who is able to reduce it to its essentials, giving the regular reader the gist, while successfully conveying that it is by necessity simplified, so that if they plan to base

further thought or even actions on it, they would know to do more research instead of acting on a crude simplification.

To borrow a simple example from physics, most exercises end with a note that frictional force should be ignored. How many people solving these exercises realise that such solutions do not describe reality? Sure, physics is the least of our problems, because cognitive perception helps us distinguish the theoretical solution from the practical. But things get fuzzier if we apply the same logic to economics. I am frequently surprised to see people upset at the fact that economists and specialists make erroneous predictions. They cannot foresee crises, they recognise bubbles only after they have burst, and have trouble predicting even anything as simple as tax revenue. We keep hearing that this is a problem. How can these clever, heavily educated fellows fail to notice that classic economic theory relies on a simplification no less significant than leaving out frictional force in physics exercises: the theory works only if humans are informed and make rational decisions. We all know that this is not the reality. However, we still expect accurate predictions, because our specialists have been given a mandate.

With the advent of the 21<sup>st</sup> century, things have become ever more wondrous. One example is the cryptocurrency boom. An interesting thing about cryptocurrency is the blockchain technology. This technology could be used to improve, for example, the e-state identification system. We could issue to each person, say, a million tokens connected to their serial number. Those tokens could be called Est-tokens. They would be a perfectly usable alternative to our current, ID-card-based identification system. It would be independent of the hardware and software used. It would make for a simple and secure solution. But just imagine the headlines: Estonia has issued cryptocurrency! The European Central Bank would get

the collective vapours, Ardo Hansson would be called on the carpet and the whole ordeal would have a long-term negative effect on us, even though the resulting negative attitude would be entirely unfounded.

Using blockchain as an identification model would be just fine. Even now, despite the risks, I believe it to be a very good idea. The problem lies in explaining it to the world in a knowledge-based, information-based manner. After all, we must keep our e-government up to date and work towards its independence from the software and hardware offered by IT giants. The Est-token would be a fantastic solution. But do we dare? As Mark Twain put it: a lie will go round the world while truth is still putting its boots on.

All of these troubles could be avoided if the vast majority of people were in the habit of science-based thinking. Perhaps this is something we should consider the overarching goal of our education system. In the past, we have set many much more complex goals for education; the silent assumption has been that all instruction offered in educational institutions is science-based. But this is no longer self-evident. Pseudoscience lurks in school yards all over the world. Pseudomedicine mingles with honest folk medicine and science-based medicine. The ills I referred to earlier reproduce themselves in millions of copies in important everyday situations.

Might the way we think of educating the young be lagging behind the times? We should not let our top-of-the-world PISA test scores deceive us. They measure largely last-century education. In the 21<sup>st</sup> century, teaching style needs to change and many of the things taught need to change as well. But nobody knows just what and how. We have to figure it out with your help. Progress in this matter requires a coordinated effort by our academic talent.

We have to create a favourable ecosystem, even if initially a small and local one here in Estonia, to guarantee







Anna-Liisa Eller created festive atmosphere by playing national tunes.

the continued viability of, and capacity for, innovation in the Estonian education system. We must create new educational thinking that helps safeguard and develop common sense. Formally, it could be called a scientific mindset, but, frankly, this doesn't really matter.

In the last eighty years, the Estonian Academy of Sciences has continued through very different times, from the point of view of the organisation as well as spiritually. It has worked towards very different tasks and in very different forms; it has represented science in various ways, but it has always represented it. The importance of the Academy lies not in its role as a formal institution, but rather in its impact on society: to put it plainly, in its force of mind.

As we know, force exists only when it is applied to somebody or something. How can we make force of mind apply to our society even in the current complicated circumstances?

Even though scientists' work is largely driven by their inner drive and inquisitive minds, it is vital for the government to have the foresight and the desire to look beyond immediate problems, to consider the future, and to listen to scientists in preparing for it.

After all, it takes two to tango. You have a vital role to play in turning your inquisitive minds into a force that is applied to people and things.

Serious scientific research is strenuous work that takes dedication and resources. Some suggest that Estonia is too small to be able to afford it. It is true that there is so much science done in the world that its volume surpasses the budget of a small state. The people present in this hall would no doubt be able to dedicate the entire budget of Estonia to science at the drop of a hat.

It is sometimes said that pure science cannot give rise to anything that benefits us. It is hard to agree with this. In an insignificant amount of time – in a quarter century – we have at least two examples to point to. One of them is the above-mentioned timestamp-based identification model, based on the work of Estonian scientists. It is often said that Estonian-made things are homespun. But this homespun thing turned out so good that, even superficially, it has led to an implementation level similar to the blockchain. Is this not a measurable benefit? Of course it is: two percent of our entire gross domestic product is based on the digital signature alone. Five percent of our gross domestic product is based on information and communications technology. The international reputation of our country is surprisingly closely tied to our e-government. The birth of the Estonian Genome Project shows the benefits of Estonian research clearly. It has made headlines through certain dramatic developments in its activity, as well as through lacking the money for liquid nitrogen. Legislation brought about by geneticists' lobbying efforts allowed us to put other states' lagging efforts and the private sector's impatience to good use. We brought them together in Estonia and created a machinery that will offer us science-based public health benefits in a way that many wealthier countries cannot yet manage. This is a major benefit. Thus, great things can be done even in a small country, even with limited means. We just need to keep in mind Lord Rutherford's famous words: "We haven't got the money, so we'll have to think."

Science is facing increasingly complicated tasks. Its main motivation is no longer the need to better understand nature and humans. Our contemporary great challenges are related to the consequences of technologies, to the changes they have wreaked. A small number of new technologies that entered our daily lives over the last century, such as efficient fossil fuels, consumer electricity produced from them, and the internal combustion engine, have had side effects with potentially grave consequences. We are now battling the consequences of the inventions of the previous two centuries. Knowing how many more technologies we are developing now, what challenges will our grandchildren have to fight?



Photo: Maris Krünvald x8



A museal on the wall of the Great Hall of the Academy. The small metal doorplate once labelled the office of the Estonian Academy of Sciences in the main building of the University of Tartu.

Success comes for those who can predict or at least estimate what might happen, and prepare for it. We cannot do this without scientists. But, as our lukewarm response to global warming shows, we cannot do it even if scientists see the problem if they are not able to motivate society. Science has been successful in introducing and harnessing its discoveries, but it chronically fails to predict potential harmful consequences and, hence, avoid them.

New technologies are flooding in. The majority of them carry the potential to unleash death on humanity or destruction on Mother Earth. To prevent this, our entire education, from kindergarten to university, must change, along with our scientific thinking. We must teach the things the modern person actually needs to know. Give up teaching what was practical a hundred years ago. Roll out new technologies, new ideas and new inventions but provide warnings or even threats about what they can unleash if we do not start to manage the corresponding risks straight away. This brings to mind the idea of an artificial intelligence that uses up all the energy on our planet and then takes off, leaving us behind. It is a matter for punchlines now, but it might not really be funny.

There is hope. Consider the child who slides her fingers across the kindergarten window to make the view go by faster, or to zoom into the outside world the way we do on

Anu Raud

a smartphone screen. It is clear that she needs to be taught differently from our generation, to be given a different world-view, because her world is different. We need to recognise this watershed moment. The several hundred years' cycle of inventions has taken us to the edge of disaster. It is reasonable to think that new technologies can do almost everything faster than old ones. Now, we have to consider the whole – the technology and the checks on it – at the very inception of invention.

We rely on scientists for this! Even though science has not brought us into the present day in complete safety, our life is certainly comfortable. Thank you for that! Thank you, Estonian research community. You have made life in Estonia better and more comfortable in a way that is not necessarily accessible to people everywhere else. The Estonian Academy of Sciences, with its eighty-year-long history, has culpability in this, and responsibility, and, certainly, reason to be proud of all its achievements. I thank you for your work, but I expect increasingly effective action towards saving the world.

The convention and festive reception were separated by a short but pleasant and refreshing walk through mild winter afternoon from the Riigikogu to the Academy.

Ene Ergma

Hillar Aben







Ruth Annus receives the certificate of The Friend of Academy.

#### CERTIFICATE

The Estonian Academy of Sciences considers

#### **Krista Aru**

its good friend for her tireless representation of academic values and promotion of them throughout her work.

*Announced at the Academy's Great Hall on the 80<sup>th</sup> anniversary of the Estonian Academy of Sciences, 31 January 2018*

#### CERTIFICATE

The Estonian Academy of Sciences considers

#### **Marti Aavik**

for developing ideas born in the Academy into striking, popular public events, and tirelessly motivating scientists to present their unpublicised thoughts to the broader public.

*Announced at the Academy's Great Hall on the 80<sup>th</sup> anniversary of the Estonian Academy of Sciences, 31 January 2018*

#### CERTIFICATE

The Estonian Academy of Sciences considers

#### **Ruth Annus**

for a deep interest and outstanding contribution to the Academy's novel forms of work and excellent ideas for facilitating scientists' cross-border movement.

*Announced at the Academy's Great Hall on the 80<sup>th</sup> anniversary of the Estonian Academy of Sciences, 31 January 2018*

## FELLOWS BECOME FRIENDS

The ceremony and the reception were bridged by a leisurely walk from one building to the other. The hike in the pleasantly mild winter weather was a welcome chance to stretch our legs.

The reception at the Academy began with sparkling wine. When the crowd had gathered, the historic wall plaque that hung on the Academy door in 1938 was unveiled.

The celebrations continued with President of the Academy Tarmo Soomere presenting the Academy's friendship certificates. The recipients of these brand new awards were three good friends of the Academy: Krista Aru, Marti Aavik and Ruth Annus.

And then it was time for presents, good wishes and feasting!

The party was lively and, despite the hall being more crowded than the hall of the Estonian parliament, certainly more than is usual for the Academy's events, the space sufficed. The doors of the offices of the board and of the president were thrown open, which provided more space and air! It was a great celebration!

Richard Villems

Jüri Viikberg

Marti Aavik





# FRAMES

## NUMBER OF ACADEMY MEMBERS SET

The number of the members of the Academy is set by law. The Estonian Academy of Sciences Act currently states that the number of members of the Academy is limited to 60, whereas the limit does not include members over the age of 75.

The average age of the members basically rose linearly between 1995 and 2009 and reached 72 years in the late 2000s. This means that a solid third of the members had crossed the three-quarter century threshold. The rule permitting new members to be elected alongside members who reach their 75<sup>th</sup> year of life was first proposed in 2010. The ten new members reduced the members' average age by just over two years.

Another 15 new members were added in the three following years (2011–2013). This process entailed a slight reduction in the average age of members, down to nearly 70 years in 2012–2013. No new members were selected in 2014 or 2015; hence, the average age shot up the way it had twenty years previously. Three new members were added in 2016 and we lost a beloved colleague, Member of the Academy Endel Lippmaa. 2017 was a dark year: within 373 days, starting 13 December 2016, we lost eight members. I refer you to the compendium “Estonian Academy of Sciences in Words and Images 2017” and the Academy’s yearbook of 2017.

At the beginning of 2018, the members of the Academy of Sciences numbered 73. We said our final goodbyes to two of our dear colleagues (Enn Mellikov, 1.4.1945–23.7.2018, and Mihkel Veiderma, 27.12.1929–25.10.2018) and elected seven new members (see p. 30–31). And thus, our ranks numbered 78 colleagues on the last day of the year.

The law dictates that the membership of the Academy be composed of members of the Academy and foreign



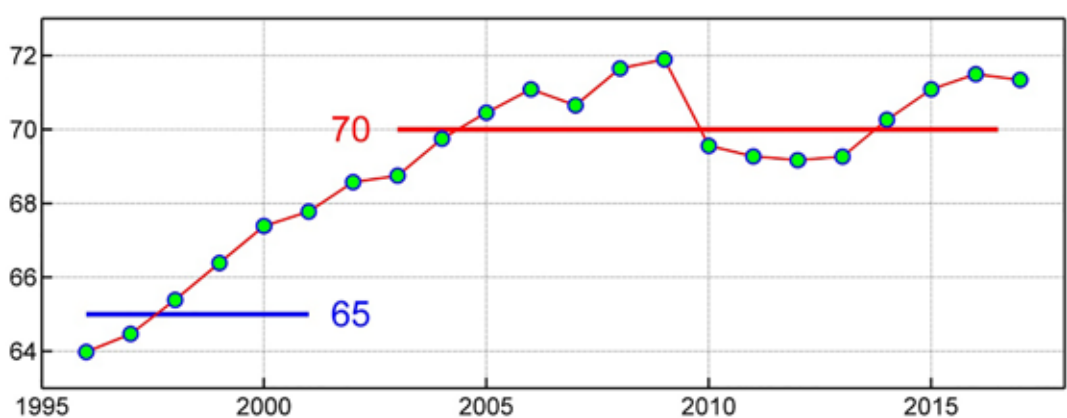
members, and adds that the number of foreign members is set by the general assembly. The number of foreign members is regulated by the statutes of the Academy, which the general assembly may approve and amend. As a vestige (or perhaps a polite nod), the Act states that the statutes of the Academy must be registered with the Ministry of Education and Research. Perhaps as a mild shadow of ancient subservience, the Act also states that the statutes and any amendments to them enter into force at the moment of their registration.

No matter how we label this procedure, the law and the statutes both state that foreign members must be foreign researchers who have achieved outstanding results and who are connected with Estonia through their research. The statutes add that the number of foreign members cannot exceed 30% of the number of members of the Academy. The general assembly must have meant to apply this limitation to vacancies only, because the membership of foreign members, too, is for life, and surely expulsions



will not be made even in a year as sad as 2017 was. Thus, on 1 January 2018, the Estonian Academy of Sciences had 22 foreign members – a smidgen more than the actual statutory limit (21.9 foreign members). After the passing of our dear foreign member Carl Olof Jacobson (24.4.1929–4.6.2018), 21 foreign members remained.

Members of the Academy at the Annual General Assembly of the Academy, 20 April 2018, at the Estonian National Museum in Tartu.



Average age at the end of the year

The full members and foreign members of the Academy (name, division and year of election) by division as of 31 July 2018. Heads of divisions are highlighted in green, female researchers in yellow, and outstanding cultural personalities in blue. More information is available at <http://www.akadeemia.ee/en/>.

As of January 1, 2019

## Division of Astronomy and Physics

**Jaan Aarik**, Exact sciences, 2013  
**Jaak Aaviksoo**, Exact sciences, 1994  
**Jaan Einasto**, Astrophysics, 1981  
**Ene Ergma**, Exact sciences, 1997  
**Arvi Freiberg**, Exact sciences, 2009  
**Vladimir Hiznjakov**, Physics, 1977

**Tšeslav Luštšik**, Solid state physics, 1964  
**Marco Kirm**, Exact sciences, 2018  
**Ergo Nõmmiste**, Exact sciences, 2012  
**Eve Oja**, Mathematics, 2010  
**Martti Raidal**, Exact sciences, 2011  
**Enn Saar**, Astronomy, 2010

**Peeter Saari**, Physics, 1986  
**Mart Saarma**, Molecular biology, 1990  
**Arved-Ervin Sapar**, Astrophysics, 1990  
**Gennadi Vainikko**, Mathematics, 1986  
**Richard Villems**, Biophysics, 1987

### Foreign members

**Jonathan (John) R. Ellis**, Theoretical physics, 2015  
**Richard R. Ernst**, Physical chemistry, 2002

**Charles Gabriel Kurland**, Biochemistry, 1991  
**Jaan Laane**, Chemical physics, 1995

**Jaak Peetre**, Mathematics, 2008  
**Alar Toomre**, Applied mathematics, 2012

## Division of Informatics and Engineering

**Olav Aarna**, Informatics, 1990  
**Hillar Aben**, Mechanics, 1977  
**Jüri Engelbrecht**, Mechanics, 1990  
**Ülo Jaaksoo**, Informatics, 1986  
**Maarja Kruusmaa**, Engineering, 2016  
**Valdek Kulbach**, Mechanics, 1986  
**Jarek Kurnitski**, Engineering, 2018

**Rein Küttner**, Engineering, 1997  
**Jakob Kübarsepp**, Materials engineering, 2011  
**Ülo Lepik**, Mechanics, 1993  
**Enn Lust**, Energy technology, 2010  
**Leo Mõtus**, Informatics, 1993  
**Andres Öpik**, Engineering, 2013  
**Arvo Ots**, Power engineering, 1983

**Tarmo Soomere**, Informatics and engineering, 2007  
**Enn Tõugu**, Informatics, 1981  
**Raimund-Johannes Ubar**, Computer science, 1993  
**Tarmo Uustalu**, Computer science, 2010  
**Jaak Vilo**, Informatics, 2012

### Foreign members

**Steven R. Bishop**, Nonlinear dynamics, 2012  
**Antero Jahkola**, Power engineering, 1998

**Michael Godfrey Rodd**, Process control and infotechnology, 1995  
**Gábor Stépán**, Applied mechanics, 2017

**Esko Ukkonen**, Computer science, 2015

## Division of Biology, Geology and Chemistry

**Toomas Asser**, Medical science, 2011  
**Jaan Eha**, Natural sciences and medicine, 2016  
**Jaak Järv**, Natural sciences, 1997  
**Ain-Elmar Kaasik**, Neurology, 1993  
**Anne Kahru**, Ecotoxicology, 2018  
**Dimitri Kaljo**, Geology, 1983  
**Mati Karelson**, Natural sciences and medicine, 2007

**Kalle Kirsimäe**, Geology, 2018  
**Urmas Kõljalg**, Biosystematics and ecology, 2011  
**Ilmar Koppel**, Physical chemistry, 1993  
**Hans Kõüts**, Agricultural sciences, 1994  
**Agu Laisk**, Natural sciences, 1994  
**Ülo Lille**, Biotechnology, 1983  
**Margus Lopp**, Chemistry, 2011  
**Udo Margna**, Plant physiology, 1987

**Jüri Martin**, Ecology, 1990  
**Andres Metspalu**, Biotechnology, 2010  
**Ülo Niinemets**, Natural sciences, 2013  
**Anto Raukas**, Geology, 1977  
**Valdur Saks**, Biochemistry, 1993  
**Raivo Uiho**, Medical science, 2003  
**Mart Ustav**, Biomedicine, 2001  
**Eero Vasar**, Medical science, 2010  
**Martin Zobel**, Ecology, 2010

### Foreign members

**Carl-Olof Jacobson**, Zoological morphology, 1995  
**Ülo Langel**, Neurochemistry, 2015  
**Pekka T. Männistö**, Pharmacology, 2012

**Matti Saarnisto**, Geology, 2008  
**Helmut Schwarz**, Chemistry, 2002  
**Janis Stradinš**, Physical chemistry and history of science, 1998

\* † 11.04.2019

\*\* † 27.01.2019

\*\*\* † 01.04.2019

\*\*\*\* † 17.05.2019



## Division of the Humanities and Social Sciences

**Jüri Allik**, Psychology, 2010

**Mihhail Bronšteín**, Agricultural economics, 1975

**Mart Kalm**, Art history, 2010

**Valter Lang**, Historical sciences, 2010

**Tiina Randma-Liiv**, Social sciences and governance, 2018

**Lauri Mäiksoo**, Law, 2013

**Karl Pajusalu**, Linguistics, 2011

**Arvo Pärt**, Music, 2011

**Huno Rätsep**, Estonian language, 1981

**Anu Raud**, Art, 2016

**Anu Realo**, Cultural studies, 2018

**Jaan Ross**, Humanities, 2003

**Hando Runnel**, Literature, 2012

**Tiit Tammaru**, Human geography, 2018

**Tõnu-Andrus Tannberg**, History, 2012

**Jaan Undusk**, Humanities, 2007

**Urmas Varblane**, Economics, 2009

**Haldur Õim**, Humanities and social sciences, 1994

### Foreign members

**Juri E. Berezkin**, Cultural anthropology, 2012

**Cornelius Theodor Hasselblatt**, Literature and culture, 2015

**Päiviö Tommila**, History, 1991

**Endel Tulving**, Psychology, 2002

**Jaan Valsiner**, Psychology, 2017

## LIFE BENDS FRAMES AND PAINTS THEM BLACK

*Carl-Olof Jacobson*

(24.04.1929–4.06.2018)

Carl-Olof Jacobson, a foreign member of the Estonian Academy of Sciences, was born on 24 April 1929 in Ör, in south-west Sweden. He entered Uppsala University in 1948 and received a master's degree in Zoology in 1953, defended a licentiate degree in 1958 and a doctoral degree in 1964, and worked for over forty years as a professor, including as a professor of zoological morphology in 1970–1994. Apart from his home university, Carl-Olof Jacobson worked as a visiting researcher at the Wistar Institute in Philadelphia (1967/1968) and as a visiting professor at the University of Texas at Austin (1969). Professor Jacobson's main research efforts focused on developmental biology and neurobiology, as well as on freshwater ecology, where he became a key figure in the field.

His activities in the field of science management, science promotion and science cooperation were highly impressive. He was also a greatly esteemed lecturer at the Swedish folk higher school. Carl-Olof Jacobson was a member of the Royal Swedish Academy of Sciences from 1979 until his death. He was the secretary-general of the Academy between 1989 and 1997; during that time, he was also on the Board of Directors of the Nobel Foundation.

During those years, he contributed significantly to the promotion of scientific cooperation between the Scandinavian countries and the Baltic states, several years before the restoration of the independence of Estonia. His role in coordinating the international evaluation of research in the



Photo: Estonian Academy of Sciences (EAS)

Baltic states, in particular the little-known fact that he was the direct initiator of the entire process, also deserves praise. In 1995, the Estonian Academy of Sciences elected Carl-Olof Jacobson a foreign member in zoological morphology. He was also a member of the Royal Swedish Academy of Engineering Sciences, Royal Society of Sciences in Uppsala, Royal Physiographic Society in Lund, and Academia Europaea. Carl-Olof Jacobson was a long-term president of the Swedish Linnaeus Society. He was a member of the American Association for the Advancement of Science and participated in a number of field-specific associations: the International Society for Applied Biological Sciences, etc. In 2001, his long-time work in promoting cooperation between the Baltic and Nordic academies of sciences was rewarded with the Medal of the Baltic Academies of Sciences. Carl-Olof Jacobson passed away after a long illness on 4 June 2018.

*Enn Mellikov*  
(1.04.1945–23.07.2018)

As the great orator Cicero said, “Friends, though absent, are still present”. This might well be a leitmotif of the day, because our dear colleague, Member of the Academy Enn Mellikov, was, and is, very close to many of us through his many contributions.

Enn Mellikov, a mainstay of the Tallinn University of Technology, who hailed from Pärnu and bore one of the oldest surnames in Estonia, was exceptionally young when he defended his thesis, set up his laboratory, received acclaim, and left this world. He was barely over 40 years of age when he became one of the youngest Estonian doctors of science at the time. The average age of PhD candidates – back then candidates of sciences – now tends to approach 40 years. Back in his time, it took decades to conduct research considered worthy of the achievement. A lifetime often wasn’t enough. The requirements were extremely stringent. It sometimes took founding a new branch of research. The scientists meeting this threshold frequently had a broader grasp, a sharper eye and a greater sense of perspective.

The world of the time was asymmetric, and genuine international collaboration could only be oriented eastwards. The results and the technology tested at the Sverdlovsk research centre of the USSR Academy of Sciences laid a solid foundation for Estonian sciences in those troubled times.

Enn Mellikov was a member of the Estonian Academy of Sciences for nearly 15 years. During that time, he contributed to the Academy’s work in many ways, including a decade of contribution as a member of the Academy Board, years on the national research awards committee, and a vast amount of behind the scenes work as a member of the Research Competence Council and of the Estonian Research Council.

Internationally, Enn Mellikov goes down in the annals of history as the developer of unique solar cells made of monograin layers (i.e. almost powder) of relatively cheap and easily procurable substances. This led to simpler production of solar batteries, which were pliable, too.

Throughout his lifetime, Enn Mellikov in his modest, yet persistent way rejected the view that something might be impossible just because it seemed impossible. On the contrary, his life is a living example of how dreams must be bigger than humans can achieve. For example, the “Sweden evaluation” concluded in 1992 that it was not possible in Estonia to succeed in a field as reliant on high-end technology as solar energetics. Enn Mellikov proved this wrong, advancing this field to the cutting edge of international research.



Photo: Tallinn University of Technology

Many might wonder how the work of a single researcher could improve their lives. The work of a materials engineer is generally realised as a tiny part, or perhaps the top layer, of a machine. Solar energetics, however, is a field that might help our civilisation continue in its current shape in the long term. Contributing to this not only improves the world but helps to save it. This is more evident than ever in the light of recent global temperatures.

Enn Mellikov’s life was exceptionally intense in almost every sense. At the time of his passing, he had been with us for as many years as an average academic with a lot left to contribute. Almost every language contains many profound words and philosophical thoughts about death and bereavement. The language we use holds it as obvious that older people eventually depart.

But we must not say that our beloved colleague Enn departed too soon. What he gave to his loved ones, his colleagues, the university, the Academy, Estonia and the world is so vast that we have not yet begun to appreciate it all. He himself said: “I do my work with all my heart, with a sense of mission, and I expect the same from the people around me.”

The results of his work were impossible to ignore. He is the only Estonian researcher known to have received three national research awards, crowned by the 2013 Lifetime Achievement Award (i.e. the national research award for outstanding lifetime achievements in research and development). Upon accepting it, Enn Mellikov said the words that might well serve as his epitaph: “Science is an inevitable means of improving people’s lives and fulfilling the prerequisites for national development. The knowledge-based economy not only guarantees Estonia’s competitiveness, but is probably the only way for the Republic of Estonia to survive as a state.”



But a machine that works without reprieve and a human who lives intensely are both fated to wear out fast. Now, looking back, it is hard to ignore the way bereavement often finds its way into our dreams. Often, we believe that the world changes gradually, in tune with our expectations. Far from it. Major changes happen fast and never ask for permission. We know that sooner or later, we all must go. But, as Isaac Newton said, we stand on the shoulders of giants. Losing our leaders means that those who see further by standing on other's shoulders find themselves on shaky ground. And so the shock of the loss affects us much more than we would think.

Even in a thoroughly rational world, even in science, the poet's words are true: every death diminishes us all. The fact that a very large part of the results in many fields of modern science are very difficult to reproduce is due to the extremely high level of experience and skill concentrated in top scientists. Often, we can mercilessly exploit this wealth of knowledge and skill, but it is extremely difficult to set it down in writing or pass it on to others.

Death is a natural event that transcends human emotions. Some things which seem accidental happen for a reason, Ana Claudia Antunes has written contemplating the principles of Taoism. But some things simply happen, they just come with the season; and we lack a way to tell the accidental from the rational. Jim Beaver wonders how such a huge gap can exist between how we think about bereavement and grief and what grief does to us.

Members of the Academy are elected for life and they remain members on the other side. We often rely on the dearly departed. The Estonian Academy of Sciences grieves with the loved ones of Enn Mellikov and remembers him as a scientist who lived intensely and contributed intensively to the environment around him, as a beloved colleague who persisted in advancing his field.

**Tarmo Soomere's eulogy** at Enn Mellikov's send-off at the Academy, 2 August 2018.

## *COLLEAGUES ABOUT ENN MELLIKOV*

### **Nothing was impossible for Enn.**

When asked what he considered important in himself and in people around him, he said: "It is primary to keep your word and be honest with yourself and others."

Enn had a special relationship with young people. He was a friendly, motivating instructor and head of a research group where the young people were given every opportunity for self-development. Enn put a lot of stock in broadening horizons

and interacting with foreign researchers, long before post-doctoral studies abroad became compulsory in an academic career. Most of the young researchers who started out in Enn's research group have worked in various European research centres and have made valuable personal contacts with researchers outside Estonia. Enn had a gift for seeing the strengths and weaknesses of young scientists and subtly steering us in the right direction. Enn believed in his young students and always made time for them.

His days seemed to be more than 24 hours long. He ALWAYS made time for everyone and during conversations with him he never seemed pressed for time or acted like he was thinking about another appointment. He was fully present and focused on your thoughts. He often quoted the former rector of Tallinn University of Technology Agu Aarna, who liked to say that he started as a pyrochemist, but ended up a bureauchemist.

Enn always thought several steps ahead; he possessed the rare gift of setting off in the right direction early and always being at the forefront. This calls to mind his often-noted quick feet: he'd always dash up the stairs several steps at a time.

Enn was a driven person with an incredible capacity for work. Member of the Academy Andres Õpik recalls that Enn was a pragmatic person, yet he always had an eye for the long term. In the early 2000s, when yet another structural reform was underway at the University of Technology and the Faculty of Science was being formed, the Faculty of Chemistry had to give up the scientifically important Institute of Chemistry to provide a "seed" for the new faculty. In order to maintain the high scientific level of the faculty, I proposed the return to the Faculty of Chemistry of the semiconductor materials laboratory led by Enn. Enn liked the idea of reviving the curriculum that we both had graduated from in a new and more modern shape. Furthermore, its students would prove a good source of new recruits for the laboratory. And that is how it turned out in the end. In 2009, we opened a new curriculum, active to this day, and the faculty gained one of the research groups with the highest potential in the entire university.

Enn had a knack for creating contacts between individuals and research groups locally and internationally. He possessed "unbounded" communication skills, far beyond those of the average Estonian. Enn was uncompromising in his position that scientists and study groups must be assessed in terms of their scientific excellence, in particular with an eye to their potential for creating new technologies of the future. Enn had an instinct for knowing who had potential to make it in science and who would excel in other walks of life.

Enn was very tolerant, he did not hold grudges ("angry today, fine tomorrow"), he offered opportunities and did

not pursue revenge even against malicious attackers and critics. He was kind to colleagues and students alike. Colleagues, students, friends and family were all close to his heart and equally important, no matter what the situation. His caring was expressed by offering capable researchers who were out of work for some reason (such as the

working group of E. Siimer, T. Tomson and D. Kropman) opportunities to continue their research efforts at the Tallinn University of Technology Department of Materials Science.

Thank you, Enn!

Members of the semiconductor materials research group

## *Mihkel Veiderma*

*(27.12.1929–25.10.2018)*

Mihkel Veiderma was one of the rare Estonian top scientists to buck the trend of moving from science into industry, never to return. Furthermore, he disproved the notion that scientists should not be trusted with managing big and important things. The youngest chief engineer of the Ministry of the Chemical Industry of the USSR (Maardu Integrated Chemical Installation, 1956–1960) turned into a top scientist. Perhaps the shock of the wasteful nature of the USSR-style planned economy contributed to his switch by creating a desire to do things differently: rationally, profitably and sustainably. He later said: “under those conditions, the values that advance us are teaching and scientific research, as well as culture.”

In 1965, the mineral fertilisers and feeds laboratory was created under his initiative at the Tallinn Polytechnical Institute (now the Tallinn University of Technology). It initiated a shift in the prevailing thinking in the field: instead of fertilising fields with ground phosphate rock, more complex products should be used instead.

As a world-class specialist in phosphate rock and, more generally, in the chemistry of anorganic phosphate compounds, he recognised how badly this resource was being managed at the time. His phosphate rock research was directed towards adding value to this high-potential resource and using it sustainably. It gained a lot of bad publicity among the general public. Yet the evidence provided by his laboratory allowed us to come out on top in the Phosphorite War protests. Since his broad perspective conflicted with the more narrow-minded, others stole the limelight. But in the long run, adequate information is a servant of progress. Furthermore, it is an eternal task of members of the Academy to steer us clear of big blunders.

Mihkel Veiderma is remembered by his colleagues not just as a skilful science diplomat, but also as an exceptionally strong-spirited person. It is hard to say why he said in an interview with Margus Maidla that “dealings with power outside science should be avoided”, since he dedicated a large part of his life to doing just that. Perhaps this reflected his experience in dealing with the European

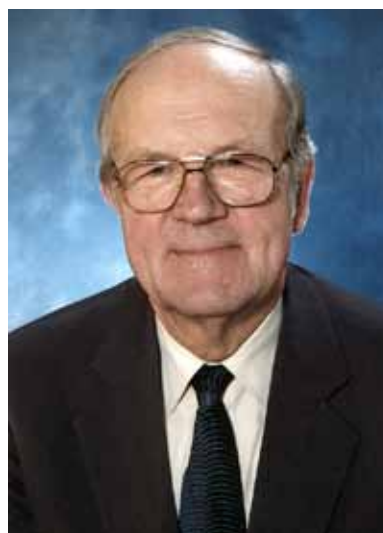


Photo: EAS

Parliament. In 2007, the European Academies' Science Advisory Council (EASAC) resolved to draw up a vision of the European Union oil shale industry for the benefit of the European Parliament's Committee on Industry, Research and Energy. Member of the Academy Veiderma led the work. The review ([https://www.easac.eu/fileadmin/PDF\\_s/reports\\_statements/Study.pdf](https://www.easac.eu/fileadmin/PDF_s/reports_statements/Study.pdf)) is currently the only known report that has spurred EASAC recommendations on such a high level based on the Estonian experience. But something unusual occurred at the European Parliament. With a proposal (one could say pressure) from the Greens, the report was rejected, with a demand to adjust its scientific conclusions. Since, however, laws of nature cannot be dismissed by a vote, the report was returned to the Parliament as it was and, of course, was accepted.

