Trade and transformations
by Nikolaus Nützel

International trade agreements promise to promote prosperity and economic growth. LMU economist Gabriel Felbermayr uses highly complex mathematical models to study who profits from these deals – and who doesn’t. For the complete article, see www.en.lmu.de/news/insightlmu/2016/03_01.pdf
Yiddish – world language in peril
by Anja Burkel

Embodying a rich culture, and having absorbed influences from all over the world during its 1000-year history, Yiddish is very special – and is now acutely threatened. Evita Wiecki teaches Yiddish at LMU, and tells us something about it.

When Evita Wiecki travels she is often astonished – and delighted – to come across traces of Yiddish life and culture: In Johannesburg she located the site of the former Yiddish theater, in Wilna the remnants of a Yiddish library, and in New York, the city with the largest population of Jews in the world, she very frequently encounters evidence of its survival.

As Wiecki remarks, Yiddish, written in Hebrew letters and read from right to left, “is a genuinely global language”. Wiecki is the present holder of the lectureship in Yiddish, a post that was set up within the department of Jewish History and Culture at LMU some 15 years ago. In addition to being a language teacher, her brief also covers lectures on the regions in which Yiddish developed and once flourished, as well as its cultural and literary history.

The position is a part-time one but, even so, it is unique in Germany. The basic problem is that there are hardly any individuals left who learned the language as their mother tongue: The language of the Jewish Ashkenazim evolved in the largely German-speaking parts of Central Europe over the period from the 9th to the 12th centuries, but it developed into a fully-fledged literary and cultural idiom in Eastern Europe. Approximately half of the 11 million Yiddish speakers in Europe prior to the Second World War were murdered in the Holocaust. The language is spoken by perhaps one million people today.

Evita Wiecki herself is not a native speaker of Yiddish. Born in Poland, she says that she was “simply smitten with Yiddish”. Its “incredibly rich store of knowledge, wisdom and literature” provides fascinating leads and insights into many other subjects – for students of German or the history of the Middle Ages because Yiddish incorporates and preserves elements of a Middle or Early High German dialect, but also for scholars interested in the history and literature of Eastern and Western Europe and the Americas.

A product of language fusion

Yiddish is a product of language fusion and has continued to evolve over the course of more than a millennium. “German constitutes its major component, but we don’t know precisely which phase of the history of German or which German dialects it ultimately derives from – partly because the Jews who spoke it were unusually mobile,” Wiecki says. The second important component is Hebrew/Aramaic. The fact that most Yiddish speakers settled in Eastern Europe quite early on explains the influence of Slavic tongues, and the wave of Jewish emigration from impoverishment and persecution in Eastern Europe in the late 19th and early 20th centuries brought Yiddish into contact with English and Spanish.

The life and lore of Yiddish today

In the Annual Scholem Alejchem Lecture given, in Yiddish, at the department of Jewish History and Culture, this year’s invited speaker – the Canadian novelist Michael Wex – discussed what Yiddish expressions can tell us about the life of the language. As he explained, the term for old wives’ tales in Yiddish – bovemayses – refers to the knight Bovo, whose hair-raising adventures are described in a popular tale of chivalry written in Yiddish in the early 16th century, which was first printed in 1541. Evita Wiecki provided a translation of Wex’s lecture so that members of the audience could follow the speaker’s train of thought.

Nowadays, the internet helps to connect scholars all over the world who study the role of Yiddish in its secular context, and the online Digital Yiddish Library provides access to 12,000 books written in the language. But volumes in Yiddish can also be found in Munich – in the collections held by the Bavarian State Library and the Munich University Library.

Translation: Paul Hardy
Virology

Invaders and infections

by Martin Thurau

Our globalized transport networks make it possible for hitherto unknown viruses to travel the world. LMU virologist Gerd Sutter has developed a platform for the production of vaccines against these emerging threats.

