Chariya got her dream job
From master’s student to graphene researcher | page 10

Antibiotic crisis a global threat
Prescription of antibiotics has to be reduced | page 20

Most satisfied students in the world?
Linköping University claims top spot in international survey | page 4
International students give LiU top marks

The International Student Barometer, ISB, is the world’s largest student survey. Over 200,000 international students from more than 200 universities in 16 countries took part in the most recent survey.

The survey contains more than 100 questions and covers most aspects of student life and one question encapsulated the general perception: “Overall, how satisfied are you with all aspects of your university experience?”

LiU received the highest marks of all universities in response to this question! Our staff and students can be proud of this fantastic result. It is a challenge for all to endeavour to deliver an extraordinary student experience going forward.

Examining the survey in more detail, it is even more gratifying that LiU received such high marks in the section on academic core competencies: course content, course organisation, laboratory resources, library, teachers’ English, etc.

However the survey clearly highlights areas where we need to improve. These include strengthening contact between Swedish and international students. We also need to find various ways to convey a clearer image of how our programmes relate to the labour market. This needs to be worked on both inside and outside the classroom. Therefore LiU chose to actively support Working for Change: a national campaign aimed at improving contact between the Swedish labour market and international students and academics.

Helen Dannetun, Vice-Chancellor

helen.dannetun@liu.se
During my youth I, like so many others, ventured out into the world. I wanted to leave the familiar behind, gain new experiences and broaden my horizons. For several summers, I travelled through Europe by train. I took the winding roads to small villages in East Africa and worked as a volunteer on the U.S. West Coast at a resource centre for nonviolence.

The experience bore fruit in the form of lasting memories. I met people who left a deep impression on me and some even became close friends.

My journey also opened my eyes to other ways of looking at life. We all have our individual vantage point, our platform, from which we perceive the world. Some platforms are close to each other, others farther away. Sometimes we need to look from another person’s platform to view the world from their perspective, in order to understand what is important for them. This is the basis for a constructive and respectful dialogue, regardless of the fact that we may have different opinions.

**TODAY, MANY YOUNG PEOPLE** take the chance to discover a little of the world outside of their homeland. One way is to study abroad and Linköping University (LiU) offer a number of international master’s programs. According to a new study, international students relish their time here, and you can read more about it in this issue. Linköping University scored highest when students rated their overall student experience.

These international students contribute to a more vibrant campus and provide an opportunity for Swedish students to sample wares from the four corners of the globe.

Even international researchers choose Sweden and Linköping University. In this issue you will meet the British professor Anthony Turner, one of the world’s leading researchers in biosensors, who is full of praise for his new research hub.

**WE ALSO PROVIDE INSIGHTS** into other highly interesting fields of research bearing an international profile. Linköping University has a strong presence within the field of environmental research, not least in terms of sustainability. Other researchers devote their time to, among other things, the looming antibiotics crisis, or study the conditions of migrant workers.

This edition of LiU Magazine will focus partly on Linköping University’s international milieu. I hope the magazine also helps you to look at the world from a new platform.

Good reading!

Lennart Falklöf, editor-in-chief • lennart.falklof@liu.se
The most satisfied students in the

For the second year in a row, international students at Linköping University have answered the International Student Barometer survey and provided a glowing account of student life at LiU.

Second spot last year and now Linköping University claimed top spot for “Overall student satisfaction” in the International Student Barometer (ISB). The ISB is the world’s largest student survey with over 200,000 students at 208 universities in 16 countries having had their say. A multitude of renowned international universities participated in the survey.

Vice-Chancellor Helen Dannetun comments:

“This is a fantastic tribute and something that everyone involved in education, support and services for our international students should feel involved in and proud of.”

FACING FIERCE INTERNATIONAL competition across the globe, LiU returned six top-3 global positions for the category ‘Learning’ and eight top-5 global positions for the category ‘Living’. Linköping University had the most satisfied students in the entire survey in six categories including: laboratories, eco-friendly attitude, learning spaces, accommodation and as mentioned earlier overall satisfaction.

Once again LiU received top spot for its eco-friendly attitude. Environmental studies, especially in terms of sustainability, has developed into somewhat of a LiU brand. During May 2011, LiU was host to the World Renewable Energy Congress (WREC)

President of International Student Association:

“IT REFLECTS MY POINT OF VIEW”

“I was surprised how well the results reflected my point of view”, says Martina Zanero, President of International Students Association (ISA) at Linköping University.

She is from Italy and is about to finish her first year as a student in the master’s programme in Business Administration. LiU received top spot for learning spaces both in Sweden and globally. Martina Zanero comments:

“I have studied at three other universities and LiU is for sure the best concerning spaces. Lecture rooms are spacious and well equipped, there are sufficient number of rooms and tables for group work, as well as spaces for individual learning either at the library or on one of the comfortable colourful armchairs!”

Martina Zanero is not surprised that LiU also finished first for transport and environmental awareness.

“I believe they are closely related. I almost always travel by bike! Bicycle paths are all around the town and cycling is strongly
In general, Swedish universities scored well in the survey, apart from issues relating to contact with the labour market. LiU also received low grades in this category. Dannetun explains:

“One of our strengths is that our Swedish courses enjoy distinct contact with the labour market. This is also evident in that LiU students acquire jobs faster than students from other universities. Unfortunately, we have not so far managed to replicate this for our international master’s programs. We have improved since last year, but we must improve even more.”

What is the ISB?
The International Student Barometer is the world’s largest student survey. It is conducted by the British organisation The International Graduate Insight Group (i-Graduate) and addresses issues relating to 80 different measures of academic structure, student services and infrastructure.

Read more: www.liu.se/isb2011

encouraged. Buses are also functional, but without a cycling culture I do not think first place would be achieved.”

Still, there are also areas in need of improvement. The ones that Martina Zanero points out are related to opening a bank account and establishing relations with locals.

“Much can be done here, but I appreciate the dedication and willingness of the Vice-Chancellor to listen to student experiences and suggestions and to really act to solve problems. If successful, next year LiU will be even better.”

LIU PROVIDES CAREERS ADVICE

At Linköping University, international students receive help for their continued professional careers in Sweden and abroad.

Over the last year, the university’s career centre has significantly expanded its services for international students. They receive advice and support which will assist them when they begin to hunt for jobs and lots of information is available in English.

“We review a lot of CVs for our master’s students and also arrange individual workshops on how to write a CV,” says Kristin Sjölander, career and academic adviser.

They also arrange popular seminars, where previous students discuss their professional careers. At other seminars students can learn about post-doctoral studies or how to start a company in Sweden, for example.

“We will continue to organise three or four seminars per term,” Sjölander says.

LiU has also chosen to actively support Working for Change, a national campaign and recruitment fair in Stockholm aimed at helping international students and academics to gain a foothold on the Swedish labour market.

At the moment LiU is taking stock of the current workplaces of former international master’s students. The results will be published in a Placement Report online at www.liu.se/alumni?l=en.

Lennart Falklöf
Getting the competitive edge

Students from all over the world come to Linköping University to study a master’s programme. It provides them with knowledge and tools for their future careers. Read more in our special section on master’s studies.

HE STUDIES AMONG A UNITED NATIONS OF STUDENTS

When British student Matthew Burton from Essex, near London, decided to study International and European Relations for his master’s degree, he opted for Linköping University in Sweden. It was even better than he expected.

Being the only student from your country on a course in a foreign university might put some people off, but not Matthew Burton who found himself at the heart of a United Nations on his two-year master’s degree.

The 24-year-old Southampton University philosophy graduate likes adventure – and after a year out working to save for his postgraduate tuition fees, he decided against returning to his family home in Colchester for a master’s at nearby Essex University in favour of venturing further afield.

And he wasn’t disappointed, despite finding himself the only Englishman on the course after being accepted on to the MA at Linköping University.

For what better way to study European relations than share a flat with an Albanian and a German on your first year, and a Swede and an Italian student on the second.

BEING A NATIVE ENGLISH-SPEAKER had its pros and cons, he admits.

“It was an advantage on the course, as I could probably understand what the lecturers were getting at easier and write essays quicker, but because everyone in Sweden speaks such good English – and with English being the common language among all the students – there was no pressure for me to learn Swedish. I did go on a course, but my Swedish is still pretty basic.”

