April, 2016

Nordisk Science Center Forbund

# NEWSLETTER

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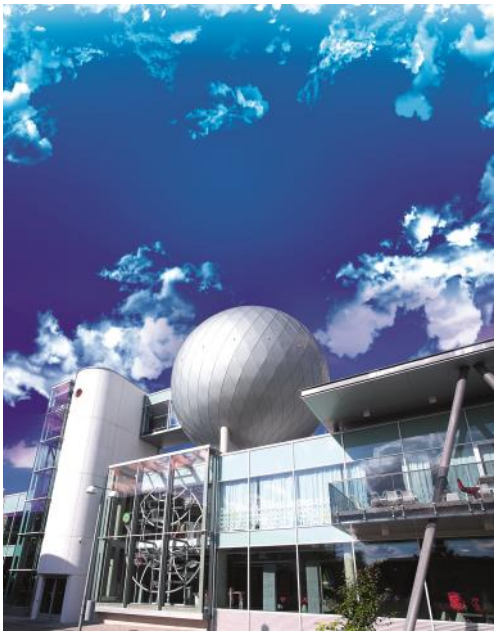


*Next EUSEA Annual Conference, will take place in Tartu in May.*

## All the colors of Cooperation

This year's ECSITE Annual Conference is titled "Colors of Cooperation", in order to remind us all the different aspects of how to co-operate. ECSITE has dedicated a pre-conference event to science centre networks and their work. NSCF has been asked to play an active role in it and our vice-chairman Lotta Johansson will be representing us at the event. Those of you who plan to take part in ECISTE annual conference in Graz, are more than welcome to join!

Another great event, EUSEA Annual Conference, will take place in Tartu in May. This conference will bring together science event organizers from all over Europe. The subject is "Empower and Engage". Annual conferences of the networks are a good way to meet personally the people in the same field. Usually science centres and museums are quite lonely in their home-countries– closest similar institutions are hundreds of kilometers away. Therefore the annual meetings might be the only time you can actually share your thoughts and ideas with someone, who truly understands your business. I hope to see most of you in our own NSCF Annual Conference that will take place in Tietomaa, Finland 12-14.10.2016. The theme of this year's conference is games and game industry.

And as last "big news" I am happy to announce that the latest member who has been accepted to our Network is Aspired Ltd from Latvia. NSCF is growing and it is a good sign. There are plans to build a science centre in Lithuania as well and we will keep you informed about the process. As usual, you will find interesting articles about our members and their doings in this Newsletter. Our newest member representative also wrote a remarkable article for us about the main differences between European, Asian and US science centres.

With best greetings,
Pilvi Kolk

Chairman of NSCF,
*Science Centre AHHAA, Estonia*

## UNESCO supports the first "World Science Centre and Science Museum Day" on Thursday, 10 November 2016

*Asger Høeg, Director of Asger Hoeg Consulting*

As a member of ASTC's Global Committee since 2012, I have followed and strongly supported the idea declaring one day of the year as "The International Day of Science Centres" where all science centres on our Planet Earth should celebrate the day and conduct experiments and other activities that might raise interest in science and technology among their visitors.

The purpose of celebrating the International Science Centre day is clear: We want to attract the interest of the communities, politicians and the media and show them the important things that science centres all over the World are doing.

In the beginning of this year, UNESCO agreed to cooperate with the science centres all over the world to celebrate an International Science Center Day. ASTC's Global Committee is co-chaired by Chevy Humphrey (USA) and Silvia Singer (Mexico).

Chevy Humphrey, Silvia Singer, Walter Staveloz (Director of International Relations at ASTC) and representatives from all the other science centre networks had a very important meeting with UNESCO on 15 March 2016 in Paris. The objective of the meeting was to establish the framework for the cooperation between UNESCO and the science centre networks. Originally, we had suggested that 14 March should be the international science centre day with respect to the value of the number PI: 3,14. But UNESCO suggested that The Day should be held on 10 November since this day already is announced as "The World Science Day for Peace and Development".

The outcome of the meeting was that UNESCO officially announced that from now on, 10 November will be celebrated as the "World Science Centre and Science Museum Day" (ID16). UNESCO suggested that the theme for ID16 should be United Nation's 17 Sustainable Developments Goals (SDG) which was adopted by UN on 15 September 2015.

