NEWSLETTER

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Nordisk Science Center Forbund

Chairmans letter to you!

I hope that you have all started a very good new Science Centre year. I wish for all of us a 2009 with many developing, inspiring and constructive meetings.

2009 is the International Year of Astronomy and the Darwin Year. This gives us plenty of opportunities to interest many new people for science. I would like everyone who intend to have some activities or exhibitions concerning astronomy and/or evolution to send a short description to me, so that it can be put on the NSCF webpage and perhaps brought to Milan.

This year, NSCF will have a corner of a booth in the Business Bistro at the Ecsite Conference in Milan 4th to 7th of June 2009. I hope that many of us will meet up there. This newsletter will of course be presented in the NSCF booth.

Many of us met in Danfoss for a fantastic conference. It was a very well arranged conference, which gave us many new perspectives. Many thanks from us all in NSCF to Danfoss!!

The next NSCF Annual Meeting will be in Jæren/Sandnes in Norway in October 2009. Jærmuseet will be our host. As soon as the dates are fixed, we will email the exact times to all member institutions in order for you to reserve time in your calendar and prepare your travel.

I would also like to remind you all of the opportunity to apply for grants for practical training at another science centre.

Best regards, Lotta Johansson (lotta.johansson@navet.com)

The NSCF conference at Danfoss Universe

■ Sara Bagge and Lotta Johansson, Navet

The 8 – 10 October 2008 we all met for a very inspiring and interesting annual conference at Danfoss Universe in Denmark. Here are some highlights from the presentations.

Science Centers and the Citizens of the Future by Hans Henrik Knoop, University Research Lab.
Hans Henrik Knoop talked about if citizens need to have a basic scientific knowledge in order to participate in the modern democracy. He started out with the question on how the environment affects the way we learn. How shall we build rooms so that people want to stay there even though they don´t have to? The idea Hans Henrik Knoop presented was that we are evolutionary designed to enjoy the esthetics of nature. The difference between the nature and something built by man is the complexity. In nature, the closer you look at something, new and interesting things will appear. This rarely happens in a room built by man.
Hans Henrik Knoop also talked about the demands for learning and the desire to learn, and what can happen if demands choke desire.
The presentation of Hans Henrik Knoop (HHK-slides.ppt) will be available for download on the NSCF website
www.nordicscience.org

Science Centers and the Children of the Future by Peter Hesseldahl, Danfoss Universe Impact.
Peter Hesseldahl talked about whether the young people of the future are different, since they will grow up being on-line 24/7. He took a starting point in what he saw was 3 important trends:

- Increasing complexity
- Increasing participating
- Merging real and virtual

He also drew the conclusion that we will be connected and interdependent and that everything accelerates.

The European Dream – From the Most to the Best by Anne Skare Nielsen, Future Navigator.
Anne Skare Nielsen started by talking about not getting the most out of everything (people, relationships...), but getting the best out of them/it. We must be better at exploiting each others competences. She also brought up the fantastic expression Listen louder. Having this in mind in a conversation includes

- stop talking for yourself
- stop downloading and focus on the other person
- listen for the meaningful
- look for the bigger picture

This presentation also brought up the question of what it takes to be successful in the future. Anne Skare Nielsen identified the following factors:

- Originality – passion
- Feel that we are doing important, meaningful work
- Good energy – create situations that gets the best out of us.

Improving Education in Science, Technology, and Health in Denmark by Keld Nielsen, Århus University, Department of Science Studies.
Keld Nielsen gave us a presentation and reflexions on a new national strategy.

Gala dinner in Cumulus
The conference dinner was an event filled with delicious food and drinks and exciting experiments in a merry atmosphere.

Thanks to Danfoss Universe!

We are all greatful for the large and successful job that Danfoss Universe and all their enthusiastic staff did for us. Thank you for a fuitful conference!!!

Integration between formal and informal learning areas – practical experience with project FUF by Henrik Jacobsen, University Research Lab.
A report on FUF project using digital technology for interconnecting the learning in formal arenas with experiences made in informal arenas.

Coproductive learning in House of Science by Heiko Buch-Illing. Heiko Buch-Illing talked about how to mind the gap between formal and informal learning. The presentation of Heiko Buch-Illing (HBI-slides.ppt) will be available for download on the NSCF website www.nordicscience.org

Workshops
Besides interesting presentations, the conference also included a number of workshops.
• Pico: Basic programming in a playful engaging way •Explorama: Explore your own Multiple Intelligences profile
•Lego Serious Play: Give your brain a hand
•Physics in a Park: An outdoor learning arena.

Cino4, Sweden's first 4D cinema

■ Mariana Back, National Museum of Science and Technology, Stockholm

In January 2007 the Museum of Science and Technology opened Sweden's first 4D Cinema. With this type of cinematic experiences you are introduced to a show that includes sensory and motion effects in addition to the 3D visuals and the impressive surround sound. The seats in the theatre can move forwards, backwards, sideways and are fitted with under-seat ticklers and individual speakers. A remote control allows participation in interactive features. Fans and water sprayer complete the range of sensory effects.

Learning to Fly

Two years have now passed and several new shows have been released. The first show on our schedule was Learning to Fly. It takes you on a dizzying airplane ride over land and sea, where howling wind and a vibrating fuselage effect is included. When the aircraft makes a sudden dive, sprays of water and condensation are produced and the engines roar until it finally levels out and calmly proceeds on its way. In this exiting journey you also get to see scenic views from the bird's perspective and follow the history of how Man conquered the sky. Audiences love this show!

Hocus Science Focus

A little later, in April 2007, we introduced the audience to Hocus Science Focus, a show about science and illusions. This show had great success with kids around 8-10 years of age, whether in school groups, or accompanied by their parents. It did not please, however, all adults that visited Cino4 without children, to the same degree. A new collaboration project is in the works where children in the 2nd and 3rd grades will be invited by different companies to see the show at the Museum, in Cino4. The main goal is to offer an exciting experience in a science-related environment and to help fostering an interest for science and technology.