Among the big surprises was discovering that Linköping was as easy to reach as his South coast
Chinese teaching students are learning how to teach geometry outdoors.

Chinese Interest in Outdoor Education

Teaching outside the classroom, amid natural surroundings or in the immediate environment, interests Chinese teaching students and Linköping University (LiU) has established an agreement with two universities in Beijing.

Now a fifth group of Chinese students has arrived at LiU to study for a Master’s in Outdoor Education.

“The first group arrived back in 2006 and discovered the university’s outdoor education course. After a few years the fervent interest from China led to LiU deciding to sign an agreement with the teacher training programmes at Beijing Union University and Capital Normal University in Beijing,” says Eva Kätting, who is in charge of the master’s programme.

“One of the first Chinese exchange students, Shiwei Zou, has become a contact person for LiU. Naturally, this has made collaboration easier.”

Last summer Eva Kätting and a colleague visited Beijing to spread information about LiU’s outdoor education programme. They also demonstrated the teaching practice by giving lessons for Chinese teaching students, who were able to see what it was like to learn geometry outdoors.

“It’s a form of laboratory learning that arouses great enthusiasm. Many students think that it is more fun and also easier to learn subjects like maths outdoors. When teachers expand the classroom and use the surrounding environment and museums, for example, learning becomes more tangible. The knowledge is immediately put into context,” says Kätting.

GUNILLA PRAVITZ

Chinese teaching students are learning how to teach geometry outdoors.

University of Southampton from Essex.

“I live near Stansted Airport, and can fly to Stockholm’s Skavsta Airport for 20 pounds and then take the coach for about an hour-and-a-half. It is actually easier, and costs about the same as getting to Southampton for me.”

So what about the change from his three years studying and partying through his undergraduate days in England?

“It is different and I’m glad I did my undergraduate degree in the UK, but I like the more academically focused environment of the Swedish university and would definitely recommend going abroad for your master’s to other British students.

“It won’t work, if all you want is a MA within a year. But if you want to widen your experience and take some time to absorb other cultures it is the thing to do.”

HE ENJOYS THE HEALTHIER LIFE-STYLE and has lost weight by cycling everywhere, like nearly everyone else on campus.

As for living costs, Matthew reckons the 6,000 pounds he has saved on not paying for his British master’s degree covered his two years in Sweden.

“My rent is a lot less than in Southampton, and food prices are on a par with those in southern England.”

But cost should not be the only motive, he insists:

“From my perspective, I prefer the two-year master’s degree. You’ve got more time to get to grips with the subject.”

SO, IF YOU WANT a good quality master’s degree to set yourself up for a good career in the global economy, or prepare yourself for a PhD, Linköping University in Eastern Sweden could be just the place, he says.

That’s especially if you want to break the nest and make yourself stand out from the crowd in an ever-increasingly difficult job market for graduates.

“I’ve had several interviews already and it certainly gives you plenty to talk about”, says Matthew, who is finishing off his master’s with a thesis of “The role of the European Central Bank in the current Euro crisis” under the supervision of the world-renown German professor Jörg Winterberg.

You can’t get much more European than that!

NIC MITCHELL

European relations in practice.
New students in the master’s programme in Business Administration receive a warm reception. An adventure day in the forest that includes a treasure hunt, rafting and outdoor cooking is one way to bond. The programme also has a system of so-called big brothers and sisters. The adventure day takes place a couple of weeks into the introductory course to academic studies. The format is secret: it’s called a trip into the unknown.

“We knew that we would be in the forest for a day and should wear suitable clothing, that’s it”, says Spanish student Nicoleta Radut one of last year’s participants.

“The aim is to create one class”, says university lecturer Marie Bengtsson, responsible for the introductory course. “Instead of the Chinese just being with other Chinese students and so on, we want to create social ties between students of different nationalities.”

The students are divided into teams consisting of seven students from different countries. On the day, the students meet early in the morning, take a bus to a forest area south of Linköping and the competition begins. First off is the treasure hunt.

Students of more than twenty nationalities bond at a three-course dinner in the light of kerosene lamps.

NEW PROGRAMME IN GENDER STUDIES: “IT IS ALL ABOUT CHANGE”

“Our goal is to educate agents for change.” Nina Lykke is very explicit when she describes the new master’s programme ‘Gender Studies – Intersectionality and Change’ that is to begin at Linköping University during August 2012.

Nina Lykke is Professor of Gender Studies and Head of Unit of Gender Studies at the Department of Thematic Studies. The Unit has been very successful, both in developing theories and methods of feminist or gender studies, and in establishing itself as a dynamic international group of researchers.

Intersectionality is but one of the methodological developments. In their study of power and people, they strive to take more aspects into consideration than just gender to include class, age, ethnicity and sexuality.

The new master’s programme takes intersectionality as its starting point. The goal is to be able to use these insights in real life to bring about change, be it in organisations, media, communication, politics and/or knowledge production. To that end, the students will build their own cases.

“There is a new ambitious generation of young women and men around the world who want to see more social justice, and who no longer accept discrimination and
ADVENTURE DAY

"In order to find the treasure, codes must be cracked. The students are provided with different information and need to cooperate with each other", explains Marie Bengtsson.

The next task is to find their way to a specific place using a GPS. Along the way, the teams pick as many mushrooms and blueberries as they can.

Following an outdoor lunch, the final challenge awaits them. The teams design and build a raft and then paddle across a lake as quickly as possible.

"It is really exciting!", says German student Martin Aschmoneit.

Once all are happily ashore again, a sauna awaits them. The day ends with a three-course dinner in the light of kerosene lamps where each team has a special task.

"After this day, students know that they can trust each other", says programme director Jörgen Ljung. "Last year we had 35 students of 22 nationalities, mostly from big cities, so this was really something special."

The students were enthusiastic.

"The excursion was very well organized. It gave us something to talk about for a long time", says Russian student Olga Shinaeva.

"We had a great day. Time just flew by", says Kamila Grabowska from Poland.

OLGA, KAMILA, NICOLETA AND MARTIN are now preparing new students who have been accepted into the programme. In conjunction with three more students they form a group called SMIO-Big Brothers & Sisters.

"We have a blog, where new students can ask questions, a Facebook group with 150 members and a newsletter", says Nicoleta.

From their own experience they know how helpful it is to be able to turn to someone to answer their questions.

"First you are very excited when you are accepted, but then you realise that you don’t know what to expect. By getting answers to your questions, you feel more confident", explains Martin.

The group of big brothers and sisters also organize a mentorship programme, where new students are assigned current students as mentors.

"We will also arrange activities that will help new students to find their way around and to feel at home at the university", says Olga.

So, new master’s students in business administration can certainly look forward to a warm reception from the current students.

"The students’ work is all very impressive, and it evolves every year. Each group adds something new", concludes Marie Bengtsson.

The students’ work is all very impressive, and it evolves every year. Each group adds something new. "Gender Studies – Intersectionality and Change" is a two-year, full-time study programme ending with a master’s degree (research master). Each year is an independent unit, so it is possible to take only the first year ending with a one-year master’s degree. The teaching will be organized online, with three intensive face-to-face weeks per year on the Linköping campus.

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CHANGE"

oppression", says Nina Lykke.

“For example, we have business administration students among the applicants, who are just fed-up with the old-fashioned patriarchal culture of management which is still to be found around the world.”

The applications to the programme seem to substantiate her claim. Almost 200 expressions of interest have been received from literally all over the world, out of which 25 have been offered a place. Previous studies on gender is one of the prerequisites. However, as Nina

Lykke remarks, there are countries where gender studies simply do not exist. Instead, applicants from these countries have to show that they, for example, have been engaged in NGO work for gender justice.

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ANIKA AGBJÖRÑN
Chariya Virojanadara conducts research on the supermaterial graphene. It is just one atom thick, but has extraordinary electronic properties and many potential applications.

She got her dream job

From the hot, bustling Bangkok streets to student life in Linköping. Chariya Virojanadara came to Linköping University to study a master’s programme. Fourteen years later she is still here, researching graphene.

“I love life in Linköping. Everything is close, everyone is friendly, everything is well-organised and as a sports freak I have every opportunity to quench my sporting thirst.”

Chariya Virojanadara, from Thailand, is employed as a post-doctoral research fellow at LiU and researches graphene. She is one of several students on the master’s programme in Materials Physics and Nanotechnology who has moved on to research.