The insight that scientists may need to grapple with these attitudes and still remain faithful to facts served Mihkel Veiderma well through his two decades in the service of the Academy. He served as vice-president of the Academy in 1988–1999, its secretary-general in 1999–2004, and a member of its board in 2004–2009. His subordinates at the time are still impressed by the way he was able, both in science and in everyday business, to focus on the key elements of every matter and to avoid excessive formality.

His greatest (although difficult to detect from the outside) contribution was the management of the Academy's Energy Council. It was this expert body that strongly recommended that the government not privatise power plants or the

railway. It also had a hand in recommendations for the Estonian government to reject the Nord Stream pipeline and to work towards having the EU-backed liquefied natural gas (LNG) regional terminal built in Estonia. As a result, we have enjoyed a high level of energy supply security, unusual in Europe; we did sell the railway, but soon paid a hefty premium to renationalise it. Now we hear our European colleagues mutter that they ought to have shared the Estonian position regarding the Nord Stream.

We often wonder how President Lennart Meri dared to interject himself into topics far outside the scope of the president's functions. The answer is simple: he utilised to the utmost the academic capacity of our country and focused much less on the PR. As the Director of the Office of the President of the Republic, Mihkel Veiderma spearheaded the creation of the Academic Council of the President of the Republic and managed its work for a long time. This think tank's capacity to support the leaders of the state by providing professional analysis and bold scenarios has so far not been matched by either the Estonian Development Fund or the Research and Development Council.

For more than half a century, Mihkel Veiderma contributed to the development of the Tallinn University of Technology and the training of ever stronger specialists. He did this as a professor and, for five years, as the dean, but first and foremost, as a scientist and a recruiter for sciences. A significant part of his life's work, therefore, was the creation of the field of the research of raw materials chemistry. Its central goal was reconciling fundamental and applied research. The goal was, and is, clear: fundamentally new applications must be found for Estonian mineral resources. Those applications should shift our science and industry out of their comfort zones and boost them far up the value chain: to the natural position of any self-respecting country. Recovery or environmentally sustainable storage of inorganic industrial waste, formerly seen as bizarre or impractical, is now a central goal of the circular economy. And thus, for decades Veiderma saw further than everybody else.

Perhaps that is why Mihkel Veiderma was seen as a grand old man who taught and supported many colleagues whose vision did not reach as far as his, yet who were convinced that Veiderma deserved every single one of his dozens of awards and recognitions. Those were bestowed on him by the Estonian SSR, the Republic of Estonia, academies, universities and scientific societies. They are all united in their thanks to Mihkel Veiderma for dedicating his life's work to turning science into an engine for the economy.

Eulogy by the Academy of Sciences and the Tallinn University of Technology

Photo: EAS



Member of the Academy Veiderma: "It will be one of Estonia's important natural resources in the future, but only if this resource is used sustainably, using a high level of technology. I do not believe it will be exploited in the near future. But not long from now, phosphates will be in short supply and will rise in price globally. Phosphorus is one of the most vital elements in the creation and development of life. I am convinced that it will gain attention. As for environmental technology, multiple solutions already exist, and many of the primarily political and national Phosphorite War-era problems no longer exist."

In hindsight, Mihkel Veiderma questioned whether he might have spread his efforts too broadly among multiple professions and projects and became too distracted from the most important task: teaching the young and conducting research. Mihkel Veiderma: "Use your youth for learning. This time, the most precious in your life, sets the foundation for your development and hence for the development of our country and our society. Do not get comfortable, stay interested and expand your knowledge in culture and global affairs! Let me quote Albert Einstein: 'The important thing is not to stop questioning.' But it is also important to have competent people to provide answers, to carry responsibility and to make decisions after competent analyses. Take good care of your language and your country. Reflect on it and make sure to act!"

M. Maidla. Member of Academy Mihkel Veiderma. Teaduste Akadeemia – Eesti kollektiivne aju, INCORP Holding OÜ, Tallinn 2014, p. 86.

# THE FESTIVE ROUTINE

---

In an anniversary year, every undertaking takes on a festive aura. This includes routine annual meetings and other activities.

By April, the bright start of the year, the solemn ceremony and the grand reception had become fond memories. As the next step, the General Assembly called its annual meeting in Tartu, at the Estonian National Museum, which is an extraordinary place. Why April and why Tartu?

The first members of the Academy were confirmed on the proposal of the Minister of Education and through a decision of the President-Regent on 13 April 1938. One

week later, on 20 April 1938, the first Plenary Assembly of the Estonian Academy of Sciences was symbolically held in the hall of the Council of the University of Tartu. That is, all members of the Academy gathered together. We now call this type of meeting the general assembly. In this anniversary year the date falls on Friday, and the old council hall would by no means have accommodated the assembly and the guests. The 80<sup>th</sup> anniversary of the first Plenary Assembly was celebrated with a celebratory general assembly and a conference on Friday, 20 April 2018 at the Estonian National Museum.

## ANNUAL GENERAL ASSEMBLY, 20 APRIL 2018

Traditionally, the role of introducing the general assembly falls to the president of the Academy. First, however, the secretary-general and the office determine the number of members present and decide in the light of the law and the statutes whether an assembly can be held at all. The general assembly's decisions are valid only if a predetermined number of members is present. The Academy is old-fashioned enough to appreciate meeting face to face in academic life. Most of the time, we have lost colleagues between general assemblies, and we take time to reflect on them and mourn their passing.

The president of the Academy started by mentioning that a few weeks after the assembly, the presidency of the Swiss Academies of Arts and Sciences passed to a top humanities researcher, Professor of Egyptology Antonio Loprieno. This year, he also takes the office of president of the European Federation of Academies of Sciences and Humanities (p.38) ALLEA (previously held for six years by our very own Jüri Engelbrecht).

Antonio Loprieno's agenda could be a mirror image of the goals and directions of our Academy. He says that academies speak with the voice of science and that the primary role of academies in modern countries is to bridge the gap between sciences and the economy. Therefore, it is increasingly important to interact closely with society

to make the meaning and necessity of science clear to all; he adds that a broad spectrum of opinions is one of the greatest experiences of the academic community. Collaboration between academies is a unique opportunity to showcase the science of your country in the international arena, as well as to practise modern inter- and trans-disciplinary research.

Naturally, the decision to ignore the long-standing tradition of scheduling general assemblies on Wednesdays warranted an explanation. Members appeared to generally accept the reason that the first general assembly of the fledgling Estonian Academy of Sciences took place precisely 80 years ago. It was a small step for the first couple of dozen members, but a giant leap for Estonia on its way to the community of modern countries.

This day is also commemorated by national institutions. The Estonian postal service released postal stationery whole items dedicated to the 80<sup>th</sup> anniversary of the Academy. Technically speaking, whole items are thematic envelopes or postcards with pre-printed postage stamps. It doesn't seem like much, but it is like being in a song: if you're on a postage stamp, you exist in the eyes of the whole society. Member of the Academy Karl Ernst von Baer, for instance, is widely known among Estonians largely due to appearing on the two-kroon note.





Photo: Asko Foto

In his speech, Prof. Valsiner emphasised the need to strive for new achievements. Being merely good on the world class level is not enough. Contentment equals defeat in the endless race for excellence. He referred to the Achilles paradox, where the invincibly fast Achilles is defeated by a relentlessly slow tortoise.

And hence a question for Estonian social scientists: have they reached the world class level yet?

Academic discussion always forms the core of the general assembly. A compulsory part of the spring general assembly is a review of the previous year. Traditionally, it is given primarily from the points of view of heads of divisions. But since a picture is worth a thousand words, the laureate of the national cultural lifetime achievement award employed the language of tapestries: her retrospective exhibition was on display at the other end of the huge museum building.

The general assembly heard presentations by the recent lifetime achievement award laureate, Member of the

Academy Agu Laisk (more on national awards on p. 34–37) and Prof. Jaan Valsiner, who was elected a foreign member of the Academy half a year before (on 6 December 2017). The scientific presentation of Academy Member Laisk focused on his life's work: **Photosynthesis in Monochrome and Colour**.

Professor Jaan Valsiner's presentation was intriguingly titled **From a Small Country into the World: An Intimate Scientific Travel Memoir**.

Margus Maidla interviewed Jaan Valsiner for the 8 June 2018 edition of the Sirp culture newspaper. Here is an extract from this long article:

**At the spring general assembly of the Academy of Sciences, you gave a thought-provoking autobiographical speech, in which you used two terms: “optimal lateness” and “constructive arrogance”. Please tell our readers more about these terms.**

Indeed, “optimal lateness” was an invention for my Tartu speech, meant to emphasise the need to calibrate actions with reference to local requirements: if silly demands abound, it makes sense to wait till they disappear or are scrapped.

Officials can be offered polite replies about how “we are considering the best way to implement your new action plan”, but meanwhile, actual important work needs to go ahead. “Non-optimal lateness” exists as well, of course. For instance, paying for education was abolished in Estonian universities a couple of years ago, and bringing it back in some shape or form is now back on the agenda.

Meanwhile, universities' economic bases have gone downhill. Universities across the globe are experiencing financial difficulties and they lean ever more on students' limited resources. We could ask how much headway Estonian universities have lost compared to the global average, and how late we are in admitting that paying for education is a necessary, though not perfect, way to increase each university's strengths.

It is a question of emphasis: whether modern universities are institutions of HIGHER education or institutions of higher EDUCATION, whether they include students in the creation of new core knowledge by utilising their youthful energy (I lived in such an environment myself in Tartu in the 1970s) or they turn into a straightforward final educational stage dispensing diplomas for passing courses. This is a scenario I am currently seeing globally, including in Estonia. Universities are turning into factories that mass-produce certificates in various competences, except for the competence of creating new competence.

“Constructive arrogance” is a concept I've been talking about for several years. It may well be my means of moral self-defence. I am fairly arrogant in my views about the development (or, rather, stagnation) of psychology as a science and the ways it has been practised over the last century.

The underlying goal of my criticism is to create a foundation for a kind of psychology that proves Immanuel Kant's prediction wrong that the disciplines of chemistry and psychology will never become sciences proper. Chemistry became a science through the theoretical developments of 1830–1870, but psychology continues to toil in the no man's land between *Naturwissenschaft* and *Geisteswissenschaft* [natural sciences and humanities – ed.] it entered in the last decade of the 19<sup>th</sup> century. The goal of my arrogance is to find new constructive aspects, to reuse the old foundation in erecting a new structure.



## Postal Stationery Estonian Academy of Sciences 80

**T**he whole item postal stationery ESTONIAN ACADEMY OF SCIENCES 80 was unveiled at the formal general assembly of the Academy. It is a pre-stamped postcard released by the Estonian post service on that day to celebrate the Academy's anniversary.

The stamp side of the whole item features a photograph from the first general assembly of the Academy on 20 April 1938 at the University of Tartu council hall. The back displays a group picture of the members taken at last year's spring general assembly. The front additionally features a picture of the Academy building (Kohtu 6, Toompea, Tallinn). This building was erected between 1865–1868 and initially belonged to *Graf* Ewald Alexander Andreas von Ungern-Sternberg (1824–1899). It was given to the Academy to use for work and formal functions in 1946. It has become a symbolic representation connecting the Academy's form and meaning.

The back of the ESTONIAN ACADEMY OF SCIENCES 80 whole item displays a group picture of the members taken at the 2017 spring general assembly.

The volume of the print run is 1500 items. The price includes postage paid to anywhere in the world. On the day of the general assembly, 155 whole items were posted in Tartu to friends and colleagues of the Academy in Estonia and abroad. On the release date of the whole item, a first day special stamp was used in Tartu. A replica was available for purchase at the Estonian National Museum.

The whole item was designed by the Omniva graphic designer Indrek Ilves, and coordinated by the head of the publication committee Ain Muldma and the Academy-side coordinator Ebe Pilt.

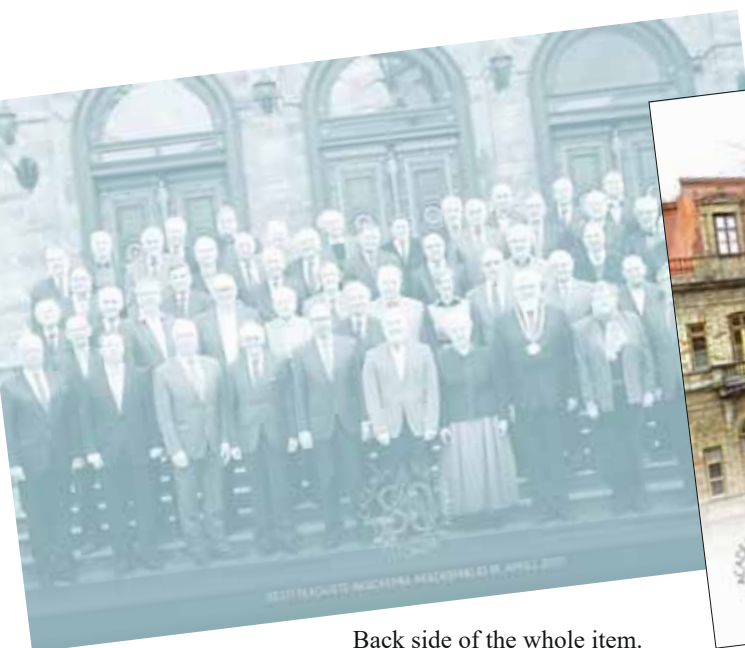
### Did you know?

The first pre-stamped postcard (whole item) was released in Austria in 1869. It simplified postal service to some extent by removing the need to buy a stamp and affix it to the dispatch. Envelopes and cards carrying pre-printed notes that the postal fee has been paid are essentially equivalent. Such illustrated envelopes, costing one or two pennies, were issued by the Royal Mail in England with their first postage stamp in 1840. They are known as Mulready envelopes after their designer. His jealous "friends" lampooned the artistic level of the envelope cruelly; furthermore, it could not keep up in popularity with the first postage stamps, and was thus removed from circulation the following year. Similar stamped envelopes were introduced in 1845 in Saint Petersburg, costing five silver kopeks for postage and one kopek for the envelope.

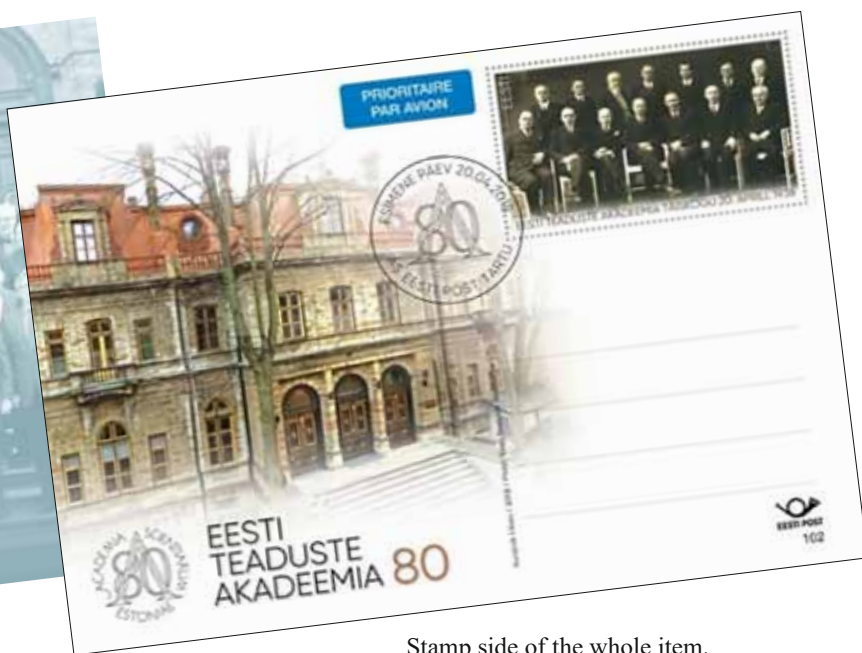
Modern whole items are issued with printed-on stamps as well as text stating that postage has been paid. Most such miniature information devices are of impeccable artistic design and commemorate an anniversary or an event.

By printing on a stamp (signifying postage paid), the post office makes the item – the envelope or postcard – whole. Thus, after the Second World War, illustrations used on such publications, as well as texts with postal elements (postage stamps, pre-printed stamps and date stamps) attracted the interest of philatelists.

Source: *Philatelist Eero Lõhmuste*, Pärnu Postimees, 04. August 2000



Back side of the whole item.



Stamp side of the whole item.

After the presentations, we proceeded with a fairly regular general assembly, and a hopefully reasonable amount of reporting and retrospective was presented by heads of divisions and the president.

The president described 2017 as a year of contrasts for the Academy. A lot of positive things happened, several plans reached fruition and even some dreams came true. On the other hand, it was a year of grief. Within 373 days, we lost eight members and a foreign member. Several staffing changes took place in the administration of the Academy, but disruption to its functioning and to the fulfilment of strategic goals was avoided through the dedication of the new secretary-general and the office staff.

On the positive side, the Academy has become steadily more prominent in society. The thoughts of the members, of course, have always been heard. The “Eesti mõttelugu” (The Story of Estonian Thought) series confirms this. They have always been an integral part of our cultural space. What is new is the way we have managed to make them ever more appealing to the mainstream media and accessible to the general public. One of the indicators of this is the lifetime achievement award for science communication presented to Ene Ergma. Another indicator is the success of the three-minute lectures series. It appeared in print last year and showed that content presented at the Academy has significant commercial potential.

Last year we managed to realise, more or less, the recommendation made by former President of Estonia Toomas Hendrik Ilves for the 70<sup>th</sup> birthday of the Academy: to maintain a presence in the media. Few weeks have passed without comments or opinion pieces by members of the Academy in some media channel. Jaan Undusk believes that the Academy is becoming an inescapable opinion leader.

The long-term goal is, to borrow the words of Jaan Valsiner, to get ahead of the world. We tend to doubt this is possible. But that our results are ahead of the world is confirmed by the science video created by Science magazine based on Hillar Aben’s solutions that became one of the most popular science videos of 2017. This level of recognition is a first in the Baltic Sea scientific landscape. It underscores that we need not be ashamed of our research results. Arvo Pärt is crowned with awards every year. The younger generation follows him. Lauri Mälksoo was awarded the Peregrinus Prize. Andres Metspalu was recognised with the Baltic Assembly

research award. The recognition received from neighbours is perhaps even deeper and more important.

Antonio Loprieno emphasised that it is our inescapable duty to build bridges among different parties and to work towards creating cohesion in society. This work is represented by three major achievements in 2017. A significant achievement is the creation of the Estonian Young Academy of Sciences. The voices of top young Estonian researchers have been consolidated, and their thoughts and recommendations strongly represented in society. Approving of all of their thoughts and recommendations is not and never was the goal.

Furthermore, the importance and influence of joint academic reflection exercises keeps increasing. They stream the competence gathered in academia and in sciences into society and the state. The two 2017 seminars on the perspectives of Estonian wood chemistry and the associated advisory work are good examples. Their influence is reflected in the collection “Estonian Academy of Sciences: In Words and Images 2017”. Finally, collaboration with the private sector and private funding were redefined through the establishment of two new international awards: the L’Oréal stipend “For Women in Science” (awarded to Els Heinsalu, head of the Estonian Young Academy of Sciences) and, as a major event, the Endel Lippmaa Memorial Lecture and Memorial Medal. This embodies a paradigmatic shift in the structure of the Academy’s awards, since it is aimed at top researchers globally.

Finally, the president mentioned that the annual report of the Academy need not be dry or formal these days. Increasingly, reporting is done in a way that is accessible to many of our colleagues. Often a picture is worth a thousand words. The first attempt, “Estonian Academy of Sciences: In Words and Pictures 2017”, has now been sent to members for their feedback.

The end of the general assembly was enlivened by the birthday gift to the Academy by Member Anu Raud, the laureate of the 2018 lifetime achievement award: a gorgeous tapestry of her own creation. She must have realised that birthdays, after all, mean presents. She knew that there is a wall in the Academy building with space for a tapestry. She resisted the temptation to exhibit the tapestry.

The tapestry is titled “A Letter from the Ancestors”, a title that might reveal a lovely research effort in genetic



Photo: Eha Inkinen

of the Academy need not be dry or formal these days. Increasingly, reporting is done in a way that is accessible to many of our colleagues. Often a picture is worth a thousand words. The first attempt, “Estonian Academy of Sciences: In Words and Pictures 2017”, has now been sent to members for their feedback.

The end of the general assembly was enlivened by

the birthday gift to the Academy by Member Anu Raud, the laureate of the 2018 lifetime achievement award: a gorgeous tapestry of her own creation. She must have realised that birthdays, after all, mean presents. She knew that there is a wall in the Academy building with space for a tapestry. She resisted the temptation to exhibit the tapestry.

The tapestry is titled “A Letter from the Ancestors”, a title that might reveal a lovely research effort in genetic

engineering or psychology, a photosynthesis formula or even a poem. The crosses on the tapestry also refer to the signs of our ancestors. It was not that long ago that three crosses served for a signature. It gives cause to reflect on how far we have come.

The tapestry might come in handy in times of turmoil, when we must decide whether or not to build a major road or railway, or which of us deserves – or does not – a monument. But what if we imagine meeting, in the second half of November, traditionally the All Souls time in Estonia, an ancestor come to quietly visit? What would they say? What would they approve of and what would they disdain? Perhaps the patterns hold a hint.

A vice-president, the art historian Mart Kalm, first replied to the gallant present of our colleague that all he could add to her words was how good it was to be given a tapestry in the precise room that hosted us at the time. He recalled that giving presents to the Academy is not unprecedented.

In the early 1970s, Academy Member Tuglas donated his house to the Academy. It now holds the Under and Tuglas Literature Centre. Unfortunately, this charming precedent has not been widely taken up.

In conclusion, he stated that the Academy building has a suitably dignified place for the tapestry. The antechamber to the Academics' Room currently displays some works of a correspondent member of the Academy, the architect Harald Arman. The back of the room has a dark green wall which will serve as a perfect background for Anu Raud's luminous white tapestry.

And thus, the tapestry now adorns one of the walls of the small room to the right of the entrance lobby. When hurrying to the Academics' Room, it is worth stopping there for a moment to catch your breath.

There were some arguments at the general assembly over how exactly the election of new members, planned for the winter assembly, should be conducted. Three technical

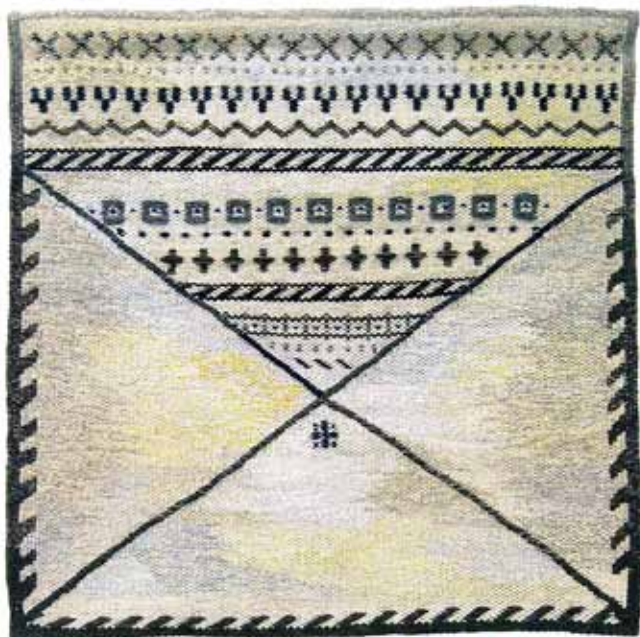


Photo: Piret Suurväli

The tapestry „A letter from ancestors“, a gift from Anu Raud to the Academy.



Photo: Estonian National Museum



Photo: Kaja Engelbrecht



details were brought up: who should be given the right to nominate candidates, when they should be nominated and registered, and what to do if the votes are split in a way not covered by the current election statutes. The first two were quickly settled. The third aspect required thought and discussion, but the solution functioned exceedingly well at the winter assembly.

The second half of the day was dedicated to the anniversary conference **“The Story of Estonian Thought”**

Presentations were made by Hando Runnel, Mart Jagomägi, Jaan Undusk, Ülo Matjus, Pärtel Piirimäe and Ester Oras. The conference was moderated by Academy Member Jüri Engelbrecht.

All attendees were invited to view Member of the Academy Anu Raud’s retrospective **exhibition “Isamaastikud”** (*Landscapes of My Fatherland*).

The exhibition opened barely a week before the general assembly. Anu Raud kindly commented on the exhibition, as well as on the tapestries.

Academy Member Raud received a lifetime achievement award in culture (see also p. 34–37).

Professor emeritus and Member of the Academy Anu Raud’s retrospective exhibition “Landscapes of my Fatherland” displays her greatest works, which form a whole, a story of thought. Anu Raud is one of the most recognised textile artists in Estonia; her lucid approach to life is always valued and she has dedicated her life to teaching. In addition to her legendary works “The Collectors”, “Kiln-drying Barn” and “Nordic Night”, a number of entirely new tapestries, dedicated to the centennial of the Republic of Estonia, are on display, including the title tapestry “Landscapes of My Fatherland”.

The exhibition is accompanied by drawings and photos by her students that depict the inspiring milieu of Raud’s hometown at Kääriku. The exhibition is dedicated to Anu Raud’s 75<sup>th</sup> birthday. It is supplemented with a map of reproductions featuring the artist’s biography, her recent bibliography, and 40 reproductions of her famous and new tapestries.

(Extract from the website of the Estonian National Museum)



Photo: Kaja Engelbrecht

**THE SURVIVAL  
OF VENICE IS  
DEPENDENT ON ITS  
LAGOON SYSTEM  
BUT THIS IS BEING  
SERIOUSLY ERODED  
BY SHIP TRAFFIC**

SOURCE: Fast shoreline erosion induced by ship wakes in a coastal lagoon: Field evidence and remote sensing analysis. PLoS ONE 12(10): e0187210, October 2017.

**THE SURVIVAL  
OF VENICE IS  
DEPENDENT ON ITS  
LAGOON SYSTEM  
BUT THIS IS BEING  
SERIOUSLY ERODED  
BY SHIP TRAFFIC**

SOURCE: Fast shoreline erosion induced by ship wakes in a coastal lagoon: Field evidence and remote sensing analysis. PLoS ONE 12(10): e0187210, October 2017.

**THE SURVIVAL  
OF VENICE IS  
DEPENDENT ON ITS  
LAGOON SYSTEM  
BUT THIS IS BEING  
SERIOUSLY ERODED  
BY SHIP TRAFFIC**

SOURCE: Fast shoreline erosion induced by ship wakes in a coastal lagoon: Field evidence and remote sensing analysis. PLoS ONE 12(10): e0187210, October 2017.

## MEMBERS OF THE ACADEMY: FROM THE MONOGRAPH TO THE TWEET

This is the title of the Academy's anniversary exhibition, which in itself is new. On 12 June, an exhibition curated by Harry Liivrand was opened at the gallery of the Tallinn University Academic Library. Members of the Academy each offered up one of their publications, whether a dense monograph, a weighty article in the culture supplement of the Postimees national newspaper, or a simple modern tweet.

Almost every member got to choose their own contribution. Some members preferred to forego writing and let either a tapestry (Anu Raud) or a composition (Arvo Pärt) speak for itself. The president explored the boundaries of the curator's trust. He organised something that looks like an election campaign ad, but was actually prepared behind the backs of the scientists (as evident next to Mart Kalm, see the photo) and which, through its exploration of the Venetian problems (see the fact box), made evident how much the work of scientists can affect public opinion.

The opening and the entire duration of the exhibition were pleasantly crowded, so the organisers decided to extend it by a couple of weeks.

An awards book fresh off the printing press was presented immediately after. A joint publication, "Awards of the Republic of Estonia, 2018", was prepared in collaboration between the Academy, the Ministry of Culture, and the Ministry of Education and Research (see also p. 34–37).



Vice-President of the Academy Mart Kalm greets the visitors. The stand displays posters designed in Venice based on the message of scientists.



Secretary-General of the Academy Jaak Järv opens the exhibition.



### **The work of Estonian researchers initiated a push to rescue one of the most unique cities in the world**

Venice, a pearl of the Mediterranean, was founded nearly one and a half thousand years ago on the islands of a shallow lagoon with a fragile natural environment. The modern shipping traffic on the canals dug in the lagoon threatens the city and the isles alike. One of the goals of the non-profit association We are here Venice (WahV) is to decrease the harmful impact of giant cruise ships entering the Venetian lagoon. The association bases its messaging on international research, whose authors include Estonian scientists.

The Italian government plans on limiting ship traffic in Venice, but according to the WahV's estimations, the plans are insufficient to protect the lagoon. Although ships with a displacement of over 55,000 tons will no longer be permitted in the lagoon, the government has proposed the controversial idea of excavating a new canal in the lagoon to allow cruise ships to enter the heart of Venice from the north.

[...] In 2014, nine international scientists under the aegis of the Venice Institute of Marine Sciences (CNR ISMAR) began to explore the impact of dense cruise ship traffic and the resulting erosion on the Venice lagoon. The research included researchers from Ca' Foscari University in Venice, James Cook University (Australia) and Sacred Heart University (US), as well as Tallinn University of Technology researchers Tarmo Soomere and Kevin Parnell. This is not the first time Prof. Parnell's work has impacted national policy. His measurements supported the decision to abolish high-speed vessel traffic in certain New Zealand fjords.

The researchers established that several decades' worth of heavy maritime traffic in the canal in the west of the lagoon has caused extensive damage to the beach and to the lagoon's ecosystem. They concluded that heavy maritime traffic has gradually deepened the central part of the lagoon and has destroyed its natural habitats. Anthropogenic excavation opens the way for storm waves and exceptional water influx directly into Venice. Constant agitation of the sediments can raise the centuries of contaminants in the bottom of the lagoon, threatening nature and humans alike.

Now, the WahV is basing its messaging on the results of the three-year-long research effort. The goal of their campaign is to make the general public realise that the idea of creating yet another channel in the lagoon is not a good solution to the cruise ship problem. The central message is that the survival of Venice relies on the perfect functioning of the lagoon's ecosystem and that any strategic decisions must be based on evidence.

It is quite unusual that the results of this research effort have been spread, rather than through the researchers' own tweets, by posters designed by patriots of their home city, which were pasted all over Venice and spread through social media. The scientists' messages are now also printed on stickers which spread like wildfire on packages shipped by local firms. Many of those concerned about the future of Venice also use them on greeting cards and wrapping paper, as well as displaying them on clothing.

<http://forte.delfi.ee/news/maa/eesti-teadlaste-too-andis-touke-uhe-maailma-ainulaadsema-linna-paastmiseks?id=83222243>



Photo: Ede Pilt x4

The displayed items ranged from massive monographs to opinion pieces in daily newspapers.

## THE GENERAL ASSEMBLY, 5 DECEMBER 2018

At the end of the year, at the beginning of the holiday season, the Academy gathered again for a regular – yet quite extraordinary – meeting. It started with the president's welcoming speech.

The tradition of describing years according to their notable characteristics is taking root. 2017, for instance, was titled the year when plans came to fruition. Several bold and courageous undertakings became reality in that year. The 2018 keywords were predefined: it was a double anniversary year. The Republic of Estonia 100 and the Academy of Sciences 80 together meant, as interpreted by the president, that one of the fundamental parts of the symbol of the Academy – the infinity symbol, or number 8 lying on its side – stood up to salute the year. Hopefully, this was to honour the Academy's achievements.

The Academy gained even more standing in the society, mainly through its cooperation with other cultural, educational and research institutions. The way was paved by the academic lecture series "The Way to the Poska Academy" in the high schools of Tartu and its apogee was the debut of academic discourse on the theatre stage in a joint project between the Von Krahle Theatre, Vikerraadio and the Academy titled "Life after Google" (see also p. 56–57). There were twelve lectures on the theatre stage to sold-out audiences, the Academy members' improvised concluding vignette, each lecture broadcast on radio and spiced with an abbreviated version of the vignette, and finally the publication of the full vignette as an essay or an opinion piece in *Sirp*, *Postimees* or *KesKus*.



Raimund-Johannes Ubar, Leo Mõtus, Andres Õpik







Photo: Reii Kõik x11

Jaak Aaviksoo







Jaan Undusk



We served our country by offering scientific advice and importing relevant international experience. On 26–27 June, the Academy hosted science advisors of the governments of European countries and representatives of the European Commission at the fourth meeting of the ESAF (European Science Advisors' Forum).

Representing and developing the science landscape, a conference for young Estonian researchers working abroad is rapidly turning into a tradition. It is vital for a small nation to maintain a connection with our best and brightest, as pointed out by Academy Member Maarja Kruusmaa (p. 51). The closer their interaction with their home country, the easier it is to return equipped with new experiences.

Attempting to fulfil our task as an emissary of foreign communication, we organised, as the last act of our anniversary celebrations, the international conference “Advisory Role of Academies in the Information-Rich Society”. The speakers were many top researchers with important messages for academia and society. The event provoked feedback in Australia and in Central America (see also the interview on p. 45).