A Journey Through the Universe

We premiered the popular show about space and astronomy, A Journey Through the Universe, in time for 2008 summer vacations in order to attract more visitors. This worked particularly well at the Museum since we also had at the same time an exhibit focusing on the International Space Station (ISS). It includes mockups of ISS modules, a Gyro Wheel, a life-sized mannequin of the Swedish astronaut, Christer Fuglesang, wearing a spacesuit plus more.

During summer the Museum ran an advertising campaign on the theme "Travel to Space! A Round-trip for less than 8 €." These features were advertised in busses and in newspapers. This combined space theme attracted many visitors to the Museum during the summer and continued to do so during the fall and the winter seasons.

Building Without Limits
The movie, "Building Without Limits", premiered in September 2008, just in time for the schools to find out about it and plan a visit to Cino4. Preparation for this particular show had already started in July a year earlier. Ideas and material had been gathered about the theme of extreme engineering. A concept was developed and agreed on in collaboration between the Museum and Orpan Group, the producers of the final 4D presentation. The movie deals with:

- Manmade constructions - tall, wide and generally remarkable.
- To present several different exciting fields of engineering that are relevant to our everyday lives.
- To show what humans have been able to achieve by using ancient and new, practical and theoretical, knowledge.
- To show engineering as an exciting, interesting and important field of human endeavour.
- To create in viewers an interest for new technology and taking part in the creation of future society.

Cino4 Takes on New Challenges
The Museum of Science and Technology has started to collaborate with Riksteatern & Tyst Teater (Swedish National Touring Theatre & Silent Theatre) and De Döv/blindas förening/The Deaf/Blind Association (DBA). Our common goal is to bring accessibility for hearing or seeing impaired in our 4D Theatre. We want to create a performance in Cino4 for people with special needs, using all of the Theatres sensory effects. Follow-up evaluation and documentation will then allow us to decide and plan the next phase.

In the first workshop held last fall it was a joy to see staff participants made up of colleagues and friends -- from DBA and staff members at Riksteatern and The Museum of Science and Technology -- listening, accepting and really absorbing feelings, facts and tips as to how these seemingly different worlds can learn from each other. But it was all about how to implement, what can we learn and how can this affect change.

One afternoon was spent in Cino 4 – with both deaf, deaf blind and hearing colleagues experiencing the cinema. This short session showed more to us than what discussions held over weeks would have done!

Click on this link and you will find a short report form the workshop held in September, 2008
http://www.svt.se/svt/jsp/Crosslink.jsp?d=98085&a=1293417&lid=puff_1293417&lpos=rubrik

All involved parties have been very inspired and are looking forward to what 2009 brings. This is the year when we shall start our intense work to fulfil one of our dreams -- to produce a performance for deaf blind audiences – an artistic work, but one that´s also attractive to hearing audiences.

Competition!

Find a name for the new Swedish Science centre on flight

Are you a science centre employee and full of ideas? Take part in the competition! Do you have an excellent idea of a name for the science centre at the Swedish Air Force Museum? Please send it to patricia.kastberg@flygvapenmuseum.se
If your suggestion is considered to be one of the best you will be awarded with a flying experience!
See more on page 7

Experimentarium is looking for the future!

■ Asger Høeg, Executive Director, Experimentarium

In 2008 Experimentarium reached 315.000 visitors which was as budgeted, but 28.000 less visitors than 2007. The year of 2007 was marked by the wet summer with 55.000 visitors in July 2007. And the summer of 2008 was dry and sunny with 33.000 visitors in July 2008. So after all, we are happy with 315.000 visitors in 2008.
But what about the future?

On 15 April 2008 we became the owner of our house on Tuborg Havnevej 7 in Hellerup. Experimentarium have paid 119 million DKK to Carlsberg A/S and is now the owner of the building including a new built underground parking facility with the capacity of 100 cars.
Being the owner of the building, Experimentarium can now dream of enlarging, reshaping and renewing the building. And that is exactly what we want to do!

We have a 450 million DKK dream of a larger and more spectacular building!
Erik Møller Architects, the architect company that has directed the three renewals on our building (in 1988, 1995 and 2001) - together with Experimentarium's staff - has set up a program for preparing the building for our future activities and also enlarging the building with a new level and an outdoor area on the roof of the building giving space for a forest(!), an exhibition, a cafeteria and a lot of solar cells! The space on the roof covers 6.600 m2!

The program predict that the building shall be (almost) CO2 neutral. The facade of the building shall be dynamic and reflect - live - the surroundings of the building.

In total, the program adds almost 10.000 new square meters gross to the building. The total cost for the program is estimated to 375 million DKK. In addition to that, Experimentarium hopes to raise 75 million DKK. for new exhibitions, equipment and other costs in connection with the project.

More information? contact asgerh@experimentarium.dk ■

NSCF offers study grants!

If you would like to send a member of your staff on a one week practical training at another NSCF member science centre, you can apply for a DKK 10.000 grant from NSCF.

Please send an application mail to our chairman Lotta Johansson (lotta.johansson@navet.com)

The application shall contain:
1. Name of applicant and applying science centre
2. Name of science centre to be visited
3. Date of the practical training
4. Description of what you are particularly interested in during the training

After the practical training period, a short report must be written to the NSCF Newsletter. When that is done, NSCF will pay 10 000 DKK to the applying science centre. ■

Explore! Experience! Enjoy! Work in progress - the Science center on flight at the Swedish Air Force Museum

■ Hanna Bjärenstam, Project leader and educational officer.

Photography: Lars Malm.