Virojanadara came into contact with three former students at her university who have earned their International master’s degrees in Linköping. Their experiences of good education combined with good access to laboratories clinched the deal. She was going to LiU!

SO ONE AUGUST DAY a few months later, there she was in Linköping, jet-lagged and slightly lost, but looking around with interest. The contrast to the bustle, the sounds and the smells of the Bangkok streets was striking.

Her first few months in the new country did provide a few culture shocks.
“I love the feeling of being confronted with an experiment and wondering what will happen. That’s absolutely the best thing about this job.”

“It took a bit too much of my time, but it was great fun.”

Taking up hockey is probably quite symptomatic. Chariya Virojanadara is hardly afraid of new challenges. If she is curious about something, she tries it. So it’s no surprise that laboratory work and experiments are her great passion.

“I love the feeling of being confronted with an experiment and wondering what will happen. That’s absolutely the best thing about this job.”

**Once she had completed** her master’s, Virojanadara stayed at LiU for five years of doctoral studies. Following that she worked as a research fellow for a year before she moved to Stuttgart in Germany for further post-doctoral research.

“I developed research on silicon carbide and the different substances that can be grown on its surface.”

However Virojanadara didn’t feel that her time in Linköping was over. She received a scholarship and went back to LiU for two more years of research. She researched how to create graphene, a layer of graphite one atom thick, by growing it on the surface of silicon carbide.

Graphene is a hot research topic; it also won the Nobel Prize in physics in 2010. The “supermaterial” is chemically stable, elastic and extremely strong but above all it has extraordinary electronic properties.

“I am interested both in the properties of graphene made in different ways and in the functionalisation of graphene, i.e. how to change its properties for example by exposing the material to hydrogen or other atoms and molecules,” says Virojanadara.

**Nevertheless her LIU story** wasn’t over yet. Facing stiff competition, she was accepted as a LiU research fellow for four years and will now put together her own research group.

“This is my dream job. I always have a long list of brilliant ideas I want to try,” she laughs.

“At the moment we are testing how lithium, sodium and rubidium interact with graphene. How it grows and how the electrons are affected.”

Last year she married the love of her life and they bought a house in Linköping.

“In ten years I hope that I am still living and working here. A lot depends on the team that you work with, but if things continue to work as well as they currently do then I want to continue on here.”

**Hon fick sitt drömförhoppning**

**Chariya Virojanadara lämnade Thailand för att bli masterstudent vid Linköpings universitet. Fjorton år senare är hon fortfarande kvar och forskar om supermaterialet grafen.**

**She is also enjoying** the great selection of leisure pursuits on offer.

“It’s so easy to get out and do sports! I go to the Campushallen Sports Hall, play tennis and badminton, and go skiing and ice-skating in the winter. During summer I play a lot of golf.”

Virojanadara even played second division hockey in Norrköping for a while.
For two years, the Visualization Center in Norrköping has shown films and real-time applications in its dome theatre. Now the centre and Linköping University want to open up the dome to students with a new course in dome production.

For the first time, the course in dome production will be held this autumn. The idea has been around for a while, and now the right software applications and skills exist. Matthew Cooper, lecturer at Linköping University (LiU) and one of the initiators of the course, tells us:

“Since the opening of the Visualization Center, we’ve been able to gain experience and expertise in creating our own content. Now we want to see what the students can achieve.”

He also points out that there is a need for the course.

“Environments and tools, like domes and multi-projector systems such as those we use, are becoming more and more common. We therefore need to teach more people how to produce content adapted to this unique, stimulating viewing environment.”

The eight-week course will be open to students in the Advance Computer Graphics master’s programme; the Culture, Society, and Media Design programme; and for future civil engineers in Media Technology.

The idea is for the students to form interdisciplinary groups, where each and every one of them can apply the knowledge from their own field. Together, they will create a production adapted to viewing on the dome. “We don’t want them to follow a finished template, but to feel free to create what they want. It will be an opportunity for the students to show off their creativity and skills. Perhaps they’ll be able to develop the production further after their exams,” Cooper says.

Students in the Swedish programmes are already showing interest in the course. Cooper hopes and believes that the course will also attract students to the Advanced Computer Graphics international master’s programme.

“This course illustrates what’s possible and what can be done here at the university, and in these environments. We’ve already produced a lot of our own content, and there’s more to be expected from our students.”

Elin Karlsson
A course in circuit design that is part of a two international master’s programmes is attracting students from around the world to Linköping University (LiU).

“Thanks for offering this course, that’s the main reason I’m here,” says Rengarajan Ragavan, international master’s student at LiU.

Ragavan and Deyan Dimitrov, from India and Bulgaria respectively, are studying the “System-on-Chip” master’s programme. A special course drew them to LiU: the VLSI Chip Design Project.

“Everyone who has the opportunity should really take this course,” Dimitrov says.

In the course, students work in groups to construct an advanced electronic circuit of the type that now sits in many of today’s electronic products. They learn the entire workflow, from idea to finished circuit. VLSI stands for Very Large-Scale Integration; this kind of circuit can contain several million transistors.

Step by step, lab session by lab session, the students go through the various steps and familiarise themselves with the process. The circuit diagram was ready in April and now the layout itself begins.

USING HELP from computer simulations, the circuit must be ready and tested by May, as far as practically possible. If the simulations yield an approved result, the students pass the course and the specifications are sent to a factory in Austria.

The circuits the students develop are actually manufactured which differentiates this course from similar ones at other universities.

“Maybe other universities think it’s too expensive. Every circuit can cost a couple thousand euros,” says Daniel Svärd, who took the course three years ago.

Today he is a doctoral student, supervisor and assistant course leader for the course.

“I have several colleagues taking similar courses in the United States, but this is the real thing and that makes a huge difference,” Ragavan says.

STUDENTS NEED TO BRING necessary theoretical knowledge to construct a VLSI circuit from earlier courses; it’s a question of the process itself. These are professional tools they’re using, the same software for construction and simulation used at IBM, Intel, and other major circuit manufacturers.

Of course, Ragavan and Dimitrov are both looking forward to the autumn, when they’ll be able to hold in their hands the circuit they built themselves and then test how well it works. The autumn term starts with a course in advanced testing and measurement techniques where they’ll get to construct testing equipment to test what their own circuit can do.

“We don’t really know what will happen; electronics is an art work,” Dimitrov says.

ATILA ALVANDPOUR, professor of Electronics Construction at LiU, manages and develops courses that have been around for almost 20 years. He explains:

“The students may not produce the world’s best circuits, but they work and that makes this course unique and they all do a good job. I’ve found my former students in top jobs throughout the entire electronics industry, here in Sweden and around the world,” he states.

MONICA WESTMAN

FOOTNOTE: The VLSI Chip Design project course is given as part of the System-on-Chip and Communication Electronics master’s programmes, as well as part of three civil engineering programmes.
Malaysian student Najihah Musa used a pheromone trap to examine the rare red click beetle for her master’s work.

**SCENT TRAPS CAPTURES RARE BEETLE**

The scent of a female is irresistible for the rare red click beetle males. For Najihah Musa, master’s student in the programme Ecology and the Environment a field experiment with a new type of pheromone trap became a real hit.

Now, Musa is nearing the end of her master’s work, which resulted in a detailed examination of an important indicator species with conservation value that was undertaken in the oak woodland south of Linköping, East Sweden. Musa explains:

“Scent traps have mostly been used to capture insect pests, now that concept was spun on its head. Why not use the same method to attract bugs with conservation value?”

Musa’s work has provided surprising new knowledge. There are far more of the red-listed (endangered species list) red click beetles than previously imagined and they are also found in areas outside those “hot spots” that researchers had previously identified. Najihah Musa elaborates:

“Seldom have red click beetles entered conventional traps. Now we have established a very different picture of their distribution.”

Pheromone traps containing substances specifically relevant to a species were unexpectedly effective, such as communicating the existence of a sexually receptive female beetle.

**LAST SUMMER,** with the help of some biology students, Musa dedicated her time to emptying the traps, colour coding the captured beetles, releasing them and then logging data about the 40x40 km large experimental field.

“I like beetles, but initially, red click beetles reminded me of cockroaches at...”

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**GLOBAL PERSPECTIVES ON ADULT EDUCATION**

Linköping University offers an internet-based master’s degree about adult learning and globalisation in conjunction with three universities in Australia, Canada and South Africa.