This year, we have planned the following actions to celebrate 10 November:

**1. Establish a website:**

1A: An interactive map similar to the Rio+20 Map (http://www.uncsd2012.org/calendar_map.html) presenting the activities during the ID16.

1B: Built and operate a blog addressing all 17 SDGs from the

perspectives of different science centres and science museums. Monitor a debate on the blog as a preparation for


*UNESCO headquarters in Paris, France*

a mini-conference (see below). The blog should also be a place for exchanging the best practices: A collection of case studies of successful SDGs activities and programs around the world.

1C: Describe the tools for action and participation: including templates for submitting case studies and local press releases.

1D: List of activities: What is going on, leading up to 10 November 2016

**2. Mini-conference in Paris held at 10 November to mark the ID16.**

The mini-conference shall include representatives from all the science centre networks: ASTC, ECSITE, RedPop, SAASTEC; ASPAC, NCSM, NAMES and the Chinese Science Centre Network. Other delegates will be non-science-centre-museum experts.

The science centre networks hold their annual conferences during the next 7 months. All the network conferences should suggest an activity to collect ideas and suggestions on the topic (the 17 SDGs) to be submitted to the mini-conference in Paris. One student from Africa will join the meeting in Paris to address the topics of the 17 SDGs that need more research and will contribute to the specific action towards science centres' and science museums' capacity building in Africa.

The outcome of the mini-conference should be a publication presented at The Second Science Centre World Summit 14 – 17 November 2017 in Tokyo by a UNESCO representative.

**3. A worldwide mass experiment!**

On 10 November, all the participating science centres and science museums shall conduct a carefully designed experiment. What this experiment should be, is not yet decided! Personally, I would prefer that we could design an experiment that could be quite easily conducted by school students and where the collected empirical data could be used by real researchers in their efforts to find ways to strengthen one or more of the 17 Sustainable Development Goals.

I challenge all the clever people from Nordic and Baltic science centres to come up with an idea for an experiment that we could suggest for school students all over the World to carry out on 10 November 2016 and in this way help Planet Earth.

Timeline: Establish an ID16 Committee. All the science centre networks designate two people to join the ID16 Committee (primo April). Launch the ID16 Website: June at the ECSITE 2016 Conference in Graz, Austria. Launch the chosen mass experiment in August 2016. The Interactive Map with all the activities should be launched at the AST Conference in Tampa, Florida in September 2016. I strongly suggest that science centres in the Nordic and Baltic countries prepare and carry out activities on 10 November this year to show that they are members of a world wide movement of institutions that try to stimulate people's interest in science and technology.

Questions to Asger Høeg, cell: +45 40 79 47 45 and mail: asgerhoeg26@gmail.com

Yours sincerely,

Asger Høeg

Honorary Member of NSCF

*Mass experiment*

# How science centres differ in Europe, USA and Asia

*By Ilze Eglāja, an expert of Aspired Ltd., Latvia*

A couple of years ago I had a wonderful opportunity to travel to more than 20 different science centres and museums all over the world. Together with my colleague Gvido, we travelled to 10 countries, visited 22 science centres and did an extensive study on them. We also met with more than 30 interactive and hands-on exhibit manufacturers. The study tour was carried out in USA, Japan, China, Poland, Netherlands, Belgium, Germany, France, Denmark and Sweden.

Throughout the study we acquainted ourselves with and analysed the operation principles and funding models of the science centre, we tested interactive exhibitions, creative tech workshops and other services. During the visits we also interviewed the science centre administrations. As a result, an extensive report was developed both about each science centre and on the common characteristics.

Although the operation principles of science centres are very similar in all regions, there are few aspects where they differ from each other. Herewith I propose an insight into a few of them. Some of the good examples could be taken to and implemented in Nordic science centres as well.

**1. Science centre profile**

Analysing the aspect of a science centre profile I had to admit that European science centres are mostly oriented to simple hands-on exhibits. Different modern and interactive multimedia solutions utilizing most recent technologies have began to be introduced to European science centres rather recently. This also applies to the US science centres where multimedia exhibits are very rarely present. Besides, US science centres also cover the functions of natural history museums, frequently maintaining rather huge living and lifeless collections as well as necessary infrastructure.

Technologically, the most advanced science centres are the ones located in Asia, where Japan definitely plays a role of a leader. Japanese science centres offer to explore exciting and technologically complicated exhibits that utilise such digital technologies as Kinect, leap motion, virtual reality, augmented reality, different simulators, etc. While educating the visitors about various topics, the exhibits also show the newest accomplishments in the field of robotics.