Right now a number of persons are working on realizing a new science centre on flight in Linköping, Sweden. We are constructing an exhibition filled with experiences for all senses. The exhibition is part of the expansion of Flygvapenmuseum - the Swedish Air Force museum, an expansion of 6000 square meters. Furthermore the reopened museum will in 2010 contain an exhibit on the Cold War, an auditorium, an archive, a library, a shop and a restaurant.

Discovering and enjoying air!

Our future science centre of approximately 500 square meters, offers a spectrum of exciting activities such as hands on stations, workshops and school projects. The central theme in the science centre is: Why does it fly? Children will search the answers to this question in the exhibition area (and outdoors too), by discovering the interdisciplinary hands on stations. We strive for interpretation on reality and the key words for the hands on stations are interactivity and pleasurable learning.

Finding out how it works! Photography: Ola Holmgren.

The exhibit is influenced by a number of questions: how do pilots and air traffic controllers interact, how is an airplane controlled, how do huge airplanes even get up into the air etc. These questions where collected by keen educational officers meeting curious visitors, youngsters and adults, during recent years. In addition to the questions collected, that hints the visitors´ wishes of understanding how it works, surveys made at the museum show that the museum audience is interested in getting closer to the amazing airplanes. They long for sitting in the cock pit, getting an idea of what it is like to control a real airplane...

The wonder of flying

It´s truely challenging to mediate a sensation of flying to someone who has never flown or to someone who might never have seen an airplane at close quarters. The relation between the experiment and reality is part of the visualization, in this way the station will be closer to the visitor's world and therefore easier to understand. We aim to mediate function as well as significance, to look at the airplanes as part of a system. A digital learning resource will enable children to reflect on several issues, for example the consequences of using airplanes – consequences on our environment and on persons/ buildings etc in conflicts.

In the exhibit, children (and of course adults as well!), will be able to take a pilot test – explore the sense of balance, sight, hearing and reaction. Try their ability to fly different airplanes in simulators or if they are a little bit younger – why not try a flying suit? Enjoy the giant and colourful wind socks blowing in the

wind and try the wooden mini-airplanes. Experience complicated theories on aerodynamics by using your own body – standing in front of a gigantic fan playing with models on your hands. This is a tangible and enjoyable way of approaching science!

On the search for how it works!

What attracts the target group, i.e. mainly youngsters in the ages 12-16 years, and what makes them want to visit us again and again? To find the answers to our questions we are conducting a survey including 20 teenagers from a nearby school - Ekholmsskolan. The project is performed in cooperation with regional and national school development authorities.

We spent a day with the students at the science centre Tom Tits in Södertälje, investigating the exhibits by exploring in small groups and then discussing what good and bad hands-on stations contain and how the students interpret them. It turned out that the students prefer stations including one or more of the following ingredients: cooperation, competition, experiencing something new and exciting, using and testing the capacities of their own body.

Ekholmsskola-students at Tom Tits. Photography: Hanna Bjärenstam.

The youngsters enjoyed the science centre of many reasons, the most common reason was: "It´s great because you are able to understand some things better". Another one is: "Here you are able to have 'fun' this is not the case at school". Most of the students experience that they learn something at the science centre and some of them see the connection between the teaching at school and the stations, for example in biology. It turned out that they would like more signboards in the exhibition so that they are able to understand some of the stations.

Investigating the visitors´ opinions

To draw our present visitors´ interest, we recently produced two vessels (they might remind you of spacehips) containing Microsoft Flight Simulators. They are installed next to our authentic airplanes. Spending a part of the visit in front of the screens gives an understanding of how to take off, fly and land an airplane. In the working process with the science centre it is important to have a continuous dialogue with our visitors – to find out whether the hands on stations are attractive or not: to get feedback on how they can be improved, at an early stage. This is going to be done continuously, starting with the flight simulators.

An exciting meeting point

We want children to use their imagination and finding out things they did not know before - that they take part in a great experience. Moreover the science centre is to function as a meeting point for people from schools, companies and organisations. Our aim is that teachers use the centre as a resource for learning science and technology. Once the children have visited the centre with their teacher they will hopefully return to enjoy the exhibition on their own or with their cousin, grandmother, father, neighbour, best friend...

Trying the new flightsimulator. Photography: Ola Holmgren.

Welcome to explore, experience and enjoy the science centre at the Swedish Air Force Museum in the summer of 2010!

Are you curious about the science centre project? Read more at www.flygvapenmuseum.se

Heureka's Learning Centre

■ Matti Rosssi, Director of Learning

Heureka offers support to Finnish schools through its newly established Learning Centre. Heureka's Learning Centre is developed in a goal-oriented fashion to become a national and international actor in scientific and technological instruction, and it is an active partner in the Finnish National Board of Education's project focused on developing new learning environments.

The Learning Centre will organise programmes in its own facilities for about 60,000 school children and students each year. The development of media competence will be an important part of Heureka's programmes. Students will be encouraged to use digital materials, and to create and present digital reports.

The Learning Centre produces laboratory and workshop programmes, and material to support the current school curricula. The teachers' professional competence in the experimental and creative teaching of science and technology will be reinforced within the inspiring environment of the Learning Centre. The workshop programmes created by Heureka will provide a foundation for resources and teaching ideas which can be utilised on the national level in daily school activities. Teachers will also have access to materials that support information and communication pedagogy. With the help of international projects, the Learning Centre aims at the top of the field of scientific education and to become an established part of the European educational arena.

The permanent staff of the Learning Centre includes explainers, planners, a school contact manager, a research professor and the Director of Learning. In order to reinforce the instructional content, Heureka has initiated a 'Heureka Teacher' system. This system will ensure that the Learning Centre will have a supply of innovative teachers interested in developing its content. Heureka has sought funding in co-operation with companies, foundations and public authorities. With the help of this funding, a teacher already working in a school or university will be able to transfer for one school year to Heureka in order to assist in the development of the experimental activities together with Heureka's other staff members and partners. A teacher exchange with other European countries will also be possible.

