



## **2<sup>nd</sup> INTERNATIONAL BALTIC SYMPOSIUM ON SCIENCE AND TECHNOLOGY EDUCATION: “SCIENCE AND TECHNOLOGY EDUCATION: ENGAGING THE NEW GENERATION (BalticSTE2017)”: SYMPOSIUM REVIEW**

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Natural science and technology education improvement remains actual. In the context of decreasing youth interest in natural sciences and technology, it is important to search for the ways and devices of effective motivation, interest formation. 2<sup>nd</sup> International Baltic Symposium on science and technology “BalticSTE2015”, having taken place in Siauliai, was devoted to this. Its major topic is the improvement of natural science and technology education of the young generation. The symposium was organised by scientific methodological centre “Scientia Educologica”. The main symposium partner is Education sciences and psychology department at Siauliai University. Such kind of symposium was organised in Lithuania for the second time after the restoration of Lithuanian independence in 1990. It is worth remembering, that the first symposium on the same theme was held in 2015 in Siauliai as well.

A welcome speech for the symposium was delivered by Siauliai university science and art vice rector dr. Ingrida Šaulienė. Musical Greeting was performed by Evaldas Vaikasas, the student of the Department of Music Pedagogy at Šiauliai University. The symposium participants were also welcomed (remotely) by dr. Paolo Bussotti (Udine University, Italy). Welcome speech can be found online at: <https://www.facebook.com/ScientiaEducologica/videos/1764116330272462/>.

Scientists from various foreign countries participated in the symposium. Despite the fact, that it was the Baltic region symposium, all interested could take part in it. Speaking about region it is necessary to emphasize, that not only inviting foreign scientists is of great importance, but showing the accumulated experience of the Baltic countries, first of all, of Lithuania, Latvia and Estonia in the natural science and technology education field. Such kind of symposiums are regularly held in Asia, Africa, South and North America and firstly they are for the encouragement of regional science development. Guests from Brazil, Turkey, Russia, Slovenia, Slovakia, Czechia, Italy, Latvia, Poland, Estonia, South Africa, Croatia, Bosnia and Herzegovina, Portugal, Finland participated in this symposium.

Plenary presentation authors, presentation topics are given in table 1.

**Table 1. Information about plenary presentations**

Author (s)	Institution, country	Presentation title
Jonas Jasaitis	Šiauliai university, Lithuania	The role of scientists in formation of state strategy
Miia Rannikmae	Tartu university, Estonia	Incorporating career awareness with motivational education through science approach: two alternative foci
Raffaele Pisano	Lille University, France	On the epistemic interplay between physics and mathematics such as a dynamical framework within nos–research teaching science
Angela James	Kwazulu-Natal university, South Africa	Science education in South Africa: engaging the new generation of student teachers in service-learning for sustainable development
Agnaldo Arroio	University of Sao Paulo, Brazil	Scientific Media literacy and young generation
Andris Broks	Univertsity of Latvia, Latvia	Systems thinking: Joint philosophical and psychological basis for modern science and technology education

On the first day of the symposium there were also presented ten board reports. For example, dr. Violeta Šlekienė made a presentation on the accumulated experience of Lithuanian non-formal educational school of young physicists “Photon”. Lithuanian education science university researchers examined pre-service primary teachers` experience organizing science lessons. Dr. Katarzyna Potyrala, Karolina Czerwiec and Renata Stasko presented an experience on using a science museum as an educational environment in natural science education. Vincentas Lamanuskas, Violeta Šlekienė and Loreta Ragulienė made a presentation on international MaT<sup>2</sup>SMc project experience (<http://www.mat2smc-project.eu>).