For the complete article, see www.en.lmu.de/news/insightlmu/2016/03_02.pdf

Biology

The structure makes the difference

In many species, the sex chromosomes are unequally distributed. In humans, as well as in the model organism Drosophila melanogaster, males possess just one X chromosome, while females have two. Male fruitflies compensate for this by doubling the activity of their single X chromosome – a vital process that is controlled by an enzyme complex known as the dosage compensation complex.

“How this regulator distinguishes the X chromosome from all the others has, however, remained unresolved,” says biologist Professor Peter Becker of LMU’s Biomedical Center (BMC). For the consensus DNA sequence that can be identified at most DCC-binding sites also occurs thousands of times on all other chromosomes. Becker has now reported an important breakthrough. The researchers first identified the protein MSL2 as the component of the DCC that binds to the X chromosome. They went on to show that MSL2 possesses two DNA-binding domains, and that one of them recognizes an extended consensus sequence which includes the so-called PionX sequence. However, only 57 of the 2,700 such sequences in the genome are genuine DCC-binding sites. The key discriminating feature was then pinpointed by bioinformatic analyses of how interactions between neighboring base pairs affect the shape of the DNA. The researchers identified a particular conformation shared by PionX sequences that is preferentially recognized by MSL2 – this structure makes the vital difference. It distinguishes the DCC-binding sites on the X chromosome from all others, enabling selective interaction and regulation by the complex. “Our work has decisively advanced the understanding of chromosome-wide regulation during the process of X chromosome dosage compensation,” states Becker.

Immunology

Children who keep HIV in check

Children who are HIV-positive but remain free of AIDS are very rare. In the absence of antiretroviral therapy, over 99% of individuals infected with HIV go on to develop full-blown AIDS, and the condition evolves more rapidly in children than in adults. However, between 5 and 10% of perinatally infected HIV-positive children avoid this fate, as an international research collaboration, led by Dr. Maximilian Muenchhoff at LMU’s Max von Pettenkofer Institute and colleagues based at the University of Oxford (Professor Philip Goulder), report.

The group has characterized the immunological responses of a cohort of these so-called non-progressors – HIV-positive children in South Africa who contracted the infection from their mothers but remain healthy. The investigations reveal that these children have high concentrations of circulating HIV particles, although their immune system remains fully functional. “Interestingly however, these infected but healthy children exhibit only low levels of immune activation. In addition, while the spectrum of cell types that contain the virus – the so-called viral reservoir – is very complex it is predominantly restricted to short-lived CD4+ T cells in these young non-progressors,” says Muenchhoff. The researchers found that most of these children have high levels of potent and broadly neutralizing antibodies directed against HIV. These features of the immune response in healthy HIV-infected children show a striking resemblance to that observed in the more than 40 species of African monkeys which are the natural hosts of Simian Immunodeficiency Virus (SIV) – from which HIV itself is derived. The new findings are of interest not only with respect to the development of effective HIV vaccines, they may also provide pointers toward potential interventions for patients with chronic HIV infections.
Conversations with physicist Ralf Jungmann demand a great deal of concentration. He takes one at a sizzling pace through a world that is inconceivably minute, a world which, according to the laws of optics, is not directly accessible to even the best light microscopes. It is also the microcosmos in which biological processes are at home. Its denizens are the metabolites and macromolecules whose interactions determine the course and the limits of our lives – and we still know very little about it. But Ralf Jungmann’s ambition is to bring every molecular machine in the cell within the purview of light microscopy, a task that inevitably leads him to the frontiers of the physically feasible. Together with his 11-member team, Jungmann, who has just been appointed to a professorship at LMU, is developing a so-called super-resolution microscope for biomedical applications, which is designed to image cellular structures with the aid of DNA-based labeling techniques. The project has received funding from highly selective grant programs run by the Deutsche Forschungsgemeinschaft (DFG) and the European Research Council (ERC).

Ralf Jungmann is extending the capabilities of light microscopy to gain deeper insights into the nanoworld of the cell.