The laboratory and workshop programmes produced by Heureka will be closely linked to the foundations of the Finnish curricula. Additionally, laboratory programmes will be designed to supplement Heureka's exhibition and science theatre offerings. The programmes will be created in co-operation with companies, research institutes and universities, which will enable the pro-

Heureka's new programme focusing on the brain and its functions is particularly geared to support the high school curriculum content in physics, chemistry, biology and psychology, and the high school subject area of Technology and society.

grammes to integrate new innovations. New instructional methods which utilise digital multimedia and electronic learning environments will be continuously examined.

The Learning Centre will also provide further education opportunities for teachers. The aim is to encourage teachers to use and produce digital materials, and to learn how to integrate online skills with creative scientific teaching methods. This training provides teachers with a solid basis for serving as a modern and innovative expert and educator within their own teaching environment.

Along with the foundation of the Learning Centre, Heureka will gain a stronger position in international research and development projects, since it offers an excellent environment for studying scientific learning and testing the methods.

For more information contact
Matti.Rossi@heureka.fi

Planetarium news from Norway

Anne Bruvold and Mona Holmø, Nordnorsk Vitensenter

Stargazers of Norway could cheer last year due to two major events:

•Jærmuseet, the Science Centre of South-Western Norway, opened their new edifice Vitenfabrikken housing a new digital planetarium in Sandnes.

•Nordnorsk vitensenter, the Science Centre of Northern Norway, replaced their interlinked projector system with a fully digital projector system.

The Science Centre in Sandnes, called the Science Factory, was opened May 23rd. The major attraction is a planetarium placed inside a 10 m hovering globe. The planetarium has 56 seats and runs a projector system from Carl Zeiss. The system is a hybrid with both a star-ball and digital projectors working together as a unit.

The planetarium at Nordnorsk vitensenter, originating from 1989, has 90 seats and runs a Definiti theatre from Sky-Scan. The original Spitz star projector is still running, but the new digital system displays a black and white contrast sufficient for running "all digital" shows.

Is this the start of an era of new digital planetariums in Norway? More Norwegian science centers have an intention to achieve a planetarium sometime in the future.

For more information contact
anne.bruvold@matnat.uit.no

MUONRAIN at Universeum

■ Sten Ljungström, Universeum

Cosmic radiation comes from outer space. Normally we do not know exactly where it originates. But we want to detect it and get new exciting knowledge about our universe.

From the cosmic radiation sub-atomic particles called muons are created in the upper atmosphere. The muons travel down to Earth with almost the speed of light, and every second of our lives several of these particles pass through us. In the new installation at Universeum, MUONRAIN, their arrivals are detected causing electric signals which are made visible by flashing lights in a beautiful artwork installation.

The muon – a fascinating particle heavier relative to the electron

The muon is an elementary particle similar to the electron, with negative electric charge. It is classified as a lepton, and has a mean lifetime of 2.2 μs. The muon is about two hundred times heavier then the electron (with a mass of 105.7 MeV/c^2 to 0.511 MeV/c^2 for the electron).

Muons were discovered by Carl David Anderson in 1936. In the same year he received the Nobel prize in Physics for the discovery of the positron in cosmic radiation a couple of years earlier. In spite of their short lifetimes many muons reach the Earth's surface, about one hundred per second per square meter. Travelling at speeds close to the speed of light, 300 000 km/s for a time of 2.2 μs,

they should, with classical mechanics, only be able to move a distance of 660 m. However, due to Einstein´s theory of relativity, time is going slower at high speeds. That is why they can travel much further, all away from the upper atmosphere down to the ground and even further down into the earth.

The cosmic radiation consists mainly of protons (about 90 %), 9 % of alpha particles, and the last percent of some heavier nuclei like Li, Be, Fe, C, and O. When they hit the particles in the atmosphere, showers of secondary particles are generated especially different mesons. They in turn decay immediately to photons and leptons, preferentially to muons. The speed of the muon is greater than 0.998 of the speed of light. Due to their greater mass, muons are highly penetrating, much more so than electrons. Of course many of them decay rather quickly to form electrons and neutrinos. Those neutrinos are denoted by $\nu\mu$. The muons that do reach the ground can be detected by different detectors. MUONRAIN has five such detectors generating electric signals which are coupled to flashes of light.

MUONRAIN is placed in the entrance of Universeum. 64 iron tubes of different lengths are formed into five constructions each with a muon detector at the bottom. MUONRAIN is created by Monica Sand.

MUONRAIN

The Installation MUONRAIN gives an immediate experience of the rain of muons that surrounds us and passes through our bodies every second. MUONRAIN con-

tains 64 tubes of iron grouped in five constructions. Lamps are located inside glass plates on top of each iron tube. Two of the constructions represent Poisson distributions. Another two are seven meters high. In the bottom of each construction a detector is placed, detecting muons in real time. When a muon hits a detector an electric signal is generated, amplified and triggered to light a lamp. Which lamp is lit depends on the dissipated incoming muon energy and which detector is hit by the muon.

Monica Sand is the artist

Monica Sand has worked to give artistic interpretations of research in Physics. She obtained a PhD at KTH – the Royal Technical High school in Stockholm concerning how changes in the physical environment impacts on the possibilities for an artist or a scientist. In 1999 she was awarded an honory doctor of technology at Chalmers University of Technology in Göteborg. Monica Sand has mainly collaborated with researchers at CERN (the European laboratory for particle physics outside Genève) and in Sweden.

For moreore information contact Sten.Ljungstrom@universeum.se

Norwegian Science centre communicators' workshop – and a Nordic?

Hanne Madsen, Jærmuseet, Norway

On 19-20th January 27 communicators from 6 different science centres in Norway met at Jærmuseet on for a 2 days workshop for "professionals". The purpose of the meeting was to exchange ideas and experiences. The idea of gathering the science communicators has been there for several years, and a late night in August 2008 at a mathematics conference we took the first step to enable it to be more than just talk...