Adult Learning and Global Change is a programme that deals with and provides experience of globalisation and learning.

“The programme provides a critical perspective on the consequences of globalisation for adult learning, and the students also gain experience of collaborating and communicating over geographical and cultural boundaries,” says Song Ee Ahn, the programme’s Director of Studies at Linköping University (LiU).

**THE IDEA** for the programme evolved among research colleagues at four universities, all prominent in the field of adult learning: the University of British Columbia in Canada, Monash University in Australia, the University of Western Cape in South Africa and Linköping University. The programme was founded in 2001 and since then interest...
home in Malaysia. It felt a bit creepy," she says, laughing.

In her study area 454 red click beetles were marked and the total number of red click beetles caught during the summer in the whole of Östergötland was approximately 1300. Musa says:

“The oak woodland is incredibly beautiful. I’m really glad to have experienced it,” she says.

Studying in Linköping was a success for Najihah Musa.

“I came here to visit my sister, who is studying an engineering programme at the Institute of Technology at LIU. Once I discovered how committed Swedes were to environmental issues, I immediately decided to pursue a master’s programme at LIU.”

What is different about the studies in your home country of Malaysia compared to your studies in Sweden?

“You build everything on two-way communication. Just listening to your teachers is not enough, you have to be proactive and that’s good, as then it’s easier to remember what you have learned.”

Following graduation Musa plans to return to Malaysia, to work on issues relating to environmental and conservation ecology either at a governmental level or with further research.

“There’s lots to do, especially due to the effects of the huge oil palm plantations, which take over more and more of the landscape.”

Her Swedish master’s thesis will in due course result in a scientific article.

“We’re counting on it. Najihah Musa has conducted great work of high scientific quality, says her supervisor, Professor Per Milberg.

GuNILLA PRAVITZ

GuNILLA PRAVITZ

has grown steadily, as has the number of applicants.

The programme contains six course modules, which each require ten weeks of part-time studies. One module focuses on research methods and is followed by a research project or local optional course. The entire programme is based on texts such as course books and articles that the students read, discuss and then give written comment. There are no video clips or lectures as in the traditional sense. Studies take place both individually and in groups via a learning management system.

“The oak woodland is incredibly beautiful. I’m really glad to have experienced it.”

“After the first term many students find that there is more work involved than they imagined, but that it is also challenging, fun and educational. They are enriched not only with new knowledge, but as people too.”

The Students Come from all over the world and are a heterogeneous group with vastly different professional and educational backgrounds.

“Some do the programme immediately following their bachelor’s degree, while others decide to resume their studies after working for many years. The participants also have diverse professional backgrounds,” says Song Ee Ahn, and mentions a nursing instructor, silversmith, student counsellor and staff trainer as a few examples.

Even though the students never meet face to face during their studies, they make new contacts and remain friends after the programme. They have formed an alumni association — a global community — and set up get-togethers at the universities in Linköping, Cape Town, Vancouver and Melbourne.

BIRGITTA WIEBULL

LIU MAGAZINE nr 2 2012
There has been a significant increase in the number of students accepted to one of Linköping University’s international master’s programmes. 539 students were offered a place compared to 390 this time last year, a 38% increase.

Most international applicants stem from India, Pakistan and Germany followed by Ethiopia and Bangladesh.

The three most popular programmes are Business Administration, Mechanical Engineering and International Relations. Also many qualified applicants sought places in Adult Learning.

A Linköping University research group are now marketing their method for graphene production. There is great interest in the Nobel Prize-winning material, which is suitable for applications such as high frequency electronics.

The quality of graphene manufactured at Linköping is the best in the world, and researchers have been supplying other research teams with material for several years. The demand is now so great that the researchers have formed a company, Graphensic AB.

“As part of our research, we deliver graphene material to several projects, both in Sweden and throughout Europe. This strengthened our belief that a commercial market for our material exist,” says Professor Rositza Yakimova, who leads the research group.

Graphene is composed of a single layer of carbon atoms. Yakimova’s group begins with the semiconductor silicon carbide, which is heated to an extremely high temperature. The group’s success lies in understanding how silicon and carbon act on the surface, and how a heating process that controls this surface can be implemented. The group have applied for a patent for the process.

“We’ve already transferred one manufacturing technology for the material for a white LED, which is being industrialised in Japan, and now we have initiated the industrialisation of the graphene method, says Mikael Suvijärvi at Graphensic AB.

An American climate researcher and a Kenyan coordinator of international exchange within the field of healthcare are two of the honorary doctors conferred at Linköping University this year.

Professor Roger A. Pielke, Jr. is an internationally renowned climate researcher who works at the University of Colorado at Boulder in the US. He broke new ground with his research on how society is affected by extreme weather events such as hurricanes and floods. Pielke was a central collaborative partner when Linköping University established its Centre for Climate Science and Policy Research in 2002.

Simeon Mining is a professor at the Faculty of Health Sciences at Moi University in Eldoret, Kenya. In 1994 he became the coordinator of a faculty exchange with the Faculty of Health Sciences (HU) in Linköping. The exchange with Moi University has meant that a large number of HU students and teachers have gained unique insight and understanding of the healthcare problems typical for developing countries.
Innovative energy storage

A breakthrough for inexpensive electricity from solar cells, and a massive investment in wind power, will mean a need to store energy in an intelligent way. According to research at Linköping University, published in Science, batteries of biological waste products from pulp mills could provide the solution.

“Nature solved the problem long ago,” says Olle Inganäs, Professor of Biomolecular and Organic Electronics at Linköping University and lead author of the article in Science. Inganäs drew inspiration from the process of photosynthesis, where electrons charged by solar energy are transported by quinones; electrochemically active molecules based on benzene rings comprised of six carbon atoms. He chose the raw material brown liquor that is a by-product from the manufacture of paper pulp. The brown liquor is largely composed of lignin, a biological polymer in the plant cell walls.

“Now we need more research into new energy storage based on cheap and renewable raw materials. Lignin constitutes 20-30 percent of the biomass of a tree, so it’s a source that never ends.”

New discoveries about epilepsy

Every thought, every movement, every heartbeat is controlled by lightning-quick electrical impulses in the brain, the muscles, and the heart. However, too much electrical excitability in the cell membranes can cause health problems such as epilepsy and cardiac arrhythmia. Professor Fredrik Elinder leads a Linköping University research group that have published discoveries that can lead to new medicines for these diseases. In April, the study was published in Proceedings of the National Academy of Sciences (PNAS).

Language Café: fun and profitable

The combination of the Swedish fika® and language training has turned out to be a big hit. Every Thursday students congregate at one of the university’s cafés to practice the language of their choice.

“The first time we weren’t sure if anyone would turn up. Around a hundred people came!” Birgitta Lönning (pictured), study adviser for language students, looks somewhat alarmed, yet pleased as well.

No one counted on such overwhelming interest. The coffee nearly ran out, and the seating was at a premium.

“Everyone thinks the language café is a great idea. Language students are able to meet one another, or even native speakers. It’s particularly good for our international students studying Swedish,” Lönning says.

Maziar Yazdan Panah, from Iran, is one of the students attending the Language Café meetings. Enrolled in the Language and Culture master’s programme he also studies Swedish, which is why he joined the table adorned with a Swedish flag.

“I was here before; met people from other countries and was able to practice my language skills,” he says in almost perfect Swedish.

At the same time is Justina Mickonyte, from Lithuania who studies computer sciences and Swedish. Mickonyte brought her Swedish lab partner along, who is helping her with a number of language tasks.

“My Swedish still isn’t very good, but I can practice speaking it with lots of people here at the café,” she says.

THE GERMAN FLAG is atop the adjacent table. Over a cup of coffee Sonja Müller is conversing in German with other students. She comes from Germany and likes the idea of a language café.

“A fantastic initiative. You get a chance to speak with people you otherwise wouldn’t meet.”

Across from her sits Anders Peterson from Sweden. During the evenings he studies German.

“Meeting native German speakers is invaluable. It’s a mutual exchange and we learn more about one another’s countries,” he says.

Up until now, students studying English, Spanish, German, French, and Swedish have attended the Language Café meetings, however other languages taught at LiU are also welcome, Lönning points out.

“This autumn, we hope to have Japanese and Chinese tables. Then it’ll just be ‘grab a flag’, sit down and start talking.”

