SCHOOL OF ENGINEERING SCIENCES IN CHEMSTRY, BIOTECHNOLOGY AND HEALTH

CBH News

Nr 20, December 2019

2019-12-19

Almost two years have passed with our new school, which today consists of nine departments of varying size, type of business and future challenges. The school's activities in teaching and research are wide in scope, but can be combined within the four areas of strength: materials, environment, energy and health.

In **January**, we conducted a number of workshops in support of our teachers, to begin working on formulating examinable learning objectives and goal-related grading criteria. Working together with other teachers, going through your courses, provides perspective and stimulation. A big thank you to our GA and our Vice GA for carrying out these more practical and hands-on work sessions.

The President and Deputy President were on a school visit to CBH in **February**. The visit was very much appreciated and this year we wanted to present our education for research and entrepreneurship of the future. Master's students in medical engineering showed, in a very inspiring way, an interdisciplinary project where sensors placed on the legs record how near perfect a cyclist tramples. In the school's Greenhouse Labs we got to meet two exciting companies where our technical doctors work. A rewarding last hour was devoted to hearing about committed program development within the biotechnology programs to meet the future.

The CBH school's first ministerial visit took place in **March** when Matilda Ernkrans, Minister of Higher Education and Research, paid us a visit. It was an intense half-day where we discussed the opportunities and challenges for KTH. In particular, our President emphasized the strong research and education that exists and the need for infrastructure. We also received a visit to CBH's course lab, where course coordinator Andre Dédinaité and laboratory manager Helena Lennholm hosted together with first-year students in the engineering and teacher program. The students did water analyses of drinking water and natural water from Igelbäcken near Ulriksdal. It was an appreciated and intensive discussion with the Minister and again the importance of being able to offer lab-intensive courses as a supplement and alternative learning to purely theoretical courses was discussed.

In **April**, we held three staff meetings at our AlbaNova, Valhallavägen and Flemingsberg campuses. It was gratifying to see more visitors than last, and the idea is that we will hold these staff meetings once per semester. During the fall we held an additional staff meeting at SciLifeLab as well. We did an activity update and a compilation shows that CBH, with an administration of 80 people, 2,000 students, 400 doctoral students and 450 faculty members / researchers, in 2018 generated:

- 15,000 exams
- 60 disputations
- 350 scientific articles
- 200 ongoing cases in the HR system
- 870 project reports
- 20,700 invoices
- 40 faculty recruitments / promotions / admissions
- Turnover of SEK 1.015 billion

These are impressive figures which can be easily forgotten in the everyday work.

Do you have news tips?

Send them to CBH News!

All news tips for CBH News should be sent to

cbh-nytt@cbh.kth.se

All contributions must be in by 12.00 on Monday the same week as CBH News is published in order to be admitted. See the current deadline at the last page

In **May**, Treesearch gathered all partners at Vildmarkshotellet in Kolmården for a two-day conference. It was universities, companies and public financiers. Starting off the event was Minister of Business Ibrahim Baylan, who talked about the importance of transforming our society into a bio economy. Sweden's dramatic wealth development has taken place at the same time as we, for example, uses more renewable energy than ever and our fossil dependency decreases. The conference showed a lot of research and education that takes place in collaboration and it feels like Treesearch is now well established. A big thank you goes out to everyone at Treesearch for a nicely organized event.

CBH's JML / work environment group, together with the KTH Equality Office, organized a seminar for managers with staff responsibility at CBH entitled "Equality, diversity and equal conditions (JML) – inclusion as theory and practice". We were over 25 people who learned more about equal conditions in the higher education sector, both quantitatively and qualitatively. The seminar is part of the theme "Leadership development with a gender perspective", which is an initiative of CBH's JML / work environment group. The purpose of the training is to raise awareness of how gender knowledge can be put into action, through concrete leadership tools in the practice of leadership.

On May 28, the CBH summer party took place. It began with some impressive doctoral presentations in KTH's largest lecture hall F1, in the form of pitches, short presentations in a popular science form. They were followed by a buffet and mingling. We were close to 400 people and have had many positive reactions, so we plan to have a similar summer party next year.