**2<sup>nd</sup> International Baltic Symposium on Science and Technology Education (BalticSTE2017)**

**SCIENCE AND TECHNOLOGY EDUCATION:  
ENGAGING THE NEW GENERATION**

**12-15 June 2017,  
Siauliai, Lithuania**

**KEYNOTE SPEAKERS**



**Prof. dr. Raffaele Pisano**  
CIREL, Lille 3 University, France

Title:  
ON THE EPISTEMIC INTERPLAY  
BETWEEN PHYSICS AND  
MATHEMATICS SUCH AS A DYNAMICAL  
FRAMEWORK WITHIN NOS-RESEARCH  
TEACHING SCIENCE



**Dr. Angela A. James**  
University of KwaZulu-Natal, South Africa

Title:  
SCIENCE EDUCATION IN SOUTH  
AFRICA: ENGAGING THE NEW  
GENERATION OF STUDENT  
TEACHERS IN SERVICE-LEARNING  
FOR SUSTAINABLE DEVELOPMENT



**Prof. dr. Andris Broks**  
University of Latvia, Latvia

Title:  
SYSTEMS THINKING: JOINT  
PHILOSOPHICAL AND  
PSYCHOLOGICAL BASIS FOR MODERN  
SCIENCE AND TECHNOLOGY  
EDUCATION



**Prof. dr. Agnaldo Arroio**  
University of Sao Paulo, Brazil

Title:  
SCIENTIFIC MEDIA LITERACY AND  
YOUNG GENERATION



**Prof. dr. Miia Rannikmae**  
University of Tartu, Estonia

Title:  
INCORPORATING CAREER  
AWARENESS WITH MOTIVATIONAL  
EDUCATION THROUGH SCIENCE  
APPROACH: TWO ALTERNATIVE FOCI



**Prof. dr. Jonas Jasaitis**  
Siauliai University, Lithuania

Title:  
THE ROLE OF SCIENTISTS IN  
FORMATION OF STATE STRATEGY

Symposium Website:  
<http://balticste.com/>

E-mail:  
[balticste@gmail.com](mailto:balticste@gmail.com)

Symposium Organizers



SIAULIAI  
UNIVERSITY



Figure 1: Symposium poster.

On the first day of the symposium work in sections was organised. The researchers from Brazil, South Africa, Poland, Latvia made presentations. Also, a remote video presentation was made from South Korea. The topic of the report is “Influence of nanotechnology related SSI program on competencies of high school students in Korea” (by Hae-Ae Seo, Hye-Sook Lee, Soonok Kim).

The second day of the symposium was devoted to the trip. The theme of the trip was – “Historical aspects of natural science and technology education”. The participants of the symposium visited and got acquainted with some North Lithuanian places of interest. They visited Joniškis basketball museum (<http://joniskiokrepsiniomuziejus.lt>) and also Akmenė region museum (<http://www.akmenesmuziejus.lt/en>). The symposium participants were extremely interested in a wonderful butterfly collection exhibited at the museum, and also in the carried-out project “Butterfly home”, one of the main purposes of which is to go to educational expeditions.

The symposium participants also visited the Pharmacy museum in Vieksniai (<http://mazeikiutvic.lt/en/the-pharmacy-museum-in-vieksniai>). Pharmacy exposition, the first half of the 20<sup>th</sup> century intellectual’s everyday life exposition is displayed at the museum. An extraordinary part of pharmacy museum is – a restored pharmacist’s herb garden, in which herb and spice plants are grown, educational practical activities are carried out. During these activities one can not only look round the garden, but also get acquainted with the features of the plants grown in it.



**Figure 2: Symposium participants in Joniškis basketball museum.**



**Figure 3: Observing butterflies, grown in Akmenė region museum.**

Symposium participants also visited Gruzdžiai black ceramics workshops, some of them practically tried themselves the subtleties of clay processing. The participants had a perfect chance to get acquainted in detail with ceramic pottery production, they could also buy some things for themselves. A very attractive place to visit was Jurakalnis observation tower in Papilė. A spectacular scenery opens from that tower to Venta countryside reserve, Papilė town, Daubiškis village, Venta river curves and other. The form of the tower itself is very impressive, reminding a blossom of a flower. Besides, the tower is made of wooden and metal constructions.