EVA BERGSTEDT

* The Swedish concept of fika is a social institution and means to meet up with colleagues, friends or family for a coffee break. Pastries, buns and cakes are often close at hand.
Biogas fuels further expansion

In Linköping the city buses and taxis are fuelled by biogas and the number of privately owned cars fuelled by biogas is growing fast. Linköping University (LiU) is now marshalling its forces in biogas research.

Linköping invests heavily in biogas. Waste from treatment plants, offal, bootleg alcohol, and damaged or old food products now end up in the municipal retting plant. Previously handling the refuse was a problem whereas now valuable raw materials are used for fuel production.

Tekniska Verken is a municipal company, which aims to create an efficient sustainable community. From 2005 to 2010, Tekniska Verken doubled biogas production, from 5 million cubic metres to almost 11 million cubic metres.

“By 2015 we will double our output again to reach 22 million cubic metres,” says Gösta Gustavsson, former municipal commissioner of the Linköping Municipality and today the Chairman of the Tekniska Verken Board.

The initiative was developed in close collaboration between the municipality, the municipal companies and researchers at LiU. It has helped to tackle environmental problems like poor air quality caused by diesel-powered buses and the management of wastewater and offal from a large city slaughterhouse.

During the mid 1990s, the municipality decided to organise a trial with four city buses fuelled by biogas. They also decided to start producing biogas, initially on a trial basis and from 1997 on an increasingly larger scale. This has given Linköping a significant head start in the race to reduce the use of fossil-based vehicle fuels.

The researchers at Linköping University were involved in the process from the early stages, primarily researchers at the Department of Thematic Studies: Water and Environmental Studies (WES).

“At the time, the head of development at Tekniska Verken contacted Jörgen Ejlersson, who currently works for Scandinavian Biogas and is an adjunct professor at Linköping University, and via a few simple measures he doubled the gas yield. Then he doubled it again,” says Bo Svensson, professor at Water and Environmental Studies.

“We knew that the methane-producing microorganisms need access to metals like nickel and cobalt to work well, but Jörgen showed how well this could work in practice,” Svensson says.

At WES, research has continued in several areas, including how different trace elements such as metals like nickel, cobalt or molybdenum affect the process.

In a recently published doctoral thesis, Jenny Gustafsson showed that the microorganisms absorb nickel even though it can be quite tightly bound to sulphides in the reactor.

“Jenny’s thesis is one of the most important in the field at the moment, and it provides new knowledge on how...”

In green bags households are collecting food waste that is then used as raw material for biogas production. The project started in April 2012.
metals should be metered so as to minimise the effect that production has on the environment,” Svensson says.

He is also involved in work focused on examining the organic material in the runoff water from paper mills. If this material can be used for biogas production, and there is a lot to suggest that it can, then this will be a major boost to the amount of raw materials available for biogas production. The increase would be of the same size as the material from water treatment plants provide today.

“Another advantage is that many of the mills are located in the northern part of the country, where there is limited access to other kinds of raw material”, Svensson says.

There are research groups working on biogas at other departments and institutions at LiU. These include the Division of Energy Systems, Environmental Technology and Management, Biochemistry, Biology, Physics and Chemistry of Surfaces, and the Department of Thematic Studies: Technology and Social Change.

In recent years, biogas research at LiU resulted in two doctoral theses, several reports, a large number of scientific articles and almost forty degree projects.

“But perhaps our greatest contribution is that we have trained many people in the field,” Svensson says.

Now a marshalling of resources is underway in this area. A proposal to invest in a Biogas Centre at Linköping University is being evaluated by the Swedish Energy Agency. The plan is that, during a ten-year period, LiU, industry, municipalities and the Swedish Energy Agency will contribute a total of SEK 210 million.

In Linköping the city buses and taxis are fuelled by biogas.

LiU Sustainable

Environmental and sustainability research at Linköping University has been earmarked for more resources and a higher profile in an area of excellence.

By bringing together LiU’s expertise and building further on well-established interdisciplinary work method, scientific breakthroughs will result that will make an impression in the academic field and in society as a whole. The hope is that the work will make a difference.

Closer collaboration between researchers is expected to result in a number of advantages, such as better potential to apply for major, long-term research funding, provide a clear scientific platform and facilitate recruitment of both researchers and students.

“LiU is currently ranked fifth best environmental university in the world. We want to build on that success by developing and demonstrating our wares. Top scientists and students interested in sustainability should see us as a natural choice,” says Anders Carlsson, Research communicator at the Department of Environmental Technology and Management.
Antibiotic crisis a global threat

The bacteria in a hospital in Vietnam are, broadly, the same as those in Scandinavia. However while the Nordic doctors can still combat most infections, their Vietnamese colleagues are fighting an uneven battle against outbreaks that hardly any antibiotics can handle.

Antibiotic resistance is one of the major threats to future health unless new efficient medicines are developed. When one antibiotic preparation after another stops working, global healthcare risks being rocked to its foundations.

“Bacteria know no borders, and we Scandinavians take resistant clones with us from our holidays outside northern Europe,” says Håkan Hanberger, chief physician and professor of Infectious Medicine at Linköping University (LiU) who has worked for many years as an expert on antibiotics issues.

However, checking holiday trips or monitoring immigration from other continents will not curb transmissibility. Furthermore, many countries in Europe, such as Greece and Malta, retain highly resistant bacteria. Instead, countries like Sweden must screen patients from countries and environments with high resistant bacteria in order to avoid spreading “superbacteria” into Swedish healthcare.

The major ECCMID 2012 Congress in London in early April addressed the non-
An overcrowded hospital in Vietnam, where antibiotics resistance is a large and rapidly growing problem.

Yet: the main issue that we can address is to reduce the unnecessary prescription of antibiotics” says Håkan Hanberger.

**ANTIBIOTICS RESISTANCE** originates through mutations in the bacteria’s genetic material, which benefits from high exposure to necessary and unnecessary treatment. The growth curve is steepest in countries that have made a swift transition from poverty to relative prosperity.

“In these kind of countries people can generally afford medicines. According to a study by KI researcher Mattias Larsson and his colleagues in Vietnam, two thirds of the children in some farming villages had received a course of antibiotics in the space of a single month, most of them for light colds caused by viruses.”

Often they have not even received a prescription from a doctor but purchased the medicine over the pharmacy counter. Subsequently, when the children get a serious infection the usual medicines are ineffective, and the necessary supplementary antibiotics are so expensive that only the wealthy can afford them.

Compared to Vietnam the situation in the Nordic countries is almost idyllic. The Nordic region has the lowest occurrence of antibiotics resistance in the world, with efficient work methods aimed at improving hospital hygiene and constraints on over-prescription in outpatient care.

“What we can learn from the Vietnamese is how to fight outbreaks of resistant bacteria using simple means. Our own methods don’t help to combat imports from abroad,” says Hanberger.

**HIS VISION OF THE FUTURE** hovers between confidence and anxiety. The work in Vietnam shows increased awareness of the problem and that the authorities are extremely anxious to take forceful action, although this is countered by commercial forces, poor healthcare hygiene and lacking primary care.

“Most worrying is the future prospects for advanced surgery. An increase in resistant bacteria strains renders it more difficult to treat infections associated with implants such as artificial hips, artificial heart valves, venous catheters and cerebral shunts,” Hanberger concludes.

European perspective quite weakly. As a contrast, Håkan Hanberger and his research colleagues at Karolinska Institute (KI) and Oxford University Hanoi reported the results of the project in Vietnam, which included an intensive care study at a number of hospitals, where all the bacteria groups researched were highly resistant to five of the six available antibiotics.

In conjunction with the Oxford researchers, doctors from the Vietnamese Association for Infectious Diseases and 16 hospitals, a new project is planned that will focus on increasing the precision of resistant bacteria diagnosis and the use of antibiotics, an evidence-based “Antibiotic Stewardship Programme”.

At next year’s ECCMID in Berlin, Hanberger is hoping to arrange a symposium focused on “antibiotic stewardship” in developing countries in Latin America, Africa and Asia. The World Health Organisation, WHO, has also highlighted the issue, and universities like Karolinska Institute and Oxford have created departments for global medical research.

**SO FAR INTEREST** has focused on issues regarding hospital hygiene and the overprescription of antibiotics. For the Berlin meeting, an agenda item is also planned that will address the role that livestock and foodstuffs play in spreading resistant bacteria.