The members of the Academy received, and the Academy granted, a number of awards. Anu Raud received a lifetime achievement award in culture and Agu Laisk in science. Ülo Niinemets was awarded his third annual award. Academy members are regular fixtures on the Plekktrumm TV show; the most recent invitee was our new foreign member Jaan Valsiner. Arvo Pärt was awarded an honorary doctor's degree by Fryderyk Chopin University and Tarmo Soomere by Klaipėda University, as well as the



Order of the Tallinn Coat of Arms. Ülo Niinemets was awarded an honorary doctor's degree by the Aurel Vlaicu University of Arad in Romania.

The Academy remains a thought leader. In the Eesti Päevaleht national newspaper's top 100 opinion leaders (which we, of course, take with a pinch of salt), there are three of us, and the omission of a fourth has raised quite a few eyebrows. The L'Oréal stipend "For Women in Science" was awarded to Karin Kogermann, a founding member of the Estonian Young Academy of Sciences. Such keywords as research, culture and sports awards and the F. J. Wiedemann language award were brought together in one collection; the training of the three-minute challenge participants and the Postimees newspaper academic column dissecting the relevance of science to society have become local classics (*abbreviated from the president's opening statement*).

Next up was the invited speaker of the general assembly, the foreign member of the Academy Professor Ülo Langel. His presentation focused on new pharmacology.

After a short break, technical aspects were discussed. The size of the Academy's board was changed, the board's mandate was extended by a few weeks, and a third vice-president was elected. And only then did we get to the most exciting matter on the agenda: electing new members. Twenty candidates had been nominated and there



were only seven vacancies (see also pp. 60–61). The meeting promised to be long and tense with excitement.

And it was. It is next to impossible to pick the best among the best. The elections were tense throughout. It took an unprecedented number of rounds – four in total – to pick the seven new members from the twenty candidates. This is where the complementary rules that were passed at the spring assembly came in handy. They helped to settle beyond dispute the stalemate concerning one vacancy, which, according to the old regulations, might have led to leaving it empty.





Kalle Kirsimäe

### *The new members of the Academy are:*

#### **Anne Kahru, Ecotoxicology**

Anne Kahru is a leading researcher at the National Institute of Chemical Physics and Biophysics and was previously selected as a research professor at the Estonian Academy of Sciences (see also p. 58–59). Ecotoxicology as a field focuses on the ways that substances in the environment surrounding us can impact or damage human health, as well as wild fauna and flora.

#### **Marco Kirm, Exact Sciences**

Marco Kirm is a Professor of Experimental Physics at the University of Tartu. He researches the radiation physics of wide gap materials and optical materials based on ions of rare earth metals.

#### **Kalle Kirsimäe, Geology**

Kalle Kirsimäe is a Professor of Geology and Mineralogy at the University of Tartu. Estonia counts on his valuable knowledge of using the production residue of the extractive and energy industries in environmental technology. He led an international research group that explored the oldest known salt deposits, nearly two billion years of age, deep in the Russian Karelian soil. Analysing sedimentary rocks nearly three kilometres deep in the ground reveals information on the first oceans of the planet and the development of an oxygen-rich atmosphere.

#### **Jarek Kurnitski, Engineering**

Jarek Kurnitski is a Professor of Energy Efficient Buildings and Indoor Environment at Tallinn University of Technology and an Adjunct Professor at Aalto University. He is a scientist who knows and promotes everything in Estonia that is related to energy- and resource-efficient buildings. He researches ways to build nearly zero energy buildings and to renovate old buildings to be energy efficient. In 2018, Jarek Kurnitski also received a national award (see also p. 37).



Jarek Kurnitski

#### **Tiina Randma-Liiv, Social Sciences and Governance**

Tiina Randma-Liiv is Professor of Governance at the Tallinn University of Technology. She researches public administration reforms, the impact of economic crises on public management, and governance in countries in transition.

#### **Anu Realo, Cultural Studies**

Anu Realo is Professor of Personality and Social Psychology at the University of Tartu and Associate Professor at the University of Warwick, a researcher who knows what makes a real Estonian. Anu Realo's main research subjects are personality and emotions, social capital, values and subjective well-being, and the the impact of culture and of genetics on personality development.

#### **Tiit Tammaru, Human Geography**

Tiit Tammaru is a Professor of Urban and Population Geography at the University of Tartu. He researches a currently extremely relevant topic: migration and segregation in European cities, including the questions such as why the Estonian and Russian populations of the Lasnamäe district of Tallinn do not integrate and why there are “fences” between Estonian and Russian children and young adults.

Marco Kirm







Anne Kahru



Anu Realo



Tiit Tammaru

Tiina Randma-Liiv



Photo: Reiti Kõkk x8

President of the Academy Tarmo Soomere noted that the selection process took four hours. "All 20 candidates are top researchers with visibility far beyond Estonian borders. Since academic elections do not have fixed or sufficient conditions, but are based on the way the elections strengthen the Academy, Estonian science and the competitiveness of Estonia as a whole, the choice is made here and now," the president explained. The final decision was made in four ballot rounds.

Unlike in 2016, all vacancies were filled. Last time, President Soomere said, the problem did not lie in indecisiveness but in the fact that the candidates did not stand out from the others sufficiently. "This was not a rejection. It showed that a decision had not yet been made," Soomere clarified.

According to Professor Soomere, a perfect modern Academy member has to be a universally excellent scientist with strong organisational capabilities, a clear speaker, and a good writer possessed of a strong social sense. "These qualities never come together in any one person in optimum distribution. This is what makes the choice so tough. Everybody is strong in some category," the professor stated.

He went on to say that the election of new foreign members would be considered in the following year, and the topic of new Estonian members of the Academy would come up again in 2020 at the latest.

*Estonian Public Broadcasting journalists Jaan-Juhan Oidermaa and Marju Kadakas*

<https://novaator.err.ee/882408/teaduste-akadeemia-valis-seitse-uut-akadeemikut>





Mart Kalm

## *More Hands at Work*

### **Electing a Vice-President**

The management of the Academy traditionally includes the president, two vice-presidents, and the secretary-general. At the end of the year, a **third vice-president** was added.

The vice-presidents elected four years ago have done an outstanding job, the president told the General Assembly, but life changes the best-laid plans. One of the current vice-presidents is carrying a large administrative workload and the other is, for reasons not under his control, not always able to participate. On the other hand, the need to represent the Academy on multiple levels and in different parts of Estonia has grown rapidly. A positive trend is that the Academy's advice is sought increasingly often. Current practice shows that formulating this advice almost always requires the opinions of experienced researchers and in-depth consideration. Therefore, we need additional help on the vice-presidential level.

The Academy is clearly visible, present and well represented in Tallinn. However, several strategic partners, such as the Ministry of Education and Research and the Estonian Research Council, are located in Tartu. Moreover, over half of our members reside in Tartu. The Office of the Academy, however, is represented there by a single staff member. Therefore, it is in Tartu that the representative capability of the Academy needs reinforcement.

The president nominated Member of the Academy Arvi Freiberg as a candidate. Professor Freiberg has extensive, decades-long science management experience spanning various levels, he is an effective writer and an excellent speaker with demonstrated skill in public speaking and debate, he exemplifies the systematic, natural laws-led way of thinking germane to physicists and, naturally, he has an excellent academic portfolio. Long-term work experience with Vice-President Ergo Nõmmiste will, no doubt, allow him to get up to speed in no time.



Photo: EAS

Arvi Freiberg

The General Assembly unanimously granted **Member of the Academy Arvi Freiberg** the vice-presidential mandate.

**Arvi Freiberg** (b. 28 June 1948) is an Estonian biophysicist and plant physiologist. He has been a member of the Estonian Academy of Sciences since 2009.

At the end of 2018, the administration of the Academy consists of five people.

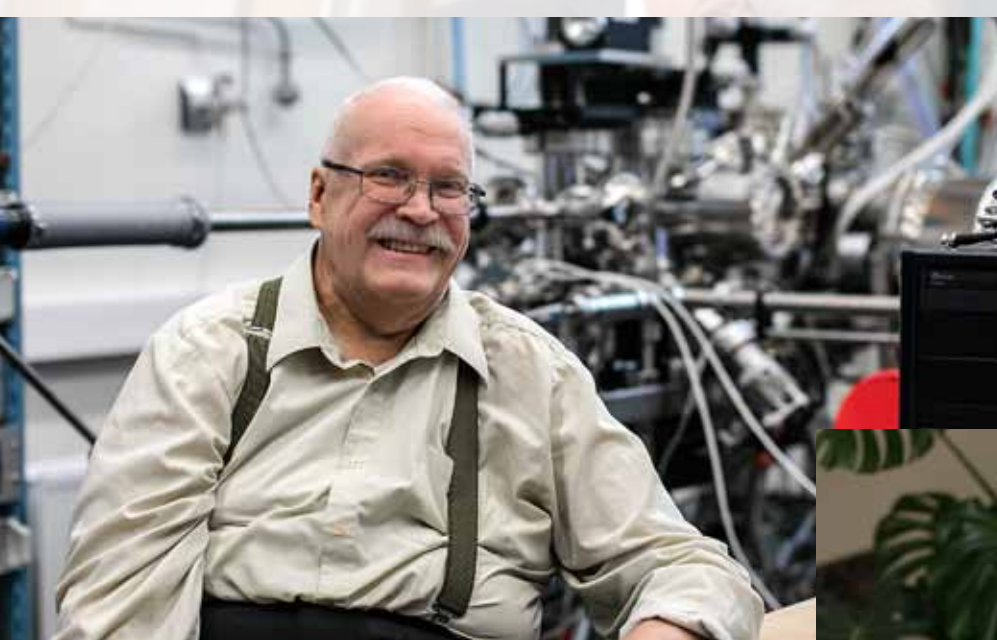
**PRESIDENT: Tarmo Soomere**

**VICE-PRESIDENT: Ergo Nõmmiste** † 11.04.2019

**VICE-PRESIDENT: Mart Kalm**

**VICE-PRESIDENT: Arvi Freiberg**

**SECRETARY-GENERAL: Jaak Järv**



Ergo Nõmmiste † 11.04.2019

### Extracts from the Concluding Remarks of President of the Academy Tarmo Soomere:

Despite the success of today's elections, the topic of electing new members, full and foreign, will come up again next year.

Four years ago, the general assembly gave the new administration a mandate to work towards four goals:

1. Strengthening the Academy's voice and its visibility in society;
2. Representing and developing the scientific chain in a dignified manner;
3. Becoming an independent and professional advisory body of the Estonian state (in particular, for the government and the parliament);
4. Continuing our work on the international level as an ambassador of top-level research and a pioneer in making use of the experiences of our sister academies.

Additionally, developing the Academy as an institution by retaining and modernising existing competence and finding opportunities for additional funding was pointed out as important.

The Academy has done well in all of the above, not necessarily by making progress in each of them every year, but over the four years progress we can be proud of what has been made in each of them.

Referring to the adventures of Lewis Carroll's Alice, it takes running as hard as we can to just stand still (or to stay competitive). Presidential elections await us in the upcoming year. And hence, from now until next summer we ought to reflect on what a perfect Academy of Sciences might look like for Estonia and what steps should be taken to move towards it.



Jaak Järv

Photo: Reii Kook x5



Tarmo Soomere



# NATIONAL RESEARCH AWARDS

On 20 February 2018, the national research, sports and culture awards, as well as the F. J. Wiedemann language award, were announced at the Wiedemann Gymnasium in Haapsalu.

Both of the lifetime achievement awards stayed in the Academy: one of them was awarded to a member of the Academy and the other to one of the scientists elected to the Academy on 5 December 2018. Academy Member Anu Raud was awarded the cultural award for lifetime achievement.

The Estonian state has delegated the national research awards procedure to the Academy. This means helping to draft the rules, announcing the competition, reviewing and registering the applications, then analysing them in depth and making decisions concerning the awarding or non-awarding of prizes. The awards committee is formed by the government.

Traditionally, two national research awards for outstanding lifetime achievements, or lifetime awards, are granted every year. Eight annual awards are given to highlight the best research work completed and published during the previous four years in specific fields of research. Awards for an outstanding scientific discovery, so-called discovery awards can be given for scientific discoveries that changed the paradigm of or world-view in particular areas of research, or that created a new field of research or led to the creation of an innovative product which has a significant socio-economic impact. In the absence of suitably high-level research efforts, the committee has the right to abstain from awarding any of the above prizes.

T. Soomere, E. Pilt, Estonian Academy of Sciences in Words and Images 2017. Tallinn 2018, p. 25.

## *The prime minister's greeting*

Dear President of the Academy of Sciences!  
Dear Ministers!  
Dear researchers, artists and athletes!  
Dear laureates! Dear guests!

It is my great honour to be here today to recognise you for your outstanding contributions to the long list of Estonian cultural, art and research achievements. They are important for Estonia and the entire world!

On the eve of its hundredth anniversary, the Republic of Estonia is still fairly young, and our labours in the field of high culture are barely half again as old. In one hundred and fifty years, we have become a people with a high culture and have founded a state that is based on this culture. We have found our respected place and successfully integrated into world culture. Our culture has advanced us and played an important role in the weightiest moments of Estonian history, in the Age of Awakening and the creation of an independent state, in maintaining the sense of a coherent nation in the hard years of the past and in restoring our independence.

We have a lot to offer to the world: in science, in art and in sport. We have clearly and proudly fulfilled the aspirations set by Jakob Hurt; as a small nation, we have become great in spirit, and it is through education that we have achieved this. Education, a culture of art and innovation are preconditions for the development of any society and a guarantee of its continued existence. High achievements in science and art are based on systematic work, talent and creativity.

Creativity and imagination are born in libraries, laboratories, studios and academies, through effort and extending one's own limits. They are present everywhere where people are hard at work. They provide reasons for people to learn and practice, to extend their skills and to hone them through long years of labour.

Every great achievement begins with the first step, the first exposure. Therefore, it is important, in addition to our





Photo: Anika Haas x5

daily work and dedication to our specialities, to inspire future generations, because they will continue our work. Furthermore, we must find ways to recognise everybody who offers inspiration, perpetuates it and helps to shape it into new achievements.

Our science, art and sport, and, more generally, our entire culture and Estonian identity, are exactly as great as our most notable young people. And their future is defined by how much they can engage our people as a whole. Therefore, we must labour to reach every person in Estonia. Intellectual wealth is one of the major indicators of the viability of a nation and it must be carefully cultivated. Only through this can we guarantee that the Estonian spirit will go on. There are not enough of us to leave out a single person, whether an able researcher, a talented athlete or a young person still looking for their way. We cannot afford to disregard any of them. It is through this that we can show our dedication in safeguarding our people, our language and our culture.

Ladies and Gentlemen!

The viability of our culture, education, science and sport is of clear importance for a dignified future and the greatness of our country. We must show this to our children from the cradle on, and support them later on in their lives. Only in this way can we walk boldly down the road towards the next big anniversary of our state.

My heartfelt congratulations to the laureates!

My best wishes to all of us for the 100<sup>th</sup> anniversary of the Republic of Estonia!

Long live Estonia!

Jüri Ratas

“Eesti Vabariigi preemiad” (*The National Awards of the Republic of Estonia*), Tallinn 2018, pp. 9–10)

**The award for outstanding long-term research and development work went to an eminent researcher of photosynthesis and a professor emeritus of the University of Tartu, Member of the Academy AGU LAISK.**

This laureate hesitated before choosing between volleyball and the saxophone. Luckily for Estonian science, he ultimately chose physics instead. Fate led him to work on a truly global matter: photosynthesis. This process is the foundation of the entire functioning of nature. Its ingredients are carbon dioxide, water, minerals and solar energy, but the end products include a vast number of complex organic compounds. Its by-product is oxygen, without which we would not be here.

When Laisk started out, it was not known how much solar radiation or under which angle plant leaves receive this radiation, how much of it is captured, or how fast the plant grows. All of this had to be measured and interpreted.

The laureate has made good use of his motto: “if you cannot measure something with traditional tools, you have to find an alternative way.” Soon enough, he became a key representative of Estonian plant sciences in the international arena.

A younger colleague has written that with the guidance of Laisk, “the fastest ever photosynthesis measuring system was constructed, the most detailed model of photosynthesis was drawn up, and many photosynthesis research results that can be titled ‘world’s first’ were achieved. The laureate has reached the very top of the global research pyramid. This achievement will be unattainable for his colleagues for a long while yet” (“Eesti Vabariigi preemiad”, Tallinn 2018, p. 13).

#### **An extract from Agu Laisk’s acceptance speech:**

Toomas Paul, a wise man, reasoned in a morning sermon that Christianity changed the world because Christianity means having faith in love. In this sense, love is a broad term, encompassing not just passion, but also curiosity. “The end of curiosity and defiance is the start of fatal compliance,” August Sang once wrote. Research is done out of love for the world and a desire to understand it in depth. Great love often gives rise to something great and beautiful, and we are here today to witness it.

Love can never be alone. Every laureate today is supported by someone whose help they could rely on, whose shoulders they could stand on. I would like to thank my lifelong collaborator Vello Oja and long-time colleagues Hillar Eichelmann and Heikko Rämma. And I very much hope that each of us has a home made warm and cosy by a loving partner and friend.

Happiness is simple: happiness is looking forward to going to work in the morning and looking forward to going home in the evening.

Thank you for my happiness, Tiit! (“Eesti Vabariigi preemiad”, Tallinn 2018, p. 21)



Agu Laisk

**The national cultural award for outstanding life-long creative work was awarded to Member of the Academy ANU RAUD.**

**An extract from the speech of the Minister of Education and Research Indrek Saar:**

Anu Raud has made introducing our national textile art to the world her life's work. Many people, especially art students, know her as a country granny, but she has been living in the countryside, where she now manages a museum and a herd of sheep, for only a short time.

Inspired by folk art, her work – both as an uninterrupted tapestry weave and as an extensive cultural memory bank – forms a living connection with the past. It is close to our national identity and our roots. Her contributions in bringing up and teaching several generations of Estonian textile artists are vast.

Rare are the instances when somebody creates a museum with a valuable collection and then donates it to the state: in this case, to the Estonian National Museum (“Eesti Vabariigi preemiad”, Tallinn 2018, p. 252).

#### Quotes by Anu Raud

The beauty and power of folk art are so great because an entire people is its creator; it carries the joy of inspiration, a sense of beauty, and the spiritual power of the entire people. The folk art heritage is a holy spring of beauty to draw on. Let us not let it run dry.

I try not to be too theoretical in my teaching: it is possible to think in pencil and wool. I consider the hands-on part very important. And I consider immediate interaction



Anu Raud

important: students at their practical work sessions should talk to people. Upon seeing an old man, they should be able to notice what he is wearing and how he speaks.

If my tapestry serves as a present to the Queen of England, my sheep must have been well worth raising.

It feels as if I had God in my heart. Happiness. Excitement. I am outside. I am in the countryside. Good Heavens, what a wonderful morning! Thank You for this day! The sun shining over me, my fatherland under my feet and birds and flowers close, so close by me. /.../

This minute must not go unnoticed. Out comes the paint. Pencils, brushes, paper. Yarns and threads at hand. Ten fingers itching to get to work. My palms shaping my thoughts into matter..

**The annual award for geo- and biosciences was awarded to ÜLO NIINEMETS, a Professor of Crop Science and Plant Biology at the Institute of Agricultural and Environmental Sciences, Estonian University of Life Sciences, for the cycle “Mechanisms of acclimation and adaptation of photosynthesis: from canopy gradients to global rules”.**

Following in the footsteps of the lifelong achievement award laureate, the laureate of the geo- and biosciences annual award researches which specific plant characteristics determine the rate of photosynthesis and studies the way climate change impacts the capacity of Earth's flora to provide us with fresh air and enough food.

The laureate has successfully solved several long-standing puzzles. It turns out that plants use different





Ülo Niinemets



Jarek Kurnitski

mechanisms to achieve a similar rate of variation in photosynthesis. More importantly, the maximum values of photosynthesis have been globally underestimated.

The laureate, with his co-authors, has shown in a Science magazine cover story that plant leaf size is limited by maximum and minimum environmental temperatures. He convinced the world using the example of the Scots pine that in widespread species intra-population variation surpasses inter-population variation by a very large margin. He has also provided a base of information for developing a new generation of climate models able to predict biosphere processes and to suggest ways to raise crop yields (“Eesti Vabariigi preemiad”, Tallinn 2018, pp. 17–18).

**The annual award for engineering sciences was awarded to JAREK KURNITSKI, Professor of Building Energy Efficiency and Indoor Environment, Director of the Department of Civil Engineering and Architecture, School of Engineering, Tallinn University of Technology; he was elected a member of the Estonian Academy of Sciences on 5 December 2018 for his cycle “Nearly zero energy building system boundaries and technical solutions”.**

Cold winters and damp autumns mean that buildings need lighting, heating and ventilation. New buildings are designed to avoid heating the street and lighting the sky.

No single technology can make any building energy efficient. Overall solutions consist of many measures. However, one thing is certain: it takes smart solutions for energy production and its efficient use, transformation and storage.

The laureate of the engineering award is one of Europe’s leading researchers in building energy efficiency and indoor environments. His work brings together building engineering physics, technologies for maintaining suitable indoor environments, and technological systems solutions. His work has allowed for the testing of newly designed systems and solutions in actual size.

He knows how to optimise heating system output and minimise losses, combine different sources of heat and test the impact of controlled external shading.

Apart from his research, the laureate is a leader in the breakthrough currently taking place in Estonia in energy efficiency methodologies and designing and building energy efficient buildings (“Eesti Vabariigi preemiad”, Tallinn 2018, p. 16).

#### **The National Research Awards Selection Board:**

Tarmo Soomere (chair), Eero Vasar (vice-chair), Jaan Aarik, Toomas Asser, Tõnis Kanger, Rainer Kattel, Maarja Kruusmaa, Priit Kulu, Maris Laan, Valter Lang, Jüri Martin, Lauri Mälksoo, Marika Mänd, Ülo Niinemets, Karl Pajusalu, Ellu Saar (did not participate this year).

#### **The National Culture Awards Selection Board:**

Indrek Saar (chair), Martti Helde, Risto Joost, Krista Kaer, Tõnis Kahu, Eha Komissarov, Marge Monko, Kristjan Mändmaa, Triin Soone, Hagi Šein, Garmen Tabor, Toomas Tammis, David Vseviov.



# INTERNATIONAL RELATIONS

---

As pointed in the interview with Maarja Kruusmaa (see p. 48), researchers can be likened to ambassadors of their countries to the academic world. The organisations that connect them (including academies of sciences) function as a highway of information, ideas, competencies and good practices.

The Estonian Academy of Sciences represents Estonian science and Estonian scientists in the major European and global research organisations. This is perhaps the only focus of the work of the Academy where many activities are carried on in an almost unchanged manner and where

the description of our partners has experienced no changes. For this reason parts of this section follow the information presented in the previous issue of this collection.

However, even the organisations that have been successful over many decades sometimes obtain a new shape. The largest change in this field is the merger of two major players, the International Council Science (ICSU) and the International Social Science Council (ISSC).

## SUMMER MOMENTS IN FRANCE

### *ICSU + ISSC = ISC*

The International Science Council (ISC), formed in July 2018 through a merger of two of the world's foremost science advocacy organisations, promotes both natural sciences and the humanities. The Estonian Academy of Sciences is a founding member of the ISC; its president, Tarmo Soomere, participated in the meeting of its founding body in Paris on 3–5 July 2018.

On 5 July, a Science Day was held to celebrate the founding of the ISC, where top researchers and politicians spoke about a few of the vast number of topics and collaborative efforts the new organisation is working on. The newly elected first president of the ISC, Prof. Daya Reddy, was among the speakers.

Another keynote speaker was Prof. Cédric Villani (a member of the French Academy and parliament), a top scientist and politician who spoke about the complicated relationship between science and politics. He emphasised that science is becoming an inseparable and inescapable part of politics, which, in turn, translates into an increased burden of responsibility for scientists and their increased participation in decision-making processes. Science Day was concluded with a reception and a concert at the French Academy of Sciences.



**International  
Science Council**  
The global voice for science



A fragment of the mural at the Paris Oceanographic Institute (the theme picture of the ISC Science Day from the website):

## Two Top International Science Organisations Merged in Paris\*

On 4 July 2018, a merger of two international science organisations was concluded at the historical amphitheatre of the Paris Oceanographic Institute. The event was attended by Prince Albert II of Monaco, a passionate promoter of marine sciences whose foundation is a supporter of the Institute.\*\* Prince Albert figures in the annals of Estonian football as the only royal person to have scored a goal against the Estonian team. This event took place at a 2002 charity match, when the Estonian team had a home game against the Monaco All Stars.

The International Council for Science (ICSU) was founded in 1931. It has two kinds of members. There is, as a rule, one institution per member country, normally an academy of sciences or a scientific board. A total of 143 such institutions represent scientists from 122 countries. The other category is comprised of leading international scientific societies, 39 in total. The ICSU is further supported by 31 associated organisations.

It was called the *International Council of Scientific Unions* until 1998 and the *International Council for Science* until 3 July 2018.

The goal of the organisation is to identify and manage key global problems in science and society through collaboration between scientists of all countries and disciplines. The Estonian Academy of Sciences has been a member of the ICSU since 1992.

The activities of the ICSU stretched far beyond the academic sphere. It was one of the initiators of the now globally popular sustainable development approach, which aims to organise our life to avoid overexploiting natural resources and excessively damaging the nature that surrounds us. In more modern words, the aim is to avoid undercutting, out of stupidity or greed, the ecosystem services that support our way of life.

The ICSU included mainly societies of natural sciences. Therefore, in 1952, a sister organisation called the International Social Science Council (ISSC) was founded for academies of social sciences and the humanities.

The decision for the merger was made at their November 2016 extraordinary joint general assembly in Oslo. The details were hammered out in October 2017 at a forum in Taipei. The new organisation is called the *International Science Council (ISC)*.

## Partnership

The first president of the newly created organisation is a mathematician, the former president of the Academy of Sciences of South Africa, Daya Reddy. In his acceptance speech, he emphasised that the new union, with its unprecedented breadth of coverage in terms of fields of research based on a joint platform of natural and social sciences and the humanities, can more efficiently mobilise the newest research to solve local and global problems.

\* The original article "The Meeting of Tectonic Plates: The Merger of Two International Science Organisations" was published in Estonian in the science portal of Postimees on 4 July 2018: <https://heureka.postimees.ee/4517755/laamade-liitumine-kaks-teadlaste-maailmaorganisatsioonihinesid>

\*\* The Paris Oceanographic Institute was founded by Prince of Monaco Albert I at the end of the 19<sup>th</sup> century. His great-grandson Albert II established a foundation to support the Institute's activities.

An apparently small change for the academic landscape, it is nevertheless a great shift in redefining science. A joint message by natural and social sciences and humanities researchers is not only stronger, it is also much more precise and more broadly relevant than a message by specialists from individual fields.



**The InterAcademy Partnership (IAP)** was founded in 1993 as a global network of academies of sciences. It is currently comprised of over 130 national and regional academies. The goal of this organisation is to advise society at large in cooperation with its member organisations and to provide support to various decision-making bodies regarding the scientific aspects of global problems. <http://www.interacademies.org/>



**The European Federation of National Academies of Sciences and Humanities “All European Academies” (ALLEA)** was founded in 1994 and brings together both classic natural sciences academies and academies of humanities and social sciences. The Estonian Academy of Sciences is a founding member of ALLEA. The goal of ALLEA is to facilitate the exchange of information and experiences between academies to achieve high standards in research and ethics, as well as to promote independent discussion of scientific strategy and policy at the European level. Jüri Engelbrecht, a member of the Board of the Estonian Academy of Sciences (at that time the vice-president) was the president of ALLEA in 2006–2011. <http://www.allea.org/>



**Union Académique Internationale (UAI)**, founded in 1919) is approaching this year its 100th anniversary. The Union connects academies of humanities and social sciences at a global level. Its goal is to promote joint research (including

joint projects) and facilitate the publishing of research results. The Estonian Academy of Sciences joined the UAI in 1998 and the Estonian representative is our member Jaan Undusk. <http://www.uai-iaa.org/>



**The European Academies' Science Advisory Council (EASAC)**, founded in 2001) is a relatively young organisation whose members are individuals appointed by academies of sciences of EU member countries. Estonia joined this organisation in 2004.

The goal of the EASAC is to direct the joint competencies of the academies in the advising of EU governmental bodies and politicians in decisions that require scientific expertise. Or in other words: it takes on the role of an independent academic counsellor to the EU, bringing together the top-level competencies and experiences of European academies.

EASAC's expert networks have been formed in the three main programmes (biosciences, energy and environment). They deal with various societally relevant topics, analyse nascent problems and predict development trends and side effects.

Through its members, the EASAC also engages in a steady dialogue with national policy-makers, striving to promote evidence-based decision-making in Europe. The Estonian Academy of Sciences is represented by Tarmo Soomere in the Environment Steering Panel and the member Enn Lust in the Energy Steering Panel. In recent years, Tallinn has become a regular meeting place for EASAC. <http://www.easac.eu/>

For more than ten years, the Academy participated in the work of the European Science Foundation (ESF). This organisation, founded in 1974, brought together scientific institutions of European countries (including the Estonian Research Foundation, later the Estonian Research Council), coordinated collaboration in research at the European level and funded interdisciplinary studies and cutting-edge research. Several Europe-wide advisory bodies, such as the European Marine Board and the European Polar Board, were active in the ESF but have now converted into independent legal bodies. The Committee on Marine Sciences and the Polar Research Committee of the Estonian Academy of Sciences contribute to their work.



## *Researcher Exchange and Science Diplomacy*

The Estonian Academy of Sciences supports researchers' international mobility. One of the results of the cooperation agreements between the academy and its partners abroad is academic researcher exchanges. They are open to all Estonian scientists. The budget of the Estonian Academy of Sciences also covers the reception expenses of foreign researchers in Estonia. The expenses of our scientists abroad are borne by the Academy's partners in target countries. The work of the programme is directed by the Academy's Council for International Exchanges (chaired by Academy Member Jüri Engelbrecht).

The grants are modest, but every little bit helps. Even though the volume of this kind of support is relatively minor, it has led to important developments such as the yearbook on Balkan and Baltic Studies, jointly published by the Bulgarian, Lithuanian, Estonian and Latvian Academies of Sciences, and several research institutes in

these countries, [https://www.folklore.ee/balkan\\_baltic\\_yearbook/YBBS](https://www.folklore.ee/balkan_baltic_yearbook/YBBS)

## *Research careers in the European Research Area*

Mobility is nowadays an integral part of a successful career in research. However, a long-term move to another country can lead to numerous administrative and practical problems. Those range from complicated visa, residence and work permit procedures and different social security and tax systems to variations in labour legislation and local lifestyles.

To tackle these obstacles, the European Commission created the EURAXESS Services Network (formerly ERA-MoRE). The Estonian Research Council coordinates the international network. Within the Estonian Academy of Sciences, these aspects are handled by Mrs Ülle Raud, Foreign Relations Manager.

### **A comment of Tarmo Soomere to the daily newspaper Postimees (The Postman) on 04 July 2018**

This kind of merger is warmly welcome in the entire scientific community. The separation of the research landscape into two compartments that had very limited understanding of each other's methods, goals and aspirations is a miserable relic from the past. It apparently stems from the time when it was acceptable to work entire life on a single problem or in a narrow field. In a way it also reflects the different use of words in different languages. While English *science* first of all denotes natural sciences, the similar words in French, German or Estonian language embrace much wider area of knowledge, including social sciences and the humanities.

The development of the two worldwide councils of scientific institutions during almost 70 years has seen too much of misunderstanding, rivalry and even confrontation of the two landscapes of the relevant disciplines. Ironically, a large part of the related misjudging in the past probably stems from the use of a particular language as *lingua franca* in the worldwide research community. The merger of these two flagships of international partnership is a major step towards better understanding of our world and society in cooperation of experts in different research fields.

Both the ICSU and the freshly baked union ISC bring together academies of science, science funding organisations and specialised societies that work at the cutting edge of research. The ISC thus unites the largely retrospective view of academies of science with funding limitations and opportunities, and mind-sets of top scientists in all fields of research. This unique and unusual union has great potential to become the backbone of knowledge-based attitude of the entire society.

### *Lindau Forum*

The 68th Lindau forum (24–29 June 2018) brought together 600 young scientists from 84 countries to meet 39 Nobel Prize winners. This time the organisers accepted all three candidates presented by the Estonian Academy of Sciences to the selections committee. The Estonian mini-delegation consisted of Uku Haljasorg (post-doctoral researcher, the Weizmann Institute of Science, Israel), Kristi Huik (post-doctoral researcher, the National Institute for Health, USA) and Liis Lemsalu (PhD student, the University of Tartu and junior research fellow, the Estonian National Institute for Health Development).