**2. Services**

In terms of services the science centres are largely similar. In all fields, beside interactive galleries, there are creative tech workshops and laboratories, scientific demonstration shows, special educational programmes, thematic events and camps. Travelling expositions are an integral part, too. Almost all science centres rent out their premises for different corporative and other events. Yet, there are some differences.

In almost every US science centre there is a huge IMAX and/or 3D, 4D, 5D etc. movie theatre, that generates additional income. However, the truth is that we did not see a full or even half-full theatre in any of them. Another feature characteristics to US science centres are outdoor exhibits and activity zones, which are not common in Asia.

There are 3D, 4D, 5D etc. movie theatres in Asian science centres, too, however they are not that huge. Asian centres tend to host large planetariums.

European science centres do not allocate huge premises for movie theatres and planetariums. If such services are available, the allocated space is small.

If speaking about experiencing rather unique services and activities, live broadcasting to the science centre from different sites, for example operating theatres in actual hospitals should be mentioned; Liberty Science Centre visitors can for example observe authentic heart surgery while listening to explanatory comments.

Another service in demand available in US science centres is renting out premises for weddings or using the premises for special nightly science events for adults only.

In three science centres (USA and Asia) that we visited we saw a science library and a reading room. In Boston Science Museum the library was provided as an on-line service thus encouraging visitors to use technology to access and read books.

US science centres also host annual science project fairs for children (effective career choice events) on school, state and national levels; representatives of top colleges, universities and technology enterprises as well as scientists and industry leaders are invited and participate actively, judging the projects and choosing their future students, employees and colleagues.

Science battle, a very interesting and unseen service is available in Sony Explora Science centre in Tokyo. The activity is carried out as a science TV show, in which 10 superheroes each represent a country or territory of a futuristic planet. The players battle or compete with each other in order to acquire advantages or “weapons” with the help of their knowledge about science, innovation and technologies. In conclusion the winner conquers the whole planet. The audience, which consists mostly of youth, is actively involved, too.

Science festivals, public outdoor events for broad audience were a service or event that we came across only in Europe. The event would include everything on and around science – different activities, exhibitions, shows, concerts, fairs, music, cuisine, etc.

**3. Staff and volunteers**

In most US science centres and in about half of Asian science centres a significant work is done by volunteers – retired people, pupils and students who do their job free of charge. Among volunteers, seniors are the most prominent group - science enthusiasts, retired teachers and scientists - as well as pupils and students who have applied for summer jobs or study field practice to get credits for their degree. Sometimes teenagers and young adults from social risk, low-income or immigrant families are recruited. Such programmes in the US have a high success rate, encouraging the volunteers to study science and technology and providing some of them with an actual opportunity to go to the college.

Volunteers mostly do the job of a guide, an informant or a coordinator of the flow of people. Science centres take good care of them, providing thorough training on how to work and interact with visitors.

Volunteers is a resource that is being utilised in European science centres very rarely; in European science centres that we visited we did not see any volunteer programme in action. Perhaps it is time for European science centres to turn to this resource?!

*Science Centre AHHAA*

**4. Budget and key funding sources**

If we speak about the budgets of science centres and museums, there are significant differences. Annual average budget of the analysed European science centres is 5 million Euros; 12 million Euros in Asian science centres and 25 million Euros in US science centres. My opinion is that it hugely depends on the specifics of funding sources, number of attracted visitors, as well as the location on the world map, as in Europe there are significantly less densely populated territories and metropolises.

The key funding sources in European science centres are state and/or municipality funding (subsidy/grants), various European funding programmes, admission fees and income from renting out premises. Admission fees make up around 30%, state and/or municipality grants about 50% (however, the specific amount may vary from 5% to 80%), and remaining part of funding comes from European funding programmes, renting services and sponsorship.

Situation in Asia is similar to that is Europe, however, European funding programmes are replaced by corporate sponsors. In Asian public science centres, state and municipality funding is a significant source (50%-80%), and the remaining part is made up of admission fees (10%-20%), income from renting out the premises as well as the donations from corporate sponsors. Conversely, in show-rooms of Asian technology enterprises (e.g. Sony, Panasonic) the most significant source is the company's own investments that add to small income from admission fees.