“We know that many resistant bacteria exist in imported chicken meat. Now we are investigating how risky imported raw vegetables are,” says Håkan Hanberger.

He believes that the value of resistance-free foodstuffs is very much a political issue. It is possible that in the future it will be necessary to put a price tag on imports. However travelling must also be identified as a risk factor, where it is up to the individual to take the necessary precautions in case of a hospital visit in Thailand, for example. It is important to avoid “health tourism”, for example cosmetic surgery in high-resistance countries like India.

The World Health Organisation, WHO, has also highlighted the issue, and universities like Karolinska Institute and Oxford have created departments for global medical research.

Antibiotikakrisen globalt hot

När antibiotikapreparaten upphör att fungera riskerar den globala sjukvården att komma i gungning. Linköpings professorn Håkan Hanberger har bland annat studerat utvecklingen i Vietnam.
Outside the safety net

A growing number of workers are subject to precarious conditions. Researchers at Linköping University are studying their situation.

They are the backbone of globalised capitalism; the flexible, nameless, underpaid, precarious workforce travelling the world and making sure that the machinery keeps going.

They are the migrant precariat, needed, but not recognized, poorly known and poorly studied. At REMESO several research projects and a larger planned programme aim at changing this. REMESO is the Institute for Research on Migration, Ethnicity and Society, at Linköping University.

Berry pickers are but one example. Each season they arrive in Sweden from Southeast Asia or from Eastern Europe to pick wild berries. They are hired by private employment agencies, and then subcontracted to the berry companies, often taking loans to finance the trip.

They are required to pick up to 90 kilos of berries each day, which presupposes a very good supply of berries. If unsuccessful, which has occurred during several seasons, their earnings will be zero and they remain in debt.

A growing number of workers are subject to precarious conditions. Many of them migrate within their home countries, as millions of workers within China.

But they also cross borders. Many of their jobs are cleaning homes and taking care of children and elderly across Europe and in the Gulf States, harvesting strawberries and grapes in the Mediterranean, and working in the building industry.

They work in high-income countries, either as irregular immigrants or as part of various forms of guest worker contracts. They are often exposed to conditions marked by high risk, abuse by employers, and a lack of social and labour rights, says professor Carl-Ulrik Schierup, Director of REMESO. Schierup explains:

“They are regarded as a workforce, but seldom as human beings with social needs and rights. Often they lack access to health care and schools, voting rights, and their freedom of speech and to organise are curtailed. Or, even if they retain formal rights, discrimination may inhibit them from exercising these rights.”

These problems are also evident in the new Swedish law on immigration, that came into force in 2008, although it is perhaps the world’s most liberal guest workers’ system.

“The relation between employer and employee is asymmetric”, Schierup says. “The guest worker is bound to the employer for two years, yet the employer can dismiss the worker at any given time. The worker then has three months to find a new job. If not, they are forced to leave the country.”

The law has been criticised for giving employers the exclusive power over labour immigration and for a lack of control. Earlier, trade unions and labour market authorities had a decisive say regarding work permits in Sweden. Now, employers decide.

The new de-regulated and transnationalised labour market is characterized by informalisation, temporary contracts, offshoring, outsourcing, sub-contracting, sweatshop production and home-working. The result is a growing precarious workforce that is “hireable on demand, available on call, exploitable at will, and fireable at whim”, to quote Alex Foti, an Italian citizen and human rights activist.

The UN system as well as nation states, have proven themselves quite powerless when defending workers’ rights, says REMESO researcher Branka Likic-Brboric:

“With the establishment of the World Trade Organisation (WTO) the issue of workers’ rights was de-linked from trade negotiations. And while powerful sanctions were tied to the international trade regime, the protection of decent working conditions is still a question of voluntariness.”

Despite a cluster of conventions and declarations on the rights of migrants and workers, not much has happened in practice.

However these developments do not go uncontested, counter-forces exist. One is
the revival of the International Labour Organisation (ILO) whose initiative “Decent work agenda” has helped spur a new wave of popular organising across the globe. Some hope is invested in both the corporations themselves and Corporate Social Responsibility (CSR) yet more is expected from civil society and a growing movement of organisations.

Many of them gather at PGAs, in this case, Peoples’ Global Action for Migration, Development and Human Rights, organising global meetings linked to the UN high-level dialogue “Global Forum on Migration and Development”. Sweden will host the 2014 meeting.

REMESED WILL HOST an international conference on the same theme during May 2012, “Labour Rights as Human Rights?”, which is co-sponsored by, among others, UNESCO -MOST. It will be attended by some of the foremost researchers on these issues, such as Sassia Saksen and Walden Bello.

Utanför skyddsnäten
Många gästarbetare lever under svåra förhållanden, dåligt betalda och utanför de vanliga skyddsnäten. De är en ofta bortglömd grupp, som flyttar både inom och mellan länder. Forskare vid Linköpings universitet genomför nu flera studier som sätter ljuset på deras villkor.
Fellow minds made him relocate

One of the early British pioneers in using biosensors to treat people suffering from diabetes has moved to Sweden to continue his dream of commercialising academic research to benefit society. Here, we meet Professor Anthony Turner, who now heads Linköping University’s Biosensors and Bioelectronics Centre.

It was no sudden move for Professor Anthony Turner to ’up sticks’ from England and move ‘lock, stock and barrel’ to Sweden after spending a lifetime seeking practical applications for his research at the leading edge of biosensors and bioelectronics.

The distinguished Professor of Biotechnology at one of the United Kingdom’s (UK) leading research institutions – Cranfield University – had visited Linköping a number of times to work with scientists and other researchers, including the University’s world-renown Professor of Physics, Ingemar Lundström.

So, when Professor Turner retired from his full-time role as Principal of Cranfield University at Silsoe shortly after his 60th birthday, he and his wife, Dr Alice Tang-Turner, opted to leave England and join an academic community some hundreds of miles away in which he felt thoroughly at home.

“It probably helped that my wife also loves Sweden, but I really like the environment and people here. I’m a great believer in the multi-disciplinary approach to teaching and research – and that’s a great strength of Linköping University. And, being able to work alongside the great Ingemar Lundström, who has done so much to encourage an entrepreneurial approach to academic research and ensure that it benefits the wider society, meant there was no holding me back when I decided to relocate here to carry on my work.”

Professor Turner, or Tony as he prefers to be called, retains a part-time role as Director of Cranfield Ventures Ltd, which oversees exploitation of Cranfield University’s intellectual property, via spin-outs and licensing. But his heart is now very much set in Sweden’s South East, building on Linköping’s strengths in science and technology as head of the recently created Centre for Biosensors and Bioelectronics.

It is a field he has devoted half his life to studying since winning a senior fellowship from Diabetes UK in 1982. Working alongside colleagues at Oxford and Cranfield universities, he developed the world’s most successful type of biosensor – the mediated amperometric glucose sensor for home use. The device has radically improved the quality of life of people with diabetes and convinced Tony of the need to work across different academic disciplines to advance science for the public good.

“That’s what attracted me at first to the university here at Linköping. I met fellow minds at an early stage in my academic career, and for three generations now this university has been instrumental in ensuring that everyone realises the benefit of collaboration rather than sticking your arms around your own little group and trying to keep everything secret. That frame of mind is still sadly prevalent in some of the big old traditional universities, but it is not for me, or the people I have come to work closely with at this university.”

“I think the fact that Linköping is a relatively new university meant it had to be adaptive, had to be ‘fleece of foot’, and has had to be a bit cleverer than relying on 500 years of history for its reputation. It’s what I liked about the place when I first came here nearly 20 years ago, and why I’ve decided to relocate here.”

LIKE A RELAY-RACE RUNNER, Tony feels it is his mission to keep the ‘spirit of collaboration’ alive and build on Linköping’s excellent track record in transferring the University’s wealth of knowledge to benefit society at large!

He would love to see more British postgraduate students and researchers follow in his footsteps, saying: “I’m sure they will be impressed. I’ll never forget one of my first visits. I’d come for a professorial committee and was met not by a member of faculty, but by the President of Linköping’s Students’ Union. You wouldn’t find that back in the UK, and I was all the more amazed when he joined us on the interview panel and asked contenders for the post what they would do to help their postgraduate students.”