In **June**, a summer school was organized, which we do jointly with Shanghai Jaio Tong University (SJTU). The initiative was taken in 2011 and the first summer school was held in Shanghai in 2012. It has since alternated between SJTU and KTH. This year, it was KTH's turn to host and we were visited by doctoral students and master students who met our students and researchers, as well as participated in a busy lecture schedule with lab activities. Associate Professor Anna Herland (ECCS) together with our international coordinator Zofia Laine was responsible for the program during the week. A big thank you for a fantastic effort!

When we were all back in **August**, the planning of the next Research Assessment Excercise, RAE, which will be held in 2020, entered a more intensive phase and the President has appointed a steering group working on the planning.

In **September**, Campus Day in Flemingsberg took place for the second year in a row. Flemingsberg is one of KTH's five campuses with a mix of educational institutions that enrich KTH. The presidents from KI, KTH, the Red Cross University, Södertörn University and Stockholms Music Pedagogical Institute participated. Our President says that it is good to have campus environments where different types of colleges are mixed. It creates opportunities for our students and staff to do things together and she is struck by the innovative thinking and creativity in Flemingsberg. We have a dialogue with the President about continuing to develop CBH in Flemingsberg by linking even more research to the education.

In **October**, UKÄ's assessment panel regarding KTH's quality assurance system made their first site visit. KTH's Board of Directors, management functions, THS, GA and FA were involved in the interviews that started in the morning and ended in the afternoon. In December, UKÄ conducted its second site visit here at KTH and we would like to thank all of you who have arranged and participated in interviews and all preparatory meetings for the interviews. In their interviews with the KTH quality coordinator and in the last talks with the President, Dean and Vice Dean, the assessment panel said that they were very pleased with all the interviews and that the conversations had all been pleasant and informative. The assessment panel now takes with them all the impressions of the interviews and continues the work of analysing how KTH's quality assurance works and what may need to be further developed. KTH will receive their first assessment in February 2020. Then we will check that the factual content is correct. The final assessment will then be finished in mid-March.

In **November**, KTH traditionally held the annual promotion and installation ceremony, and since the previous promotion event 55 people have graduated in subjects belonging to the School of Chemistry, Biotechnology and Health. A fantastic figure considering all the work everyone has put in, as well as doctoral students and supervisors. Administering up to 10 disputations in one month also requires a lot. Congratulations to everyone! Imagine the amount of new knowledge that has been gained, something that the recipient of the KTH gold medal for industrial collaboration, Malcolm Norlin, mentioned in a very memorable speech at the Concert Hall. Norlin underlined KTH's research power and stated that when working with technology development, you are thinking in new ways!

In **December** I attended the inauguration of Makerspace in Flemingsberg. You have probably heard of Hewlett & Packards garage in Palo Alto, which was the starting point for what would later become known as Silicon Valley. In the same spirit, KTH Flemingsberg has built up a new Makerspace with the intention that the school's students should be able to take their initiatives one step closer to a possible realization together with teachers, researchers, industry and KTH resources such as KTH Innovation.

It was wonderful to experience the enthusiasm of the students in different grades when they got the opportunity to produce their own printed circuit boards and 3-D-printed demo products, all the way to a working prototype. The project is led by Anders Cajander, whose commitment has spread throughout the entire Makerspace environment. It will be really exciting to follow the development and a big thank you to Anders with co-workers for this venture.

Finally, I want to wish everyone a peaceful and pleasant Christmas holiday and:

A big and heartfelt thanks for your splendid cooperation and all the great efforts during the year!

Mikael Lindström
Head of School

KTH ROYAL INSTITUTE OF TECHNOLOGY

Christmas spirit at the CBH school

Christmas is just around the corner and all around the CBH School the spirit of the season is palpable.

In some places, they have taken the whole thing a bit longer and decorated a little extra. Such as in the departments of Protein Technology and Protein Engineering at AlbaNova, where an ornament contest is traditionally being organized.

“It is always the new employees who fix Christmas parties according to their own ideas. So it looks a little different. But this is the third year we run a decoration competition,” says Professor Stefan Ståhl.

