Talking Heads

In 1873, Ernst Abbe published an equation with which the resolution limit of an optical microscope can be calculated. According to his equation, the resolution is limited by the wave length of light such that we would never be able to observe things smaller than roughly half the wavelength of light, i.e. around 0.2 micrometres or so. As a consequence, the interior details of cells and organelles, which are smaller than this length scale, were “invisible” using light microscopy. As an aside, Abbe introduced the 8-hour workday at Carl Zeiss’ microscope works, where he was a co-owner.

The Nobel Prize in Chemistry 2014 has been awarded to three scientists who designed experiments that circumvented Abbe’s predictions. Eric Betzig, Stefan W. Hell and William E. Moerner developed super-resolution fluorescence microscopy. Using the fluorescence of molecules, they have shown that details on much smaller length scales can be resolved, thus effectively turning the microscope into a nanoscope.

On October 28th, the Faculty of Science (together with Kommunförbundet) is arranging an education day for teachers. The topics for the day have been suggested by teachers working with children from the age of 7 years up to 18 years. Unfortunately, there was little apparent demand for education in topics related to chemistry. It is our belief that this does not really reflect the need among all teachers. Since this is planned to be a reoccurring event, we will make sure that chemistry is not left out in the future.

Nevertheless, this year KILU will be represented during this education day on one occasion. There will be a contribution focused on chemistry for teachers in the first to third grade. This event will be guided by Marie Skepö and Johan Reimer and there will be lectures by Reine Wallenberg, Petter Persson and Axel Thunesson.

Finally, we congratulate the team at physical chemistry headed by Peter Schurtenberger, who were awarded a KAW project grant.

/Olle Söderman and Jan-Olle Malm

News

Easier to trace toxic algae with new technology

New technology makes it easier to trace toxic algae at a very early stage. The new method developed by researchers from the Division of Biotechnology makes it possible to trace up to 10,000 times lower concentrations than is possible today.

Cyanobacteria, which is the more correct name for the unhealthy organisms, is rapidly increasing worldwide as a result of eutrophication and global warming. Early detection can save lives and make cleaning operations easier and more efficient. The new technology is portable, inexpensive and fast.

Behind the technology is Lesedi Lebogang, PhD in biotechnology. The method is an adaptation of a technology developed by Bo Mattiasson and Martin Hedström, which aims to trace extremely small concentrations in liquids. Read more
Liquid DNA behind virus attacks

Viruses can convert their DNA from solid to fluid form, which explains how viruses manage to eject DNA into the cells of their victims. This has been shown in two new studies carried out by researchers at Lund University.

“Our results explain the mechanism behind herpes infection by showing how the DNA of the virus enters the cell”, said Alex Evilevitch, researcher from the Division of Biochemistry & Structural Biology at Lund University. Read more

Researchers from Lund University have developed the world's smallest microphone

The microphone, consisting of a single molecule, is designed Yuxi Tian from chemical physics at Lund University, together with colleagues from the Netherlands.

Smaller microphones can detect smaller vibrations. Yuxi Tian of Lund University in Sweden and his colleagues have taken this idea to extremes by embedding a molecule of dibenzo[12]terpyrene inside a crystal. When sound waves disturb the molecule, it vibrates, shifting the frequencies of light it absorbs. So by shining a laser into the crystal and watching for changes in absorption frequencies, the team can listen in on the sound it picks up.

The team hope that by refining the device, it could be used as an acoustic microscope to spot tiny motions in chemical and biological systems, writes the NewScientist. The Swedish journal NyTeknik has also written about it here.

Skin pigment neutralizes harmful UV rays from the sun

Researchers at the Department of Chemistry have discovered how skin pigmentation succeeds to protect the body from the sun's harmful UV rays. The skin pigment eumelanin, which gives color to dark hair and skin, converts the UV radiation into heat through a chemical reaction that shoots protons from the pigment molecules.

- The chemical reaction is extremely fast, in less than a thousandth of a billionth of a second, says professor Villy Sundström from the Division of Chemical Physics who is behind the research.

The research gives insights on how nature protects against UV light. These insights can hopefully help researchers develop new and better sun protection products and help us protect us against skin cancer. Read more (In swedish)

Physical Chemistry researchers have been granted 42.398.000 SEK by KAW for research in colloidal chemistry

A group of nine researchers at the Division of Physical Chemistry, coordinated by Peter Schurtenberger, have been granted 42.398.000 SEK by the Knut and Alice Wallenberg Foundation for the research project Anisotropic Forces in Colloid Chemistry. The Foundation has granted a total of SEK 810 million to 24 research projects that they believe have the ability to lead to scientific breakthroughs. Read the press release

Willy Sundström appointed honorary doctorate

The South Bohemian University in České Budějovice appointed Professor Villy Sundström from the Division of Chemical Physics at Lund University an honorary doctorate in the field of biophysics. They describe him as one of the world's leading researchers in the field of time-resolved spectroscopy, a
method that makes it possible to study extremely fast processes at the molecular level.

**AT KILU**

**Financial report**

The financial results for the first half of the year 2014 are -13,6 MSEK compared to a budget of -12,3 MSEK for the Department of Chemistry as a whole including the board of joint services at Kemicentrum (husstyrelsen). It should however be noted that the results are distorted by vacation costs in a total of 7,1 MSEK, a cost that will be neutralised during the year as the employees use up their vacation days.