“So, yes Sweden is another world when it comes to universities like this one, but it is all the better for that”, says Professor Turner, who points to the more relaxed, safe and caring environment, the well-equipped laboratories and the flat management structure as some of the key reasons behind Linköping’s high level of student satisfaction and its reputation as a good place to work.
Linköping & Vienna:

**DOUBLE DEGREE IN MEDICAL BIOSCIENCES**

Medical biologists now have the opportunity to earn a double master’s degree by studying for one year at Linköping and one year in Vienna, Austria.

The Medical Biosciences master’s programme at Linköping University and the Tissue Engineering and Regenerative Medicine (TERM) master’s programme at UAS Technikum Wien have inaugurated collaboration. Lena Thunell, academic coordinator of the programme in Linköping explains:

“We’ve chosen to collaborate with a programme that differs somewhat from our own. While our master’s programme is focused on continued activities within research, the students in Vienna venture into industry.”

The students study at their home university for the first year. Linköping students then choose freely among different courses in biomedicine and, in addition, undertake a smaller project. During their year in Vienna, courses on offer include; management skills, biomedicine, and specific TERM-related courses, as well as methods of scientific research.

**THE AUSTRIAN STUDENTS** only attend courses during their initial year and then undertake a more substantial project at Linköping University.

“They’ve shown great interest in contacting those research groups in Linköping working with tissue engineering. It’s a field that has continued to develop here,” Thunell says.

This autumn, the first Linköping student will move to Vienna for one year. At the same time, four students will move from Vienna to Linköping. Thunell elaborates: “Next year we anticipate that four students from both universities will relocate.”

**TEACHING INTERNSHIPS ABROAD**

Future teachers Jaclyn Spraetz, USA, and Natalie Sezgin, Sweden, chose to plan parts of their school internships abroad. Jaclyn came to Sweden, and Natalie went to the United States. As an added bonus, they received lessons about life and school.

“My time in Sweden gave me the opportunity to reflect on how I teach and how to educate in a way that enables students to understand and take in information,” Spraetz says.

Spraetz has nearly finished her studies to become a high school teacher at a university in Lexington, Kentucky and has had a twelve-week internship at a secondary school and upper-secondary school in Linköping.

In parallel with her being in Sweden, Natalie Sezgin who is studying at Linköping University (LiU) to become a high school teacher has spent five weeks at a high school in Kentucky. This is the first time LiU has offered this form of student teacher exchange.

“I wanted to go to the USA, and I also wanted to develop my teaching skills, so I killed two birds with one stone,” Sezgin says with a laugh.

**DURING HER STUDIES,** she also had shorter internships in Sweden, however she believes the internship in the States provided her with something out of the ordinary. Sezgin explains:

“Apart from practice in educating, we get insight into another school system, see how our colleagues and students interact with each other in a different country and we learn to deal with unfamiliar situations.” Spraetz confirms this and says:
LiU engineers can also get a double degree

COLLABORATION WITH CHINA AND FRANCE

As a result of a partnership with one of China’s top institutions of learning, Linköping University’s students in computer technology and IT can now take a Chinese master’s degree. A double-degree agreement has also been established with a French university.

This autumn the first four LiU students will commence their studies aiming to acquire a Chinese master’s degree as well as a Swedish civil engineering degree. They each have three years of studies behind them on the civil engineering programmes in computer technology or information technology.

The Chinese master’s degree is focused on software development. During the first term the students will attend courses and complete a major project in Linköping.

Then, during spring, they will set off for the Harbin Institute of Technology in northeastern China, where they will study software development with Chinese students and international students from Harbin’s other exchange programmes. All of the courses are in English.

The following autumn they will return to Linköping and study with Chinese students who are also participating in the programme. During the final term they will work on a degree project in Sweden or China.

“We are very happy to have this opportunity to work with Harbin, which is one of nine Chinese higher education institutions selected for development to an international, world-class standard. We have had teachers who have worked there before,” says Programme coordinator Jonas Detterfelt.

A double-degree agreement is also in place with Université de Technologie de Compiègne, UTC, in France. This enables LiU’s computer and IT technologists to obtain a French master’s or engineering degree.

The Master’s degree is oriented towards built-in systems in vehicles and includes at least one term at UTC and a degree project supervised by UTC and LiU.

A French engineering degree, which is a door opener for a career in French technology companies, requires at least three terms at UTC with specific in-depth subjects and a degree project supervised by both universities.

“The teaching is in French and the language skills required are quite advanced. As a result we currently haven’t filled the two available places. However, two French students in Linköping are studying under the collaboration framework,” Detterfelt says.

In the near future, more Linköping students will be able to take double degrees. Discussions are under way with INP in Grenoble about agreements that target students on the civil engineering programmes in Industrial Economics, Applied Physics & Electrical Engineering and Mechanical Engineering.

Lennart Falklöf

LiU engineers can also get a double degree through collaboration with China and France. As a result of a partnership with one of China’s top institutions of learning, Linköping University’s students in computer technology and IT can now take a Chinese master’s degree. A double-degree agreement has also been established with a French university.

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Lennart Falklöf

“ar Härne Institute of Technology is in northeastern China.

Jaclyn Spraetz and Natalie Sezgin are happy with their internships abroad.
ALUMNI BECAME PIZZA MILLIONARIES

German fast food chain Delivery Hero recently acquired the Swedish company Onlinepizza, which was founded by three LiU students.

Why can’t you order pizza online? That’s what a trio of friends, Per Anders Bjelkestål, Erik Mellström Byrenius and Dan Castillo wanted to know. They found the Internet lacking in this area so they promptly started Onlinepizza while students at Linköping University (LiU). Initially a hobby project, it soon turned profitable. Seven years later, the three students sold the company to a German fast food chain for SEK 250 million.

Online-pizza is now a subsidiary of the German fast food giant, and the three founders continue to work for the company. Apart from Sweden, Onlinepizza is now present in Poland, Finland and Austria.

STATISTICS IN YOUR SMART PHONE

The tiny spin-off company NComVA has hit the ground running by producing a visualisation tool that brings statistical data to life. Now they can also deliver a world of statistics to your iPad, iPhone or Android phone.

Three LiU alumni and an adjunct professor founded the company. In a short space of time they landed large and important clients, both internationally and in Sweden. Their biggest catch to date is the OECD (Organisation for Economic Cooperation and Development), which has an extensive statistic database regarding the activities of member states. This is now displayed using the Norrköping company’s products on the organisation’s website, in reports and at conferences.

Other clients include Statistics Sweden (SCB) and their counterparts in Denmark, Finland, Estonia and Italy.

NComVA received positive feedback on their system for displaying statistics on smart phones. Read more and see demonstrations at NComVA’s website www.ncomva.com.

Want to know more about LiU Alumni?

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Alumni world

ABDUL LATTIF ADAM works as Assistant Operations Manager at Port Futures Ghana Ltd in Ghana. He studied a master’s programme in International and European Relations and graduated in 2008.

NICLAS BRÄNNBERG works as CAE Manager at Chery Quantum Auto Co Ltd in Shanghai, China. He earned an MSc degree in Mechanical Engineering in 1988.


RAKIBUL ISLAM works as Executive at Square Pharmaceuticals Ltd in Bangladesh. He gained an MSc in Medical Biology in 2011.

SYLVIA KARLSSON-VINKHYZEN is Assistant Professor at Wageningen University in Netherlands. She wrote her thesis on environmental concern in a globalised world, and received a doctoral degree in 2000.

JOHAN RHODIN works as Kernel Developer at Wolfram Research in Champaign, USA. He gained his MSc in Applied Physics and Electrical Engineering in 2011.

KRISTOFFER ROBERG works as Product Plan Engineer at Metanoia Communications in Hsinchu, Taiwan. He gained his MSc in Applied Physics and Electrical Engineering in 2010.

PER TRULSSON works as Senior Adviser at African Development Bank in Tunis, Tunisia. He wrote his thesis on strategies of entrepreneurship in Tanzania, and received a doctoral degree in 1997.

EBBA ULFSPARRE works as Regional Product manager for Asia at Atlas Copco Trading Co Ltd in Shanghai, China. She earned an MSc in Industrial Engineering and Management (International) in 2007.
LiU’s cable guys made the headlines

Three Master’s students from India, Dilip Vajravelu, Bibin Babu and Kiran Kariyannavar have made the headlines. This is all thanks to their thesis, which immediately landed them jobs at Ericsson in Kista.