In USA, the situation is different, as proactive donation and culture of giving back play a significant role. Admission fees make up around 27%, various state and city municipality grants add about 30%, yet the biggest part of income (43%) comes from the donations from private and corporate sponsors. In all the US science centres that we visited there were huge teams that work with sponsors on daily basis. Science centre staff constantly maintains close contact with them, demonstrates the results and achievements of the centre and at least once a year organises a large scale event to honour the sponsors and collect donations.

San Jose science centre, which is located in Silicon Valley has an interesting experience of cooperating with Valley entrepreneurs. They not only attract donations, but also provide companies with an opportunity to develop and display their own exhibits, thus contributing to the science centre.

**5. Admission fee**

In all regions, there are differences regarding admission fees as well. In Europe and USA, an average admission fee (standard fee, no additional services included) is 10,73 Euros and 13,24 Euros respectively. However, I have to mention that in some European centres the average admission fee is considerably lower – 4,20 Euros, equating it to the price of a movie theatre ticket.

It seems that this principle is used also in Asia, as the average admission fee to public science centres partly funded by state and/or municipality does not exceed 3,33 Euros. One can assume that the low admission fees make science centres more available and that it could be the reason why young adults of Japan and Chine choose science and technology industries as their career path more often.

*Ilze Eglāja is an expert of Aspired Ltd., a Latvian company that develops and manufactures interactive multimedia exhibits and solutions for science centres and museums, provides consultancy in the field and that develops and organises creative tech workshops for children, youth and adults. Aspired Ltd. recently became a member of Nordic Science Centre Association.*

# News from members

## Science for politics

*Norway, Nordnorsk vitensenter*

Together with UiT—The Arctic University of Norway, Polaria, the Fram Centre, the Science Centre of Northern Norway and the Association of Polar Early Career Scientists (APECS), we invited all 10th grade students in Tromsø to a scientific side conference at Arctic Frontiers 2016. The project ended with a poster session where all the students presented the results of their projects.

The aim of this event was to present some of the exciting and important research on Arctic issues that is currently being done. Also, the event aims at communicating the many exciting tasks related to working as a scientist. Furthermore, we work to establish this as an arena where the students are allowed to engage in their own research projects and through this contribute to important knowledge-building in their own region. At Arctic Frontiers 2015, nearly 450 junior high school students from Tromsø participated in this event and we had more in 2016.

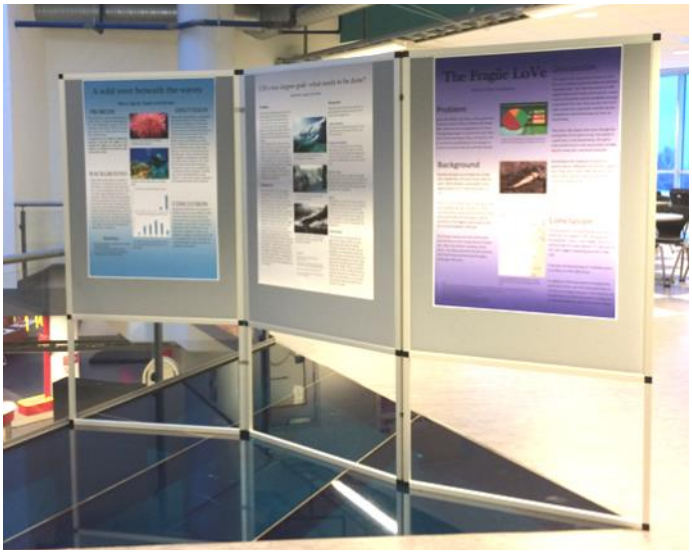
Arctic Frontiers - Science for Schools took place 26 – 28 January. The Science for Schools conference took place at the Science Centre of Northern Norway and it was in English only. The performances of schools were divided between the three days and each day consisted of three different parts:

1. Lectures by young scientists from amongst other APECS members

2. Poster session, during which the students presented their research posters to a jury.

3. Science show and Poster awards, where the best poster was awarded.

For more details about the event, contact Elisabeth Killie Kanebog or Tove Marienborg at the Science Centre of Northern Norway.



## News from members

### Good mathematical training - What is it really, when you are only two years of age?

*Norway, Nordnorsk vitensenter*
*By Astrid Lill BErg*

-Is it necessary to engage in mathematics in kindergarten? - Isn't playing with LEGOs enough for mathematical education?
-Can't we just be mindful about mathematics throughout the day, and the kids will learn what they need in the process?


