Waste: The dark side of consumption
Moderation: Maximilian G. Burkhart und Nicola Holzapfel

How can we cope with our waste? Historian Christof Mauch and jurist Jens Kersten discuss recycling and rhetoric, the limited reach of legal measures, and the role of civil society in waste reduction and reuse. For the complete article, see www.en.lmu.de/news/insightlmu/2013/04_01.pdf

At the museum, looking at atoms
by Kerstin Maierhöfer

To visit Christine Wamsley at work, take the route past the Viking ships, the aero­planes and the huge turbines. Christine is a Euro­scholar, and is spending a semester with a research team at the end of a long, brightly lit corridor – in the Open Research Lab at the Deutsches Museum. continued on page 2

Confronting theory with practice
by Clemens Grosse

The international doctoral program on Evidence-Based Economics (EBE), which has been set up at the Munich Graduate School of Economics with support from the Elite Network of Bavaria seeks to reconcile empiricism with theory. continued on page 3

Giving the gift of sight has unexpected rewards
by Elizabeth Willoughby

After 14 days, a man gets a profession for the first time in 40 years. But it is LMU student Jakob Schillinger who feels benefited by the radical change in the other man’s life. continued on page 5

More news on LMU Munich at www.en.lmu.de/news
At the museum, looking at atoms
by Kerstin Maierhöfer

To visit Christine Wamsley at work, take the route past the Viking ships, the aeroplanes and the huge turbines. Christine is a Euroscholar, and is spending a semester with a research team at the end of a long, brightly lit corridor – in the Open Research Lab at the Deutsches Museum.

Sitting in the midst of a maze of apparatus, cables and monitors, Christine Wamsley is about to insert a sample into a scanning tunneling microscope. The object of interest is a tiny drop of quinacridone, an industrial pigment, sitting on a flake of graphite. The term “open research lab” means what it says: Visitors to the Museum can watch her at work and put questions to her – and Christine has already learned the art of explaining in simple terms how this microscope allows her to visualize the atomic structure of the sample. “The tip of the microscope is so sharp, there’s only a single atom at the end of it,” she explains. When she turns on the apparatus, the tip nears the sample and is moved across its surface. A voltage is applied to the tip, and at each point the electrical current that crosses the minuscule gap between the atoms of the sample and the atom on the tip is measured. Christine points to the patterns that appear on her computer screen: “Now I can see how the molecules assemble on the surface – and potentially identify them.”

Basic research in the heart of a museum

The enthusiasm with which Christine talks about her work is highly infectious – even though she ended up studying biochemistry largely by accident. She caught the biochemistry bug during a compulsory course in the subject at her alma mater, Colby College in Waterville, Maine. “I loved it – and I decided to make it my major subject.”

Christine’s other major is German, and that too resulted from a chance encounter. While still at school, she visited Oelde near Münster as an exchange student. She planned to stay for 11 days, but plumes of volcanic ash over Iceland kept her there for a further 10 days. In these three weeks, the Varsity soccer player developed an enduring passion for FC Bayern Munich, and made lots of friends, which sparked a desire to learn more about Germany. In her search for an exchange program that would enable her to extend her horizons at a foreign university, she discovered the Euroscholars Program, which gives gifted undergraduates from Canada and the US the opportunity to do a research project at one of 11 European universities, including LMU and the universities in Heidelberg and Leiden.

Euroschiors can choose their host university, and Christine chose LMU. “The project in the Open Research Lab spans the interface between chemistry and nanotechnology, and I was immediately fascinated by it,” she says. “The observations that I make here could provide the foundation for my undergraduate Honors Thesis.” And the research experience gained in the group led by her Munich mentor Frank Trixler will certainly help her to realize her dream of going on to medical school.