“I shook hands with the Ericsson CEO. I also had a chance to employ him as a human cable. The greatest thing that could happen to anybody, straight from school!,” says Vajravelu.

At the big consumer fair in Las Vegas last winter and at the mobile world’s big get-together in Barcelona this spring, Ericsson’s CEO Hans Vestberg acted as a human cable for clients and the media. A picture was transferred from the phone he held in his left hand to a computer he was touching with his right. The reaction was positive, to say the least.

“We are really happy about the overwhelming response from Ericsson’s customers. It was like a dream,” says Babu.

IN THEIR THESES the three Indian students at Linköping University developed the super-sensitive receiver that caused all the fuss. The idea originally came from Jan Hedérén, strategist at Ericsson Radio, who contacted J. Jacob Wikner, university lecturer at the Division of Electronics Systems at Linköping University. He, in turn, farmed out the assignment as a thesis for students of the System-on-Chip master’s programme.

“The three of us specialize in different fields and this project needed the right composition of skill sets,” says Vajravelu.

They managed to solve the task so well that Ericsson immediately hired all three, and they couldn’t be happier.

“There is a good culture of innovation and fun with work,” Kariyannavar says. “I need to get good experience in the System-on-Chip design.”

Babu agrees with him, while Vajravelu has a slightly different focus:

“I still have a lot to learn. Currently, my focus is to gain more work experience by taking part in large projects.”

SO THE HUMAN CABLE...? Well, a research project at Linköping University headed by Wikner is now developing it even further. The objective is that within a few years it will be possible to transmit a small film through the body, at a speed of 10Mbit/s.

That is the necessary speed to be able to unlock a car when taking hold of the handle, transfer a business card from your telephone to the person you are shaking hands with, or transfer a code when making a payment via the Internet.

The technical principles were already known. This is the same phenomenon used for EEG in the healthcare sector, the difference being that it is only used to measure and receive information. For this scenario it will be used as two-way communication.

However the signals that are to be sent through the human body are very weak. It’s an issue of a solitary volt from the transmitter and the signal drops significantly on its way from the palm of one hand to another.

“If a couple of volts are sent, only a microvolt is involved at the other end. Nor is a current sent through the body, it only affects the electrical field and redistributes the charge,” Wikner says.

So this is a extremely sensitive receiver we are talking about. The project also includes finding out whether this could be harmful in any way.

“We’re relatively sure that it’s not harmful; the fields involved are very weak. However part of the project involves studying the safety aspect even more closely,” says Wikner.

MONICA WESTMAN
Aiming for the top

After 14 years in Japan, LiU alumnus Magnus Nervé is aiming to establish a subsidiary of the Swedish company Haglöfs in Asia’s leading outdoor market. His background includes a passion for mountaineering.

Magnus Nervé has scaled many of the world’s highest peaks. They taught him how important it is to prepare properly and, when the climbing gets intense, to remain calm. In short: to run through the available options and analyse realistic alternatives, for example, the option of turning back.

“I have learned that the mountain will still be there,” he says.

However, he isn’t the kind of guy to shirk a challenge.

In autumn 1993, Nervé was one of the first eleven students to attend the new Japanese syllabus at the civil engineering programme in Industrial Economics, without knowing very much about Japan or the Japanese language.

“The teaching was good, but it was difficult for us to adapt to something as new and different as the Japanese culture,” he says. Nervé adds that the current Swedish ambassador in Japan, Lars Vargö, was one of the popular principal lecturers during the course; he had a lot to teach them about Japanese history and politics.

Nervé has lived in Japan for the last 14 years. He has a family there; a house an hour south of Tokyo, and a new job for the Swedish firm Haglöfs. He was recently offered the task of building a subsidiary in Japan, which is the leading outdoor market in Asia.

“The majority of the Haglöfs range has been available here for a long time, so we have a strong position to start from. In a way Japan is like Norway. 80 percent of the country is restful, dramatic wilderness, and Japanese customers are very knowledgeable and quality-conscious.”

Now Nervé is going to introduce the entire range to several of the leading outdoor chains and also open the company’s own brand stores. Included in his plans are six new shops, events for new collections and sponsoring climbers and professional guides.

“I have reached the point in my career where I want to have a job that I really enjoy and think is fun,” he says.

HIS CAREER WAS FLYING before he even graduated.

As the Japanese syllabus at Linköping University’s Institute of Technology (LITH) was so new, there was a shortage of internships in Japan when the autumn term of the third year was approaching.

“I managed to arrange a place for myself at ABB in Japan, yet only for six months. This left a six-month gap until the fourth year started at LITH.”

Nervé took the opportunity to go to the US and the University of Miami for a term, which turned into a year. It was an intense twelve months and he took courses that suited his Swedish civil engineering degree while simultaneously studying for a Master’s of Business Administration (MBA). He also met a Japanese student who would become his wife.

Nervé never came back to Sweden, apart from short visits.

Tokyo was waiting and a job at Ericsson.

“I was allowed to write my thesis within the framework of the job, and that was great. It was about the emerging mobile telecom markets in Japan and the West,” he says.

In 2000 Ny Teknik magazine in Sweden wrote about “young Swedes” who were invol-
Magnus Nervé has climbed all the highest mountains in South America, Africa and Europe.

In kick-starting the mobile Internet revolution in Japan, where the technology was in the vanguard of technical development.

Nervé was one of the people interviewed in the article. At the time he worked for the Japanese firm Cybird, which creates custom mobile services; the work included consultancy in the Middle East.

“The company was founded by the Japanese equivalent of the Swede Jonas Birgersson”, says Nervé with a chuckle. “The IT bubble burst in Japan too.”

HIS CAREER has constantly taken new directions, with no shortage of job offers. He had brief stints at Reebok and Bodyshop (in Singapore), prior to that IKEA contacted him to establish a presence in Japan.

Nervé became part of a team of ten that launched the venture in 2003.

“I took on lots of different roles, ranging from assuming responsibility for IT and administrative routines to bank contacts regarding loans and even buying the staff coffee machines,” he says.

He became project manager for the launch of two IKEA stores (now five) and when he left IKEA, after a six-year stint, the total number of employees had increased to 2,500.

The project involved a lot of work and a lot of overtime. In between projects he could take time off; that’s where mountaineering enters the frame.

“I started off by going on simple hikes. The Japanese scenery is amazing, so my hikes became longer and higher.”

His biggest challenge to date is Cho Oyu in Nepal, the world’s sixth-highest peak at 8,201 metres.

“When you’re in a snowstorm at seven thousand metres you can’t get too agitated and only see the problems. You need to stay calm without slowing down.”

It’s great leadership training, and Nervé has held training courses on this theme.

The highest mountains in South America, Africa and Europe have all been ticked off his list.

“For me it’s not about reaching the top at any cost. My goal is to learn to survive.”

Magnus Nervé has climbed all the highest mountains in South America, Africa and Europe. Siktar mot toppen

Efter 14 år i Japan ska nu LIU-alumnen Magnus Nervé etablera svenska Haglöfs på Asiens ledande outdoor-marknad. Han har själv ett starkt intresse för bergsklättring.

<table>
<thead>
<tr>
<th>Name</th>
<th>Magnus Nervé</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Master of Science in Industrial Economics International, first cohort, 1993 MBA, University of Miami</td>
</tr>
<tr>
<td>Lives</td>
<td>South of Tokyo with his wife and two girls aged five and nine.</td>
</tr>
<tr>
<td>Work</td>
<td>Country Manager for Haglöfs in Japan</td>
</tr>
<tr>
<td>Leisure interests</td>
<td>Mountaineering. Keeps exciting aquarium fish like lionfish, Moray eels and sharks.</td>
</tr>
<tr>
<td>Fond memory of LIU</td>
<td>Studying for exams with friends, especially Japanese exams. There are five of us who remain friends.</td>
</tr>
<tr>
<td>Typically Japanese</td>
<td>People stay calm and stick together. For example, following the huge earthquake in 2011, electricity never needed to be rationed. Every company and individual took their responsibility and turned off their appliances.</td>
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</tbody>
</table>
EXHIBITIONS

Restaurant and Café

Science Center

Knowledge Center Shop

Guided Tours

Swedish Air Force Museum

Entrance fee for students: 40 SEK

flygvapenmuseum

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