These are all arguments against teaching and learning mathematics in kindergarten. Would we accept these statements if we were talking about learning languages?

In Norway, there has been a great emphasis on early intervention, especially when it comes to language and social skills. Over several years, we have built expertise and knowledge in the area, but when it comes to mathematics in kindergarten, the focus has not been the same.

Research has proven that children who develop math skills (numeracy) early have an advantage, not only in mathematics, but also for all kinds of learning later in life. This may indicate that these children are getting a head start that others have difficulties to catch up with later on. (http://video.adm.ntnu.no/pres/5296e9edd97ad)

What specific training should we give children to help them gain this learning advantage?

This was the kind of question we asked ourselves at Nordnorsk vitensenter, when we started a project with two nursery schools at kindergartens in Tromsø. In addition to us, we had the following members in our team: Monica Volden and Geir Olaf Pettersen from UiT The Arctic University of Norway, and Anne Nakken from the National Centre for Mathematics Education (Matematikksenteret). By now, there are four kindergartens involved, and we are slowly opening up for additional kindergartens to join the project.

The main objective of our work has been to find good math activities that safeguard playfulness and the kindergarten uniqueness. We do not employ traditional schoolwork methodology, but rather take advantage of the opportunities inherent in the various rooms and group activities in the kindergartens. It has been important for us to preserve a playful and exploratory attitude, and to seek a broad and basic understanding of the subject.

If mathematics in kindergarten required children to sit quietly with worksheets, practicing how to write the numbers in the right way, it would be more harmful to their later understanding and interest in learning, rather than helpful. We must make sure that we focus on the basic principles of mathematics, and that we do not fall for the temptation to draw conclusions prematurely.

## News from members

One of the challenges we face is that there are very few people with a love for science and mathematics, who seek out the kindergarten teaching profession. In fact, many of those who work in kindergartens look back on their own school mathematics with little fondness. When the government requires that children should learn math in kindergarten, it is not surprising that the kindergarten teachers are unsure on how to proceed.

Can we help make kindergarten staff more confident in their own practices and playful explorations, in relation to mathematics?

To achieve a lasting change of practice, we think it is important that all kindergarten employees are involved in the project. We started with a staff meeting where we looked at the content and definitions in the curriculum about what mathematics in kindergarten should contain. We compared and elaborated this with Alan Bishop's six fundamental mathematics activities.

We played and laughed until eight o'clock in the evening. By then everybody had been given an assignment. Until the next session, each person would bring a scheduled math activity for either a large or a small group of children.

Two weeks later, we met again. Everyone presented their suggested activities, while we discussed the mathematics within. We looked at whether it was a good activity or not, and how it could be expanded or adjusted in a way that would dig even deeper into the fundamental core of mathematics.

After the meeting, 20 large and small complete activities remained, that would work in practice with real children. Together with the whole staff, we had a productive discussion about what good mathematical training really is, when you are only two years of age!