All the communicators from the Science centres came with both ready-proven programs and schemes that are under development. We used each other to be even better! We hope that the contact between the communicators will continue after the meeting, just by the fact that we know each other.

At our annual NSCF meeting in Danfoss Universe the issue of holding a Nordic workshop for science centre communicators was discussed, but the Norwegian committee decided to try this out in Norway first, since it was already planned.

Based on the evaluation of the meeting of the Norwegian science centre communicators it is clear that the Norwegian science communicators will be happy to exchange ideas with their Nordic colleagues and they suggest to hold a Nordic workshop for science centre communicators e.g. every other year. It is important that it is practical, interactive workshops, combined with didactic reflections and experiences. It is also important that all participants bring their own contribution in order to exchange ideas on a practical way.

With this notice we call on the Board of NSCF to carry out this proposal!

If you are interested please contact:
Hanne.Madsen@jaermuseet.no

Events and festivals at the Science Centre

■ Poul Kattler and Helle Rimmer, Experimentarium

At Experimentarium we have just held our 4th Soap bubble Festival. This 3-days festival was, as the previous ones, successful and very well visited. A festival at Experimentarium is holding a specific theme; in this case our much loved soap bubbles. This means that all activities in the house have to do with soap bubbles: shows, demos, hands-on activities, displays in our shop, etc. As a special feature at our Soap bubble Festivals we have the famous and very entertaining Soap bubble artist Tom Noddy as our main attraction. He was performing 3 times a day with a 30-40 minutes show. Each time with a full audience of 250 persons. In the lab the Swedish professor Göran Rämme from Uppsala worked with the audience. Each year we are adding a few new activates to the bubble-program, so that the experience differs a bit from year to year.

Why festivals?

There are more strategic reasons why Experimentarium is concentrating some of our efforts on events on besides our exhibitions. Firstly we do of course wish to attract more visitors in general. Secondly an event or a festival is a good chance to promote and facilitate some of our focus areas within science and technique and hereby emphasise what we do as a science centre. And finally a festival is an obvious way to start up new strategic partnerships.

When planning a year we are also very conscious about slow periods compared to the more busy ones. The busy periods are primarily the school holidays. Events here are aiming at spreading the audience out, giving them more room during their visit and more offers. More shows at our two stages, workshops in our lab and meeting rooms, both with own science shows and hired in shows, e.g. from a science theatre. When organising a festival, we most often focuses on the slower periods during the year. Here the aim is to attract more guests. The range of possible festival themes is wide. Soap bubbles, robots, fireworks, or a theme related to the present special exhibition. Just now we present a spy-exhibition and we would in fact love a second wave of interest from our audience. So why not 'build' a Spy Festival on top of this exhibition? We then give our guests the possibility to meet the technical partners we have had

while developing this exhibition and a whole range of fun spy activities. So would you like to join us for a Spy Festival? Then put a note in your calendar April 24th to 26th.

Catching the press' interest
The last few years we have experienced that it is getting more difficult to attract the Press' interest when opening a new exhibition. 'Isn't this what you always do?" is their comment, when we are doing our presswork. It is quite a challenge to catch their interest, if they cannot see the news angle right away. Unlike this they seem to be a lot more interested when we are telling them about our festivals. Last year we had our first Robot Festival and we were busier than ever taking care of the journalists and TV who wanted to cover the event. That interest had an immediate effect on the numbers visiting during the event, but also on the following weekends.

Events and festivals – to be continued...
Experimentarium will continue focusing on this part of our strategy based on experience gathered from events the last few years. More events and festivals will follow. Some will be planned well in advance; others will be developed during the year.

Fore more information contact
poulk@experimentarium.dk
or
heller@experimentarium.dk

Why is Science and language an important combination?

■ Paula Bäckman, Center Director, Balthazar, Skövde

Like most Science Centers, Balthazar aims at increasing interest, curiosity and knowledge in the fields of science and technology. But it is also about getting students to apply for further study and eventually to work in the field. There are many things that are important to make this happen, and the effective use of language is one of them. To be able to communicate in different languages is of great importance for the challenges that face us. Intensified international mobility and the closer co-operation needed for development in trade and industry are two such challenges. What is the best thing we can do for our children? We need to prepare them for the future, and the future lies within those fields.

In 2008 we took one step further in this direction. Balthazar Science Centre in Skövde became an "educational trinity" and now consists of the Science Centre, a Nature School and the English House.

The story of John Downey
Below is the story of John Downey, who is working at the English House. What does he think about working at a Science Centre and how does he see the future?

"Well, three years at university studying history of Art, and a Master's degree in "English Language Teaching", and maybe a question "What am I doing here, working for a Science Centre?" I think it would be insulting to ask the question how important is English to science and technology. Oh, I am not doing this in any feeling of superiority or attitude that the English speaking world has made more contributions etc. Neither am I going to apologise for being a native English speaker and advocate the introduction of Esperanto. My background is a broad one: I have lived and worked in 6 countries, speak three European languages fluently, have worked with language training in many of Europe's leading industrial companies and taught ages 6-70 in my varied career. Papers are published in English, conferences are addressed in English, research is conducted in English, and professional relationships are made and maintained in English.

In September 2008, I began my employment at Balthazar Science Centre in Skövde. An innovative appointment by the Centre manager, Paula Bäckman. What is my role? Children are getting better at English. The effect of exciting children's literature has combined with films, music, computer games, TV and internet to produce a new generation of children who are getting more exposure to English in their private lives than in the classroom. Teachers continue to use traditional methods and materials. This does not cater to the immediate or future needs of the learners. In the English House we

stimulate communication, encourage self confidence and focus on English as a tool for communication rather than a school subject that has to be graded. Activities are designed to involve cooperation as well as laughter. The focus is on understanding and expression of individual ideas rather than accuracy. We discuss cultural issues as well as multi-cultural awareness and politeness. Balthazar, with its exciting experiments, activities and themed exhibitions, provides a great backdrop for communication, but this does not mean that there is no room for discussion about the children's own world beyind their interest in science and technology.,. Newton and Galileo are just as welcome as The Simpsons, My Chemical Romance, World of Warcraft and Harry Potter. Science centres are a place of excitement and innovation. Language learning should be just as innovative and effective as well as relevant."