The exciting competition was decided at the department’s Christmas party, and the winners were Maria Geis, Linnea Hjelm, Emma von Witting, Hanna Tano, Danielo de Olivieira and Andreas Wisniewski who produced a Christmas tree of green gloves.

The competition was stiff and there was a lot of Christmas decorations in the corridor on level 3 on AlbaNova.

At the Service Center on Valhallavägen, morning staff could heard beautiful Christmas songs on December 13th.

Occupational health – agreement expires

The agreement with the occupational health care Avonova expires at the end of this year.

A new agreement with a supplier of occupational health care will be signed after the appeal period has passed.

Read more at KTH's intranet

Low staffing within administration during the holidays

Large sections of the technical and administrative staff at the CBH school will be on leave during the Christmas holidays.

Squeeze days are red days for the technical and administrative staff at CBH and these operations will therefore have low staffing from December 23 until January 6.

Parking stickers at Service Centre

Parking stickers for 2020 are now available at Service Centre!

Around our main campus there are parking spaces where anyone can park for a fee and KTH staff can park for a reduced staff fee. For the staff fee to be valid you need a small sticker with the current year.

The sticker can be collected from Service Centre. See link below to KTH Entré for parking rates.

Map of the main campus and parking spaces

Information about parking from KTH Entré

Information from the purchasing manager

Which vendors can be hired for catering on which sites – and what rules apply when you buy a new camera?

All the answers can be found in the latest info from the purchasing manager. Also: the latest information about e-commerce and orders in WISUM during the Christmas and New Year holiday.

Read more here

Information from the finance unit

Don't forget to certify all your invoices before you go on Christmas leave! We monitor the invoices during the Christmas holidays.

The final date for financial certification of invoices is 3/1 at 15:00, in order for the invoices to be posted in 2019.

KTH's alarm number and safety support number

In effort to increase KTH's cricis management ability and security support, there will be two phone numbers starting January 1 2020.

KTH's alarm number 08-790 7700, will be completely dedicated to major accidents and crises.

KTH's safety support number 08-790 9900, will lead you to the security guard support.

Different opening hours during Xmas

During the Christmas holiday the opening hours of KTH's central service functions will be changed.

The reception at Brinellvägen 8, KTH-switch/ Service number 9200 and the KTH Post will, for example, be closed on 23 December until 1 January 2020. In addition, all entrance doors on the KTH Campus Valhallavägen will be closed 23/12 2019 through 6/1 2020. Card and pin code will be required to enter during this period.

All opening hours during Christmas Holiday 2019/2020

Photo: Pixabay

Still in town for Christmas and/or New Year?

From December 20 until Jan 7 you will notice that most people vanish. It is Christmas and Swedes will leave the city for skiing, for the countryside and to hang out with family. If none of that is an option to you, please sign up for the KTH Relocation "Christmas mailing list". It´s for KTH employees how will be around during this time and who also would like to make new acquaintances and new friends. When signing up you agree on making your email address public to all the others on the list, to make contact and to be contacted if something fun or interesting will take place.

We will give you tips and ideas of what to do but you are off course free to make any kind of private initiatives for Fika, walks, movies, day trips, etc.

Sign up for KTH Relocation Christmas list

The climate fund in practice

Cutting back on air travel and with it carbon dioxide emissions is an issue KTH is continuously addressing to help sustainable development and is one of KTH's general sustainability goals.

"Reducing our climate impact is key to this and something we must tackle even more vigorously as we are facing an urgent situation. We all have a responsibility on all levels," says Sigbritt Karlsson, KTH President, as KTH's climate funds have now been turned into practice.

KTH decided to introduce climate funds last spring. For every flight that personnel and faculties at the five KTH schools have made over the last six months, money from performance-based funding in research and third cycle education grants, at each respective school, is paid into a fund.

"I can see two big advantages with this. Firstly that our air travel is put on the table and secondly that the funds can be used to stimulate alternatives," says Göran Finnveden, Vice President, Sustainable Development.