# News from members

## Estonian Researchers' Night Festival brings FameLab to Northern Europe

*By Annika Vesselov and Kai Kaljumäe*
*Science Centre AHHAA, Tartu, Estonia*

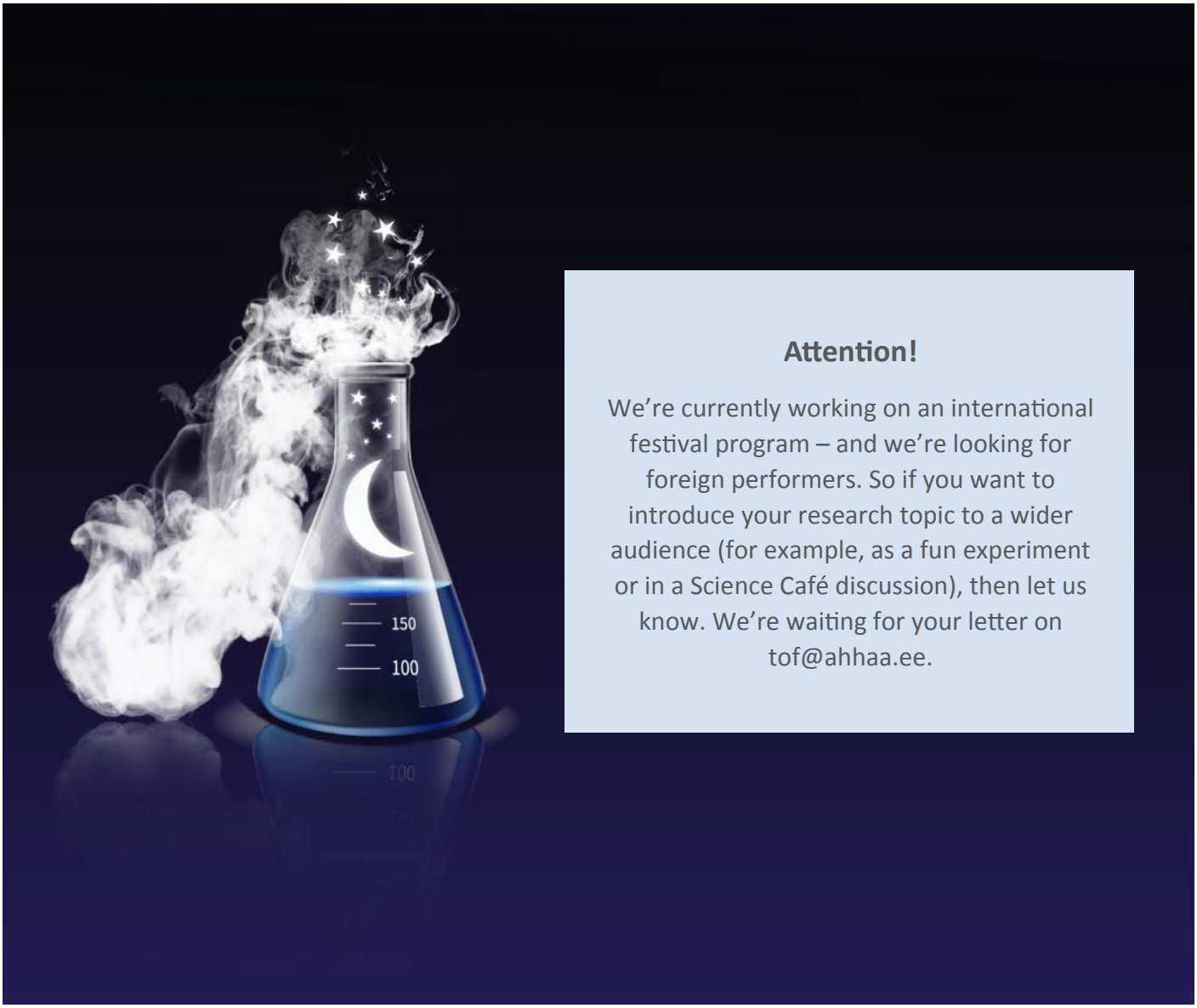
The largest and coolest science event in Estonia is about to happen again - and for the 11th time already! This year the festival takes place from 25-30 September, offering a week's worth of excitement and fun for families, youngsters and adults. The main theme of the festival is Science & Fiction and the program has more than 400 thrilling events all over Estonia.

Every year, we try to add something completely new and unique to the program. This time, we're very happy to present the very first FameLab in Nordic region! The event takes place on the 30th September and it is organized in cooperation with the University of Daugavpils and the British Council (including the local offices in Estonia and Latvia) and Cheltenham Festivals.

FameLab is a science communication competition for natural scientists, mathematicians and engineers to talk about an aspect of their science in three minutes only, without any powerpoint but with any choice of props that they can carry on to stage. Participants have to win over the judges and crowd with a scientific talk, judged on content, clarity and charisma. First, the participants compete on a national level and then meet the other competitors in the international finals (in summer 2017).

Another important addition to the program is the bigger involvement of schools. Around 30 Estonian schools already organized their events last year, but this time, we plan to involve at least twice as much. A brand new "festival package" will soon be available for the teachers. The package includes video tutorials for workshops and experiments, but also plans for interactive science classes and school projects.

The Researchers' Night Festival aims to inspire people of all ages, making them discover that science is awesome and it is actually everywhere around us. Festival's exciting and diverse programme includes everything from fun family days out to discussions on intriguing topics, interactive workshops, snug and fun science cafes, movie screenings and drop-in activities.




### Attention!

We're currently working on an international festival program – and we're looking for foreign performers. So if you want to introduce your research topic to a wider audience (for example, as a fun experiment or in a Science Café discussion), then let us know. We're waiting for your letter on tof@ahhaa.ee.