The second forecast of the year hence shows a result which is 2 MSEK better than the calculated budget (-17,2 MSEK compared to a budget of -19,2 MSEK), which is mainly caused by higher contributions from ERC, the Bo Rydin Foundation and the Foundation for Strategic Research (SSF) at the Division of Physical Chemistry as well as non-budgeted compensation from the Faculty of Science for a postdoctoral research fellow at the Division of Biochemistry and Structural biology. We are currently in the process of making the third forecast for 2014 and have initiated the budget preparations for the next year.

If you have any questions contact Karolina Isaksson, Head of Finance at the Department of Chemistry.

**At Lund University**

**Events**

**Excellence Seminar by Chemistry Nobel Prize Laureate Peter C. Agre, October 9**

The Faculty of Medicine is holding a seminar with Peter C. Agre, who won the Nobel Prize in Chemistry in 2003. Professor Agre will hold a seminar on the title: "Aquaporin Water Channels: from Atomic Structure to Malaria". Introduction by Professor Per Kjellbom from the Division of Biochemistry and Structural Biology. October 9, 15:30–16:30 in Fernströmsalen, BMC, Sölvegatan 19. More information

**WINGS Annual Conference, October 21**

*Spread your WINGS! Boost your career through collaborations and networking*

This is an excellent opportunity for cross-faculty networking and to learn how interdisciplinary research and sponsorship can boost your career and that of your research team! For this year's conference we have the pleasure to present international speakers who have a wealth of experience in interdisciplinary research and who are going to shed light on how sponsorship can work for you as a researcher. 21st October at Stora Salen, AF-Borgen. More information, Register now

**Research seminar: Open Access - What can it do for you?, October 24**

GOLD FOR GOLD - CUTTING COSTS ON OPEN ACCESS PUBLISHING
Monica Lassi, Department of Research and Study Services, Lund University Library
GOLD FOR GOLD - OPEN ACCESS VOUCHERS FROM RSC
Brian O'Connor, Royal Society of Chemistry

Deadline for registration: October 20. Register at http://libguides.lub.lu.se/researchers_seminars
24th of October at 9:15-11:30, Kemicentrum, lecture hall G
See poster

**Sandblomdagen: kärleken - livet - döden (love - life - death), October 29**

Lectures by Ulf Ellervik and others.
October 29, 16.00-19.00, Aulan, Skånes universitetssjukhus
See full program

**Symposium by KVA: Crystallography - Present and future, November 11**

This symposium is part of the celebration of the International Year of Crystallography 2014. The symposium will be held in Lund, where two world-unique facilities, MAX IV and ESS, for crystallographic research now is being built.

SPEAKERS:
Tomas Schneider, EMBL Hamburg, Germany
PhD program

PlantLink Industrial mentorship programme for PhD students

PlantLink is currently surveying the interest among PhD students to participate in an industrial mentorship programme. The idea is to pair an industrial mentor with a PhD student. They will then meet 3-4 times over a year around special events arranged by PlantLink. Preliminary the first meeting with your industrial mentor will be 1st of December with lunch and afternoon seminar.

If you are interested in participating in this programme please e-mail erik.alexandersson@slu.se not later than 15 October presenting your research, background and interests in no more than 2000 characters including blanks. We cannot guarantee that there will be a match, but will of course do our best.

CALENDAR

**2014-10-09**
Seminar by chemistry Nobel Prize Laureate  
Seminar by Chemistry Nobel Prize Laureate 2003 Peter C. Agre. BMC, Fernströmsalen at 15.30

**2014-10-21**
Physical Chemistry Seminar  
Tuesday 21 October at 14:15 in Kemicentrum, Lecture Hall F

**2014-10-22**
Symposium: Realizing reformulation  
A symposium on surface and materials chemistry, 22-24 October 2014 in Lund

**2014-10-23**
Seminar  
Oomics and microbial metabolism of cellulolytic bacteria, October 23rd, 15:00-16:00, KC: F

**2014-10-24**
Defence of thesis in Applied Microbiology  
Sudhanshu Pawar, Kemicentrum, Lecture Hall C at 10.00

**2014-10-24**
Defence of thesis in Biotechnology  
Serena Bisagni, Kemicentrum, Lecture Hall B at 13.15

**2014-10-24**
Research seminar on Open Access  
What can open access publishing do for you? 24 October, Kemicentrum, lecture hall G, 9.15-11.30

**2014-10-27**
Physical Chemistry Seminar  

**2014-10-30**
Workshop: Functional Surfaces  
This event will explicitly focus on applications close to industrial needs and the design of spin-off
collaborative projects focusing on product development.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>2014-11-06</td>
<td><strong>Physical Chemistry Seminar</strong></td>
<td>Thursday 6 November at 14:15 in Kemicentrum, Lecture Hall B</td>
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<tr>
<td>2014-11-11</td>
<td><strong>Crystallography symposium by KVA</strong></td>
<td>Crystallography- Present and future. November 11, Medicon Village</td>
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<tr>
<td>2014-11-17</td>
<td><strong>Physical Chemistry Seminar</strong></td>
<td>Monday 17 November at 14:15 in Kemicentrum, Lecture Hall G</td>
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