Captivated by Bavaria

In the meantime Christine is making the most of her semester in Munich. At lunchtime she often goes out onto the roof of the museum. “One has a wonderful view of the city from there, all the way to mountains,” she enthuses. Colby College is located in a town of 15,000 inhabitants. “When I heard that LMU has 50,000 students, I knew there would certainly be lots to see and plenty to keep me busy,” she says. She has indeed made many new acquaintances and, on her days off, she plays football with other enthusiasts. And in order to follow the fortunes of FC Bayern, she no longer depends on the sports channel. Since her arrival in September she has attended three of their home matches in person. On weekends she likes to travel, visiting her old friends in Oelde, or venturing farther afield to Vienna and Helsinki. “There was a meeting of all the Euroscholars in Helsinki recently, and that opened up the prospect of further excursions and encounters.”

Translation: Paul Hardy

www.euroscholars.eu
Confronting theory with practice
by Clemens Grosse

The international doctoral program on Evidence-Based Economics (EBE), which has been set up at the Munich Graduate School of Economics with support from the Elite Network of Bavaria seeks to reconcile empiricism with theory.

One of the first things that Daniel Wissmann, Anastasia Driva and the other eight PhD students in the group mulled over was the question of how they could make their new offices a little more appealing. And when they located a suitable sofa, they joined forces to transport the bulky item to its new home – on the underground. Indeed, working out ways to solve problems – and not just the furnishing of their offices – is what motivates them all.

Focus on methodology

For they are all concerned with issues related to the function, or dysfunction, of economic processes and programs. The international doctoral program (International Doktorandenkolleg, IDK) on Evidence-Based Economics is part of a general trend that is currently sweeping the science of economics: confronting field experiments in the real world with models that attempt to describe and account for economic phenomena from a theoretical standpoint. Co-Coordinator Professor Florian Englamaier explains the approach using an example. “We have all heard of the role of microcredit in developing countries. But there is also a market for microinsurance in such settings. After all, it is clear that relatively minor risks can have major repercussions, especially for people who have built up a little business of their own,” he points out. But field studies have shown that microinsurance schemes do not function as they were designed to do. “The question is: Why not?”

The ten doctoral students in the first cohort – five women and five men – have come to Munich from institutions all over the world, and have quite diverse backgrounds in economics. Anastasia Driva from Athens studied at the University of Nottingham, and at University College London, where her research was devoted to health economics. “It is a very broad and interesting field, which has been relatively little studied,” she says. Her Master’s thesis focused on India which, like many other emerging economies, offers a rewarding field for research on the topic. However, the 22-year-old Driva, who learned about the EBE from a fellow-student in London, does not yet want to commit herself exclusively to this single theme. For her, the most attractive aspect of the IDK is that, in their first year, graduate students can become acquainted with many different areas of economics. Indeed, it was this that decided her to move to Munich.

“The great advantage of the IDK on EBE in comparison to a classical Graduate School is that we do not prescribe any particular class of research problem to which every doctoral thesis must contribute,” says the Dean of LMU’s Faculty of Economics and Coordinator of EBE, Professor Joachim Winter. “The trademark of the IDK is a methodological one: We believe that the application of evidence-based methods is of relevance to all areas of economics.” Thus, the IDK has formed partnerships with commercial enterprises and other organizations, and institutes at the universities in Regensburg and Erlangen-Nürnberg are also actively involved.

Daniel Wissmann (30) has already picked up much practical experience in his field, and was elected as one of the IDK’s two student representatives, together with Driva. In the course of his university career, which has taken him to Tübingen, Brown and Harvard, as well as to the Barcelona Graduate School of Economics, he worked as an analyst in consulting firms. What he finds most stimulating about the IDK are the links between the theoretical level, which is generally based on the idea of the rational agent, and empirical reality, which often reveals a crucial role for irrationality.

The two student representatives have not yet decided on what sort of professional career they will later take up. As Anastasia Driva remarks, the only thing that is clear is “that we will have a solid grounding in economics, which will enable us to find our way in many different branches of the subject.”

Translation: Paul Hardy

http://evidence-based-economics.de
Quantum physics

Immanuel Bloch uses batteries of lasers and sophisticated control circuitry to create artificial crystals with which he can simulate and study physical phenomena at the quantum level.