# News from members

## Pearls as the new stars

*By Jana Paju, Enery Discovery Centre, Estonia*

In the beginning of May, Energy Discovery Centre is changing the star exhibit of the exhibition “Treasures of the Layered Earth”. The new stars will be amazing pearls from the depths of the layer of hydrosphere.

This is made possible by the fruitful collaboration with gemologist Heli Kuulman and the Jewellery Gallery Aurum. They have previously enabled us to exhibit precious stones and will now provide the top quality pearls - freshwater, Japanese and South Sea pearls.

The new stars of the exhibition will reveal how the pearls form, what are the differences between natural and cultured pearls, and tell a brief history of these beauties.

## New life begins in AHHAA’s Hall of Nature

*By Kai Kaljumäe, Science Centre AHHAA, Estonia*

The biggest science centre in the Baltic States just got a little bit bigger! In 18 March, AHHAA opened a refurbished Hall of Nature, including a newly built second floor, which means that now we have 250 square metres of additional exhibition area and a brand new laboratory for our school programs.

The renovated Hall of Nature shows our visitors something that they usually see deep in the woods and far away from the city. For example, you can see real chicken hatching from eggs, get to know the birds that live in Estonian forests and peek inside an anthill. Soon, our visitors will also be able to see freshwater fish, house dust mites and fungi. The number of the inhabitants in the Hall of Nature will then exceed 20 000!

We’ve also added numerous new and exciting exhibits to the Hall of Nature. Now you can check out the water printer, which is unique in both Nordic and Baltic States. The printer creates a continuous waterfall, where you can draw different patterns. By creating clouds and tornadoes, you’ll also find out what it feels like to control weather,

And we haven’t forgotten our youngest visitors either – a special construction site is now waiting for them. Why not build a house or a castle – or maybe an entire town!?

# Upcoming events

## Euro Science Open Forum (ESOF) 2016
## 23-27 July, Manchester, UK

ESOF – EuroScience Open Forum – is the biennial pan-European meeting dedicated to scientific research and innovation. Registration open.!

More information :
**http://www.esof.eu/about/introduction-to-esof.html**

EuroScience Open Forum Manchester 2016

## World Science Festival, 1-5 June, New York, US

Hundreds of thousands of people will gather for a five-day celebration, taking science out of the laboratory and into the streets, parks, museums, galleries and premier performing arts venues of New York City.

More information: **http://www.worldsciencefestival.com/**

WORLD SCIENCE FESTIVAL JUNE 1-5, 2016 NYC
Rethink Science.

## ECSITE ANNUAL CONFERENCE
## 9-11. June 2016, Graz, Austria

The "Colours of Cooperation" theme not only resonates with Ecsite's network activities: we are sure that collaborations, co-creations and partnerships are at heart of your daily professional activities as well. You and your team will get inspiration, motivation, tips and tricks, do's and don'ts. You'll discover cutting-edge tools, gain new knowledge, and walk away with a refreshed look on your own practice. Use this conference as a springboard for personal development, for unexpected ideas, for future collaborations. The conference is being co-hosted by three organisations: the FRida & freD Children's Museum, the Universalmuseum Joanneum and the association ScienceCentre-Network.

- 24 February 2016: online programme is released + online registration opens
- 23 March: last day of the early bird rate
- 7-8 June 2016: pre-conference workshops
- 9-11 June 2016: main conference

colours of cooperation

## 1st International ECSA Conference on "Citizen Science - Innovation in Open Science, Society and Policy", 19-21 May, Berlin, Germany

This trans-disciplinary conference will highlight, demonstrate and debate the innovation potential of citizen science for science, society and policy and its role within open science and innovation.

More information: **http://www.ecsa2016.eu/**

## IPS Fulldome Festival, 15-17 June, Brno, Czech Republic

The organisers promise "No lectures! No workshops! Only fulldome projections, just shows!"

More information:
**http://starrylab.cz/ips-ffb2016/**

FFB
IPS FULLDOME FESTIVAL BRNO 2016

## EAC16 - EUSEA Annual Conference 2016
## 18-19. May 2016

The European Science Events Association Annual Conference 2016 takes place at the AHHAA Science Centre in Tartu, Estonia. The theme is **Engagement and Empowerment** and the program will be full of surprises!

Registration is open here:
**http://www.eusea.info/About/Annual-Conferences/EAC16-Eusea-Annual-Conference-2016**

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