This forum is famous for the unique possibility to attend lectures given by numerous Nobel Prize winners on topics of their latest interest, participate in various discussions, familiarise yourself with the very best posters by young scientists, talk personally to selected Nobelists, be part of master classes where fellow scientists present compact overview of their advancements and, last but not least, to reach direct feedback from top scientist. For the first time there was an opportunity to participate in science walks and lunches where about ten young scientist were *vis-à-vis* with a Nobel price winner for a couple of hours. The major message was simple: „*You cannot learn how to do good science just from reading the literature.*“ – Avram Hershko.

The presentations are available at <https://www.mediatheque.lindaunobel.org/>



## THE ADVISORY ROLE OF ACADEMIES IN THE INFORMATION-RICH SOCIETY

*The French Académie des Sciences (<http://www.academie-sciences.fr/en/>) expressed the two principal obligations of academies of sciences in 1666: the advancement of science and advising government authorities. Over time, the amount of knowledge has vastly increased, and the opportunities and means of their use and communication have changed completely; however, the principles remain.*

Any sensible national-level advice can only be based on high-level science combined with an ability to grasp and comprehend the big picture. This principle lends real weight to new knowledge gained through cutting-edge research that can impact society and change the world.

An ever more important task of modern academies is to participate in society and to contribute to the common good, i.e. to provide professional and timely advice. An international conference that took place at the Academy on 22–23 October 2018 discussed the opportunities and problems related to the advisory role of academies:

### ADVISORY ROLE OF ACADEMIES IN THE INFORMATION-RICH SOCIETY.

Prof. Sierd Cloetingh, Prof. Antonio Loprieno and Dr. Katrien Maes spoke about the message of science. Prof. Janusz Bujnicki and Prof. Jorge Huete-Pérez discussed the ways science is converted into advice. Dr. Robert-Jan Smits and Prof. Marju Lauristin discussed how to use advice for







Photo: Retti Kõkk x5



It was introduced by President of the Riigikogu Eiki Nestor. In his welcoming speech, he emphasised his positive expectations for the future of Estonian science and spoke about the recent prominence of science in Estonian politics (including the strategic development goal of increasing state research funding to 1% of the GDP). According to the president of the Riigikogu, routine cooperation between politicians and scientists is a highly practical approach; he said that “when a scientist has stated something, it is difficult for the politician to argue.” <http://www.akadeemia.ee/et/tegevus/uudised/uritused/20180901100136/>

the common good. Representatives of Estonian universities, ministries and social organisations spoke about their experiences. Several panel discussions also took place.\*

The conference was the third celebratory event of the 80<sup>th</sup> anniversary of the Academy and the 100<sup>th</sup> anniversary of the Republic of Estonia.



\* Presentations and panel discussions can be viewed on the Academy’s website.



## *The Possibility of Scientific Advice During Politicide\**

On 5 November 2018, Postimees published an in-depth interview titled “Populism can destroy decades of work” with Prof. Jorge A. Huete-Pérez, a founding member of the Academy of Sciences of Nicaragua.

Prof. Huete was one of the keynote speakers at the conference “Advisory role of academies in the information-rich society”. His presentation was a wake-up call to the “old” academies of Europe, located in a democratic comfort zone where public discussions and freedom of opinion are so elementary as not to be perceived as a privilege. The young academy of Nicaragua (it will reach 10 years of age in 2019) has had to fight for science and science-based decision-making in their state in challenging, politically tense circumstances. Advice running contrary to the opinion of the political elite can be life-threatening. Nevertheless, the Academy spoke up against the authoritarian government’s grandiose plan to build a Chinese-funded canal through the country that would cut the land in half and subject it to a host of environmental and social dangers. Since advising the government directly was not feasible, the Academy focused on advising the society as a whole. Ultimately, the knowledge-based public opinion, informed by the Academy, came out on top (at least for the time being).

\* Politicide – politically motivated genocide.

Panelists Siim Kallas, Christoph Eichhorn, Hanno Tomberg



Panelists Jorge Huete-Pérez, Anne-Marie Coriat, Edwin Kreuzer, Andres Metspalu, Oliver Väärtnõu



The second day of the conference was moderated by Professor Kari Raivio.





Professor Marju Lauristin  
discourses on the inter-  
relations of science and  
policy-making.



The chancellor of justice Ülle Madise



Photo: Reti Kõik x-8

An extract from the interview with  
Prof. Jorge A Huete-Perez?:

*How did you manage to compete with the (Nicaraguan –  
ed.) government's seductive message of endless wealth  
from the inter-ocean canal, and get heard regarding the  
dangers of the project and the need for additional studies?*

Prof. Huete: We saw that the decision to build the canal  
was taken hastily, within some 48 hours, without consulting  
with scientists, experts or local inhabitants. We saw a clear  
need for debate and disseminating information.

Although the state was not interested, we decided  
to conduct studies, organise a couple of international  
conferences, and share the gathered information with the  
government and the people as much as possible. I believe  
this is our most important lesson: you should take the initiative  
to organise discussions even without the government's  
backing.

We emphasised that the project was badly designed  
and extremely risky. We explained that it would impact a  
big part of the population, who would have to leave their  
homes, and several future generations, because the Chinese  
investor had been promised the use of the canal for decades.

Our work informed the society that the project left a  
lot to be desired, people began to resist it and they were  
able to base their resistance on our scientific arguments. I  
believe that the project was cancelled largely due to popular  
resistance informed by Academy-led discussions.

In my opinion, it is a great example of science advising  
not just the government, but the nation as a whole. Scientists  
are responsible for making their messages clear and simple  
to understand."

Interviewed by Bretty Sarapuu. See the whole interview  
in Postimees (5 November 2018, p. 12) or online [https://  
www.postimees.ee/6445418/nicaragua-teadlane-popu-  
lism-voib-havitada-aastakumnetepikkuse-too](https://www.postimees.ee/6445418/nicaragua-teadlane-populism-voib-havitada-aastakumnetepikkuse-too).

Prof. Jorge A. Huete-Pérez



## *Giving People the Means to Protect Their Minds*

*JAAN ARU's after-dinner speech at a reception hosted by the Estonian Chamber of Commerce and Industry*

We, scientists, enjoy invisibility. We focus on our work and do not enjoy taking our attention off it to talk to people who don't understand what we are doing. And yet, there are times when scientists must speak up. Not because we are unintelligible, but because we are capable of explaining the state of affairs to the general public. We have to speak up because political choices made now, the future of our country, of Europe, and of the entire world depend on people's voting decisions.

Those decisions are based on the people's beliefs. Even if they understand that their beliefs and knowledge may not be factually correct, there is a real impact on their decisions. This has been perhaps best said by Rudy Giuliani, attorney for President Donald Trump at the moment of writing. He stated in an infamous televised interview: "Truth isn't truth."

For a scientist, this statement is unheard of, yet it is true. What the truth is for a person depends on his or her beliefs and knowledge systems. A simplified example: if somebody believes that the European Union is a negative influence on his or her life, then in the light of this conviction, voting for Brexit becomes the correct choice.

Where do beliefs come from? They are acquired from the surroundings. In this sense, we live in difficult times,

because people get their beliefs and knowledge from sources other than school, TV, radio and newspapers; after all, anyone can make themselves heard on social media.

The problem is that people with strong beliefs have the highest impact there. They impact the general public the most because they believe firmly in their causes: they are passionate, sure of their opinions and willing to spend time and energy to spread them. They are motivated to impact and infect others' minds. They are often excellent speakers who use every trick in the book to persuade others.

Sir Francis Crick has said: "The dangerous man is the one who has only one idea, because then he'll fight and die for it." Francis Crick, of course, was speaking of scientists, but I find his words fit the broader context of our times: most scientists can be convinced by facts, but for people without scientific backgrounds data is but a means of persuasion. Scientists do not consider such data to be data. They are not gathered in a controlled environment with the express goal of getting to the crux of a problem. Rather, they are collected with the purpose of shoring up desired goals with numbers. They are data for the sake of having data. To quote President of the United States Donald Trump: "Our gross domestic product ... was below zero". In a different speech, he claimed that "In fact, the GDP since I've taken over has doubled and tripled." The first





Photo: Reiti Kõkk x6

## FUTURICT 2.0 IN TALLINN

### *Intense day of understanding and managing complex social systems*

The Flag-ERA FuturICT 2.0 network of future technologies addresses new and innovative ICT means for in-depth understanding and pre-emptive managing of global challenges (including social and economic crises in modern society) by combining the potential of smart technologies, educated citizens and effective communities (for more information, see <https://futurict2.eu/>). The Academy of Sciences, in cooperation with the Tallinn University of Technology, is a project partner of FuturICT 2.0.

As part of the network's 2018 general assembly, a public seminar titled "Understanding and managing complex, global, socially interactive systems" was held on 28 August 2018 at the Estonian Academy of Sciences. It covered various topics, from block-chain technology in the agricultural sector, smart coordination of social relations and using mobile phone positioning to describing migration and segregation, managing big data on the national scale and the problems of human coordination technology.

The keynote speakers were Prof. Anna Carbone (Politecnico di Torino), Prof. Stefan Klauser and Dr. Marcus M. Dapp (ETH Zurich), Dr. Anto Aasa (University of Tartu) and Prof. Egils Ginters (Riga Technical University).

quote is stupid and the second one wrong. But people like him juggle numbers, because they know that numbers and data are persuasive, that they help to form opinions and shape minds.

In these circumstances, we scientists must speak up to explain the functioning of the world to the general public. We must speak up to explain the difference between belief and fact. We must speak up to explain how to think critically, evaluate statements and check data. We must speak up and ask difficult questions. We must speak up and always be ready to enter into a dialogue with society. We must speak up and take the time to understand the beliefs and convictions of ordinary citizens. It is not up to us to change those beliefs, but it is up to us to give people the means to protect their minds.



**FuturICT 2.0**



Photo: Peit Kook

## SCIENTIFIC LANGUAGE CONNECTS – AN INTERVIEW WITH MAARJA KRUUSMAA

*Member of the Academy Maarja Kruusmaa made two unusual foreign visits in 2018. She participated in a scientific conference in Turkmenistan and represented the Estonian Academy of Sciences at the 75<sup>th</sup> anniversary of the Armenian National Academy of Sciences. In an interview on 28 December 2018, we reflected on the trips and their significance.*

*Maarja, are you in the habit of summarising years as they end?*

Not really. It is simply another day when the Earth crosses a random point in its orbit: nothing more. But I am generally unaware of anniversaries; people have to remind me of my own birthdays... *(laughs)*

*You spend a lot of time travelling. How many trips did you take this year?*

I make a point of not counting my travels. It would be akin to showing a chronic drunk all the bottles he has emptied. I have spent a whole lot of days in European airports. Most of my trips are short: to Brussels, and to visit European project partners. I am a visiting professor at the Norwegian University of Science and Technology and spend some of my time in Trondheim. I gave up on conferences long ago, unless I am invited to be a keynote speaker. There is simply not enough time to go somewhere without a compelling reason.

*You are an excellent traveller. Do you simply pack your bags and take it easy?*

I function well while travelling and have a fairly good capacity for work. I cannot sleep on aeroplanes (men can, apparently), so I finish up small tasks, or just sit at some anonymous European airport. They are classic non-places, as defined in anthropology. There is no history, no identity, no personal relationships in non-places. Therefore, there are also no limits. Nobody disturbs you and the non-place kind of liberates you. You are there, just the way you are, doing the things you need to do.

I can sit in such a non-place for six hours and simply work. When the travel agent tells me there is a long layover, I don't mind; I can sit there and do my work gladly enough.

*How did you come to visit Turkmenistan and Armenia?*

Those adventures started with conversations with Tarmo Soomere. It came down to a practical need, really.



Somebody had to represent the Estonian Academy of Sciences. I found it interesting. I had not been east of Estonia since the fall of the Soviet Union. And I wanted to get out of my comfort zone.

Tarmo and I had some fairly involved arguments over whether those trips were necessary or not. I rather thought not. He believed that they were. And I think we were both right.

*What were the arguments?*

Turkmenistan is the second harshest dictatorship in the world, after North Korea. If you go there as a representative of your state and participate in everything you are told to, you are essentially legitimising the government and functioning as its tool. That is not great. (*Maarja has turned serious and pensive.*)

Tarmo's counterargument was that we should maintain some ties with such countries nevertheless. If the circumstances change and we have any personal contacts there at all, we might be able to leverage them and perhaps include or positively affect those countries, the way we were once helped.

Science is a small part of international interaction, but it carries classic soft power. Science is global by definition. It is easy for scientists to create contacts and do something together, just like artists and musicians. They speak a universal language. Businessmen, too, speak a universal language to some extent: the language of money. It is easy for those professions to work cross-culturally and transnationally.

*Turkmenistan is a Muslim country? Did you encounter any other female scientists there?* (Pictured: Maarja Kruusmaa's Armenian name)

No local female scientists attended the Turkmenistan conference. The representative of the Kazakhstan Academy of Sciences was female. There were a few other female guests, too.

In Armenia, I was the only female participant. It was all very strange. We were all sitting at the presidium table.



The foyer of the Palace of Conferences.

During the introductions, I was skipped. I suppose the president of the Armenian Academy of Sciences thought I was somebody's wife or daughter and called out the next name.

*How was this awkward moment resolved?*

I was seated between the representatives of the Lithuanian and Latvian academies. They immediately spoke up. I introduced myself. I was the only one of the 15 representatives who had bothered to ask a local person to teach me a local greeting and a few words of Armenian. This gained me the good will of the whole hall. From then on, it was easy.

*Can Turkmenistan be described as Kafkaesque?*

Everything was borderline absurd, really bizarre! There were codes and behavioural norms I vaguely recall from the Soviet era, mixed with Islamic and local tribal traditions, and a terrible dictatorship the likes of which I had never encountered before. The president had built a big, white, completely empty city for his capital. Nobody lived there because it was too expensive.

And then, he decided that he didn't like coloured cars driving on his white city's streets and banned them, leaving only white cars. At around the same time that Saudi Arabia permitted women to drive, he decided that women shouldn't really be driving. Turkmenistan is now the only state in the world whose president believes women are not competent to drive. While not directly forbidden, it is frowned upon. What a country!

*I am surprised female scientists were allowed to enter at all.* You need an invitation to be allowed into the country. Somebody at the airport had been made aware of my name and that is what got me my visa. But making it that far meant that the state had decided to let me enter. There are only five or six international flights daily arriving at the Ashgabat International Airport, to service a country of five million people! There are a handful of destinations, such as Moscow, Frankfurt and Istanbul. The Frankfurt flight made a stop in Baku. The flight was full until Baku. At Baku, everybody but the five people flying to Ashgabat got off.

*Is Ashgabat the white city?*

New Ashgabat is white. Old Ashgabat is different. A guide took me to Old Ashgabat, to a place where locals eat. The food, by the way, is very good. There is a vast difference between the old and the new. This is a typical dictatorship that erects mausoleums and mosques and palaces, and a completely non-functioning city. We stayed at a hotel with 700 rooms but just 30 visitors. The city was full of such hotels. From the perspective of urban planning, New Ashgabat is a horror show. Walking from one hotel to

Photo: Maarja Kruusmaa

another, I had to climb across crash barriers and cross landscaping to get to pedestrian crossings. This would simply not be possible in a democratic state. The people would not allow such a waste.

The conference was just as strange. The country has been closed off to the world for so long that they seem not to know any longer what a scientific conference ought to be like. It was a strange mixture of a party congress, a *kolkhoz* [state-owned collective farm in the former USSR – ed.] harvest party and a symposium. Every once in a while, long speeches were delivered, praising the president. Everybody had to stand up and give a long ovation. And then there were the so-called scientific presentations, at a seriously terrible level.

*Was your presentation well received?*

Most of the people did not understand anything because they do not speak English. The text was translated, sure, but afterwards, a German attendee told me, hey, you're talking about the Internet of Things in a country with no Internet and no things (*laughs*). Internet access is limited to certain Russian and local websites. No YouTube or Facebook. Interaction with the outside world is forbidden: no foreign TV and no surfing the Internet. But people are not stupid. They have set up VPNs [virtual private networks – ed.] to access Western websites.

*Did you manage to make any contacts among local scientists?*

I tried to make contact with the locals, but not with the old functionaries who head the local academy of sciences, I

looked for younger and brighter people at the helms of institutes. Of course, there is no way to tell if the contacts will lead to anything.

What surprised me the most were the views of certain Western invitees. Several Western European guests really enjoyed the way they were shown to the VIP lounge at the airport and dispatched to fully paid five-star hotels by taxi, with everybody waiting on them hand and foot. It was as if they did not understand how cheaply this state was buying their approval. They give you a police escort, and you feel important for a moment.

It seems like we don't always realise the value of living in a democratic country. Exchanging freedom of expression and other fundamental values for privileges like this is not a good deal. But people who have not been inside of a dictatorship might not get it. This is where our background comes in. I grew up in an occupied country. I recognise the signs.

*Might this have been the point of the whole event: to create a certain kind of image?*

It was meant as internal propaganda. The goal was to present Turkmenistan as a flourishing country where researchers from the whole world gather because science is so dismal everywhere else. But their science was comically bad. We remember how these things were done in the Soviet era. It's like Putin now: he announces a congress for certain Russians, buys their flight tickets, everybody gathers together to talk about the greatness of Russia and then they go back home.



The white city is monumental and full of shine of gold.



Caption: The president of Turkmenistan is a real polymath. Apart from governing, urban planning and other activities, he is a prolific writer. His books cover a number of topics, from Turkmenistan's horses to a monograph on its medicinal herbs. His most recent work, about his mother, also contains philosophical musings on the role of women and mothers in society. The delegates could buy those books to take home.

### *So they paid for everything?*

Yes, in cash. I put the envelope with 800 dollars for the airfare in my bag and forgot about it. Half a year later, I was quite surprised to come across an envelope with 800 dollars in it (*laughs*). Locals aren't allowed to own foreign currency. Currency exchanges were one way only. You could buy local currency, but not convert it back into foreign money.

### *Would you visit Turkmenistan again?*

I would not go back, but visiting it once was an interesting experience. It is not the kind of place I normally go to. I go where research is done. Decent-level science, as a rule, requires a democratic and wealthy country. It gives you a different image of the world.

### *Was Armenia any better?*

Two days before we got there, the prime minister of Armenia had dissolved the parliament and called new elections to get a parliamentary majority. The elections took place at the end of the year. He got 70% of the votes. He was previously in the minority and could not pass his decisions, but now he has a large majority and a mandate to implement his policies.

It was a very dynamic period. The Economist selected Armenia as its country of the year in 2018. Exciting

developments are happening. The mood reflected it. Whether you are talking to a taxi driver or a street merchant or somebody at the Academy, you get a sense of an atmosphere not unlike our Singing Revolution. There is an enthusiasm, a belief that things are looking up. It is powerful to sense that a nation has hope. There was no depression like there was in Turkmenistan.

Armenia is a long-suffering nation with a difficult destiny. The difference with Turkmenistan is huge. Armenia has serious science. It also has a widespread international diaspora. The nation has made good use of it. When their academy of sciences was celebrating its anniversary, many Armenian ex-pats were present.

I think Armenia handles some things better than Estonia. They maintain a connection with researchers who have emigrated to America, Europe or Asia. Through these bonds, the state works very much for the benefit of its people. We have something to learn from this. Interesting suggestions were made by representatives of other East European academies. For example, it would make sense to see which young scientists of ours come home for Christmas and perhaps invite them to visit or to organise a conference around Christmas time. It is likely a time when many Estonian ex-pat researchers are home. That is exactly when we should meet with them and integrate them.

### *When ex-Soviet bloc countries meet, do they discuss how well they coped back in the day?*

We met the prime minister of Armenia and tried to show our support the best we could. It is interesting to note that the Russian and Ukrainian academies of sciences were represented, as well as the Baltics, several East European countries, the Czech Republic and Slovenia. Attitudes are divided by age groups rather than geographical borders. It is the 70+ crowd that tends towards nostalgia (*laughs*). Their golden years were back in Soviet times.

I was very impressed by the president of the Kyrgyz Academy of Sciences. He worked hard to get an overview of his options, of what was really happening, and how to improve the country's position in the world. He apologised for not speaking English, but it was clear that he was looking for contacts. The majority of the old elite simply ignored me. It may have been a language problem. I don't speak Russian as well as I speak English and the opposite is true for them. So I was a stranger to them linguistically, culturally, gender- and age-wise. No such common ground as, for example, with Lithuanians, with whom you have common memes (*laughs*). But again, the attitude difference was generational rather than geographical.



Photo: Maarja Kruusmaa x3

The president of the country has a perfect view on the conference.



Photo: Maarja Kruusmaa

### *What was going on in Armenia?*

Technically, it was the anniversary celebrations of their Academy of Sciences. The Academy of Sciences of Armenia is like ours used to be [pre-1995 – ed.], an umbrella organisation of many research institutes. It's impressive on the outside. In this sense, the visit reminded me of my childhood, perhaps with a hint of modern times.

It seems like the boundary between hospitality and corruption lies elsewhere than in our country (*laughs*). The way everybody came and gave expensive presents was new to me. I had remembered to bring something along at the very last moment. All I had was a small glass apple with the Academy's symbols. But some brought grandiose paintings! It was like they were meeting an oriental prince. In Estonia, the receiver of such presents would have had to declare them on their tax declaration. Our presents tend to be more symbolic.

And then there were the organised tours. For me, this, too, seems more of a Soviet vestige, that you are taken everywhere, and everything is done for you. I guess our customs are different. But the difference is interesting.

### *Would you like to visit Armenia again?*

I would like to meet the ordinary people there. During the main formal dinner, I went to see what the men in the smoking area were talking about. When I said I was Estonian and researched underwater robotics, the reaction was: "I am a physicist, I research fluid dynamics, and we should do something together." There were no barriers. The language of science is universal. They are very interested in making contacts. And again, the divide between an interest in collaboration and a lack of interest is generational.

### *Does it look like those contacts might last?*

Tarmo [Soomere – ed.] and I had a long conversation on the subject. I believe it doesn't make any sense to depend on the elderly gentlemen of Eastern academies. They are out of touch. We need a different point of entry: younger

directors, laboratory heads or simply brighter thinkers who still (or already) understand what is happening around them. They would have to be interested, they should have vision, and they should have moved on beyond the Soviet Union.

The contact should take place in collaboration with the Estonian Research Council and perhaps the Ministry for Foreign Affairs. Either way, it should be better calibrated. One very good measure is the DoRa doctoral studies and internationalisation programme, which works both ways.

Since Armenia is currently relatively poor, they are, as tends to be the case with poor countries, stronger in theoretical aspects, where we are relatively weak. We might complement each other in certain areas. But, of course, we need to ask why Armenia might want to come to Estonia, rather than, say, the US. We need to consider our strategic strengths carefully. I can see why we need Armenia. In certain fields, they have very strong scientific traditions. However, those relationships need to be engaged systematically. One visit gets nowhere.

### *But you made a start.*

Surprisingly few East European young people, or young people from anywhere east of us, choose to study at Estonian universities. We have a few Ukrainians, but not really any Belarusians, Moldovans, Armenians or Georgians. It ought to be fairly easy, culturally and logistically. And getting up to speed would be far easier for those young people than, say, PhD students from Iraq. Why don't we attract many people from Poland? We might say that it is easier for them to go to Germany, but there are more Germans than Poles among my exchange students. We must have dropped the ball somewhere.

And we must certainly not see relationships with those countries in terms of personal or utilitarian benefit alone. Our older generation of researchers remember well how Swedish scientists came here and gave us our first fax



machine and showed us how to use forks and knives. We don't have the moral right to get arrogant and say we don't care if others catch up with us. In the long run, we should care very much. Sure, we love to talk about how we are doing so well because we are so diligent, but we have had a lot of luck, too.

Perhaps we should support those less lucky than us, not by stealing their people, but by giving them added value and sending them back. It might help stabilise the region.

As I said, scientific language is so universal that it facilitates coming to an understanding with people who have radically different views on religion or culture or nationalism or something else. You can always discuss theoretical physics. This abstract language unites, kind of like music, and releases tension.

For me, the common ingredient of all those journeys is that we have not been able to leverage science diplomacy well enough. But this is not a subject with which everyone can deal privately. It should be a more systematic part of Eastern partnership.

*Sounds good. Are there any more such trips coming up?*  
We are going to the island of Grenada to study their river water quality in the framework of a development aid project funded by the Estonian Environmental Investment Centre. It is very practical, not just simply an interesting research project.

There are always opportunities to go somewhere. Normally, I do not take advantage of them, since there is no need to. But if there is a place where I could contribute something important, I would certainly go.

Armenia, formally the Republic of Armenia, is a landlocked country in the southern Caucasus, between the Black Sea and the Caspian Sea. It is bordered by Georgia on the north, Azerbaijan (and the Republic of Artsakh (formerly known as the Nagorno-Karabakh Republic, recognised only by Armenia)) on the east, Iran and Azerbaijan's exclave of Nakhichevan on the south, and Turkey on the west, thus covering only the eastern part of historic Armenia.

The Republic of Armenia forms a small part of historic Armenia, which covered 300,000–400,000 km<sup>2</sup>, from eastern Turkey to the Caspian Sea.

Its total area is 29,743 km<sup>2</sup> and its population is 3,027,600 (as of 1 April 2013).

The capital of Armenia is Yerevan, and the official language is Armenian. The monetary unit is the Armenian dram. (Wikipedia)

The photo: hangs on the wall at Maarja Kruusmaa's office and describes her as well as it describes her multinational team.



Photo: Reiti Kõik

Located in Central Asia, **Turkmenistan** is bordered by Kazakhstan, Uzbekistan, Afghanistan and Iran. The Caspian Sea lies to the west of the landlocked country. Turkmenistan possesses the world's fourth-largest reserves of natural gas and substantial oil resources.

It has a dry subtropical and desert climate. The Karakum Desert covers over 80% of the country's territory. Arable land forms 4.51% of the territory.

As of July 2011, the population was 4,997,503 people. The median age is 25.3 years. 50% of the population lives in the cities.

The biggest city, Ashgabat, was home to an estimated 637,000 people in 2009. Technically, Muslims constitute 89% of the population and Orthodox believers constitute 9%, but the state itself is strongly secular. Turkmenistan is an authoritarian presidential state that defines itself as a secular democracy and a presidential republic. (Wikipedia)

# NEW BEGINNINGS

## IN COLLABORATION WITH THE POSKA ACADEMY

*Member of the Academy Urmas Varblane*

*Photos: Tartu Jaan Poska Gymnasium*

An important part of the Academy's work is popularising science and, in particular, introducing young people to the joys of discussing scientific problems. The annual Academy of Sciences days, which have been held in several Estonian counties, have always included meetings with students. However, once a year is not really enough for an activity to be systematic. Since collaboration with the "Poska Academy" initiative began, Academy members have been meeting with school pupils more regularly.

The concept behind the "Poska Academy" student conference was born in Autumn 2013. It aims to offer students an opportunity to introduce their research in a friendly, non-competitive environment. The impetus was provided by research work having become compulsory in the high school curriculum. The "Poska Academy" aims to encourage students and their supervisors to present their work. It was initiated by Mari Roostik, the head of the humanities curriculum at the Jaan Poska Gymnasium, with colleagues; the headmaster of the school, Helmer Jõgi, has been extremely supportive.

The first "Poska Academy" took place on 28 March 2014. The one-day conference attracted students from 13 Estonian schools. Twenty-one presentations and seven workshops were given. The following year's edition lasted two days, five more schools participated, and the number of presentations and workshops grew accordingly. In 2016, the "Poska Academy" became international, with participating schools from Latvia, Finland and Sweden. The original one-day conference has become a two-day international event for both younger and older learners to share their experiences.

The preparations for the fifth "Poska Academy" conference, in the 2017/2018 school year, included the participation of the Estonian Academy of Sciences. The collaboration led to a lecture series titled "The Road to the (Poska) Academy", where, on the first Monday of every month, two Academy members visit the Jaan Poska Gymnasium to show young people the way to academia. In the first year of collaboration, Tartu's students met Prof. Maaja Vadi and Academy Members Urmas Varblane, Jüri Allik, Anu Raud, Ene Ergma, Peeter Saari, Urmas Kõljalg, Andres Metspalu, Ülo Niinemets and Valter Lang. The topics





varied significantly, from neuroplasticity, telepathy and gravitational waves to populism and Brexit.

The 2018/2019 school year began with a clear understanding that the collaboration must continue: meetings with top researchers broaden the students' horizons, create cross-references among previously acquired knowledge and help students make better life choices. These meetings represent Academy members' invaluable contribution to the future of the students. The first lecturer of the school year was the rector of the University of Tartu, Member of the Academy Toomas Asser; Academy Members Valter Lang and Ülo Niinemets have already made their visits. Next up are Academy Members Lauri Mälksoo and Urmas Varblane, as well as our recently elected members. The Academy coordinator of the lecture series is Ülle Sirk, who has successfully persuaded members to make time in their busy schedules to meet with students.

The hall is always full at the Academy members' lectures and sometimes extra chairs have to be found. The atmosphere is warm and friendly and the attitude of the listeners is extraordinary: there are a lot of questions, all of them heartfelt. Questions on more difficult subjects can be hard to express, but the speakers are helpful and every question is answered. The whole time slot has always been put to good use and is often exceeded because the questions won't stop. But we don't mind, since this comes from a place of mutual respect and interest. This event series is a particularly pleasing one and we mean to continue it!



Toomas Asser



Ene Ergma



Photo: Jaan Poska Gümnaasium

Jaan Aru speaking about human brain on the stage of Von Krah! Theatre.



LIFE AFTER GOOGLE

## JAİK?!

JAİK on Von Krah! Teatri algatuse ja koostöös Vikerraadio, Eesti Teaduste Akadeemia, Eesti Kunstiakadeemia, Tallinna Tehnikaülikooli, arhitektuurbüroo b210 ning Aafimiga loodav kunsti- ja haridusprojekt, mille teemaks on Eesti ja maailm 25 aasta pärast.

Projekti põhimõttelised fookused on dokumentaalsus, ulme ja tegelikkus ning mängulised vormid tegeletakse ühiskonnale oluliste teemadega. Ühest küljest annab tipprežiiside esitus akadeemiline loengusari südamaterjali ja inspiratsiooni teatri- ja teleprojektide, teisalt saab tootmise loengusari sel moel mängulise hoo, mis kaasab suuremat vastajaskonda ja teadusmaailma avatakse teatrituulile ja raadiokuulajatele.

Peamisteks teemadeks on demokraatia, bioloogia ja biomehaanika, IT ja AI, kosmoloogia, energia, raha, surm, füüsika, ressursid, meditsiin, haridus, rahvasõda.

Projekt koosneb loengusarjast, raadiosaadetest, nähtustest, lavastustest ja teleseriaalist ning vältab septembrit 2018 kuni aastani 2020.

JAİK õigused haldab / Von Krah! Teater / Vikerraadio / JAİK on põhendatud Eesti Vabariigi 100. sünnipäevale



### *Radio JAİK and the 12 lectures at the Von Krah! Theatre*

How to make the classic lecture format so attractive that the queue to see it snakes out of the Academy door, the hall is forced to fit three times the usual crowd, and the viewers concentrate till the end of a 1.5-hour lecture without resorting to any tricks? We pulled off this hat trick last autumn. The trick was to remove academic lectures from their accustomed setting and hold them on the stage of the Von Krah! Theatre. It worked like a charm for twelve autumn nights in the packed (alternative) theatre.

Science communication is naturally complicated. It is ever more difficult in the era of digital and interactive media, where truth flounders and lies abound. One of the great challenges of modern science is creating new and effective means of communication. Old formats have lost most of their effectiveness in the new society.

Borrowing from the theatre experience has been a popular way to communicate science to the general public.

Screenshot from the Von Krah! website: <http://jaik.ee/jaigist>

Most often, the “show” is made attractive with lots of smoke and explosions, to the detriment of actual content (with exceptions, of course).

It is much more exciting to see how the theatre setting releases the public from whatever strange reluctance they have towards academic lectures. It lets lecturers captivate their audiences without much spectacle. Interesting content turns out to be enough. This stage synergy between theatre and science pairs the aesthetic, creative and emotional goals of drama with curiosity and the aims of science.

The lecture series “Life After Google” and its offshoot “Radio JAİK” were part of the Von Krah! Theatre’s 25<sup>th</sup> season’s massive education and art project dedicated to the 100<sup>th</sup> anniversary of the Republic of Estonia. The project focused on Estonia and the world as they might look 25 years from now. Its thought experiments mainly explored the ways our current decisions can impact the environment and attitudes of people in 2043.





The series was realised through a collaboration between the Von Krahle Theatre, Vikerraadio and the Estonian Academy of Sciences. Twelve lectures took place at the Von Krahle Theatre; they were followed by twelve radio broadcasts on Vikerraadio. Each lecture, topic and broadcast concluded with an improvised pop-up reflection or “concluding vignette”, as they were dubbed by the organiser of the series, Peeter Jalakas, presented by the President of the Academy Tarmo Soomere. Those vignettes later became full-length opinion pieces published in the *Sirp* and *Postimees* newspapers and the monthly magazine *KesKus*.