Göran Finnveden, Vice President for Sustainable Development

The climate funds for the different schools also provide a pointer as to how much air travel each school has done. The School of Engineering Sciences in Chemistry, Biotechnology and Health has 340,000 in its fund to be used for a series of seminars at the School on the theme of sustainable development and starting grants for teacher appointments.

Read Jill Klackenberg's full text here

Chemistry programmes receive million investment for bio-based education

With this economic addition, KTH's study programmes in chemistry can further customize their courses towards sustainable technology with focus on wood science

The Department of Fibre and Polymer Technology at KTH has been awarded SEK 2 970 000 by the Ljungberg Foundation. The aim with this investment is to provide possibilities for the study programmes in chemistry to further develop courses in sustainable and renewable materials from the wood-processing industry.

"For industry, it is really important that KTH can continue to educate engineers who can contribute in development of technologies based on forest raw materials. Now, for example, wood can be used for both clothing and medical chemistry. It is exciting to see what new areas may develop next," says Sara Jons, CEO of the Ljungberg Foundation.

Currently a lot is happening in the chemistry field linked to the forest industry. For years, great emphasis has been placed on traditional packaging industry. But the focus has now also been on other areas where bio-based materials from the forest can be used - for example in the textile industry and on carbon fiber, where lignin from wood can replace crude oil.

Monica Ek.
Photo: Jon Lindbe

The investment enables the chemistry programmes in continuing to develop state-of-the-art education in renewable materials. Parts of the money will go to adding and expanding the department's specific course literature. For example, with new chapters on nanocellulose and lignin applications, which are some of the most interesting areas in renewable materials right now.

"So much has happened in recent years in terms of sustainability, a circular economy and recycling. This said, it is important that we keep up with and update our educational material so that the students get modern knowledge together with older core competence," says Monica Ek, professor of wood chemistry.

The development of what trees as a raw material can be used for is progressing fast. Photo: Manfred Antranias Zimmer

At the turn of the millennium, interest was low for the focus on pulp and paper-related specialization. Today, almost twenty years later, the trend has reversed and the interest in chemistry, the environment, sustainability and renewable materials are growing sharply. The previous academic year 2018/2019 was a record year for admitted students to the Master's programme Macromolecular Materials, which includes forest industrial material and process training.

The updates of course material will mainly impact Macromolecular Materials as well as the Degree programme in Engineering Chemistry. It is hoped that even more KTH programmes will be able to contain elements regarding the forest industry and its possibilities in materials, energy and chemicals.

In addition to updated literature, Monica Ek also hopes that the money can go to more video-filmed moments and an extended investment in study visits for the students.

"I feel that technologists are generally eager to visit workplaces. In our courses, students regularly make study visits to a number of different companies, not least to our strategic partner Stora Enso's production facilities. In this way, the students can get inspiration about what they can work with after graduation," she says.

Text: Kenneth Carlsson

Armin Halilovic is Teacher of the year at KTH

Armin Halilovic, Associate Professor of mathematics who teaches at the CBH's Department of Basic Natural Sciences in Flemingsberg, has been named Teacher of the Year for the entire KTH by the Swedish University's Student Union (THS).

"I feel proud and I was surprised, a little bit anyway," says Armin Halilovic.

Armin Halilovic is Teacher of the year. Photo: Jon Lindbe

It is not the first time Armin Halilovic is praised for his educational efforts. In fact, he has been chosen teacher of the year on various programmes six times before. But now THS has appointed him Teacher of the year at KTH as a whole.

When we meet in Flemingsberg the day before the awards ceremony, Armin Halilovic admits that he is actually a little nervous and complains about his newly cut hair which he feels is slightly too short. He was chosen Teacher of the year two weeks ago and knew about the nomination for longer than that, but he didn't dare hope for too much.

"It was a big thing, but I didn't think I would be chosen because I think there are so many good teachers at KTH," he says.

Armin Halilovic, Deputy President Mikael Östling and student representatives Elisabet Lövkvist and Arvid Nilsson.

There sure are a lot of good teachers, but few have been teaching for as long as Armin Halilovic. He came to Sweden from Bosnia in 1994 and started working at KTH in August 1996. But his teaching career started much earlier.