**Figure 4: Herbal tea drinking ceremony at the pharmacy museum.**



**Figure 5: Climbing the Jurakalnis observation tower.**

On the third day of the symposium, two more plenary presentations were made. Dr. Angela James (Kwazulu-Natal University, South Africa) talked about natural science and technology actualities in her country. An extremely big attention was devoted to sustainable development questions, an experience was shared on work with local communities. Prof. dr. Agnaldo Arroio (University of Sao Paulo, Brazil) examined scientific media literacy and young generation actualities. He also shared his work experience in Mozambique.

Symposium work took place in two sections as well. The first one was for general natural science and technology education questions, in the second one – practical education process matters were discussed. The spectrum of the questions discussed is rather wide. Dr. Elena Vasilevskaya (Republic of Belarus) examined university natural science education problems, shared her personal experience, prof. dr. D. Cedere (Latvia) talked about students' interest in natural science subjects and mathematics in Latvian and Lithuanian comprehensive schools. Comparative research results were presented.


The fourth symposium day was for presentations, during which ICT usage in natural science and technology education process and other actual this sphere questions were discussed. Prof. dr. Andris Broks (Latvia) made an interactive plenary presentation on the topic "Systems thinking: Joint philosophical and psychological basis for modern science and technology education". Later a discussion took place on the mentioned topic, which was moderated by prof. Vincentas Lamanuskas. During the time of discussion R. Pisano (Italy), A. James (South Africa), J. Holbrook (Estonia), B. Cavas (Turkey), B. Aberšek (Slovenia) presented short reviews.

During the whole symposium, various country researchers shared their insights on possible further collaboration with Šiauliai university, international research organising and carrying out, common science project preparation.



**Figure 6: Symposium participant photo.**

Before the symposium an article collection was prepared and issued. The full version of the publication is very freely available on the internet at [https://www.academia.edu/33349325/SCIENCE\\_AND\\_TECHNOLOGY\\_EDUCATION\\_ENGAGING\\_THE\\_NEW\\_GENERATION](https://www.academia.edu/33349325/SCIENCE_AND_TECHNOLOGY_EDUCATION_ENGAGING_THE_NEW_GENERATION). In the publication, a total of 35 short papers are published, in which various natural science and technology education problems are discussed.



## SCIENCE AND TECHNOLOGY EDUCATION: ENGAGING THE NEW GENERATION

Proceedings of the 2<sup>nd</sup> International Baltic Symposium on Science and Technology Education (BalticSTE2017), Šiauliai, 12–15 June, 2017

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Reviewers:

Dr. Rita Makarskaitė-Petkevičienė  
Dr. Milan Kubiastko



**Figure 7. Symposium publication cover.**

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**Figure 8: Symposium publication title page.**

The authors had also a possibility to prepare and publicise full text articles in scientific journals “Journal of Baltic Science Education”, “Problems of Education in the 21st Century”, “Gamtamokslinis ugdymas / Natural Science Education” and other.

Symposium participants had perfect possibilities not only formally participate in the symposium. Constant non-formal discussions were going on, contact information was exchanged, experience was shared, project partners were searched and so on. Symposium guests got acquainted with Šiauliai university Educational sciences faculty, Natural science education research centre activity was introduced. Some of the guests visited Crosses Hill, and also got acquainted with the Baltic god museum in Naisiai village.

So, the second symposium is also already a history. A wider presentation in English one can find on the internet at: <https://www.facebook.com/media/set/?set=a.1771904166160345.1073741888.290054444345332&type=3>. As always, not everything was fixated, not all interesting questions were discussed. One can hope, that natural science education movement will continue and develop. It is expected, that the third symposium will take place in Šiauliai in June 2019. A detailed information is given in the symposium internet cafe at: <http://balticste.com>.

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