Balthazar Astro news!

Paula Bäckman, Center Director, Balthazar, Skövde

I'm sure you have heard by now that it is 400 years since Galileo Galilei first pointed his telescope at the stars? This was when he began his exploration of the sun, the moon, the stars and the planets. Such an event deserves international recognition and celebration, and we at Balthazar Science Centre in Skövde will be doing our bit! After all, wasn't Balthazar himself an astrologist?

The 20th of February sees the launch of Balthazar's "International Year of Astronomy" events at Balthazar from 10-4. We have a range of events for children and adults including space themed activities and a visit from Lugnås' Astronomy Club.

We will be hosting the exhibition "Upptäck Universum – I Galileis fotspår" ("Re-Discovering Galilei's Universe") and having extra space-themed visits for schools.

In 2009, Balthazar will become part of "Sweden Solar System"; a solar system where Globen in Stockholm is the sun, and other planets are situated around Sweden, according to their distance from Globen/the sun. Balthazar Science Centre is the location for an artwork representing Halley's Comet.

Linked with this event, we will be running a competition where pupils can work with facts about the comet, draw or make models. The best contribution will be produced as the work of art to be unveiled in the autumn.
From 2-5 April, we will be organising buses to take those interested and curious to star-watching evenings at the observatory in Lugnås. The evening will consist of a talk and a closer look at planets and stars.

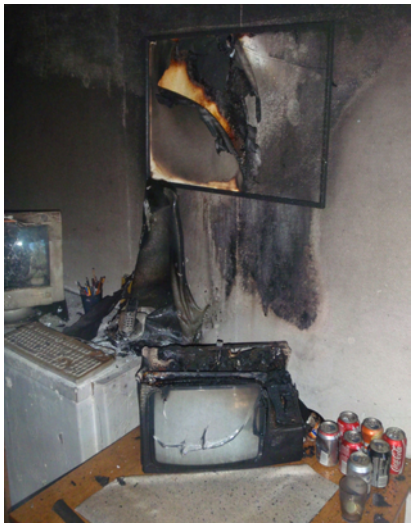
In the summer Balthazar Science Centre together with the English House plan to take a group of young people to Kiruna for a "space course" which will be held by students at the "Rymdgymnasium" (Sweden's "Space High School"). The course will include information about the research carried out at the Esrange Space Centre.

We have also planned a series of lectures with Cathy Horellou (Onsala Observatory).
As you can see, we have absolutely no intention of allowing the "International Year of Astronomy" to pass uncelebrated or unrecognized!

More about us, and our programmes and arrangement can be found at www.balthazar.skovde.se

Who lit the fire?

This autumn, NAVET has started a new crime lab theme. It is a fire theme, which has been very appreciated by pupils, teachers and not least by the staff at NAVET. We incorporate several subjects in this theme, and we feel that it serves an important purpose. The theme started since we were contacted by the fire department, who asked us for help. The number of fires in Borås and the surrounding area are rapidly increasing. To prevent this,



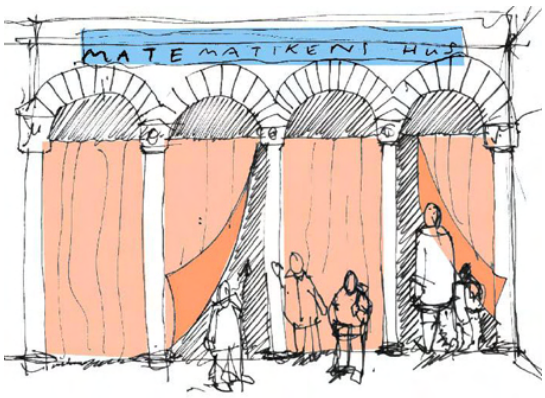
NAVET and the fire department in Borås started this cooperation. The goal with the theme is that the pupils acquire knowledge about fires in an engaging and fun setting. They should also be aware of the consequences of deliberately causing a fire.

The pre-visit assignment for the pupils is a short film. It is about a group of pupils, who are going to a school disco in the youth centre. On their way there, they are reached by the news that the youth centre is on fire! They hurry over, and see the fire brigade's work with putting out the fire. The leader of the fire brigade talks to the pupils, and describes the fire. He answers their questions about arson, how fires spread, and so on. The pupils then turn to the audience and ask for help finding out who caused the fire.

At NAVET, the fire theme starts with the pupils in the class dressing up in overalls and helmets in order to examine the "crime scene". A container, set up and decorated as a youth centre, and then burned out by the fire brigade serve as the "crime scene". In here the pupils get to take the roles as fire investigators. The purpose is also to give the pupils the experience of seeing a burnt out room. After the search for evidence in the container, the pupils head for the crime lab, where they examine different evidence material from the fire. In the lab, knowledge about fires in general is also included. Together, the pupils in the class find out who have started the fire.

The assignment after the visit at NAVET is to set up a trial in the classroom as a role-play. Everyone in the class participates, with a specific part in the trial for each pupil. The judge and the jury men reach a verdict. The class also discuss if the verdict is reasonable compared to other real verdicts. The trial is a very important part of the theme. It is important to understand that even if you are under 12 years old, you will still be liable for the damages if you start a fire. After this theme it is time to put on the "pyromaniac glasses" and examine the school and the home. Where is it most likely for a fire to start?