The lectures were delivered by Kaupo Vipp, Asse Sauga, Mart Noorma, Rea Raus, Ringo Ringvee, Kristjan Port, Saale Kareda, Sten Tamkivi, Mihkel Kangur, Jaan Aru, Member of the Academy Jaak Vilo and Oliver Laas.

See more: <http://jaik.ee>

“Radio JAIK” at Vikerraadio: <https://vikerraadio.err.ee/raadio-jaik>

<https://vikerraadio.err.ee/raadio-jaik>

Sri Aurobindo had a singular way of describing humans, one that is particularly close to a marine scientist’s heart: “The Person is a bubble on Time’s sea.” A bubble is an ephemeral phenomenon with hardly any qualities. People come with more qualities. Sure, Mati Unt found people boring: “Each of us has two arms, two legs, a head...” An old saying reflects on other body parts: “Humans do resemble apes, after all: the higher he climbs the tree, the more of his butt you’ll see.”

Wilhelm von Humboldt believed that “there is nothing more interesting for a human in the world than other humans”. We Estonians tend to worry about what others think of us. Perhaps that is why we forget to wonder what sort of creatures we are or what the meaning of civilisation is. Sigmund Freud came to the rescue: “The first human who hurled an insult instead of a stone was the founder of civilisation”. And now, we are back to the pre-civilisation days. Insults are joined by stones (or at least punches thrown in front of the parliament building).

Smart devices have made novelty cheap and convenient. Plutarch knew what it meant in the long run: “Character is simply habit long continued”. Isaiah Berlin added: “Out of the crooked timber of humanity, no straight thing was ever made.”

The curve has its ups and its downs. A recent study of Norwegian conscripts suggests that the decline of human intelligence has already begun. Thilo Sarrazin backs this up with his worry that the quality of the human race is declining, since relatively uneducated people are having more children.

Jaan Aru said that smart devices kill millions of children’s potential ideas. Of course, birth rates could be higher in Estonia. But from the perspective of the future of the world, the smartphone could prove the best means of contraception. Everybody will stay in their own room or echo chamber, never venturing out to interact with others physically. In a couple of decades, the concern about mass migration will have disappeared. Furthermore, smartphones make the dream of looking smart come true. Mark Twain suggests that it’s “Better to remain silent and be thought a fool than to speak and to remove all doubt”.

| (From Tarmo Soomere’s comment to Jaan Aru’s lecture)

## RESEARCH PROFESSORS' CONFERENCE

18 December was an intense day of work at the Academy. It began with a research professors' open mini-conference, which was followed by a statutory meeting of the board. The day concluded with a festive end-of-year dinner, where new members were presented their diplomas and other regalia.

The three presentations made at the research professors' conference were essentially the reports of their third year of work:

- "Innovation in the public sector: From Machiavelli to artificial intelligence" by Rainer Kattel
- "Magnetic and electrical memory effects in artificially defective atomic layer deposited metal oxide solids" by Kaupo Kukli
- "The joy and pain of synthetic nanoparticles" by Anne Kahru.



Photo: Tallinn University of Technology

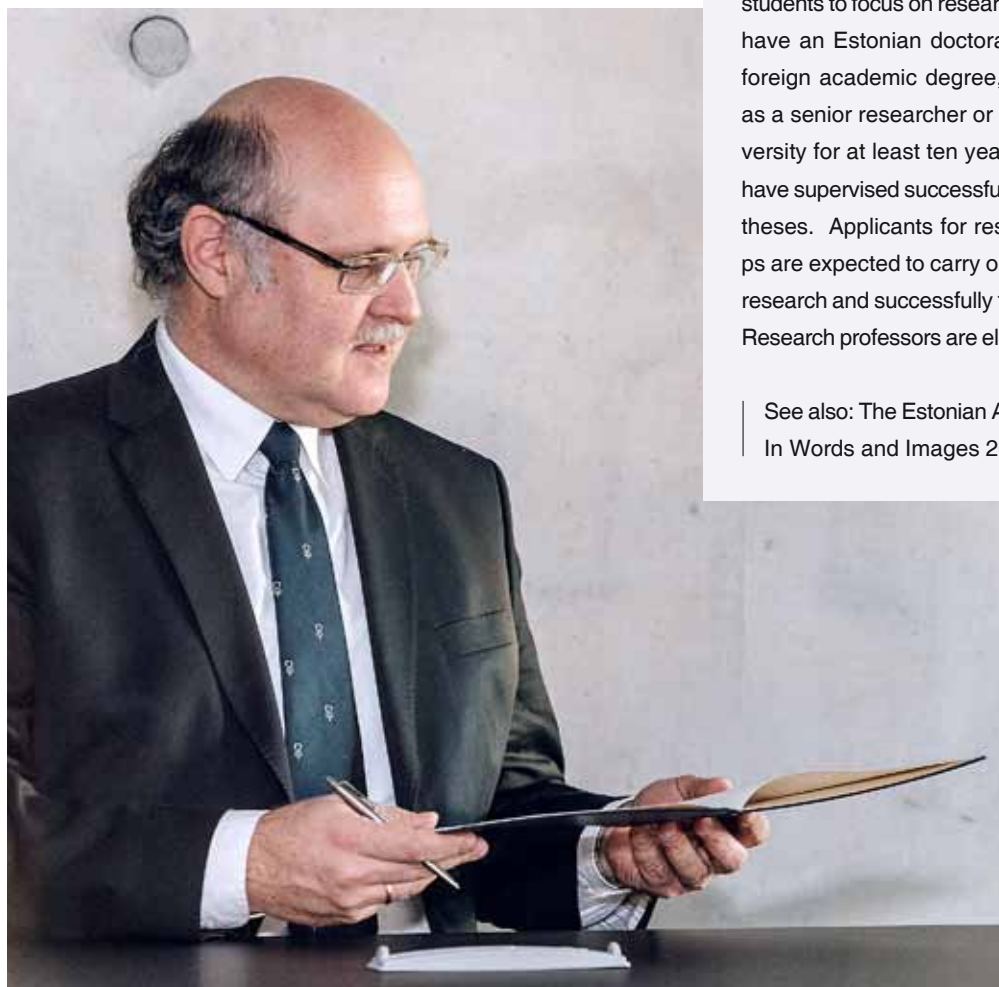
Rainer Kattel

### Who are Research Professors?

Every three years, the Estonian Academy of Sciences announces a competition for the position of research professor. The position is designed to enable a researcher who leads studies at a research and development institution or at a university and supervises doctoral students to focus on research. A candidate must have an Estonian doctorate or an equivalent foreign academic degree, must have worked as a senior researcher or a professor at a university for at least ten years in total, and must have supervised successfully defended doctoral theses. Applicants for research professorships are expected to carry out international-level research and successfully fulfil research grants. Research professors are elected for three years.

See also: The Estonian Academy of Sciences  
In Words and Images 2017, pp. 34–36.

Photo: Marek Meisland x3



Andres Merits

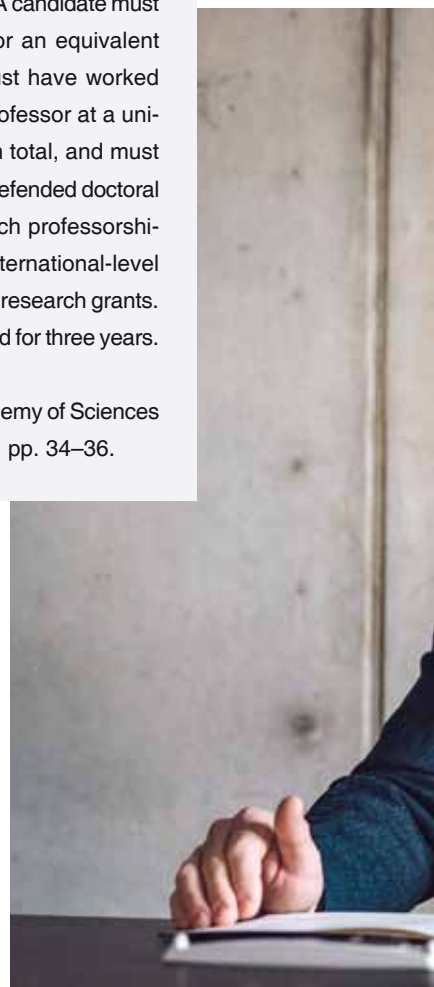






Photo: Reiti Kokk

Anne Kahru



Photo: Andres Tennus

Kaupo Kukli

At the 18 December meeting of the Academy's board, three new research professors were elected for the period 2019–2022:

- **Andres MERITS** – Professor of Applied Virology at the Institute of Technology, University of Tartu
- **Dmitri VINNIKOV** – Leading Researcher at the Department of Electrical Power Engineering and Mechatronics, National Institute of Chemical Physics and Biophysics, Tallinn University of Technology
- **Toomas RÕÕM** – Leading Researcher at the National Institute of Chemical Physics and Biophysics

Trilateral agreements between the Academy, research professors and the heads of their institutions were signed at the field meeting of the board of the Academy at the Estonian Academy of Arts on 22 January 2019.



Dmitri Vinnikov



Toomas Rõõm

## PROSPECTIVE ACADEMY MEMBERS' CONFERENCE

It had been clear since the beginning of the year that the Academy needed new members. Every meeting of the board through the winter and spring discussed where the need for strong researchers and capable representatives of their fields was most urgent. The fields were agreed on in the spring and the election was announced at the beginning of summer. Since there were 20 outstanding candidates and just seven vacant seats, members of the Academy wanted to meet each candidate in person.

We revived an old tradition to accomplish this. Some colleagues, who have been members of the Academy for over 40 years, recalled that member candidates used to have to give public lectures to the entire Academy. We could have chosen from a whole host of other traditions, of course. For example, potential members of the French Academy of Sciences used to have to visit each existing member in person. This, however, would have placed too much of a strain on our current members. Or we could also have had foreign powers dictate who was to be elected and when.

Against this background, the member candidates' conference, held for the first time in decades, came as a fresh and pleasant compromise. One month before the election, on 9 November, all potential candidates introduced themselves at the Academy's hall. The event was streamed online, and the speeches were recorded. The candidates who couldn't be there submitted video introductions. The resulting overview of the candidates is available on the Academy's website. at <http://www.akadeemia.ee/et/tegevus/uudised/uritused/20181024042022/>

This arrangement offered additional value to everybody, since each candidate was represented through voice and image. More importantly, members of the Academy – the deciders – got a much better idea of the candidates than through the usual departmental discussions. Perhaps it was thanks to this admittedly brief personal experience that all vacant seats were successfully filled at the December general assembly (5 December 2018).

Twenty researchers were nominated for the existing vacancies.



### Exact Sciences (one seat)

**ELS HEINSALU**, Senior Researcher at the National Institute of Chemical Physics and Biophysics

**JAAN JANNO**, Professor of Applied Mathematics and Head of the Department of Mathematics at the Tallinn University of Technology

**MARCO KIRM**, Professor of Experimental Physics at the University of Tartu

**TOOMAS RÕÕM**, Leading Researcher at the National Institute of Chemical Physics and Biophysics

### Engineering (one seat)

**MARIO KADASTIK**, Senior Researcher at the National Institute of Chemical Physics and Biophysics, and Deputy Director

**JAREK KURNITSKI**, Professor of Building Energy Efficiency and Indoor Environment at the Tallinn University of Technology, Director of the Department of Civil Engineering and Architecture of the School of Engineering, and Adjunct Professor at Aalto University

**JAAN RAIK**, Tenured Professor of Computer Systems Test and Verification at the Tallinn University of Technology, and Head of the Centre for Dependable Computing Systems at the Department of Computer Systems





Photo: Reiti Kokk x5

A highlight of the conference was the presentation of the new item among so-called „blue books“ that is a nickname for high-level collections of overviews and essays. The book „Science and Society“ was introduced by Jüri Engelbrecht and commented by Ülle Madise.

#### **Geology (one seat)**

**KALLE KIRSIMÄE**, Professor of Geology and Mineralogy at the University of Tartu, and Head of the Department of Geology of the Institute of Ecology and Earth Sciences

#### **Ecotoxicology (one seat)**

**ANNE KAHRU**, Senior Researcher at the National Institute of Chemical Physics and Biophysics, Head of the Laboratory of Environmental Toxicology, and Research Professor at the Estonian Academy of Sciences

#### **Human Geography (one seat)**

**HANNES PALANG**, Professor of Human Geography at Tallinn University, and Leading Researcher at the Centre for Landscape and Culture at the School of the Humanities  
**TIIT TAMMARU**, Professor of Urban and Population Geography at the University of Tartu, and Head of the Chair of Human Geography

#### **Cultural Studies (one seat)**

**KRISTIN KUUTMA**, Professor of Cultural Studies at the University of Tartu  
**MARE KÕIVA**, Leading Researcher at the Estonian Literary Museum, Head of the Department of Folklore, and Director of the Centre of Excellence in Estonian Studies

**JAAN LAHE**, Professor Extraordinarius at the Institute of Theology of the Estonian Evangelic Lutheran Church, and Acting Head of the Chair of Comparative Religious Studies

**REIN RAUD**, Professor of Asian Studies and General Cultural Studies, Tallinn University

**ANU REALO**, Professor of Personality and Social Psychology at the University of Tartu, and Associate Professor at the University of Warwick

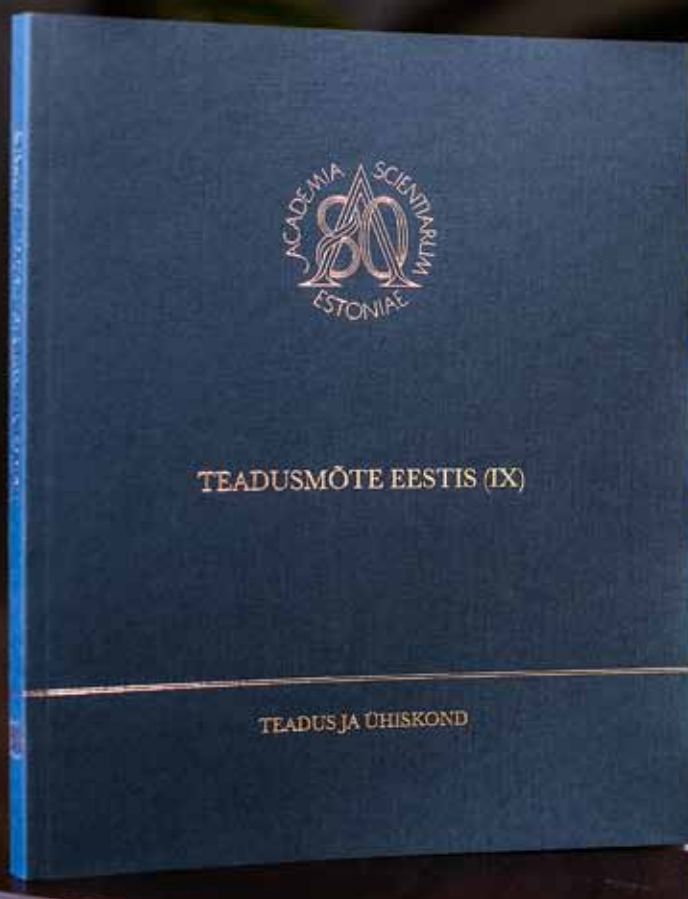
**PEETER TOROP**, Professor of the Semiotics of Culture, and Head of the Institute of Philosophy and Semiotics, University of Tartu

#### **Governance and Political Studies (one seat)**

**EIKI BERG**, Professor of Theories of International Relations, Programme Director for International Relations and Regional Studies

**Tiina Randma-Liiv**, Professor of Public Management and Policy at the Tallinn University of Technology, and Vice Dean of the School of Business and Governance

**Ellu Saar**, Professor of Sociology, and Leading Researcher at the Institute for International Social Studies at Tallinn University



It is certainly not obvious that a nation as small as Estonia can transpose the world's top research into its language. This capacity is like freedom: you don't know what you have until it's gone. Estonia has as many researchers in total as some large research institutes, whose scientific boards, in turn, are the size of our academy. Hence the question: what makes a scientific body an academy? What connotations and what minimum level of quality should this name carry?

Some classical names of academies offer hints. The oldest surviving modern academy, the Accademia dei Lincei in Italy, founded in 1603, is named after the lynx. The lynx symbolises alertness in that country. An organic component of the academy is the strength that comes from numbers. And hence, any definition of an academy contains the dimension of plurality, a spectrum of opinions: a reflection of top research based on a broad foundation.

The world is full of academies of sciences. Every self-respecting country has one. It is logical to think that having an academy gives a state a competitive advantage: or why else would states support them? The mission statement of the French Academy of Sciences explains it well: "Ever since it was created in 1666, the Academy has been resolutely committed to the advancement of science and has advised government authorities in those matters and issues deemed within its remit."

Keeping the academy alive as a representative body of scientists is a matter of technique. But bringing together this scientific competence and channelling its work into the needs

of the society is a cornerstone of a state's competitiveness. The academy becomes profitable only when its advice carries clear added value as compared to the advice of single researchers, research organisations, societies or universities. This explains in part why, like the parliament, a classic academy has closed admissions, and why the people who nominate the candidates are not the same as those who elect the members.

But part of the process must be public in order to show the high quality of Estonian research and the high level of the candidates.

There is always the question of whether it makes sense for a country as small as ours to bother with having an academy of sciences at all. In other words: how big does a country have to be to benefit from having an academy? Estonia appears to be presently the world's smallest state with its own language where an academy of sciences exists as a state organ. In a way, we have a historic role. Perhaps we are the test case that determines whether modern small countries need academies of sciences. If our academy is part of the success of the Republic of Estonia, our example will encourage many small nations to strive for their own states. If, however, we are nothing but a white elephant, others will be able to calibrate accordingly.

The opening address of Tarmo Soomere, President of the Academy





## THE CONSTITUTIONAL LAW ENDOWMENT

On 20 December 2018, Minister of Justice Urmas Reinsalu and President of the Academy Tarmo Soomere signed a cooperation agreement through which the Ministry supports the formation of a constitutional law endowment to promote teaching and research in the field of constitutional law. The government will make an annual contribution of 300,000 EUR to the endowment.

The activities of the endowment will be governed by a committee presided over by former Chief Justice of the Supreme Court Dr. Uno Lõhmus. The committee includes the jurist and Member of the Academy Dr. Lauri Mälksoo, Chief Justice of the Supreme Court Dr. Priit Pikamäe, Justice of the Supreme Court and former State Secretary Dr. Heiki Loot, Administrative Court Judge of the Tartu Circuit Court Madis Ernits, Professor of Legal History at the University of Tartu Marju Luts-Sootak, former Chief Justice of the Supreme Court and former Judge of the European Court of Human Rights Dr. Rait Maruste, Secretary General of the Ministry of Justice Tõnis Saar, and, *ex officio*, the President of the Estonian Academy of Sciences.

The quality of university graduates and their ability to contribute to the development of the state and the economy is closely related to the quality of research done in their fields at their universities. Estonia can be proud of its jurists, such as Friedrich Martens and Ilmar Tammelo. But great people need a supportive atmosphere and material support to come into their own. While law in general is the focus of society's attention, constitutional law is a field to which the state needs to contribute systematically.

Science is a global, international phenomenon. However, it includes fields where single countries have special obligations. We generally take national studies, which no other scientific community can work on, to mean studies of the Estonian language, culture, literature, history and history of thought. But law, too, should be included. Every language carries a vast number of invisible structures and connotations on which the legal system and legal practice rely and without which neither truth nor justice can be discussed. These aspects cannot be disregarded without creating a backlash. /---/

It is the Academy's privilege to help to provide means for developing constitutional law to support our state with the help of top specialists.

The constitutional law endowment allows us to support not only high-level research articles and international collaboration, but also the foundation underlying those achievements, such as the publication of constitutional law textbooks and other means of studying, conducting analyses, and organising lectures, discussions and research competitions.

Extract from the press release: <https://www.just.ee/et/uudised/riigioiguse-sihtkapital-hakkab-edendama-riigioiguse-alast-teadustegevust>

# NAVIGATING THE MINEFIELD OF ADVISING THE STATE, PART II

---

## ENERGY PRODUCTION AND SUPPLY IN ESTONIA

In late March, many Estonians received the following invitation:

*You are invited to participate in a discussion regarding problems surrounding Estonian energetics and energy supply on Tuesday, 17 April 2018 at 10:00 am at the Academy of Sciences (Kohtu 6, Tallinn).*

*Participants will include politicians, entrepreneurs, specialists from the ministries and official bodies responsible for various fields, scientists, and representatives of the media and of society.*

*The discussion on energetics problems will continue at the joint meeting of the Economic Affairs Committee, National Defence Committee, Environment Committee, and Rural Affairs Committee of the Riigikogu on the same day at 14:00–16:45 in the conference hall of the Riigikogu. The discussion focuses on risks surrounding the gas market and synchronising the electrical grid of the Baltics with the European Union grids. Registration is required.*

In January 2018, a memorandum of understanding between Estonia and the European Commission's Joint Research Centre (JRC) came into effect. It includes the fields of energetics, smart specialisation, macro-regional cooperation, cybersecurity, e-governance, the data economy, health, social affairs and agriculture, and takes the forms of joint projects, joint events (seminars, workshops, training sessions etc.), participating in the other partner's events, exchanging people and information, and hosting visiting researchers and grant holders.

The event of 17 April was the first step in its actualisation. The JRC initiative *Science meets Parliament* has become the main JRC annual event at the European Parliament in Brussels. Last year's discussion focused on the role of science in the post-truth society.

Expanding the concept into member states seems to have potential. In her opening statement, Deputy Director of the JRC Maive Rute pointed out that under conditions

where governance decisions are more difficult to take than a couple of decades previously, science has the obligation to assist politicians by offering scientific models and facts.

Head of the JRC energy unit Marcelo Masera introduced a study of wind farms in the Baltics and a web-based model that grants a quick overview of, and possible solutions to, certain problems in this field.

Head of the European regional office of the World Energy Council Einari Kisel followed up with a presentation on energy security. He acknowledged that currently Estonia depends too much on European and Russian energy markets. The state should be more active in energy security policy. The approach of the European Union (EU) as a whole to energy supply and energy security matters needs further coordination, since member states' current approaches vary widely. Estonia should maintain a sufficient reserve for peak consumption times.

Nicola Zaccarelli, an expert in the energy security unit of the JRC, spoke about energy security from the point of view of natural gas supply risk assessment. Several other studies have been conducted on the topic and in 2010 the EU enacted a relevant regulation whose uptake is being monitored. The JRC conducted a joint study in the Baltic region and Finland. The technical report was published in 2016. The study was conducted using the *Eugas* model, which is a simulation method allowing long-term predictions to be made. The European Commission has called for projects of common interest (PCIs) for risk mitigation. They leverage the nine key corridors of geographic energy infrastructure in the field of energy, gas and oil, and the three key European infrastructure sectors in the field of smart grids and strategic power transmission lines.

Projects of common interest are meant to assist the EU in achieving its energy policy and climate goals. The main goals are to supply affordable, secure and sustainable energy to all citizens and to reduce long-term economic carbon dioxide emissions in accordance with the Paris Agreement. The European Commission draws up a new





Photo: Geraldine Barry x2



Tea Danilov, Head of the Foresight Centre of the Riigikogu, Tarmo Soomere, President of the Estonian Academy of Sciences, and Deputy Director of the Joint Research Centre (JRC) Maive Rute

list of PCIs every two years. The Commission's November 2017 regulation lists the Baltic Energy Market Interconnection Plan in gas (*BEMIP Gas*). This includes the expansion of the Estonian–Finnish connection (currently known as the Baltic connector) and the Estonian–Latvian connection. See the complete list of countries at: [https://ec.europa.eu/energy/sites/ener/files/documents/memberstatespci\\_list\\_2017.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/memberstatespci_list_2017.pdf)

At the end of the seminar, Marcelo Masera gave an overview of an ongoing study that gathers feedback on consumers' positions on energy supply security using the Value of Lost Load (VoLL) measure. This is the estimated sum that fixed-contract consumers would be willing to pay to avoid interruptions in their energy supply. The sample includes consumers from Estonia, the Netherlands and Portugal. The day was summarised by Ülle Must, the JRC's Estonian contact. Watch the presentations at the Academy's website: <http://www.akadeemia.ee/et/tegevus/uudised/teated/20180424003855/>

## REFLECTIONS TO PLAN S

On 4 September 2018, the association of European national science funding organisations Science Europe and the European Commission released a powerful joint statement: Research results funded by European taxpayers must be publicly available free of charge from 1 January 2020 on.

The goal of this statement, called Plan S, is to radically speed up the uptake of research results. It will certainly redefine the research publishing market, currently worth several tens of billions of euros, and change the way new knowledge is communicated. Currently, it is readers who pay for science journals. The implementation of Plan S means the money must be found elsewhere.

All journals of the Estonian Academy of Sciences have been free for all readers for years. This practice, however, is still unusual in Europe. The European Federation of National Academies of Sciences and Humanities ALLEA announced its agreement with the authors of Plan S and

with the concept of free access to publicly funded research results on 12 December 2018.

In the light of Plan S, the academies emphasise the need to essentially overhaul the entire scientific system. Any reforms should, however, be preceded by broad-based discussions and dialogues with various partners, scientific communities and stakeholders. The current, if questionable, predominant practice is to assess the quality of research results and researchers by the popularity of their publications. Plan S renders certain indicators based on this approach meaningless.

This process must not limit young researchers' career opportunities or the development of specific research fields, undermine the integrity of science or infringe on the principles of scientific ethics. The financial and intellectual property rights aspects of the plan must be thoroughly considered. The Estonian Academy of Sciences believes that opening up research results to everyone will clearly improve their accessibility. However, the associated costs must not be borne by research projects: that might hinder research efforts considering the limited science funding in small states.

The continued access of Estonian scientists to paid scientific journals published outside Europe must be guaranteed. In other words, participation in Plan S must not hinder Estonian researchers' access to the latest information.

As an alternative to Plan S, Estonia has the data base of the Estonian Research Information System ETIS. It includes nearly all publications published by Estonian researchers in recent years. Apart from technical modifications, this solution must be recognised by the European Commission.

The Academy of Sciences pointed out to the Commission experts that researchers make a substantial contribution to scientific publishing as reviewers and editors. A large proportion of science publishers' profits is based on their unpaid work. Financial or alternative compensation for this work is basic, just and necessary, and it should be an integral part of Plan S.

# OTHERS ABOUT US

## TOP OF THE WORLD – RAPID PROGRESS SINCE LAST YEAR

In the previous year, we celebrated having seven influential Estonian researchers on the Clarivate Analytics Web of Science list. We have done even better this year! Seventeen Estonian scientists made the list of the most influential natural and social scientists in the world. Five of them are Members of the Academy: Andres Metspalu, Martin Zobel, Urmas Kõljalg, Ülo Niinemets and the new member Anne Kahru.

The methodology has changed since 2017. Previously, the analysis included only influential scientists within individual fields. This year, the editors have included researchers who have published influential works in more than one field within the last decade. The editors base the rating of a scientist on the extent to which other scientists use his or her work, i.e. the number of citations.

The Clarivate Analytics Web of Science data base influential scientists' review "Highly Cited Researchers Report 2018" lists over 6,000 of the most influential natural and social scientists of the last decade. The number of Estonian researchers more than doubled. In 2017, seven were mentioned among about 3,300 top researchers. The high level of Estonian science is illustrated by our success compared to our neighbours: no Latvian researchers are mentioned, there is one from Lithuania, there are seven from Russia, and six from Poland.

The more frequently other researchers use a scientist's work to support their work or to contrast with it, the more influential the scientist is considered in the Clarivate Analysis. Apart from the top-cited researchers in every field, the list includes those who have not reached the threshold in a single field but are very close to it in two or more.

According to the most influential Estonian scientometrics expert, Professor of Experimental Psychology and Member of the Academy Jüri Allik, Estonia looks like a science superstate: "There are 36 Finnish researchers on the list, which is twice as many as from Estonia, but since the population is more than twice as large, our ratio is better."

## ESTONIA'S MOST INFLUENTIAL

In late 2018, journalists of Eesti Päevaleht, LP, Delfi, Eesti Ekspress and Maaleht drew up the fourth annual ranking of influential Estonians. Although the Academy tends to take such rankings with a grain of salt, it is interesting to note that Academy members often figure in them.

Member of the Academy Arvo Pärt was voted the 7<sup>th</sup> most influential person in Estonia. The choice was explained as follows:

*Pärt is Pärt is Pärt. The music of Arvo Pärt is a global highway to Estonia. Those who love Pärt know of Estonia. All his concerts here and elsewhere are packed. The ear catches his unmistakable music in films. There is no such thing as Pärt overload. His music captivates, and so does his personality of divine love.*





Foto: Frédéric Chopini muusikakool

President of the Academy of Sciences Tarmo Soomere is ranked 83rd. The explanation:

*The President of the Academy of Sciences is an active participant in thorny debates on current affairs. He can explain complex topics, such as the wood processing factory debate, in simple terms while bringing more nuance to simpler questions, such as proper child-rearing.*

Rector of Tallinn university of technology (TalTech) Jaak Aaviksoo is listed 93rd in the top 100.

*Known as a firm reformer, Jaak Aaviksoo had the honour of presiding over the Tallinn University of Technology on its 100th anniversary. The anniversary saw the unveiling of the University's new name: TalTech. While some may find it strange, it signifies to others the University's willingness to march in step with the current beat.*

In comments on the rankings (LP 42(320), 1.12.2018, p. 62), Anvar Samost noted that he believes that people who prefer to keep a low profile have been excluded from the rankings. He pointed out Rector of the University of Tartu and Member of the Academy Toomas Asser as an example, adding that this may be an advantage of sorts: it is still possible to be an active participant in Estonian society while staying off the radar.

Arvo Pärt receives the *Doctor Honoris Causa* (Honorary Doctorate) diploma from the Fryderyc Chopin University of Music, the oldest music school in Poland, for outstanding musical achievements and for the universal creative depth (26 November 2018).

#### How was the 2018 list drawn up?

The Influential Estonians 2018 list was drawn up by journalists of Eesti Päevaleht, LP, Delfi, Eesti Ekspress and Maaleht, who assessed the candidates' impact on Estonia during the year. Journalists who pay special attention to societal events have been creating this ranking for four years. They selected Marju Lauristin as the most influential Estonian in 2015, Kersti Kaljulaid in 2016, and Jüri Ratas in 2017. Influence is the ability to achieve desired results and change and influence important processes, behaviours or the thinking of others.

<http://epl.delfi.ee/mojukad2018/>

# ESTONIAN SOCIETY OF HUMAN GENETICS LIFELONG ACHIEVEMENT AWARD

The Estonian Society of Human Genetics recognised Member of the Academy Andres Metspalu, Professor of Biotechnology at the University of Tartu, for his broad and multifaceted work in the field of human genetics. The Genetics Lifetime Achievement Award was presented to Metspalu on 22 November 2018 at a human genetics conference in Viljandi.

“Andres Metspalu is a one-man orchestra,” Prof. Maris Laan, President of the Estonian Society of Human Genetics and Professor of Human Genetics at the University of Tartu, who presented the award, said. “He has been active in human genetics for over 25 years and is one of the leading researchers who have put Estonian human genetics on the international science map. His excellent work through the years has been marked by many outstanding achievements,” Laan added.



Andres Metspalu

Metspalu was one of the founders of the Estonian Society of Human Genetics in 1999 and its president in 2007–2013. He has been an active member of the European Society of Human Genetics and he was its president in 2005–2008. He developed the laboratory molecular diagnostics service in Estonia at the Tartu University Clinic Foundation (1996), as well as for the biotechnology company Asper Biotech three years later.

Metspalu thinks big. This is evident in the nationwide campaign to collect gene samples of 100,000 Estonians for the Estonian Genome Project in 2018, in addition to the existing 52,000. Gratitude for this massive popular contribution was memorably expressed by the employees of the Estonian Genome Project through their participation in the “Dancing Estonia” project. The dance conveyed 100,000 thanks to the 100,000 gene donors. All dances can be viewed at <http://www.err.ee/eestitantsib>. That includes the performance of our colleague.

Photo: Reiti Kõkk

## HONORARY DOCTORS

### TARMO SOOMERE

On 4 May 2018, Tarmo Soomere, President of the Estonian Academy of Sciences, Professor of Coastal Engineering at the Tallinn University of Technology and Leading Researcher of the Institute of Cybernetics, was named an Honorary Doctor (*Doctor Honoris Causa*) of Klaipėda University. He was recognised for his excellent cooperation and contributions to cross-border marine science. According to Rita Vaičekauskaite, Vice-Rector for Research at Klaipėda University, the historical and cultural relations between Lithuania and Estonia are very close, and the two countries are connected by another dimension, which emphasises this proximity: the Baltic Sea.