For the complete article, see www.en.lmu.de/news/insightlmu/2013/04_02.pdf

Pharmaceutical research

The heart’s metronome

A specific cell population is responsible for ensuring that our heartbeat remains regular. LMU researchers have now elucidated the mode of action of one of the crucial components of the heart’s intrinsic pacemaker. The heart possesses a pacemaker of its very own. Specialized cells in the so-called sinoatrial node control its rate of contraction and relaxation by orchestrating a recurring sequence of electrical signals. Proteins known as HCN channels, which are located in the surface membranes of pacemaker cells, play a central role in the generation and transmission of these signals. HCN channels come in four subtypes, HCN1-4. “While the functions of HCN2 and HCN4 have been extensively studied, the impact of HCN1 on heart rate has so far remained unknown,” says Professor Christian Wahl-Schott of the Department of Pharmacy at LMU, who has now closed this gap. He and his team were able to demonstrate, for the first time, that HCN1 is involved not only in generating the electrical impulse but also in its propagation within the node. Defects in HCN1 compromise the normal operation of the pacemaker. This results in bradycardia – a pathological reduction in heart rate – and increases the incidence of arrhythmias. The new findings regarding the role of HCN1 in the regulation of heart function are of clinical interest for two reasons. First, this channel subtype offers a promising target for drugs designed to normalize heartbeat frequency. Secondly, HCN1 is also found in nerve cells in the brain, where it likewise acts to control rates of neural firing. Hence HCN1 blockers are also under consideration for use in the treatment of epilepsy, chronic pain and depression. “In light of our results, the potential effects of HCN1 blockers on cardiac function should be carefully assessed before such agents are used in other contexts,” Wahl-Schott warns.

Molecular biology

Designer of protein factories

For 10 years, Patrick Cramer and his colleagues at LMU have probed the structure of RNA polymerase I, a crucial cog in the machinery of all cells. Now they unveil the full three-dimensional conformation of the enzyme – at atomic resolution. Actively growing cells must synthesize large amounts of protein, which in turn requires huge numbers of protein production plants, the ribosomes. Ribosomes themselves consist of proteins mounted on a framework of ribosomal RNA that accounts for as much as 60% of the RNA in cells, and is synthesized by the enzyme RNA polymerase I (Pol I). Pol I is therefore a central pacemaker for cell growth. In spite of its pivotal role, the structure of the enzyme has remained poorly understood. But in a technical tour-de-force, Professor Patrick Cramer – the Director of LMU’s Gene Center – and his team have now revealed its detailed architecture at a resolution that not only allowed them to localize all of its 14 subunits, but also to define the positions of its 35,000 (non-hydrogen) atoms. The resulting model provides detailed insights into the enzyme’s mode of action. It turns out that Pol I has several elements in its active center that are involved in the regulation of the enzyme. By altering the shape of the entrance to the active site, they enable it to adopt an “open” or a “closed” conformation. The researchers suggest that this mechanism allows Pol I activity to be inhibited, thus preventing uncontrolled cell proliferation. “With this conformational switch between inactive and active states, we appear to have stumbled on a general mechanism that regulates the expression of genetic information in the cell,” Cramer says. He and his associates will now turn their attention to the problem of how the polymerases recognize their respective target genes.
When LMU student Jakob Schillinger began sharing his knowledge with freshmen on Facebook, the response was immediate and, to his surprise, instantly satisfying. Jakob was answering basic questions, such as exam structure and specific professors’ main focuses, as well as encouraging demotivated students not to give up their studies. This was his first contribution to random peoples’ lives without expecting anything in return. Jakob liked it and wanted more, so when he heard about a project being launched that would provide eye glasses in developing countries, he signed on.

Down to earth

“Martin Aufmuth’s One Dollar Glasses project was exactly what I was looking for,” says Jakob. “It tackled the fundamental need to treat the visually impaired affordably and combined the machine he invented that produces the glasses with a simple but effective business model. Being able to see allows people to learn, and therefore able to work and feed their families.”

In March, Jakob and two other students from Enactus, an organization that provides the administrative structures for social entrepreneurial projects, joined Aufmuth in Africa for two weeks. They went to teach 19 men and women from Rwanda and Kenya how to use the all-mechanical machine, basic knowledge on optics and how to run a business. While their hands hurt at first from the bending of the steel wire to make the glasses frames, Jakob was impressed with their discipline and speed of learning.