Carina Lindberg



The Palace of Mathematics

Baghdad – the mathematics theme of NAVET – has been a great success and one of the most popular themes of NAVET since it was created in the year 2000. Since then, the permanent Baghdad exhibition at NAVET has been complemented with two travelling Baghdad exhibitions, which has been on tour in Sweden and Norway.

Now it is time to take the next step! The permanent Baghdad exhibition at NAVET is being replaced by a 500 m² Palace of Mathematics. It will be a palace filled with beautiful, fantastic, fascinating, thrilling, wonderful, exciting mathematics. It will be a palace where mathematics is experienced with the entire body and with all your senses. It will be a palace where everyone can find a way in to the world of mathematics.

In the Palace of Mathematics, there will also be a room designed as the classroom of the future. This will serve as an inspiration for teacher groups visiting NAVET, and the mathematics education at the teacher program at the University of Borås will also have the possibility to have lectures and workshops there.

The Palace of Mathematics

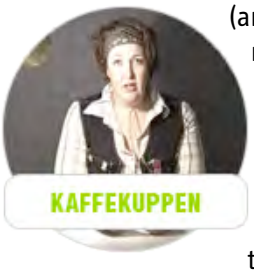
is developed in close contact with mathematicians, representatives from the teacher education and teachers. We all look forward to the inauguration of the Palace of Mathematics in April 2009!

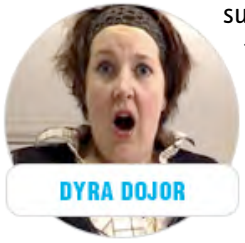
Sara Bagge

Social Profit Network (SPN)

NAVET, WWF, STENA Metall and Miljölots now proudly presents "Konsumtion på Hållbar väg", a school material about sustainable consumption.

The way we all consume has an effect on our environment in many ways - and most of the time not in a positive way. This situation is one of the major challenges that we will have to work with now and in the future, in order to live sustainable lives on earth. "Konsumtion på Hållbar väg" will show its users better ways to act as consumers, and will give young people ways of influencing the adults around them. The investigations will among other things focus on the ways adults consume, mainly because they have the power (and the money) to point out the directions for our consumption – towards sustainability or not . Four different areas of our consumption are in focus in the material; coffee, computers, shoes and transports. All of them are somehow closely connected to the adult consumption. If you want to know more, download the material at www.wwf.se or place an order for your own disc. Start an SPN investigation of the consumption that takes place close to you!





Anna Gunnarsson

Sense and Sensibility

Today the leaders and the scientists of the world all agree that we stand before great challenges to be able to secure a sustainable future. Never before has the level of CO_2 in the atmosphere been higher and during the last 30 years alone, the global average temperature has increased by 0.8 degrees Celsius.

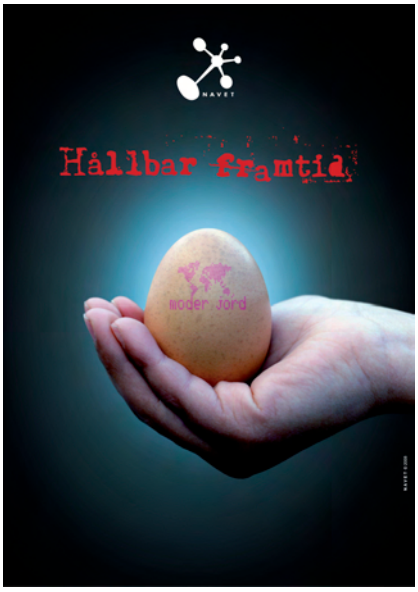
A sustainable future is possible by means of conscious choices, good political decisions and people with knowledge. People in families, in workplaces and in companies feel worried about what is happening. Everyone needs knowledge in order to develop a power to act and creativity. Creative people with power to act can make a difference!

NAVET has been working with sustainable future since the year 2006, and we have met thousands of people in schools and in associations. Now, we have started to work with companies and workplaces. We develop individual concepts for each place and group depending on their need and situation. We offer concepts in connection to a number of different areas, all involving the development of a hope for the future while experiencing and doing things together. Examples of different concepts we have worked with are *The cosmic cycle – think universally, global and local, Energy today and tomorrow, Consumption, Waste – a valuable raw material, Fair Trade and organic production, ...*

Now, NAVET invites EVERYONE to a series of seminars concerning sustainable future. This series will start in February, and the themes will be:

- **Efficient energy usage**
- **Efficient transports**
- **Provisions – local, organic, fair.**

We will invite interesting and competent speakers, who can address these subjects and give us an input for our work in the future. Are you interested in participating? Please, send a notification to me.
Lotta Johansson.
lotta.johansson@navet.com.



Educational development

Every year in the end of October, a big school fair in Stockholm is organized. The fair last for three days and a lot of teachers, principals, headmasters and politicians etc visit it. The visitors are mostly from Sweden, but also from our neighbouring countries.

NOS (Nature and society) – a school project at NAVET, for senior-level teachers, has been appointed to one of the most interesting school projects in Sweden. Therefore we went to Stockholm to present NOS at the fair.

NOS intend to work with sustainable development, both in a human perspective and for the nature. This is done by integrating NO (science studies) with SO (social studies) to create a meaningful collaboration and to be able to show different topics in a better context. This gives the students interesting, meaningful education with sustainable development as the main theme. A cooperation and integration of these subjects also increase the possibility to reach the goals set up in the curriculum.

Two teachers from one of the NOS-schools participated at the fair and told the visitors about their work with NOS. They also brought works from students. For example a film they had produced together with the students, about historical events and technical inventions.

Jan Thuresson (Särlaskolan, Borås), Fredrika Lundqvist (project leader NOS, NAVET), Martin Persson (Särlaskolan, Borås).