Vaičekauskaite states: “Giving the honorary doctor title to the outstanding marine scientist Tarmo Soomere, whose research deals with the study and interpretation of sea waves as a phenomenon, is symbolic. Folklore describes the mythological power of the sea, while modern studies help to find renewable sources of energy and other resources from the power captured in the sea. Marine science is the flagship of Klaipėda University. Professor Tarmo Soomere has made a significant contribution to the development of Lithuanian marine science as it has risen to a level of excellence at the international level. Tarmo Soomere’s fundamental achievements are complemented by rather unusual communication skills, which make possible the





Photo: Andreea Pintea



Photo: Fryderyk Chopin University of Music

unification and promotion of different cultures, generations, personalities and knowledge to create the future prosperity of a modern society.”

### ÜLO NIINEMETS

On 8 November 2018, Ülo Niinemets, Professor of Crop Science and Plant Physiology at the Estonian University of Life Sciences, was awarded the highest possible recognition by a foreign university. He received the title of Honorary Doctor (*Doctor Honoris Causa*) of the Romanian Aurel Vlaicu University of Arad.

According to Prof. Niinemets, it comes after long-term collaboration with the Romanian university. “We have jointly published nearly fifty articles, primarily with Professor Lucian Copolovic, who used to work as a post-doctoral researcher and senior researcher at the University of Life Sciences,” he said. “Collaboration between the two universities will certainly continue in the

future. From now on, the focus will shift towards researching the secondary metabolism of medically and agriculturally important plants,” Niinemets concluded.

### ARVO PÄRT – NOW AND FOREVER

On 25 and 26 November in Warsaw, Member of the Academy Arvo Pärt was presented two high awards. On Sunday, 25 November, Arvo Pärt was awarded the highest cultural award of the Republic of Poland, the *Golden Medal for Merit to Culture – Gloria Artis*. The Golden Medal is the highest category of the award and it was presented by the Polish Minister of Culture and National Heritage Jaroslaw Sellin.

The award was presented at a concert of Pärt’s music at the Rotunda of the Museum of John Paul II Collection, with the Estonian Philharmonic Chamber Choir, the Tallinn Chamber Orchestra and conductor Tõnu Kaljuste. The concert was a part of the Eufonie festival, dedicated to the 100<sup>th</sup> anniversary of the Republic of Poland, at which Pärt



Classical music website Bachtrack published an overview of concert statistics for 2018; Arvo Pärt's works are the world's most performed by a modern composer for the eighth consecutive year.

was an honorary guest. The festival was also a nod to other European countries, including Estonia, celebrating their 100<sup>th</sup> anniversaries in that year.

Arvo Pärt received another high award on Monday, 26 November, when Poland's oldest music school, the Fryderyk Chopin University of Music, awarded him an Honorary Doctor's (*Doctor Honoris Causa*) degree for outstanding musical achievements and universal creative depth.

Previous recipients of the Fryderyk Chopin University of Music Honorary Doctor's degree include the Polish composers and conductors Krzysztof Penderecki and Witold Lutosławski, the French composer and legendary professor of musical composition Nadia Boulanger, the Russian cellist and conductor Mstislav Rostropovich, and the opera singer and conductor Plácido Domingo.

Among the many awards Arvo Pärt has received, including honorary membership in the American Academy of Arts and Letters (USA, 1996), the Praemium Imperiale (Japan, 2014) and the Ratzinger Prize (Vatican, 2017), are multiple Honorary Doctor titles from universities in Estonia (Estonian Academy of

He has received prizes from Poland as well. In 2007, Arvo Pärt was awarded the Görlitz/Zgorzelec Brückepreis (Bridge prize) award and in 2016 the Pontifical Council for Culture Medal "Per Artem ad Deum", founded by Pope John Paul II and awarded in Kielce, Poland, at the SACROEXPO international exhibition.



The Golden Medal for Merit to Culture Gloria Artis.





Music and Theatre, 1989; University of Tartu, 1998) and abroad (University of Oxford, 2016; University of Durham, 2002; University of Sydney, 1998).

## HONORARY CITIZEN

On City Day in Tallinn (15 May 2018), President of the Academy Tarmo Soomere received the badge of the Coat of Arms of Tallinn for his long-term contribution to Tallinn's development through marine research.

This acknowledgment includes receiving the title of Honorary Citizen of Tallinn.



Photo: Reiti Kõik x2

The badge of the Coat of Arms of Tallinn.

City Day in Tallinn commemorates the day Tallinn adopted the Lübeck Law in 1248. It signifies 770 years of being a legally recognised city.

# TRIPLES

Three is a nice number, a good enough mark for a schoolboy, yet symbolic and especially meaningful since ancient times.

The Academy is brimming with triples. Some of them are more obvious than others. For instance, among its members are three university rectors, who are all members of the board. Academy members through the ages have founded three creative (science)

centres. Under the Academy's aegis, the three-minute lecture series reached its fourth season. Three Academy members work in the small village of Tõravere. There are three former or current presidents of the Academy that we can chat with.

Let us take a closer look at a triple or two.



The Tõravere Three: members of the Academy Jaan Einasto, Enn Saar and Arved-Ervin Sapar.



## 3 AUTUMN DAYS, 3 RECTORS

**Three university rectors sit on the board of the Academy. Impressive!**

The year was special for each of them.

Member JAAK AAVIKSOO, Rector of the Tallinn University of Technology, in short TalTech, celebrated the 100<sup>th</sup> anniversary of his university, which changed its name for the occasion. Now we will all try to get used to “TalTech”.

Member TOOMAS ASSER, Rector of the University of Tartu, took office in August. For him, it is all new, exciting and instructive.

Member MART KALM, Rector of the Estonian Academy of Arts, was glad to finally have a home building for his academy again. The new building opened in the autumn in a former stocking factory.

In the autumn of the Academy’s anniversary year, the photographer Reti Kokk and Piret Suurväli spent some time shadowing each of them.





## *SHADOWING RECTOR*

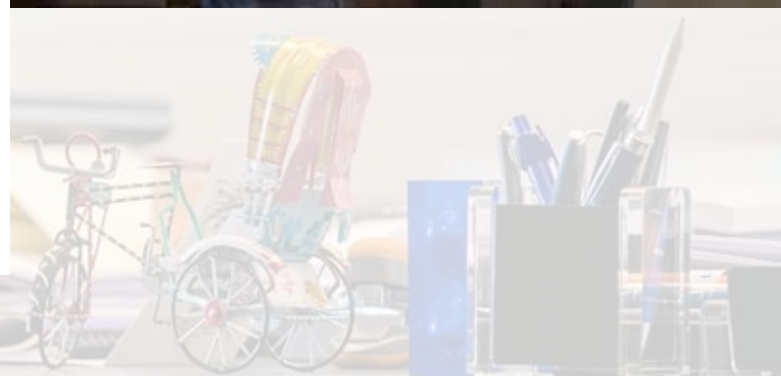
### *JAAK AAVIKSOO*

4 September is a Tuesday.

• Rector Aaviksoo had told us to meet him at the rectorate at 9 am. He seems like a tough person. We made sure to be early and waiting. We wanted to see how his day begins. A few minutes before nine, the rector walks into his office. He seems to be in high spirits and after a brief practical discussion, he is ready to accept us as proverbial flies on the wall. It is good to follow him like a shadow!

For the rector, the first hour of the day is dedicated to getting up to speed. It starts with coffee (black, just a touch of sugar), which arrives in a big mug straight after his arrival. No other problems (other than the flies on the wall). The rector first goes through his emails, then the newspapers on his desk, and then the news online. Since the university does not commission media studies, the rector conducts his own.

After having perused the media, he picks up a document, reads it and underlines it as necessary. The computer keeps notifying him of incoming email. Aaviksoo receives up to 100 emails a day. It seems like a lot, but he does not want to delegate it.







While he works, we study his working environment. The desk is cool, full of intriguing trinkets. The rest of the space is classically sparse. The small adjoining rest area does not see much use. The rector rarely goes there. The broad terrace is pleasant, with an excellent view of the university.

The first, quiet hour turned out to be deceptive. The rector's schedule is, in fact, hectic. Today is busier than usual. He warns us that lunch might be slow in coming. Coffee helps him deal with the delay, although he thinks he should drink less of it. Aaviksoo admits that he has tried and failed to give it up. Now he is trying to cut down. Healthy eating suffers, too: he admits there is often no time to eat.

At the stroke of 10 am, three men walk in. The rector lets them wait and continues perusing a document. In a moment, he stands up, walks up to them, and the first serious meeting of the day begins. They discuss cooperation while sitting under the 37 TalTech gold sponsor diplomas. Aaviksoo's

message focuses on joint responsibility and equal communication. Obviously, his voice is dominant at the meeting. At times, it turns into a persuasive monologue. He lists talking points and emphasises them with abrupt gestures punctuated only by quiet email notification signals from his PC.

In fact, the atmosphere is convivial and conversational. They dispense with formalities and joke around. But it becomes evident that the rector's arguments always focus on Estonia. How would this or that benefit Estonia? Where are the state's priorities?

By 11:00, the meeting should be over, but it stretches on. Aaviksoo tries to keep it focused, but his time buffer gets used up. The people arriving for the next meeting have to be patient. The rector dashes to his PC and puts out some virtual fires. The next meeting is brief and punctual.

The rector gains half an hour to make phone calls and read up on the topics of the next meeting. His mobile number, by the way, is public. He tries to be open to



*Let's take this resolute position, stake it out and see what happens! We can criticise ourselves over and over again. But who could do better?*

*This report must be nipped in the bud!*



“*How much opera, how much elocution?*”

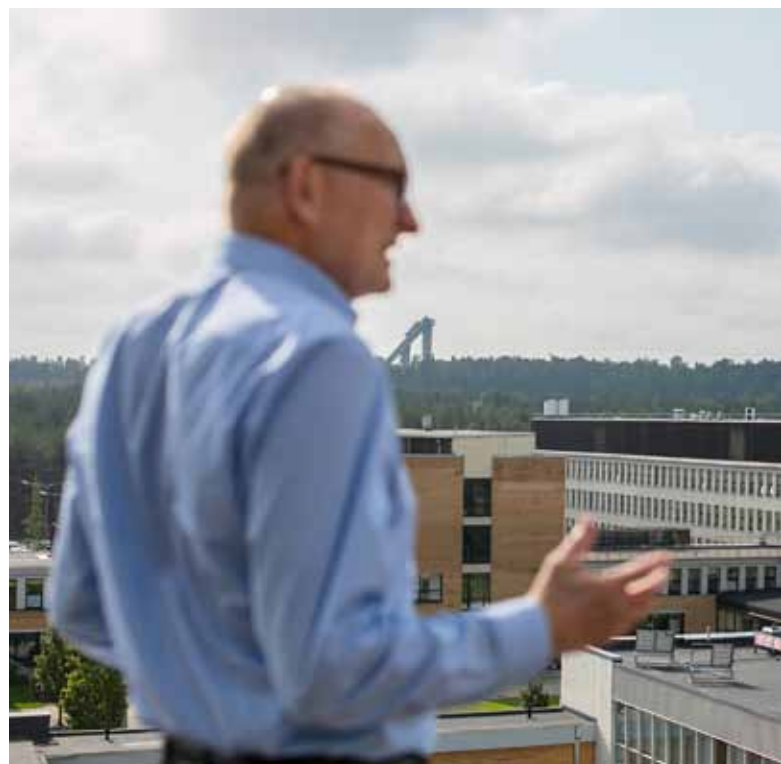
communication but has to admit that calls can be a bit of a time thief, since there are always journalists looking for the next scandal and lunatics looking for a receptive ear.

The next crowd enters at 11:30. The discussion focuses on curricula and money. The meeting is immediately followed by another on grants.

Then, time for a quick bite to eat. The hallways to the cafeteria stretch on and on. A brief glimpse at the exhibition dedicated to Paul Kogerman and then it is time to queue up. The rector's lunch: harchoo, pasta with ham and vegetables and a glass of kefir.

Back to the rectorate! We have been forewarned that the next meeting is a rock opera rehearsal. We enter the meeting room. It is a big circular room currently busy with work on the university's anniversary programme. All members of the rectorate are there. They are talked through the programme and their parts in it.

What is great is that they are all rapping! The texts have been written for them – no room for improvisation – but the idea sounds intriguing. The rector seems comfortable





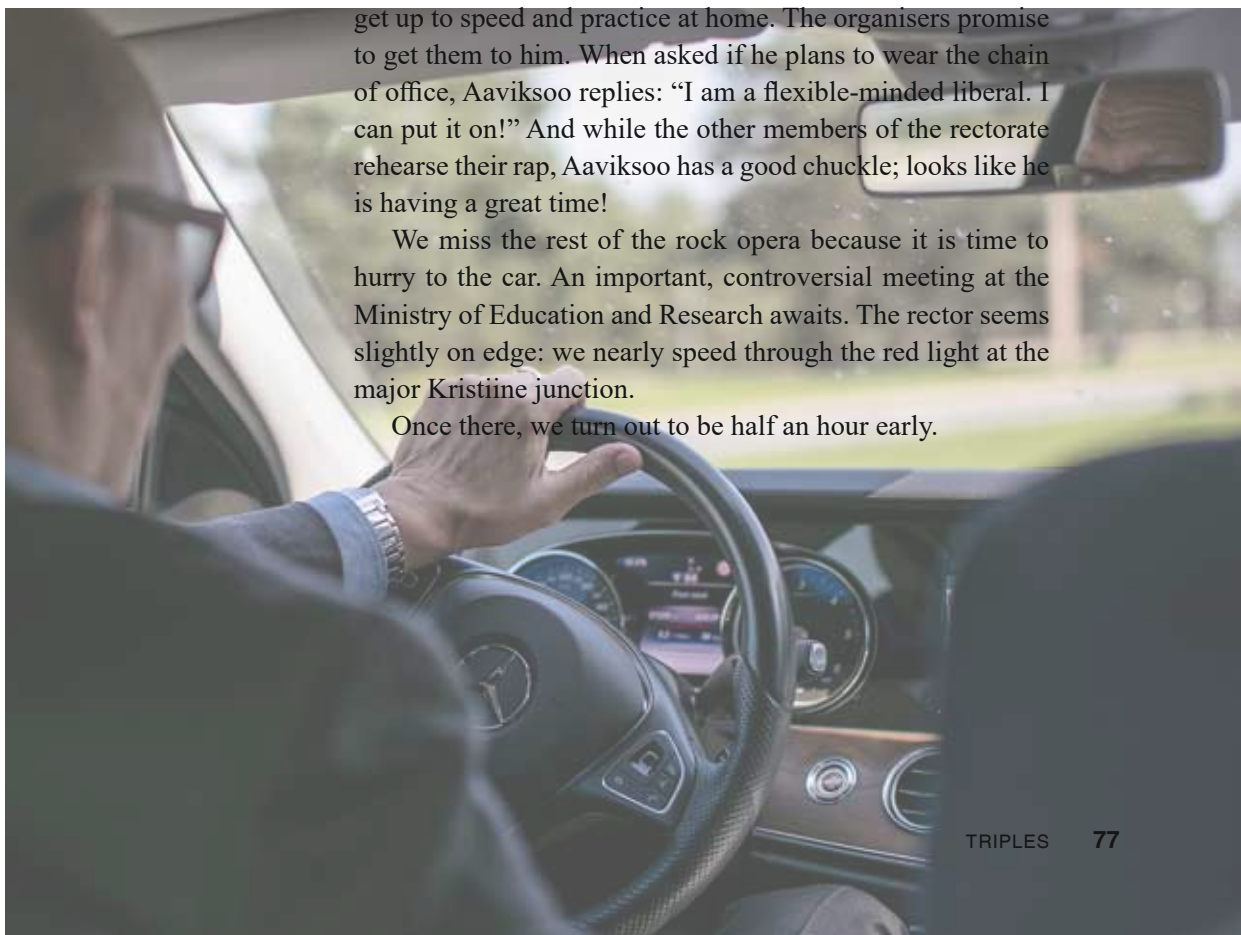


with this youthful approach. He chuckles and asks for a stronger beat. The end of his piece sounds declarative: “knowledge is strength, education is light!” The rector happily proclaims this out loud to the rhythm of the beat, and belly laughs follow all around! Aaviksoo admits he cannot sing: he was told 50 years ago not to bother.

He makes two new calendar entries: next rehearsal and final rehearsal. Unfortunately, he is scheduled to be in Helsinki during the latter. He asks to see the recordings afterwards to get up to speed and practice at home. The organisers promise to get them to him. When asked if he plans to wear the chain of office, Aaviksoo replies: “I am a flexible-minded liberal. I can put it on!” And while the other members of the rectorate rehearse their rap, Aaviksoo has a good chuckle; looks like he is having a great time!

We miss the rest of the rock opera because it is time to hurry to the car. An important, controversial meeting at the Ministry of Education and Research awaits. The rector seems slightly on edge: we nearly speed through the red light at the major Kristiine junction.

Once there, we turn out to be half an hour early.







The rector has time to gather his thoughts, walk around the familiar corridors and meet acquaintances.

When the meeting opens, we, the shadows, retreat. This is serious business and third parties are not invited.

I know that the rector is expected at the Nordic Hotel Forum (as listed on his agenda: 15:30–17:00 *Participating in the panel “Brainstorm of visions where the energy sector is heading”. Annual Conference of World Energy Council on potential development and synergy*). As time passes, I grow antsy. Isn’t it getting late? The meeting hall has turned quiet, the din of voices has ceased. Then the door opens wide and the cheerful rector is the first one out. He hurries us along and we sprint to his car. What a miracle: there is a parking space by the hotel, and double miracle: we are on time for the debate!

The rector is given a microphone, is the last panelist to take a seat, and begins in perfect English. He makes short work of introducing







*When it comes to energy production, we must be at the top – top of the top.*

himself and proceeds to present the problems. It is definitely a dashing entrance.

After the heated beginning, the Academy member picks up his phone and spends a couple of minutes interacting with it.

The conference ends and Rector Aaviksoo goes home! Just briefly, though, to get ready for the late evening's live broadcast. It is the evening when a new series, "Esimene stuudio" (First Studio), kicks off on Estonian Television. Its first guest is Rector Aaviksoo, whose university is preparing to celebrate its 100<sup>th</sup> anniversary. His shadows peel off in front of the broadcast building. We watch him on a TV screen.

The screen gives no sign of a long and intense day of work. Rector Aaviksoo, with his always descriptive language, is still ready to stand up for his university and his own interests. Andres Kuusk is surely not disappointed with his first guest.

In conclusion, what did this September Tuesday tell us? It was fast-paced and active. Rector Aaviksoo was good-spirited, generous and very charming. I got the impression that he is a strong, rather authoritarian leader, who is comfortable with the attention of the general public and someone whom friendly shadows bothered not at all. We wish the centenary Tallinn University of Technology and its leaders the best of luck!



*For now, it makes sense to continue with the ships that the navy already has. Public pockets are running empty all over Europe.*

*A democratic state is always in a crisis.*



## SHADOWING RECTOR TOOMAS ASSER

27. September is a Thursday. Academy Member Toomas Asser was the first rector to set a date. His assistant, Saima, wrote: “Rest assured that the rector has no plain or boring days, so there will be a lot of variety! And there are certainly not many breaks during his workdays.

At the moment, I would suggest 27 September. The schedule features opening an international conference, a university council working lunch (the rector, vice-rectors, and heads of various areas), and a meeting of the university’s academic committee.”

We have agreed to meet at the rector’s office at 8:30 to have a few moments to make introductions before the day begins in earnest. Secretly, we hope to see the rector arrive and watch his morning work habits. We arrived at Tartu the day before to be sure to be on time.

The main building of the University of Tartu is a tourist site in its own right. Especially now, when teaching has been moved elsewhere and the building is rather empty, it seems to almost echo. We experience a sense of reverence as we get closer to the rector’s office. The premises are undeniably awe-inspiring.

We are mildly surprised to find the rector already there. He has been in for some time already! Rector Asser starts work at 7:30. His subordinates come later; only one early bird, Signe, gets there roughly at the same time. Toomas Asser says that working early mornings is a habit that he picked up during his days of practising medicine and intends to keep. But new habits must be acquired, too. Getting

*I have attached Rector Prof. Toomas Asser’s schedule, which you are invited to take part in.*

*Thursday, 27 September 2018*

*9:00 Opening of the University of Tartu Asian Centre’s interdisciplinary conference-seminar “Japan and Estonia: Contemporary Challenges in the Humanities and Social Sciences”*

*12:00–14:00 Weekly meeting of the reduced composition of the rectorate (rector, vice-rectors, head of finance, secretary general, academic secretary)*

*A light lunch is offered.*

*14:15–15:45 Meeting of the academic committee*

*16:00 University of Tartu Memorial Day at the Raadi Cemetery*

*18:30–20:30 Reception hosted by the Ambassador of Japan, Yoko Yanagisawa*

| An excerpt of the email sent by the rector’s assistant

comfortable in the grandiose new office is necessary as well. He hopes it will have become more familiar in a year’s time.

Before we arrived, Rector Asser was reading medical journals and a doctoral thesis whose defence he unfortunately couldn’t attend. Inevitably and not entirely without regret, he has to shift his focus away from his discipline.

The rector’s former profession has taught him attentiveness: he checks whether we have eaten and rested. It is good of him! He offers coffee. We accept and the women at the front office get busy. The rector makes his own coffee, brewing it straight in the mug like in the olden times, the way it ought to be.





*The new laptop collapsed completely!*

His giant desk (finely decorated, yet dignified and impersonal) hosts a couple of PCs. Those seem new to him. When technology (whether a PC or a telephone) gives him trouble, he asks for advice directly, without any hesitation.

Academy Member Asser has not been rector very long, but he has already instituted changes, mostly in the areas closest to him. But will there be anything more extreme? In the future? How to navigate the ship? The response is resolute: “No more talk about navigating ships!” Clear enough: discussing manoeuvres with a nearly 400-year-old university is off the table.

At 9 am, we head to the council hall. The rector has to open a conference. The crowd is international. Hosted by the Asian Centre, the event has attracted people from multiple disciplines, and the hall is crowded. The conference involves someone the rector is familiar with: one of the keynote speakers is his dear friend Kazuto Matsumura, a Japanese linguist and an Estophile. Decades ago, young Doctor Toomas Asser spent several months in Japan. Mr. Matsumura offered him valuable information and support to ensure a successful visit.

Rector Asser has prepared his welcoming speech. He speaks excellent English. His speech is accessible, with a personal touch: he speaks of the ageing populations of Japan and Estonia and of technologies that could help both.

After the welcoming speeches, the rector stays for Mr. Matsumura’s lecture. His phone lights up silently, the rector mumbles something indistinct and hangs up. The first event of our





*Stalemate!*

*Is there any space for compromise at all?*

day ends with this lecture. The rector ignores the catering but exchanges a few jocular words with colleagues and students. Back to the rectorate!

Rector Asser becomes concerned about a former patient who had called. Asser had promised to call back. The women in the office are looking for the number. And then it is time to focus again. The rector's executive assistant, Saima, has arrived and they discuss serious strategic and tactical considerations. Saima is a perfect aide: she has spent a long time at the rectorate, she knows the people, the problems and the backgrounds.

The first result of the meeting is a phone call to a top ministry official. A call to the minister follows, but it goes to voicemail. The rector decides to try again later.

The rector and Saima check the time – there is still some left – and delve into the agenda and the speeches prepared by Saima for the Memorial Day event. The rector reads them carefully and changes the speech slightly. He adds the aspect of overworking. I find it touching: he cares, notices and knows.

At a quarter past eleven, the person who called during the conference calls back. It is the rector's PhD student. The rector offers advice on the finesses of the medical bureaucracy and takes a vivid interest in someone's recent stroke. The rector has two PhD students about to defend their theses. He mentions that he is proud of them!

At half past eleven, the rector picks up the phone and returns someone's greeting. It's interesting that the phone neither rang nor vibrated.

Precisely at noon, the regular meeting of the rectorate begins. The meeting hall is equipped with a long table. Everybody gets their own coffee in the adjoining room. There are sandwiches and small pies. This is all there is for lunch.

Several urgent topics are up for discussion. The rector stands out as an attentive listener. He leads quietly and delicately, summarising talking points and introducing new ones. His attitude is calm and relaxing, as suits a doctor.

The rector's assistant is mindful of the time. The next meeting is about to begin. He exhorts us, his shadows, to





*In summary, this change is happening! I hope it goes well!*

*This matter is important enough to require us to be in the same information space.*

*Time to finish!*



*The vision and the action plan could use some more courage, some more details.*

*None of this is worth bickering over!*

finish off some more pies, because there won't be any more time and the day is still young. We obey. In the intervening fifteen minutes, the rector has a brief discussion with Aune Valk, and gets to stretch his legs, if only briefly. And then, new people enter the same space (the rector prefers the small room: it is cosier). The academic committee meets at a quarter past two. One of the agenda items concerns career paths at the university and the tenure system, introduced by Vice-Rector for Research Kristjan Vassil. But first, the rector says a few words. This is his first meeting with this committee and he hopes for good advice. This committee covers professor attestations, confirming research awards, etc. The decisions require a consensus. Today, the matter requiring consensus concerns new candidates for the Academy of Sciences. The University selects the candidates and the Academy makes the final choice. The academic committee meeting comes to an end, since the rector has to hurry to his next important event: Memorial Day for the university employees at the Raadi Cemetery, which is held on the last Thursday of September every year, come rain or come shine.

We hurry to get our coats. Once again, I bring up my worry about the rector's lunch. Is a pie and a sandwich really it? The Rector says that he wouldn't even think about food if he wasn't constantly asked about it. An enviable characteristic!

The Raadi Cemetery is an impressive site! So many signposts to the graves of our great forebears! Such intricate





and varied headstones, and so many people are present!

The Academic Men's Choir strains to sing over the wind, and Toomas Asser reminisces about the employees and students who passed away during the previous year. Here is the rector's speech:

A chillingly long list of names follows. There are many groups here. All of them remember their loved ones, their friends and predecessors. The entire rectorate is present to commemorate the former rectors buried here. A guide tells stories that attendees then complement with their own memories. The

My dear university family!

It is a heart-warming tradition to gather here at the Raadi cemetery on a Thursday every autumn to commemorate our colleagues, fellow students, teachers and students. Even though they are no longer with us, they are still on our minds. We continue what they started, work on their research questions and carry their spirit.

I, too, have many, far too many colleagues here at Raadi. Teachers, colleagues and fellow students. Their words, presence, behaviour and actions – their example – are clear in my mind. For example, Ernst Raudam, Ülo Arned, Matt Mägi, Kuno Kõrge, Valve Saarma, my group mate Veiko Vasar and many others.

Here rests the founder of neurosurgery Ludvig Puusepp, along with his daughter Liivia Luts. Liivia was my dear colleague for a long time. I visit their graves often and guests from abroad have come to visit, too. Last year and this year have brought many heavy losses to the university. There were some who left too soon, who had too much left to do, and others who gave their all to the university during long and fruitful lives. Peeter Tulviste, Volli Kalm, Rein Ahas, Väino Puura and Tullio Ilomets ... They all knew the past and the future of the university. The university knows that much less now. Yes, they gave their all, all too often at their own expense. Hence, I take this opportunity to remind you, dear friends, to take care of yourselves and to find time to rest. No matter how important the work, it is not worth your health. Take care of yourselves, and others, and notice when a colleague is getting close to burnout and their mind or body is suffering. Silence is not a good idea.

Each of us is going to visit the graves of people important to us. But first, let us remember the members of the university family who passed away within the last year.





feeling in the air is good, even collegial. The members of the rectorate visit the graves of all 32 rectors buried at Raadi.

The three-hour journey of remembrance at Raadi is clearly an emotional experience: beautiful, slightly sad, but truly dignified.

With our wind-chilled fingers and noses, we enter the rector's warm car again. We hurry to the reception of the Ambassador of Japan, Ms. Yoko Yanagisawa. It is held in connection with the morning conference. The location is the main building again, the University's proud and exciting art museum. The tables are heavy with food. What a sight among the antique art! Shouldn't the rector be hungry after a long day? Welcoming speeches go on and on, champagne and fruit drinks are offered (the rector chooses

a soft drink). No one is in a hurry to start eating, least of all Rector Asser. Finally, the ambassador walks him to the table and provides a compelling example as they get started. The shadows did not go hungry, either!

We finish our day after 7 pm, and rather out of breath, too! The rector continues tirelessly. It seems to me that several important conversations are still in full swing. But as his schedule confirms, the reception is his last official duty of the day.

When we go to pick up our clothes in the cloakroom and say we've finished our shadow duties, the women in the cloakroom ask us how we liked the day and if the rector's work seems appealing. Heavens – no! The pace of it! Everybody laughs.



## SHADOWING RECTOR MART KALM

9 October is a Tuesday.

We have been discussing potential opportunities for shadowing Rector Kalm for a while, but have always postponed it. In early October, we finally made it work!

On Tuesday morning, we head to Põhja Street, right behind the main railway station. It is an exciting moment: so what does the new Academy of Arts look like? The media has written about it a lot, but you have to see it to believe it!

Old and new, glass and concrete and much more. An interesting building! But construction is still going on in early October. The photographer and I, as always, make sure to come early to watch the rector arrive. We get lucky! Rector Kalm, with his long steady stride, walks through the glass doors of the rectorate and appears slightly surprised to see us waiting. His journey to work consists of a half-hour quick-paced walk. A great warm-up!

The rector has handled a large part of the more focused work at home. It is time to communicate with others. The lion's share of Mart Kalm's working time is taken up by exhibition openings, discussions and meetings. The weekly meeting of the rectorate is due to begin. The rector often gets delayed on the way. A good communicator, stairs and corridors take him more time than strict geography demands. The meeting starts on time. It is nice to see the construction workers behind the glass doors of the office discuss their

*Rector Kalm wrote:*

*Hi,*

*Perhaps we could meet at 9:45 am at the rectorate at Põhja 7, 2<sup>nd</sup> floor (I start early and do most of my morning work at home, but will not be inviting you there).*

*The governing board of the Academy meet at 10 am.*

*There is a viewing of Japanese and Estonian animated films at 15:30.*

*Something is bound to happen in between, too.*

*BR,*

*Mart*







*Our meeting room has a clear view of the prime minister's work space.*

*Everybody is exceptionally eager to pass on their problems.*

*I see! Where's the next Gordian knot?*

own important (and, evidently, fun) matters. To each his own.

I like the way Mart Kalm introduces us at the beginning of the meeting: he even remembers our names! The rector also introduces his new assistant, for whom this is the second day of work and who gets trusted with the protocol. She is an Estonian philologist so hopefully she will do a thorough job. Many immediately touch base with the newcomer, hoping to put her additional language and proofreading capacity to use. The young assistant is eager to help. But Kalm, smiling, interrupts: "Now, wait a moment – the rectorate never agreed to provide so much help!" General mirth follows. And in fact, despite the topics, which can be very serious and matter-of-fact, the atmosphere is open and positive. Kalm is attentive, too: He soon notices the assistant huddling over a laptop by the wall and invites the newcomer to the table: it's more comfortable! Through

the lens of humour, too, though: "I look more important with an assistant by my side!"

The meeting proceeds in a friendly, constructive spirit. When somebody wants to make a point, Rector Kalm is quick to notice. The rector is an active communicator and (frequently witty) thinker. When the collective wisdom of the group comes up short, the rector makes a call to bring in somebody important to provide information. When things get heated, he is quick to cool them down: "Steady now – one at a time!" He is fully present, observing and leading. On the other hand, the atmosphere is democratic: Rector Kalm is not a dominating leader. If anyone uses a combative tone, he chuckles – and thus defuses tension with humour. His is an exciting and impressive style of leadership. An example of his complex-free attitude: "I am going to send a letter to the council of rectors, and please make sure that I don't send anything daft."



*I hope the IT guys don't work in pairs just for the fun of it.*

*We have to really lean on them!*

*I sense that the problem lies in the chaos.*

*You are being so cryptic...*

”



*Was this the revenge on the school?*

The meeting is over by 12:10 and Kalm goes to get some quiet work done at his office. The first meeting at the office focuses on what to tell the media and how. A longer creative process follows: the Academy of Arts has to submit a report on the management agreement to the state. The deadline is quickly approaching. The colleagues gather in the rector's slowly darkening office to discuss the matter. Kalm doesn't like sitting alone on his side of the table and he invites a colleague over to balance it out.

At some point, the rector remarks that it's time to eat. He mentions being weary of the meetings and heads towards the canteen.

The Academy of Arts canteen is great: a varied selection of food at affordable prices.

The rest of the time until half past three is dedicated to the management agreement report. It is not particularly exciting for us shadows. Rector Kalm sits in his dark office, with the Toompea hill visible through the rain-flecked windows. The rector is focusing. At times, he jumps up and dashes to the spacious front office to talk to his philologist assistant, or to confer with somebody else. Back to his office, back to the weighty writing. But since his doors are wide open, people keep walking in. Once, when he jumps up to go talk to the accountant, he returns with







an armful of ripe pears. The assistant gets some and so do we. They were perfectly ripe and delicious.

The apparent seclusion of the rector's office is deceptive. Soon enough, his attention is drawn to problems with the coffee machine. Even though Rector Kalm is drinking only water today, the question of good coffee is still important to him.

The time for Japanese anime approaches. On the way to the Great Hall, we encounter the Academy building's architect lecturing to some twenty people.