Days began with a water bucket shower and 7 a.m. toast and tea before training, and ended at 5:30 followed with dinner out on the grass, maybe a walk to the nearby village, and sleeping in a big room on mattresses on the ground.

“If we don’t see our responsibility in serving those in need, who should?”

“It was all very simple but I enjoyed the peace of mind that came with it. We were seeing steady progress and time was flying. Everywhere we went people waved at us and wanted to meet us, such immense openness and hospitality.”

Back in Germany, Jakob saw things from a new perspective: “For the first time I really noticed how developed our country is with the subway, twenty-story houses and running water in my kitchen. I missed the open communication even between complete strangers in Africa, and realized that I needed very little to be happy, but I also appreciated the things I had been taking for granted in Germany.”

The Rwanda project’s success led to another one in Burkina Faso in July and Bolivia in September, both of which Jakob attended. One trainee in particular made a profound impact on him. A polio victim since childhood, Souleymane walks on his hands and is an outcast of society. Though always at the top of his class, the now 40-year-old never had a job. After 19 years of searching he was losing hope.

“From day one Souleymane was one of the best trainees,” says Jakob. “He asked a lot of questions, trying to understand the process instead of just copying the movements. At the end of the 14 days he received a machine as a loan to start his own business. For the first time in his life this man had a profession and a reason to get up in the morning. I will never forget his shining eyes when I told him that he could continue to work with the project. ‘Merci, merci beaucoup Monsieur Jakob. I’m the happiest man in Burkina Faso today.’ It was the most impacting experience for me to see how only two weeks of hard work could so radically change a person’s life.”

Jakob feels it is the duty of the privileged to help those not lucky enough to be born in a developed country, and he’s studying psychology to understand people so that he can help them with the problems they face. His participation in these projects this year has been educational in a practical way, but also deeply fulfilling. “I’m definitely thinking about pursuing this work as a career. We will see what the future brings.”

EinDollarBrillen e.V.: www.EinDollarBrille.de
LMU’s Institute of German as a Foreign Language has set up an International Research Unit for Multilingualism (IFM). It brings together various lines of research relevant to the acquisition of multilingualism and its significance in a globalized world, and will serve as a focal point for researchers from Germany and abroad who are working in fields related to multilingualism and multiculturalism. The IFM will also offer a visiting professorship, as well as fellowships for junior researchers. An international network will be built up and a database containing the latest information on research into multilingualism will be constructed. The Unit will also develop new training programs and course materials to facilitate the acquisition of German as a foreign/second language.

www.ifm.daf.uni-muenchen.de

Michael Brenner elected President of the Leo Baeck Institute

Professor Michael Brenner, who holds the Chair of Jewish History and Culture at LMU, has been elected International President of the Leo Baeck Institute. This is the first time since the establishment of the Institute in 1955 that the leadership of the foremost institution for the study of the legacy of German-speaking Jews has been entrusted to an academic who works in Germany. Brenner is also the first person born after the Shoah to hold the post. With research centers in Jerusalem, London and New York, and a branch based at the Jewish Museum in Berlin, the Leo Baeck Institute is dedicated to the preservation and study of the cultural heritage of German-speaking Jewry.

www.lmu.de/international/misu

LMU student is Disabled Sportswoman of the Year

Anna Schaffelhuber has been named Disabled Sportswoman of the Year for 2013. The LMU law student was chosen from a roster of 13 candidates in an online ballot. “I am really delighted to receive such an honor. It is a further motivation for my next goal – to win a gold medal at the Paralympics 2014 in Sochi,” said Schaffelhuber. In February, she took the slalom gold at the World Championships held in La Molina (Spain), and so qualified for inclusion on the list of nominees for the title. In fact, this is the second time that such an award has gone to Schaffelhuber. She also came out on top in 2011, after having won no less than three gold medals at the World Championships in Sestriere (Italy) that year.

www.lmu.de/international/misu