"I started teaching my friends when I went to high school, and then at university I worked as a student assistant. After that, I started working as a teacher in mathematics in 1977. Before coming to Sweden, I worked as a university lecturer in the city of Tuzla in Bosnia," says Armin Halilovic.

How did you know you wanted to teach?

"I was always good at explaining mathematics, ever since I was a student. As a student, I also organized summer courses for other students who had problems with the mathematics at university, and everyone was happy with my explanations," he says.

During his more than 20 years at KTH, Armin Halilovic has taught a large number of programmes, he has taught at every level; from first-year students to doctoral students, and he has conducted researched in functional analysis. But when it comes to the secret to becoming a good teacher, he is not sure.

"I do not know. I think about it sometimes. But I just teach in a natural and relaxed way and try to explain in a way that the students understand. There are many good mathematicians who are not very good at explaining things. So maybe it is experience and maybe even some talent, says Armin and laughs.

On Wednesday, December 18, he received the award for "Teacher of the Year", a walking trophy in the form of a silver apple and a diploma from the Technical University Student Union with the motivation:

"Armin teaches the basics in several ways and creates interest in his subject by connecting the abstract to everyday examples and simulations so that everyone can keep up, while at the same time challenging the students who need more advanced examples. He complements course books with his own material that is appreciated by many students, even outside his courses and sometimes outside KTH."

Text: Jon Lindhe

Armin Halilovic

Associate Professor of mathematics at KTH. Teaches at CBH's Department of Basic Natural Sciences in Flemingsberg

Has been appointed Teacher of the year sex times before at different programmes.

Defended his thesis in mathematics in 1990 at Zagreb University

Has worked as a teacher in mathematics at various levels since 1977 and at KTH since August 1996

Family: wife Biljana and daughters Amela and Adisa. Became a grandfather three weeks ago

In his spare time: strolls in nature, playing chess and reading about ancient civilizations

Research

Wood an important material in flexible electronics

Researchers from KTH have invented a way to use wood fibers to create a durable and cheap electrically conductive material. This material can be used in lightweight and durable flexible electronics such as body-worn technology.

A research group led by Max Hamedi in the Fiber and Polymer Technology department at CBH has created a new composite material. The new substance has been developed by combining cellulose nanofibrils with MXene, a conductive, two-dimensional material that is but a few atoms thin. The fibrils have thus given the new material a durability it would otherwise lack, while still being flexible.

"Our research results will eventually lead to flexible and multifunctional components for energy storage, such as batteries. This at a low cost and high performance," says Max Hamedi.

By extension, these batteries could, for example, be an important part of body-worn technology. In order to use the new material, the researchers intend to form electrodes of it, in the form of thin cables that can conduct current.

"In addition, these electrodes are strong enough and have the ability to store energy which makes them suitable for electrochemical applications", says Max Hamedi.

According to him, the material's strength is the result of a combination of geometry and chemistry. The cellulose nanofibrils attach to MXene flakes; they lock against each other.

"If we had incorrect geometric matches between the size of the flakes and the rods of cellulose nanofibrils, we would not get the same bonds between the two and a much weaker composite material," says Max Hamedi.

In addition to the new material, he has worked for several years on another technology: a fluffy three-dimensional battery that can withstand bumps and strokes, constructed using cellulose from trees. In this case, it is a matter of nanocellulose used to build a fluffy material called aerogel.

Read the full paper in Advanced Materials here

Text: Peter Ardell / David Callahan

New scholarships

There are a number of new scholarships and grants available for application for researchers at KTH.

The application deadline is in many cases at the end of this year or at the start of 2020. Do not miss out on the chance to get funding for your research.

Information about scholarships and grants outside of KTH

New course for doctoral students

This spring the new course "Involving old people in engineering and design 7.5 credits" will start.

The purpose is to provide doctoral students with knowledge and tools to in an effective and meaningful way, engage elderly people in development, testing and evaluation of technological applications and systems, and to contribute critically and constructively to optimize digitization of later life.

In charge of the course is Britt Östlund, Professor, Technology in Health Care.

Read more about the course

Thesis defences

You can find all thesis defences at CBH on the school's internal pages