Rector Kalm listens, captivated. But not for long. Japanese culture awaits. A group of representatives of the Tokyo University of the Arts is visiting the Academy. The rector would like to hear the introductions of the Japanese professors. We get to watch several strangely interesting films directed by Professor Koji Yamamura, who is among the visitors, ready to field questions.

It is cool and windy in the Great Hall. The heating is not finished yet; it might still take weeks.

There is an icy draught where Mart Kalm is sitting. He doesn't stay long for the Q&A. His phone chirps. It gets his attention and he is once again in a hurry. He bids polite farewells to the Japanese visitors and hurries back to the office. He has just received a surprise invitation to the opening of Jaan Elken's exhibition: "The exhibition deserves a visit and I cannot possibly turn Elken down!"



*Warm underwear is  
your friend!*







The rector plans to spend at least half an hour at the celebration. There are a lot of people and there is a lot of talking to do. But nevertheless, Kalm soon says that it's time to move on. There is a photography lecture at the Contemporary Art Museum of Estonia at 6 pm. We rush there and arrive at the last moment. The small room is overcrowded. The crowd makes way for Rector Kalm, he finds a free place and the last task of his workday begins. Isn't it great when work coincides with hobbies! I don't even try to squeeze in. Reti, the photographer, takes the rector's advice, finds her way in and listens to the thoughts of her colleagues.

What a day – full of serious meetings and varied art.

The three days were wonderful! It is interesting to watch interesting people in interesting positions. We wish them the best of luck!





### 3 LEGACIES

The definition of a legacy is broad. For creative persons and researchers, it covers their whole life's work. All they have done, all their errors and achievements passed down to the next generations. But some organise their legacies, making sure that the focus is preserved and always accessible.

We have three excellent examples!



Photo: A. Rätsep, Under and Tuglas Literature Centre (UTLC), F96/A15.

#### *The Legacy of Academy Member Friedebert Tuglas*

**O**n 8 May 1970, Friedebert Tuglas, an author and a member of the Academy, made his will, in which he left his belongings to the Academy of Sciences of the Estonian SSR. He also stipulated in his will that a house museum and research centre be established at his home in Nõmme. The house was originally built for a writer couple, Artur Adson and Marie Under, in 1933. After the owners emigrated in 1944, the house was granted to Friedebert and Elo Tuglas, whose house in Tartu had been destroyed in a fire.

Tuglas had been a corresponding member of the Academy of Sciences since 1946 and remained a member through the deepest Stalinist era, when he was expelled from the Writers' Union he himself had established, and lost access to publishing. It may have been as an acknowledgement of this strange decision that Tuglas left his manuscripts, library, art and photo collection to the Academy. According to the list drawn up by the committee for registering succession property, the library of the Tuglas family included 12,618 books and the art collection featured 1,014 single items.

The living room of the Tuglas home in 1963; on the wall, a major Estonian painting in the collection of the Literature Centre: "The Portrait of Konrad Mägi" by Nikolai Triik. In 2018, the painting was shown at the Orsay Museum in Paris at the "Wild Souls. Symbolism in the Baltic States" exhibition, visited by over 236,000 people.

On Tuglas' birthday, 2 March 1971, the first Tuglas short story award laureates were announced. The award was established by Tuglas himself. He had announced his decision to establish an annual literature prize to the Council of Ministers of the Estonian SSR and the board of the Writers' Union in 1969: "Since my contribution to literature is dominated by short stories, it is the future of this genre that most weighs on my heart."

Now, the Friedebert Tuglas Short Story Award is the longest-existing regularly awarded literature prize in Estonia.

**On 27 May 1971**, the Central Committee of the Estonian Communist Party and the Council of Ministers of the Estonian SSR ordered the establishment of "the Friedebert Tuglas House Museum as a branch of the Academy of Sciences of the Estonian SSR Literature Museum in Nõmme, Tallinn, in the house where Tuglas spent his last years." It was established by decision of the presidium of the Academy on 28 September. The director of the museum was





Photo: UTLK

Researchers' office built during the enlargement of the Tuglas House Museum, 1976. Under and Tuglas Literature Centre, UTKKF13-21-10HFFO

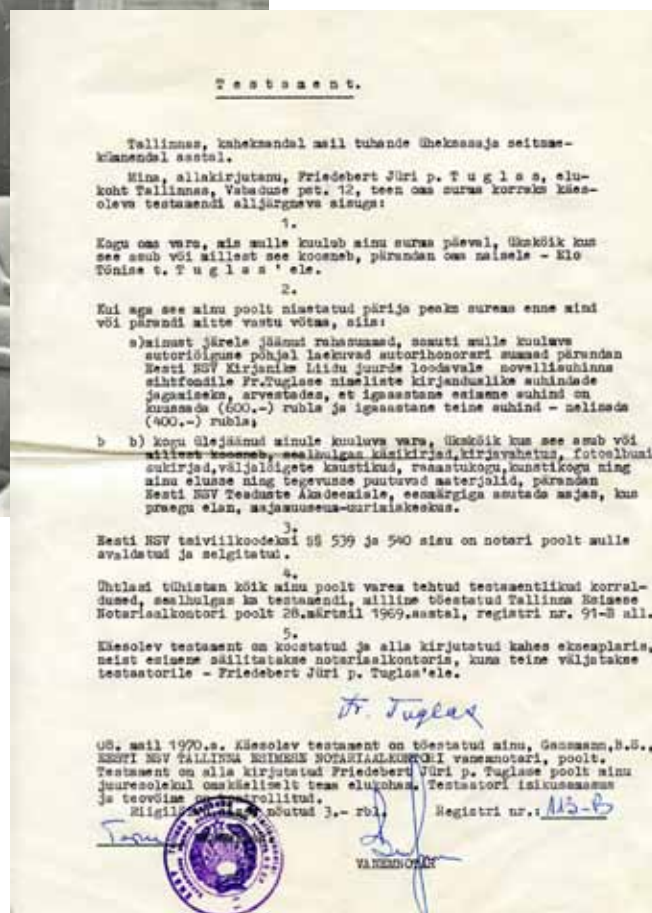
August Eelmäe, a professor of literature, and its treasurer was Valter Kruut.

The initial collection consisted of what Tuglas had left to the Academy. It consisted predominantly of books, which fill almost all the shelves and cases at the museum (in Tuglas' office at the museum, the original order of the books is still maintained). His art collection includes many important works of Estonian art heritage, by e.g. Nikolai Triik, Aleksander Tassa, Andrus Johani, Oskar Kallis, Ants Laikmaa, Konrad Mägi and Ado Vabbe. The collection also includes various items, photos, postcards, clippings, manuscripts and a music collection.

The Tuglas house museum opened to the general public on **2 March 1976**, on the writer's 90<sup>th</sup> anniversary. The building was enlarged after his death: a small meeting room was built on the first floor and an office for researchers on the ground floor.

Tuglas himself, who wished his home to be turned into a house museum and research centre, had planned the work. His wish came true; now, the house museum's offshoot, the museum department of the Literature Centre, manages the cultural property of Tuglas, Artur Adson, Marie Under, the art collection of the Foundation for Estonian Arts and Letters (USA), and the Paul Reets book and art collection. It is a site for tours, lectures, seminars, exhibitions, meetings with authors, and much more. Research is equally important. The cultural heritage is made public through the preparation and publishing of scientifically edited editions.

On **19 January 1993**, the Academy of Sciences renamed the Tuglas house museum the Under and Tuglas Literature



The will of Friedebert Tuglas.

Centre. On 4 October, a new scientific institution – the Under and Tuglas Literature Centre of the Estonian Academy of Sciences – was created by merging the house museum with the literature department of the Institute for Language and Literature of the Academy of Sciences (created in 1988 on the basis of the literature sections of the Institute).

According to the first statute of the centre, signed by the Council of the Literature Centre on 27 October and ratified by the general assembly of the Academy on 13 December, the goal of the Centre was to “collect, research and publish materials connected with Estonian literature”.

On **7 February 2000**, Jaan Undusk, now a member of the Estonian Academy of Sciences, was elected Director of the Literature Centre. He still holds this position. In his policy address, Jaan Undusk characterised the Literature Centre as an elite national studies institute, which, like several foreign examples, would allow highly qualified researchers to focus fully on writing (“Jaan Undusk valiti teadusastutuse juhiks”, Päevaleht 8.2.2000).

Excerpt from the website of the Under and Tuglas Literature Centre: <https://www.utkk.ee/en>

## *The Legacy of Academy Member Arvo Pärt*

40 km outside Tallinn, by the Lahepere gulf, lies Laulasmaa. Named for its “singing sands”, it borders the village of Heliküla, established in the 1950s and 1960s to provide summer homes for Estonian composers and other cultural figures.

It was a favourite place of the composer Heino Eller, and his students and colleagues used to frequent it, Arvo Pärt among others. The picturesque sea and serene pine wood have always inspired Pärt. In his youth, Pärt would arrive by motorcycle, then walk with his teacher Eller through the forest to go swimming, sit on the beach rocks and talk.

Now, decades later, when the composer is the age his beloved professor was back then, he walks these paths and contemplates the full circle he has come. And hence, here, away from the din of the city, in the nature that supports his creation, the perfect place was found for the Arvo Pärt Centre: a personal archive containing his creative inheritance.

Arvo Pärt himself laid the centre’s cornerstone. The building, “flowing” in shape, without any straight angles, opened to visitors on 17 October 2018.

### **Background**

Fifteen years ago, Arvo Pärt and his family began to wonder about the future fate of the composer’s rich musical legacy, and they decided to take the matter into their own hands. The first and simplest solution would have been to hand it over in its entirety to the Berlin Academy of Arts (Akademie der Künste), with its hundreds of years of archiving experience.

“They would have gathered the entire existing material, taken it away and systematised it. But for my parents, this did not seem like the right solution,” the chairman of the board, the composer’s son Michael Pärt says, recalling the early stages of the Centre’s creation. “The decision was made to do it on our own, even though we were strangers to archiving.”

The family rented a small room at the Laulasmaa Spa and work began. Systematising and digitising the archive was given top priority. Arvo Pärt’s wife Nora was the first archivist and categorised, by years and topics, material that was later used nearly without changes by professionals.

“The first major step was to organise Arvo Pärt’s musical diaries, which contain, apart from sheet music, the texts that inspired them, noted down by the composer either from books or from what he had thought or heard,” Michael Pärt recalls.

A few years later, the archive was moved to the house in Laulasmaa, called Aliina. Initially privately funded, the centre started receiving state support in 2011. This made

it possible to build a larger team. It took a huge amount of preparation to clarify the directions of the work: the archive had to be open to the general public, which the small house did not allow. Inspiration was gathered from other countries, archives and great musical centres.

“With a few years remaining until the hundredth anniversary of the Republic of Estonia, it was decided that the centre should have a public function by that date,” Anu Kivilo, the Managing Director, explains. The initiators had to take a risk that the chosen direction would be right and still workable in five years’ time. “The building was one thing: there were architects, designers and various organisations involved. The content, however, was harder; we had to decide on that on our own,” Kivilo adds. “We were given credit for being quite brave early on.”

### **The Archive is the Heart of the Centre**

The archive is the heart of the Arvo Pärt Centre. It gathers together the composer’s creative legacy and related information and documents physically, as well as digitally. It is a unique undertaking on the global level, since the composer’s style is perceptible throughout. He still creates, his creation is performed daily, and therefore the archive continues to grow and develop very rapidly. Pärt himself is an active user of the archive.

“For instance, he sometimes asks to see a music diary, to correct or change manuscripts, which means that the most recent manuscript is no longer final,” Kivilo mentions, and Michael Pärt adds: “Arvo is capable of tearing a page out of a manuscript, and he is the only one who is allowed to do so. But just imagine what the archivist says....”







### Arvo Pärt Centre

Laulasmaa, Kellasalu St

Open since 17 October 2018

Founded in 2010 by Arvo Pärt and his family.

The goal is to create the circumstances necessary for maintaining and researching the creative legacy of the composer in Estonia, in an Estonian language environment.

The heart of the centre is the archive, which gathers the entire creative legacy of the composer, as well as related physical and digital information and documents.

In the future, the centre will be a focal point for many activities related to Pärt's creation, acting as a music and information centre, but first and foremost, a research and learning environment, with the archive at its core.

The surface area of the new building is 2,348 m<sup>2</sup>. It hosts the archive, a library, an auditorium seating 150, an exhibition area, a film room, classrooms and staff area.

The cost was 8.5 million euros.

### The Doors are Open to All

The centre is not an ivory tower: it is meant to welcome everybody. Arvo Pärt may be a world-famous composer whose creation is dominated by serious, in-depth topics, but it is hard to find a simpler and warmer person. The centre, too, is not an elitist site, but welcomes everybody with open arms. You just have to want to come, and take the time to come here and be here.

According to initial plans, the Arvo Pärt Centre can host 20,000 visitors annually.

"This number is related to its location and size. We hope that the number of visitors remains in good balance with the soul and activity of our building," Michael Pärt explains. "If it gets too big, the centre will fragment and lose its meaning. This centre is small and compact enough to stay whole."

"We are still taking the first steps and learning and growing along with the building. We have a lot of interesting things to offer, but we want to trust our visitors to come and explore the centre and to contribute," Kivilo reflects. "The creative aesthetics of Arvo Pärt are anything but domineering. They leave space, as does the centre. Ideally, the centre will become, in the broadest sense, a place with space to be and to meet yourself, and not necessarily Arvo Pärt."

Extracts from Kirke Ert's article "Arvo Pärdi Keskus – ainulaadne isikuarhiiv männimetsas": <https://kultuur.err.ee/867776/arvo-pardi-keskus-ainulaadne-isikuarhiiv-mannimetsas>



Photo: Tõnu Tunnel x2





## *The Legacy of Academy Member Anu Raud*

Member of the Academy Anu Raud is more than a genial tapestry artist! She is more than a talented word-smith, and more than a collector of folk culture and a charming teacher!

Did you know that she is attempting to resuscitate an old village centre, the village of Heimtali? Yes, you have heard about the Heimtali schoolhouse. It is a museum that Anu Raud donated to the Estonian National Museum (ERM) and that the ERM now operates, joyfully and with great diligence. But this is not all. Anu Raud has used all her profits and savings and has purchased almost the entire former village centre: the town hall and community centre. The community centre, too, has been handed over to the ERM.

The former village centre – the schoolhouse, town hall and community centre – have been brought together under a single vision: a shelter for the spirit, a peaceful harbour to rest and to reflect. Anu Raud's own homestead, Kääriku, lies a few hundred metres away. There is a lake, a hill and the Mõttekoda (Thinking Hall) of her dreams. It is not finished yet, but soon... And





somewhere out there, among the trees, lies the forest ranger's farmstead. It is for sale and Anu has her eye on it. The farmstead would become a site for thinkers in need of a longer period of focusing; it would be a perfect refuge, with few distractions, for any writer or researcher.

And if creative people find their way to Heimtali, they will still find the old village centre. Thus, Anu keeps her family home alive, the place where her grandparents lived and where memory goes so far back! Anu Raud is no mere dreamer: she has a will of steel and her vision is compelling. It is interesting to watch her wade through the hardships and make her dreams come true.

The Academy, too, lent a hand here. The early December training sessions for the 3-minute-lectures took place at Heimtali. This was the first time we took everybody out of Tallinn and brought the PhD students together under one roof.



Photo: Reil Kõkk x4







### 3 MINUTE LECTURES: WINTER TRAINING SESSION

The old Heimtali schoolhouse seemed like a perfect place to hold the seminar. It has been a site of learning for a century, and the drive to learn through the seminar is pretty strong, despite the fact that the learners are young PhD students and we are at an old village school. The training was meant to last two days to let the young people get acquainted with each other and give them time with Academy members. The afternoon of the first day featured “inspirational lectures” by President of the Academy Tarmo Soomere and Member of the Academy Maarja Kruusmaa. The second day was earmarked for practical work. We had invited TV people: the director Indrek Simm and the producer Kaspar Kaljas, who work on the Rakett 69 TV series.

We met at the old town hall on 1 December at noon. We were greeted with a buffet (warm fresh pies, sandwiches and plenty of sweets) and Member of the Academy Anu Raud spoke in her quiet charming way about the Heimtali village centre. When everybody had arrived, were warm and had been fed, we went on an outing to see the future cultural centre, already slightly familiar through stories.

We left a lot of time for the trip, because Academy members were due to arrive only in the afternoon.





And it is good that we did! It was lovely outside! A stunning, crisp winter's day, so long awaited, perfect for walking and admiring. The final stop of the tour was Anu Raud's homestead at Kääriku, with more food waiting. We realised that the Heimtali seminar would leave impressive memories. And the food was delicious, even though there were different cooks for almost every meal.

When we reached the schoolhouse, the huge stove was radiating cosy heat. We laid our mittens (because this is a place for wool and mittens) out to dry and waited for the Academy members to arrive. First, the president got there (directly from the anniversary of the University of Tartu!): like Santa Claus, he stuck his bearded face through the door to ask if all the good children were there. And the inspirational lecture began. During a break, he requested something to drink and perhaps a bite to eat. Anu Raud went off to get soup (sauerkraut soup with beans!)

By the time the soup was warm, Maarja Kruusmaa had arrived (and found a spoon, too). And the evening proceeded with a pleasant discussion of how to perform, what to consider, and what to avoid at all costs.

To conclude the evening, the makers of Rakett 69 introduced themselves and spoke about the practice events planned for the upcoming day. For homework, Indrek Simm gave each participant a wine cork for



Photo: Reiti Kõkk x18









articulation exercises. It is not only content that matters, but also if, and how, it reaches the listener.

In the evening, the young people had a sauna and a good time at the Kivi holiday centre (because the town hall is not ready for overnighting yet).

The classroom at the schoolhouse had been transformed by the following morning. The screen and projector remained, and they were joined by a camera and an uncomfortable bright light aimed at the speaker. The goal was to listen to the participants' 3-minute lectures and to record, review and analyse them. (*The clever young people constructed their own clickers and gave the museum people advice on where to invest.*)

The day was long, but without doubt interesting for all, because we learn through more than our own mistakes.

We agreed that we needed one more training session, sometime in January before the gala itself. This event will be reflected in the next issue of this collection.



The second day of training sessions was attended by the museum staff, eager to watch and cheer everybody on.

Looks like we might well go to Heimtali again next year. (See more photos at: lk 98)



# ODDS AND ENDS

## OUR MEMBER ORGANISED THE GLOBAL FORUM AT TOULOUSE

The EuroScience Open Forum (ESOF), a major biennial European research policy forum, took place in Toulouse, France on 9–14 July 2018. Estonian science was represented by personalised medicine, smart city environment, e-health and cyber security.

In 2018, the head of the ESOF programme committee was Member of the Academy Andrus Metspalu, Director of the Estonian Genome Centre. The forum had nearly 30 Estonian participants. Minister of Health and Labour Riina Sikkut participated in the personalised medicine panel on the final day of the forum.

## ENOUGH OF EXPERTS?\*

When it comes to researchers and experts, the statements of the Minister of Education generally carry more weight than those of other ministers. The British politician Michael Gove's famous statement "Britain has had enough of experts" was often quoted at this year's international forums in France.

The sharp sound-bite reverberated around the globe, and it remains a current topic. It is particularly regrettable that it was essentially a statement by the Minister of Education. The former Vice-President of the World Bank Ismail Serageldin presented it as a very negative example at Science Day, celebrating the founding of the International Science Council on 5 July. (see p. 39–40).

Projected on the big screen, this crude statement was met with an audible murmur of displeasure by the heads of academies of sciences and international research societies. After all, no minister should ever say this, even if it was their firm private belief.

But in truth, this cutting meme was created through a kind of collaboration between politicians and journalists that should be held up as a particularly negative example of cooperation. Professor Julie Maxton, the Executive Director of the Royal Society of London (and the first woman to hold the post in the 350-year-long history of the institution), analysed it at the EuroScience Open Forum in Toulouse. She spoke about the basic facts: what Michael Gove said, what his government position was at the time, and how his words came to be interpreted the way they were.

Gove was the Minister of Justice when he was quoted, having left the Ministry of Education. The reference to one of his previous jobs, seemingly a detail, became a major factor in amplifying the quote: a small lie to make the big lie sound more powerful.

The Minister of Justice was interviewed before the infamous Brexit referendum. The interviewer pointed out that the heads of several institutions (such as the IFS, CBI, NHS and TUC) did not share the minister's views on Brexit.

So when the minister began his reply with customary English thoroughness and diplomacy, saying "I think that the people of this country have had enough of experts from organisations with acronyms saying that they know what is best and getting it consistently wrong," the interviewer was shocked by his first words, interrupted, and kept repeating: "Have had enough of experts? Enough of experts?..." The statement was reproduced millions of times. Barely anyone could be bothered to finish listening

\* The text "Enough of Experts?" was initially published in the Postimees research portal on 13 July 2018: <https://arvamus.postimees.ee/4886673/ebe-pilt-villand-ekspertidest?>



to the minister's statement and many were persuaded that the minister really had rejected the views of all experts.

Thus, a reasonable explanation was turned into nonsense by the unwillingness of one party to let the other finish.

Both forums discussed how science can give good advice to society and its leaders only if scientists begin by listening to the other side.

But both forums emphasised as even more important that neither experts nor scientists should ever decide what is good for others. Their task is to bring facts to the table, to explain their meaning and background, and to draft out the scenarios that possible decisions would create: and then leave decisions to the people mandated to make them.

## THE ACADEMY'S PUBLICATIONS AND ITS MEMBERS' WRITINGS

### January

Jüri Allik's non-memoirs "Välidi igavaid inimesi ja olukordi" (*Avoid boring people and situations*)

Valter Lang "Läänemeresooma tulemised" (*Finnic comings*) (Valter Lang spoke at the presentation of the book at the University of Tartu art museum on 26 January.

**June** – a book on national awards

### November

Mart Kalm "Eesti arhitektuuri 100 aastat. Talust tarbimis- maastikuni" (*A Century of Estonian architecture. From the Farmstead to the Consumer Landscape*)

"Teadusmõte Eestis. Teadus ja ühiskond" (*Scientific Thought in Estonia. Science and Society*)

Ülo Niinemets's articles on the **Monsanto Files** were awarded the Sirp laureate prize:

Member of the Academy Ülo Niinemets, Professor of Crop Science and Plant Physiology at the Estonian University of Life Sciences, published a series of articles on the dangers of glyphosate and the global lies around it in Sirp. In the "Monsanto Files", he describes in detail how Monsanto, a major producer of glyphosate-based herbicides,

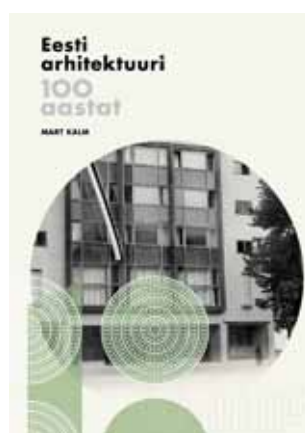
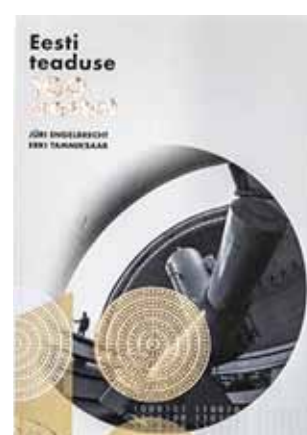
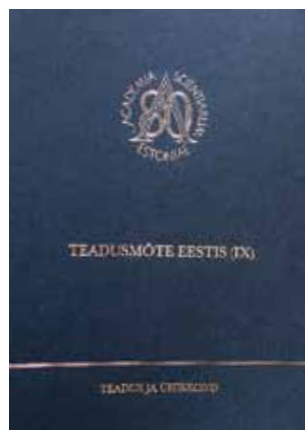


Photo: Margus Ansu

Valter Lang at the presentation of the book "Läänemeresooma tulemised" (*Finnic comings*) on January 26 at the University of Tartu Art Museum.



Achieved the global predominance of its product Roundup and the price that using glyphosate-based herbicides can exact on humans and the environment.

Ülo Niinemets states that since glyphosate is one of the most widely used chemicals in agriculture, it is generally seen as irreplaceable. His preferred course of action would be to initially ban its use as a convenience chemical to speed up and uniformise the ripening process, and later impose a total prohibition on its use. Niinemets believes that it is time to begin preparations for the end of the glyphosate era, which, at least in the EU, will arrive soon: “I tend to believe that the authorisation of glyphosate in the EU cannot be extended again due to overwhelmingly negative public sentiment.

As we remember, last time glyphosate was authorised with a razor-thin majority after heated discussions. The UK was the greatest supporter of glyphosate in that round. Brexit takes out its main proponent.” In any case, he suggests listening to Estonian researchers.

Ülo Niinemets’s principal job is researching plant stress hormones at the Estonian University of Life Sciences. He is convinced that accounting for plants’ adjustment capacity makes climate models much more accurate. This is particularly important in an era in which humanity is facing its greatest ever challenges: climate change, food and water security, and ambient air pollution.

As for the factors threatening the Estonian environment, Niinemets names surface and ground water pollution as the most significant problems: the use of chemicals in agriculture is rising with the increase in the EU area aid and, since these chemicals reach bodies of water, it is likely to lead to a deterioration of the state of the river Emajõgi and Lake Peipus in the near future. Oil shale mining uses a huge amount of water; additionally, by releasing a huge amount of fossilised carbon dioxide in the environment, it has a vast ecological footprint.

Niinemets considers the pollution of ambient air during the heating period a serious problem in several towns, especially in Tartu, where the main sources of pollution

are local solid fuel furnaces and stoves, as well as diesel engines: “One stove with bad air circulation, where household trash is burnt along with wood, can pollute more than, say, the Vão power plant. It is bizarre that the national excise policy supports burning coal and wood – the highest pollutants – in households by taxing heating oil, gas and electricity heavily.”

Another problematic time is the post-thaw spring period, with asphalt dust thick in the air. The WHO’s International Agency for Research on Cancer recently added ambient air pollution to the list of carcinogenic factors, and efforts to decrease it are being made globally. “The technology is there,” Niinemets states.

In the opinion of Niinemets, scientists should explain science to the public, although Estonian scientists are already overworked: “For a long time, scientists’ contributions have been assessed solely based on international publications. Science communication is increasingly emphasised and everybody should contribute, in particular those whose contributions to global science are lower.

But paradoxically, it is the internationally successful researchers who write popular science articles and talk to the media. New winds are blowing in politics, including cooperation with industry and higher accessibility. The principle is solid, but it requires an equivalent, top-level effort in the private sector. In many fields, it does not necessarily take science to improve life. In agriculture, for example, yields can be at least doubled solely through applying existing knowledge. The proof lies in the fact that smart adopters already receive double or triple yields!”

Ülo Niinemets was the first Estonian researcher to receive the prestigious European Research Council top researcher grant (2012). He is also a three-time national research award laureate (in 2000, 2006 and 2018), was named one of the world’s 3,300 most influential scientists in 2017, and listed among the 6,000 most quoted researchers in 2018. He was awarded the Order of the White Star Fourth Class in 2012.



# STUDENT SCIENCE FESTIVAL

The 2018 festival took place at the Estonian National Museum in Tartu on 12–13 April. The participants and supporters were numerous. There were numerous prizes, too, both ordinary and extraordinary. The Academy of Sciences awarded its special prizes once again:

- Alex Savolainen (Tartu Kristjan Jaak Peterson Gymnasium) for his work “Aluminium-air battery: a simple and cheap construction”;
- Karl Robert Kuum (Hugo Treffner Gymnasium) for his work “Determining ageing-related gene expression changes in human skeletal muscles using a real-time PCR method”;

- Daniil Vaino (Narva Pähklimäe Gymnasium) for his work “Controlling computers and machines using brain waves or electric activity”;
- Aleksandra Lilleorg (Tallinn Secondary School of Science) for her work “Bulgakov’s *The Master and Margarita*. The differences between the editions of 1968 and 2010 and their backgrounds”;
- Emilia Rozenkron (Saaremaa Gymnasium) for her work “The breeding of the lesser wax moth (*Achroia grisella*) and the greater wax moth (*Galleria mellonella*), and their ability to digest polyethylene plastic”.

## $\pi$ -PRIZES

The laureates of the national student research paper competition were announced at the Academy on 12 December.

There is no doubt that many of the laureates have received awards, at different levels, throughout their lives. Some may have started in kindergarten, but everybody almost certainly received some in middle and high school. For most, however, this particular acknowledgement is likely to mean more than just flowers, a diploma, a bank transfer and a minister’s handshake.

It embodies the state’s recognition of work to which most of the laureates have dedicated many years. The state uses the recognition to say that they matter.

One of the hidden meanings of the day relates to the question of what good science is. There is no single definition and the requirements change over time. It is an unquantifiable category, just as one musician makes the fiddle sing and another makes it scream.

But that makes it even more important to take the occasional break from the rat race to focus on a better life, to look back, further and wider than usual, and to acknowledge the people who have contributed to the advances. Those contributions may be key to our future, even if this is not clear yet. After all, it is a fundamental quality of our world that tiny contributions can lead to major achievements. Perceiving this pattern has great value.

Each recognition not only describes, but also enriches the giver, not necessarily through the award itself, but through the process. It offers a unique way to position

yourself. Making these choices often inspires the awardees more than the receivers of the prizes. And so we move forward together. Furthermore, recognising the best requires getting out of your comfort zone, which is an important component of making progress. Arnold Joseph Toynbee noted half a century ago why keeping moving is important: civilization is a movement and not a condition, a voyage and not a harbour.

This is the third time that the president of the Academy’s special prize has been awarded at the student research papers’ competition organised jointly by the Ministry of Education and Research and the Estonian Academy of Sciences. The Academy places a lot of importance in the ability to perceive currently immeasurable things that might be part of our future. Equally, it is important to think outside the box and explore the limits of our current existence. Therefore, we wish to acknowledge elegance and unconventionality as aspects that dignify even very good science. Following from these two principles, two special prizes are awarded at the PhD and master’s studies level: one for the “**most elegant student research paper**” ( $\pi \times 1000$  EUR) and the other for “**an unconventional student paper**” ( $\pi \times 500$  EUR). A frequently used metaphor for gaining new knowledge is the torch. Therefore, a special prize for “**auspicious scintillating sparks**” ( $\pi \times 250$  EUR) is awarded at the bachelor’s and professional higher education level.

Extract of the welcoming speech of Tarmo Soomere, President of the Academy



Gaspar Epro

The first prizes to be awarded were the  $\pi$ -prizes: the president of the Academy's special prizes.

The special prize for **auspicious scintillating sparks** went to AUNE ALTMETS (Tallinn Health Care College, supervisors Kaie Eha and Laine Parts) for the thesis "Gas chromatography of industrial hemp and the pharmacological profile of cannabidiol".

This is an attractive piece of analysis with real results and outcomes on the perceptive and informational as well as real-world applications levels. While the intriguing topic helped it stand out, it is a big step on the path to the world of research.

The special prize for an **unconventional student research paper** went to LIIRI OJA (European University Institute) for the doctoral thesis "Who is the 'Woman' in Human Rights Law: Narratives of Women's Bodies and Sexuality in Reproduction Jurisprudence".

The problem discussed in this work is rather uncomfortable for the largely male scientific world and the almost equally male "landscape" of international organisations, yet it is timely and necessary. The work, a discussion written as a captivating essay, includes the author's presentation of personal, contrasting positions.

Somewhat unusually, the author declares at the beginning that the work is based on feminist analysis. The author turns this apparently biased point of view into a strength



Photo: Reiti Kook x5

Liiri Oja

and makes creative use of the classical position of science: that there is no final truth and every position is open to discussion.

The special prize for **the most elegant student research paper** went to Gaspar Epro (German Sport University, Cologne) for the doctoral thesis "Triceps surae muscle-tendon system mechanosensitivity and gait stability in older adults: a longitudinal investigation over 1.5 years and long-term exercise intervention".

This is a high-quality work on a very relevant topic. The more the healthy life expectancy in an ageing society increases, the higher the population quality and the healthier and more flexible the society as a whole. This thesis unites sports science with solid mechanics competence in elasticity and inverted pendulum stability, as well as a professional application of statistical tests. Many of the applications are oriented towards supporting a core function of the healthy person: walking. There is a thorough discussion of the credibility of the results, the limits of their use and the interpretability. Important links whose applications can significantly improve many people's quality of life are provided.