Fredrika Lundqvist

Pilot Schools at NAVET

NAVET has started an in-service training concept for teachers in primary school. By taking a starting point in the situation in each school and teacher group, we make specific plans for the content and program for each school. In this way, the in-service training becomes more rewarding. It is not just one separate occasion, but a long-term cooperation between the school and NAVET. An important part of the commitment is that not only the science

studies teachers participate, but all the teachers and other staff working with the pupils in the

school. It is important to have a common experience, to know what the other teachers teach, and also to be able to discuss science with the pupils when the questions pop up – they will not only pop up during the science studies class...

The Pilot School project has developed from the experiences from the NOS project. One of the ambitions with the NOS project was to find out what knowledge in the science studies area the students need when they start the upper level of the compulsory school. Quite a lot of the things traditionally taught in the 7th to the 9th grade could actually be taught earlier in the school years. Having this in mind studying the curriculum, different themes for the in-service training days has been developed.

Travelling Exhibition: Berta the Chemistry Dragon

The travelling exhibition about Berta is introducing the young kids from 4 to 8 years to the fantastic world of chemistry. The chemistry work starts with a letter from Berta the Dragon, sent out before the children come to visit. The letter contains a fascinating experiment which is easy

MINUTES OF NSCF ANNUAL MEETING

9. October, 2008 at Danfoss Universe, Denmark

AGENDA

1. Opening of Meeting
The chairman of NSCF, Lotta Johansson, opened the NSCF Annual Meeting 2008.

2. Approval of the agenda
The assembly approved of the agenda.

3. Election of chairperson for the meeting
Sara Bagge from Navet was elected chairperson for the meeting.

4. Election of secretary for the meeting
Målfrid Snørteland from Jærmuseet was elected secretary for the meeting

The following institutional members were present at the meeting:
Allan L. Winther, AQVA, Denmark
Georg Nissen, Danfoss Universe, Denmark
Nils Hornstrup, Dorthe Weis, Kim Gladstone Herlev, Experimentarium, Denmark
Åsa Egeld, Graciella Beloni, Faktotum, Eskilstuna stadsmuseum, Sweden
Sigrun Thorlacius, Fjölskyldu- & húsdyragardurinn, Island
Elisabet Eronn, Framtidsmuseet, Sweden
Jaakko Pöyhönen, Seppo Stark, Heureka, Finland
Jerry Alrup, Stefan Krusell, Innovatum Science Center, Sweden
Målfrid Snørteland, Gro Persson, Anne Torunn Braut, Jærmuseet, Norway
Tina Ivarsson, Mats Olsson, Kreativum, Sweden
Hans Hallman, Molekylverksta'n Sweden
Lotta Johansson, Riitta Carlström, Sara Bagge, Navet, Sweden
Tove Marienborg, Nordnorsk Vitensenter, Norway
Olle Nordberg, Eva Jonsson, Teknikens Hus, Sweden
Jonna-Marlena Hārö, Sampo Puoskari, Tietomaa, Finland
Ulrika Komnes, Jonas Bostrom, Universeum AB, Sweden
Petra Skoglund, Vitensenteret Innlandet, Norway
Jan M. Øverli, Atle Kjærvik, Vitensenteret I Trondheim, Norway
Anne Vibeke Kragelund, Finn Lillethorup, Hanne Rasmussen, Økolariet, Denmark
Others:
Hanna Bjārenstam, Flygvapenmuseet, Sweden

5. Report from the board
Lotta Johansson presented an oral annual report . The report will be published in the next NSCF Newsletter.

6. The economical report
The board presents the economical report.
39 members have paid their fee for 2008.
This year is an intermediate period, so the board shall not present an audit statement this year.
NSCF's assets by 1.October 2008 were 319.393,75 SEK

and non- toxic to do with young children. When the group comes to meet Berta in person (dragon) she experiments with them in a playful way – so that everyone can feel successful in chemistry. Her aim is to show interesting and fantastic chemistry with everyday stuff – mainly ingredients that most people can find in their grocery store.
When Berta comes to visit a new

place (science centers, schools, pre-schools...) she´s even more happy if she can meet groups of teachers as well as groups of children. Berta knows that if the teachers get a proper Berta – chemistry - training - class, they´ll be having more fun with the kids, and will feel more secure with chemistry all together.

7. Travel grants
The meeting approved to double the travel grants to members of NSCF for practical training at another science centre to DKK 10.000.
How many who will be granted such support in 2009 depends on NSCFs economy. The board will decide this later.

8. Presenting of the NSCF on the Marketplace during the ECSITE conference in Milan 2009.
The board is aiming to make a common presentation and exhibition of the Nordic science centres during the Ecsite conference 4-6 June 2009 in Milan. More information will come in the next NSCF Newsletter .

9. Questionnaire
Last year the annual meeting discussed to establish a database of information about Nordic science centres, for example information about funding, schoolgroups and educational programmes, tickets and entrance fee, etc.
The board hoped to send a questionnaire to out members during 2008. Unfortunately this has been delayed.

10. Approval of new members
New member approved: Flygvapenmuseet in Linköping, Sweden.

11. The next annual conference
Jærmuseet invited the NSCF to Jæren/Sandnes (in the Stavanger region), Norway in October 2009.

12. Other matters
ECSITE board
NSCF thinks that there is to few women in the board of ECSITE.
NSCF will promote the candidature of Eva Jonsson, Teknikens Hus, and request the Nordic science centres to vote for her at the next annual meeting in ECSITE in Milan 4-6 June 2009.
Workshop for communicators?.
The board has discussed the possibility for common workshops for the different occupational groups working in our science centres, for instance the communicators. The Norwegian communicators are planning a common workshop at Jærmuseet in January 2009. Could this workshop include colleagues from the other Nordic countries?

13. End of meeting

Målfrid Snørteland, Secretary of the meeting
NSCF – Nordiska Science Center Förbundet

Right now, Berta is having chemistry -fun at **Vitensenteret in Trondheim, Norway**, meeting children and teachers.

Anna Gunnarsson

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