**Letters of appreciation for the candidates of the most elegant student research paper prize:**

TANEL SÕRMUS for the master's thesis "Photo-regulated inhibitors of cAMP-dependent protein kinase"





Aune Altmets

ALEJANDRO GUERRA MANZANAREZ for the master's thesis "Application of full machine learning workflow for malware detection on the basis of system calls and permissions"

DANEL AHMAN for the doctoral thesis "Fibred computational effects"

**Letters of appreciation for the candidates of the unconventional student research paper prize:**

LISBETH NEEVITS for the master's thesis "Evaluating melanoma treatment costs based on the Estonian Health

Insurance Fund database: possibilities of decreasing costs through early detection supported by teledermoscopy"

JOHANNA ROSS for the doctoral thesis "From Aira Kaal to Mari Saat: The Soviet Estonian Female Bildungsroman and Its Reading Modes"

**Letters of appreciation for the candidates of the auspicious scintillating sparks prize:**

KATRIN PETRITŠENKO for the bachelor's thesis "Applications of two-photon absorption spectroscopy in metal-organic compounds: Changes in the electric dipole moment of electron transition due to solvent polarity"

HELEN ASUKÜLA for the bachelor's thesis "Gravitational waves in general relativity and scalar-tensor theories of gravity"

**Letters of appreciation for the supervisors of the special prize laureates:**

KIROS KARAMANIDIS and GERT-PETER BRÜGGE-MANN for supervising the most elegant student paper prize winner, Gaspar Epro's doctoral thesis "Triceps surae muscle-tendon system mechanosensitivity and gait stability in older adults: a longitudinal investigation over 1.5 years and long-term exercise intervention"

MARTIN SCHEININ for supervising the unconventional paper prize winner, Liiri Oja's doctoral thesis "Who is the 'Woman' in Human Rights Law: Narratives of Women's Bodies and Sexuality in Reproduction Jurisprudence".

LAINÉ PARTS and KAIE EHA for supervising the auspicious scintillating spark prize winner, Aune Altmets' thesis "Gas chromatography of industrial hemp and the pharmacological profile of cannabidiol".





Photo: Office of the President of the Republic of Estonia.

## THE SCIENCE DAY OF THE EDUCATION AND CULTURE CONGRESS AT THE ACADEMY

The congress “Learning and development in the Estonian culture”, organised jointly by the House of Estonian Culture, Estonian Education Forum and the Estonian Academy of Sciences, took place on 24–26 November 2018. It started with a science day at the Academy on 24 November. President of the Republic Kersti Kaljulaid delivered a welcoming speech.

**Science’s benefits to the economy have been widely debated, but its impact on education much less so. How could science redefine the content and means of learning and why should it?**

**Tarmo Soomere:** “Here, science carries a dual meaning: education science and related fields, such as cognitive studies and psychology (which help to teach better), and the sciences whose discoveries are taught. Since our factual knowledge tends to grow geometrically, but learning capability increases in linear progression at best, it is ever harder to pick out the pattern of core facts and their relations that young people will need in the future. Hence, there is increasing pressure to learn more efficiently, not so much to expand students’ memories as to create links, teach thinking outside the box and develop creativity to improve adaptability in rapidly changing conditions. There is an increasing need to apply the output of the “soft” sciences to realise at least a linear expansion of learning capability in as many children as possible.”

**Marju Lauristin:** “First, science has made such headway in exploring the complexity of the world and of the human being that it is time to refresh our understanding of what it means to be educated. Since we need to be able to compete against artificial intelligence in every walk of life and to predict the potential social problems caused by using genetics to direct heredity or by making robots into indispensable everyday tools, we will need a lot more basic knowledge about people, nature and society than we have considered sufficient so far. Also,

if the primary cultural media change, if books are replaced by adventures in virtual reality and if big data makes it possible to decode the algorithms of subconsciousness within seconds, we must pay attention to retaining our humanity and remembering our human language and human feelings, our stories and the smells of nature. I believe that education’s main challenges will be maintaining culture and continuity, and learning a plurality of cultural codes and their translatability. In other words: scientific and technological advances shift the horizon of educatedness towards deconstructing ever more complex mathematical, biological, social, psychological, ecological and semiotic relationships. At the same time, science and technology offer new means and methods of learning to help imagine and interpret those complex relationships. We are shifting from subject-focused rote learning to problem-focused learning, multidimensional modelling and a seamless educational environment where each learner is able to find a suitable individual learning path.”

An extract from Ott Karulin’s article “Neoliberaalne (tagasi) pööre” (*Neoliberal (re)turn*), *Sirp*, 23.11.2018.

<https://www.sirp.ee/s1-artiklid/c9-sotsiaalia/neoliberaalne-tagasipoore/>



## NEWS FROM SCIENTIFIC AND LEARNED SOCIETIES

The **Learned Estonian Society** celebrated its 180<sup>th</sup> anniversary in 2018. A celebration conference took place at the University of Tartu Museum on 23 November 2018. Since the anniversary coincided with the anniversary of the Republic of Estonia, the conference focused on the relationship of Estonians to the earlier German-speaking society, as well as the role of Estonians in the early days of the society and the society's role in the development of Estonian language and culture. The speakers were Kersti Taal, Piret Õunapuu, Tiit Rosenberg, Heiki Valk, Kristi Metste and Valve-Liivi Kingisepp.

The secretary-general of the Academy, Jaak Järv, opened the conference by announcing that the Academy will give each member of the Society a copy of the history of the Society. This history – Kersti Taal's fresh-off-the-press monograph “Õpetatud Eesti Seltsi ajalugu” (*The History of the Learned Estonian Society*, Tallinn: Argo, 2018) – was presented at the conference.



The Learned Estonian Society

The author is one of the re-establishers of the Society and a long-time member of the board; this dignified and valuable publication is the culmination of years of research.

The **Mother Tongue Society** held the international conference “**Mother tongue in Estonia, mother tongue in Europe III**”, dedicated to the Estonian linguist F. J. Wiedemann, on 22–24 April in Väike-Maarja and in Rakvere.

The conference was organised and supported by the Ministry of Education and Research, the Institute of the Estonian Language, the Mother Tongue Society, Väike-Maarja Rural Municipality, the town of Rakvere and the ALDE group of the European Parliament. The conference

can be viewed on Youtube and on the Institute of the Estonian Language's Facebook page.

A monument to the Estonian wrestler Georg Lurich was dedicated in Väike-Maarja and the laureate of the Wiedemann language award, docent emeritus of the University of Tartu Reet Kasik, planted an oak in the Language Grove. Presentations were given by the sports journalist Paavo Kivine and a member of the board of the Lurich Foundation, Raul Rebane, the laureate of the Wiedemann language award, Reet Kasik, and the director of the Emil School in Tallinn, Indrek Lillemägi. Reet Kasik's presentation “The value of the mother language” addressed the current tendencies in the modern Estonian language and the dangers of globalisation that affect our attitudes towards our mother tongue.

The plenary speeches in Rakvere focused on the century of Estonian language education and management, the foreign reception of Estonian literature, language awareness, the future of the Estonian language, language as used by lawyers, and the long-term perspectives of the Estonian language. The presentations were given in three parallel sections: “The treasure trove of the Estonian language”, “Learning and teaching languages”, “Young people about Estonian language”, “Language and literature”, “Translator and interpreter” and “Language in use”.

Discussions were held on subjects such as “The role of the Estonian language now and in the future” and “The PR of the Estonian language”. The play “The language of this land?” (Author: Jüri Valge, producers Anu Lamp and Christopher Rajaveer) premiered.

The **Estonian Literature Society** held a memorable meeting.

On 17 April, the Society held its traditional literature annual review meeting, which has become an important forum for modern Estonian literature and is also the oldest traditional event for the society: the 2018 meeting marked 110 years since the first meeting. These review meetings supplement the annual review editions of *Looming* magazine and allow a large number of opinions to be expressed; they attract considerable public interest and presentations are followed by intense discussions.

This meeting included five presentations. Ene Paaver, a dramaturge at the Estonian Drama Theatre, spoke about dramaturgy (“Theatre texts in 2017”). Helena Koch, head of communication and PR at the Estonian Children's Literature Centre, analysed children's literature (“Estonian children's literature through the keyhole”). The poet and teacher Kristjan Haljak spoke about poetry (“Doors on a plain”). Ann Viisileht, a master's student at the University of Tartu, analysed literary criticism (“Variations on literary criticism 2017”). The translators and literary researchers Rauno Alliksaar and Siim Lill offered a review of prose texts (“Prose 2017”).

The **Biochemical Society**'s definite annual highlight is its spring school. The traditional two-day field trip is characterised by a good balance of daytime educational presentations and evening entertainment. The custom is to alternate the organisation annually between the Tartu and Tallinn research groups. This year, Prof. Peep Palumaa of the Tallinn University of Technology oversaw the organisation and the event took place on 10 and 11 May at Paunküla. Twenty members and guests of the Society delivered presentations.

The University of Tartu researcher Aleksander Žarkovski's humorous overview of pharmaceutical toxicology, or the fine balance between healing and poisoning, and TalTech researcher Dr. Tiit Lukk's (pictured) presentation on the very relevant topic of wood chemistry, elicited the liveliest discussions.



Photo: Estonian Biochemical Society

Spring School in Paunküla.

The contributions of young bachelor's and master's students are also well worth highlighting, because their presentations, as a rule, give good and focused overviews of the topics studied and problems encountered in research groups. Apart from polishing their speaking skills, students receive useful feedback and food for thought that often comes in handy in their upcoming theses. The evening was spent in a relaxed atmosphere, with a sauna and live guitar music.

The 13<sup>th</sup> annual conference of the **Estonian Economic Association** was particularly memorable for a presentation by Bengt Holmström, a laureate of the Nobel Prize in Economics. Took place on 25–26 January 2018 in Tallinn and Toila and focused on institutional and education economics.

The keynote speaker, a laureate of the Nobel Prize in Economics, Professor at the Massachusetts Institute of Technology Bengt Holmström, spoke about performance-based awarding from the perspective of contract theory. This was the first known instance of a laureate of the



Photo: Estonian Economic Association

Photo: Laureate of the Nobel Prize in Economics Bengt Holmström and the President of the Estonian Economic Association Meelis Kitsing with University of Tartu doctoral students Youjun Shin and Gaygysyz Ashyrov.

Nobel Prize in Economics speaking at a conference of an Estonian scientific society.

The topic of Holmström's Nobel Prize winning work and of the lecture was "Beyond Pay for Performance". It is particularly relevant to business executives and employees as it offers a model of contract theory to make the work of an enterprise and its employees or other contract partners more efficient using a range of motivating factors. Holmström received the Nobel Prize in Economics in 2016 for developing a contract theory that analyses contracts and



Photo: Estonian Musicological Society

compensation models from the perspective of maximising the efficiency of the parties to the contract.

The **Estonian Musicological Society**'s event of the year was an international conference dedicated to the 60<sup>th</sup> birthday of Professor of Musicology at the Estonian Academy of Music and Theatre Toomas Siitan. It took place on 14 April at the National Archives.

Presentations were delivered by Heidi Heinmaa, Toomas Siitan, Andreas Waczkat, Anu Schaper, Katre Kaju, Mart Humal, Kristel Pappel, Friedhelm Brusniak, Kevin C. Karnes and Christopher J. May.





Photo: Estonian Association of the History and Philosophy of Science

Peeter Mürsepp – chairman of the Estonian Association of the History and Philosophy of Science

**The Estonian Association of the History and Philosophy of Science's event of the year of 2018** was held in 2017. It was the XXVIII Baltic Conference on the History of Science, dedicated to Georg Friedrich Parrot, titled "On the Border of the Russian Empire: the German University of Tartu and its first rector, Georg Friedrich Parrot". The EAHPS organised the conference in collaboration with the University of Tartu Museum. Hence, the conference was nominated for the "Museum Rat" prize in the category of scientific events.

At the gala in January 2018, it was declared the winner.

A picture from the award ceremony is attached: the acceptance speech was delivered by Lea Leppik of the University of Tartu Museum, who is also a member of the board of the EAHPS, with the assistance of a member of the EAHPS and the author of the idea of the Parrot conference, Epi Tohvri, and a member of the organising committee, the head of the EAHPS Peeter Mürsepp (pictured).

**The Society of Estonian Areal Studies** has a long history. In 1918, the Estonian Agricultural Association founded the country's first agricultural secondary school, which started work on 16 October 1918 in Tallinn. In 1921, the school relocated to the Jäneda Manor. The first trained agricultural scientists graduated at Jäneda. The school museum was founded in 1968.

The continued collection and research activities of the school personnel have brought to light a lot of knowledge on the school that helped to shape Estonian rural life, as well as on local history, cultural history and nature. The 100<sup>th</sup> anniversary of the school was celebrated with the book *Jäneda Agricultural Secondary School 1918–2000. II. The first Estonian agricultural secondary school 100. Studies, memories, fates. Jäneda Museum*, 400 pages (Ed. Member of the board of the SEAS Georgi Särekanno).

**The 100<sup>th</sup> anniversary was celebrated with a reunion of alumni and teachers on 18 August. After the opening ceremony, a group photo was taken in front of the old schoolhouse.**



Photo: Erik Lööper

In 2000, when the last, 76<sup>th</sup> class graduated, the first Estonian agricultural secondary school closed its doors. The oldest reunion participants were graduates of the 27<sup>th</sup> class, who graduated in 1949, including former President Arnold Rüütel (pictured in the middle).

# THE PRESIDENTS OF THE ACADEMY

The Academy's current, ninth president's term comes to an end in 2019. Members of the Academy will gather to elect a president on 25 September 2019. Two possibilities: either the ninth continues or a tenth takes over.

## **The first president of the Estonian Academy of Sciences was Karl Schlossmann: 1938–1940**

Karl Schlossmann was the first president of the Estonian Academy of Sciences and the founder of Estonian microbiology. President–Regent Konstantin Päts made Schlossmann, Professor at the University of Tartu, a member of the Academy and its president for five years.

The first Academy was a personal academy. Most of the members worked at the University of Tartu and the Academy was managed by the university's rules and customs.

Karl Schlossmann was not able to finish his tenure. Two years into his term, the independence of the Republic of Estonia came to an end and the Academy was liquidated under Soviet rule. On 20 July 1940, an act signed by the new Minister of Education Johannes Semper closed the Academy.



Photo: EAS

**KARL SCHLOSSMANN**  
(1938–1940)

### **What was the first Academy like?**

According to law, the new organisation had to be governed by the president of the Academy, the general assembly, the heads of the humanities and natural sciences sections and section assemblies. The Academy could choose active, honorary and corresponding members. It was limited to 20 active members; the number of honorary and corresponding members was unlimited. Active members were granted the status of members emeritus on their 70<sup>th</sup> birthdays (the status change could also be requested earlier). The law stated that if the president initially nominated

under 20 members, then another active member had to be elected annually until the limit was reached. This requirement also applied to replacing deceased or newly named emeritus members. Expulsion from the Academy required the decision of two-thirds of the members of the general assembly.

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi” (*The History of the Estonian Academy of Sciences. Developments and Conclusions*), Ken Kalling and Erki Tammiksaar, 2008, p. 34



### **The explanatory statement for the act for the closure of the Academy.**

“The goal of the Estonian Academy of Sciences was to be the advancement of science in general and Estonian science in particular, but also coordinating and managing research work done outside of universities. However, the Estonian Academy of Sciences was incapable of this overarching work, which required an outstanding level of impartiality, due to its exceptionally biased composition and equally biased direction. The majority of the Academy members were nominated from among people who were full supporters of the previous direction of governance; any researchers dedicated to research alone who did not support

former policies were excluded. Hence, the assistance given through the Estonian Academy of Sciences was bestowed mainly upon a narrow group of people rather than the entire Estonian science community. But the termination of the Estonian Academy of Sciences is not meant to end the hopes it offered regarding scientific efforts, or to interrupt the course of the useful research work initiated by the academy; research must be developed much more extensively, and plans will be drawn up accordingly.”

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”, Ken Kalling and Erki Tammiksaar, 2008, pp. 48-49

### **The second president of the Estonian Academy of Sciences was Hans Kruus: 1946–1950**

Member of the Academy Hans Kruus led the Academy through extremely difficult years.

It would be more accurate to say that Hans Kruus was the first president of the Academy of Sciences of the Estonian Soviet Socialist Republic (Estonian SSR). Although restoring the Estonian Academy of Sciences was endorsed in Moscow, the Estonian SSR Council of People’s Commissars and the Central Committee of the Estonian Communist Party resolved to create (not restore!) the Estonian Academy of Sciences on 28 June 1945. An organisational committee with six members, headed by Hans Kruus, was created to enact the resolution.

Hans Kruus submitted the projects of the structure and statutes of the Academy of Sciences of the Estonian SSR, as well as a list of people to be considered for the learned councils of the Academy’s institutes and the candidates for the members and corresponding members of the Academy.

On 5 April 1946, the Council of Ministers of the Estonian SSR approved the statutes, structure, active members and



**HANS KRUIUS  
(1946–1950)**

Jüri Kivimäe, Professor at the University of Toronto:  
“Hans Kruus is unique. He is one of the great men in Estonian history; we can emphasise the words *great man*, highlight them in yellow or red or blue, because this great man shared the fate of his people through different regimes and somehow remained himself” (source: <https://vikerraadio.err.ee/788122/eesti-lugu-hans-kruus-1>).

corresponding members of the Academy of Sciences of the Estonian SSR. Hans Kruus was elected president. For the Academy, this was a brief period of massive growth and relative freedom.

By 1947, however, many of the illusions had disappeared, and the mass deportation of 1949 was a clear sign of change in the prevailing winds. The firing of President of the Academy Hans Kruus in early 1950 stunned the presidium of the Academy. It took a long time to find a replacement.

### **The third president of the Estonian Academy of Sciences was Johan Eichfeld: 1950–1968**

Johan Eichfeld was an agricultural researcher, a biologist and a politician.

His stint at the helm of the Academy lasted 18 years. It covered a long and varied historical period that included Stalinist repressions, an atmosphere of mistrust and neighbourhood spies, but also the optimism of the later Khrushchev Thaw.

Member of the Academy Eichfeld had to be a flexible person to manage the Academy in such difficult times. The Academy of that era was a gigantic organisation where quantity exceeded quality. Good researchers were in short supply. The Academy focused heavily on popularising science and attracting young people to science.

Academy President Eichfeld's 75<sup>th</sup> anniversary celebrations in 1968 were followed by the announcement of his retirement.

**INTERESTING TO KNOW:** Academy Member Johan Eichfeld was elected the Chairman of the Presidium of the Supreme Council of the Estonian Soviet Socialist Republic for the 1958–1961 period. The Academy had to do without its president. His duties were assumed by Vice-President Gustav Naan.



Photo: EAS

**JOHAN EICHFELD**  
(1950–1968)

### **The fourth president of the Estonian Academy of Sciences was Arnold Veimer: 1968–1973**

Arnold Veimer, who had resigned from the position of Vice-Chair of the Council of Ministers of the Estonian SSR, was elected the new president in 1968. The presidium (now the board) instated new operating procedures in April of the same year. The presidency became a purely managerial position. He managed the finances, construction, material supplies, special commissioning and civil defence.

The Academy continued intensive efforts in popularising science. Archives reveal that the auditing authorities had already become fond of bibliometrics.

In late 1972 and early 1973, the Soviet Union Council of Ministers' State Committee on Science and Technology evaluated the 1968 regulations of the Estonian SSR Academy of Sciences. The results were positive for the Academy. Academy scientists had been active in radio and TV broadcasts (over 400 instances), popular science presentations (3,500), and writing popular science articles (1,200) and books (250).

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”,  
Ken Kalling and Erki Tammiksaar, 2008, p. 174



Photo: EAS

**ARNOLD VEIMER**  
(1968–1973)



## The fifth president of the Estonian Academy of Sciences was Karl Rebane: 1973–1990

Karl Rebane was president of the Academy for 17 years. Most of this time overlapped with the historical period of stagnation of the Soviet Union. For the Academy, it was a time of continued expansion.

On 1 January 1985, 4,410 people were employed by the system, 2,698 of them in research organisations. The Academy included 1,110 researchers (91 Doctors of Science and 611 candidates). In early 1989, 4,446 people were employed in the academy system, 2,814 of them in research organisations (1,312 of them researchers).

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”,  
Ken Kalling and Erki Tammiksaar, 2008, p. 183

The year 1985 brought major changes. The Academy, however, failed to appreciate the irreversible nature of the new processes. President of the Academy Karl Rebane was re-elected in 1987. It was a time of turmoil in society, where many Academy members were in the thick of things (e.g. E. Lippmaa, E. Parmasto, A. Raukas, H. Trass and M. Veiderma). The turbulence reached the iconic Science magazine (Aaviksoo, J., 1997. Estonian physicist: Active and productive. *Science*, 275(5299), 463–464. Rebane, K. 1997. Estonian physicist: Active and productive. *Science*, 275(5299), 464–465).

The intense political activity of Academy employees beginning in 1987 was illustrated by the fact that five members (M. Bronšteín, E. Lippmaa, V. Palm, K. Rebane and E. Tõugu) and five full-time employees (Igor Gräzin, Jüri Kahn, Tiit Käbin, Ivar Raig and Vello Vare) were elected deputies of the Supreme Soviet of the Soviet Union in March 1989.

The general assembly of 6 April 1989, which approved the new Academy statutes, also discussed a letter written on the initiative of E. Parmasto and signed by 18 members immediately and another 10 members later. The letter called for the immediate election of a new presidium of the Academy, departmental offices and the directors of research institutes. According to U. Margna, the letter was motivated more by a desire to replace President of the Academy K. Rebane than by a wish for a democratic election of a new Academy leadership. President Rebane had held the position since 1973 in spite of a 1969 provision in the Academy statutes stating that the



Foto: EAS

**KARL REBANE**  
(1973–1990)

The name of the Estonian Academy of Sciences was restored in 1989. The “personal academy system” of the First Republic era, with a membership of elected outstanding scientists, was restored as well. The Academy successfully weathered the crisis. The 1989 statutes abolished the status of corresponding members, and they became full members of the Academy. The Academy assumed the right to elect foreign members.

membership of the presidium would be renewed every two election cycles if none of its members gained over 2/3 of the votes of the general assembly at the elections. Rebane had had the votes, though. It was likely that under the circumstances, others had not had the ambition to lead the Academy. The new-found relative freedom of 1989, however, meant that it was time for new leadership.

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”,  
Ken Kalling and Erki Tammiksaar, 2008, p. 198

## The sixth president of the Estonian Academy of Sciences was Arno Kõörna: 1990–1994

The extraordinary elections held by the general assembly on 4 January 1990 voted Member of the Academy Arno Kõörna as the new president.

Times were difficult. Estonia launched a successful bid for independence, promising to dine on potato peels if that's what it took. Those were times of poverty. The Academy was not able to guarantee the rights and welfare of its employees; pay-days became infrequent.

The number of employees in the system dropped by half. The newly founded state was busy with legislative efforts. The Academy, too, was about to have a new regulatory act, with substantial changes to its functioning.

The Research Organisation Act was in preparation by the government, parliament and research council throughout 1994. The president of the Academy was unable to defend the Academy against disintegration. On 15 December 1994, the Research Organisation Act was passed by the parliament over the Academy's protests. It entered into force on 22 January 1995.

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”,  
Ken Kalling and Erki Tammiksaar, 2008, p. 197

The power hierarchy changed: this time, unlike during the Soviet period, in favour of universities. The Academy had to accept the changes and adapt to them.

## The seventh president of the Estonian Academy of Sciences was Jüri Engelbrecht: 1994–2004

### Going forward: the president – *primus inter pares*

At the general assembly meeting of 7 December 1994, the Academy divisions jointly nominated Jüri Engelbrecht as the president of the Academy. Their choice was approved by the general assembly.

The board that took over in 1995 gave the Academy its new shape and its members a new dignity even without a system of scientific institutes. The Academy found its place in Estonian science and in the research policy, and the Academy's institutes continue to exist. Merging them with universities raised the level of research efforts at universities significantly.

“Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi”,  
Ken Kalling and Erki Tammiksaar, 2008, p. 208



Photo: EAS

**ARNO KÕÖRNA**  
(1990–1994)

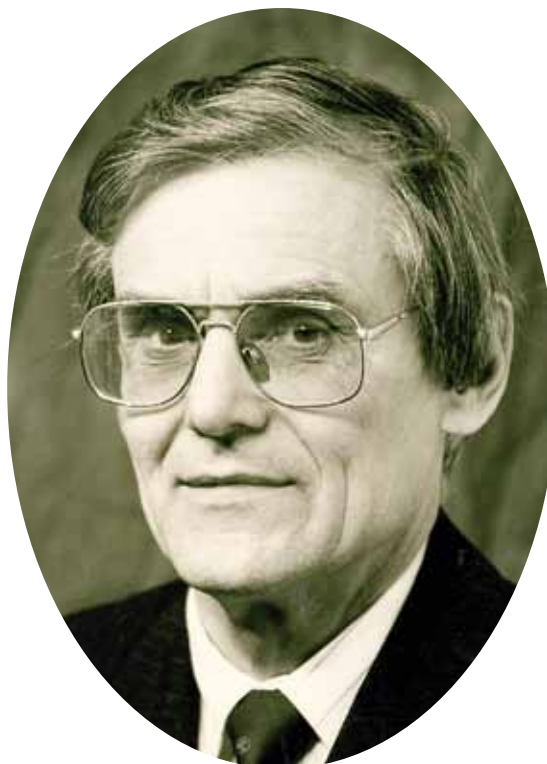


Photo: EAS

**JÜRI ENGELBRECHT**  
(1994–2004)



In “Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi” (*The History of the Estonian Academy of Sciences. Developments and Conclusions*), the authors Ken Kalling and Erki Tammiksaar state that the statutes of 1995 gave the principal role in directing the Academy’s activities to its president. President of the Academy Engelbrecht gave the Academy its new meaning and set the broader goals for its activities. The emphasis was initially on active participation in designing Estonian research, designing financing mechanisms based on single quality standards, developing connections abroad, supporting young researchers and promoting the integration of science and education. Later, publishing efforts were included.

President Jüri Engelbrecht handled those complicated problems well. On 16 April 1997, the Riigikogu passed the Estonian Academy of Sciences Act. It entered into force on 19 May 1997. Before that, the Academy was under the jurisdiction of the Ministry of Education; the Act granted

it the status of a person in public law. It was a victory for the Academy.

See also: “Eesti Teaduste Akadeemia ajalugu. Arenguid ja järeltusi” (*The History of the Estonian Academy of Sciences. Developments and Conclusions*), Ken Kalling and Erki Tammiksaar, 2008, p. 202

Academy Member Engelbrecht himself categorises his presidency as follows: “1994–1997 was a time of reforms and 1998–2004 was a time when the Academy functioned in the new, changed conditions, and developed its new public face” (Academy yearbook 2004, p. 23). After serving as the president of the Academy, Jüri Engelbrecht served as the president of ALLEA in 2006–2011 (see p. 40).

### **The eighth president of the Estonian Academy of Sciences was Richard Villems: 2004–2014**

The Academy became more open and more youthful under President Villems. Furthermore, representatives of artistic associations (e.g. Arvo Pärt and Hando Runnel) were elected as members again after a long absence from the Academy. The main positive message of the decade was a general revival of scientific life, science infrastructure, new centres of excellence and modern technology: all enhanced significantly.

An extract of the speech of Member of the Academy Villems as a candidate for the position of president:

“Over the years, the Academy’s work has focused on different tasks. I believe that in modern Estonia, the Academy’s primary goal is to be the environment and the messenger that incessantly tells everybody that assessing R&D work should focus on quality. There are two definitions. Research is a pyramid. It cannot be merely an isolated top, especially not the research of a small nation. It takes a broad foundation. We know all too well that if you measure research in e.g. kg/m, 70%–80% of it is done by doctoral and postdoctoral researchers rather than professors or Academy members. This is a well-known fact. But the call for quality, or for excellence, as we now call it, does not contradict this fact. Emphasising the quality of science as a specific goal is essential to the Academy and can even seem trivial and overemphasised. But we have to do it: not for the sake of the Academy or its members, but because there are too many powers in Estonia that cannot or will

not see that states where the requirements for research excellence are the highest are also the most successful in innovation, their economies flourish, and their people live well.



Photo: EAS

**RICHARD VILLEMS**  
(2004–2014)

## **The ninth president of the Estonian Academy of Sciences is Tarmo Soomere, 2014–**

15 October: the General Assembly elected Member of the Academy Tarmo Soomere as the new president of the Academy for the following five years.

Tarmo Soomere: “The goal is a clearly visible, societally relevant Academy, whose membership’s efficient work is supported by appropriate material means. The voice of the Academy of Sciences as a whole becomes stronger and the Academy itself more visible through utilising its recently added potential. In the context of the science financing crisis, the Academy bears a special responsibility for the normal functioning of science as a holistic (eco)system. The Academy of Sciences will become the ambassador of Estonian science on the international level, including being the consolidated representative of single disciplines.

Since Estonia regained its independence, the Academy has changed radically. We have changed from a Ministry of Science equivalent or branch into a personal academy connecting outstanding scientists and creative individuals. Hence, the role of the Academy in the scientific landscape and the entire country has changed. Our strength no longer lies in managing single disciplines or allocating funding. Our strength is now in our members, their activities, and the impact of their activities on the Estonian and international levels. The Academy of Sciences Act states: ‘the Academy of Sciences relies on the intellectual strength of its members to develop and represent Estonian science.’

The Academy has the means, the need, and the duty to drive Estonian academia on substantial questions: not acting as the leader, but rather as an engine. The diversity



Photo: Reiti Kook

**TARMO SOOMERE**  
**(2014–...)**

of opinions is our strength and our scientists hardly ever agree completely. The role of the Academy lies in finding common ground, a common platform and a common voice in this diversity of opinions, and to amplify it on a suprainstitutional level.”



# POLARISED REFLECTIONS

## THE PRIME MINISTER'S FINAL WORDS:

“Science cannot be infinitely simplified, because there are often no simple and clear answers.

Member of the Academy Tarmo Soomere said some astute words about it at a conference that took place here at the Riigikogu in October. I quote: ‘The modern problem is that science no longer offers absolute truth, but rather available information organised in the best possible way. This is an uncomfortable truth for the state as well as for scientists, because it is hard to refer to and rely on science like this: today’s knowledge might be antiquated by tomorrow.’ We have to educate ourselves and the whole Estonian nation on how to unite new information with existing knowledge, how to take into account the best knowledge in decision-making, whether in private life, work or on the national level, and how to adapt according to new information.”

The prime minister’s overview of the situation of research and development activities and the government policies in this field, XIII Riigikogu records, IX session, 16 January 2019 at 14:00.



Photo: Erik Peinar (Chancellery of the Riigikogu)

## SOME CITE US AS AN EXAMPLE...

Estonian academia created an institutional system of high-authority representatives years ago. It is not a random Prof. X. or Dr. Y. requesting money, but rather the Estonian Academy of Sciences and the Universities of Estonia council. Science speaks through democratically elected spokespeople with a strong mandate. They have set common goals and designed their public relations carefully. There is currently nothing comparable in the field of the humanities, even though barely a generation ago a council of the leaders of artistic associations was one of the most important councils in the whole society. Now, everybody does their own thing; anyone speaking up for the common cause remains a lone voice in the wilderness. Hence, if an area is not internally disciplined, its efforts are easily disregarded.

In science, as well as in national defence, economic arguments are frequently used. There are calculations and price lists that reveal the profitability of investing in science and security, whether laboratory devices or weapons systems. And soon the financial output will start surpassing the input.

Kaarel Tarand, Sirp, 11.01.2019

Kaarel Tarand, <https://sirp.ee/s1-artiklid/c9-sotsiaalia/horisontaalne-teema/>

## SOME GO ALL IN, NO HOLDS BARRED

It is probably relevant that in China research is divided into five institutional sectors. Chief among them is the Chinese Academy of Sciences, which encompasses over a hundred scientific institutes and which is considered the world's leading research institute. /---/ In Estonia, research is mainly concentrated in universities. Research in private enterprises is not yet well developed. As in China, certain research organisations – the Estonian Crop Research Institute, the National Institute for Health Development, and a few others – are structured under the relevant ministries.

Military research and development activities lag surprisingly far behind. And the worst of all is the Academy of Sciences, which has changed from a research organisation into a club /---/.

Els Heinsalu, Postimees, Arvamus 22.01.2019

Els Heinsalu, President of the Estonian Young Academy of Sciences <https://arvamus.postimees.ee/6505297/els-heinsalu-mida-on-meil-oppida-hiinlastelt>

## FACTS, OR THE USES OF CLEVERNESS!

In conclusion, it could be said that the Academy and its members get involved in things that others would argue are none of their business. Yet it is good that they do so.

It is the right of Academy members to speak their mind, but this comes with obligations. The task of a member of the Academy is to promote science, technology, literature or art through personal creative work; to participate in creating scientific, cultural and socio-economic development plans in Estonia; to participate in training educated people; and to advance the perceived value of science, culture and education in Estonia. The first three goals overlap the activities of the Academy as a whole; the latter rests on the shoulders of the members as private individuals: to advance the perceived value of science, culture and education in Estonia. Values are often seen as the opposite of facts. Deriving values from facts is done through giving estimates, which is highly personal work. Advancing values also means offering a personal example, not just talking about values. That is, *Facta non solum verba*, as the motto of the Academy goes. This is likely to be the greatest responsibility placed on members of the Academy. If a day comes when the Estonian society no longer values science, culture or education, the Academy and its members will have failed, and their actions will have been meaningless. We hope and believe that this day will never come.

Eesti noorte teaduste akadeemia, Postimees, Arvamus 31.01.2018