All a question of visibility
by Hubert Filser

Ralf Jungmann recently won an Starting Grant of the European Research Council (ERC) – and with it a physics professorship. His research utilizes DNA-based nanotechnology to visualize biological structures that have dimensions of a few nanometers.

“People can no longer hide from the fact that the microworld is at work in all areas of our lives,” Jungmann says enthusiastically. “Our technologies, from smartphones to engines and microchips for medical diagnostics, are all based on very small structures. It is therefore indispensable to understand how these structures work. But we can only do that if we also understand the processes at the molecular level.”

His goal is now to make the invisible visible. “My aim is to visualize at the highest possible resolution hundreds – no, thousands – of the components in cells, whether proteins, genes or RNA molecules. And I want to make the technique so simple that a normal laboratory anywhere in the world can use it.”

Molecular breadboards

Jungmann currently heads an Emmy Noether Junior Research Group in the Faculty of Physics at LMU, and the MPI for Biochemistry in Martinsried. He recently won one of the highly endowed Starting Grants awarded by the ERC, and a grant of a million euros from the Max Planck Foundation. The proximity of both institutions facilitates interdisciplinary collaboration in well integrated teams which Jungmann finds so important. He learned how productive this approach can be when he joined the laboratory led by William Shih and Peng Yin at the Wyss Institute for Biologically Inspired Engineering at Harvard Medical School in Boston. The Institute employs specialists in all relevant disciplines, from mechanical engineers to biologists and computer scientists.

Three of his doctoral students did their Master’s under his supervision when he was still at Harvard. That extends their network of international contacts, “and having successfully gone through the Harvard mill is a recommendation in itself,” he adds. These graduate students now form the experienced core of his team, something even the best group leader can’t do without. It also means that ideas for projects are never in short supply.

The funds made available by the Emmy Noether Program and the ERC Starting Grant, together worth some 3.5 million euros, provide him with the scope to pursue his dream for the next several years. In addition, LMU now offers ERC Starting Grantees tenure-track professorships (W2) and Jungmann is among the first to profit from the scheme. On August 1st he became Professor for Molecular Imaging and Bionanotechnology. “That gives me a degree of security, though it does not guarantee that I will later obtain an academic chair,” he says. His work will be reviewed in 5 years’ time. “And that is of course a further incentive for me,” he adds – with a grin.

Translation: Paul Hardy

For more information and research stories on ERC grantees at LMU, see:

www.en.lmu.de/about_lmu/introducing_lmu/people/grants/erc_grants/erc
Winter Semester 2016/17: Semester statistics

Precisely 7967 first-year students have so far registered for the new semester at LMU. This brings the total number of students on campus in the new term to approximately 51,000. The figures cited above mean that both the size of the new intake and the total number of students registered will remain essentially constant. The same is true for the proportion of female students on campus: Approximately 30,000 are now on LMU’s books. And these tens of thousands of young minds should have little problem slaking their thirst for knowledge. No less than 15,585 classes are on offer this term – ranging from seminars for MSc. students through field-trips to special language courses. LMU’s attractiveness for students from elsewhere continues to grow: More and more foreign students are choosing to study at the University. According to a preliminary statistical assessment, there are now some 8400 international students at LMU. This represents an increase of around 7% over the corresponding figure for 2015/2016. The most popular degree courses at the University are, once again, those in Law, Medicine, Economics and Physics – and although registration is ongoing, all the indications are these are the subjects that will draw the largest numbers among the new crop of first-year students also.

More Facts and Figures: http://www.en.uni-muenchen.de/about_lmu/factsfigs_new/index.html

LMU again ranked as best German university

In the latest (2016) edition of the World University Ranking published by the Times Higher Education (THE), LMU takes 30th place and retains its rating as the best university in Germany. The new THE Ranking leads off with a first – in two senses of the term. For the first time, the top spot in the list is occupied by a European institution - the University of Oxford – which is followed by the California Institute of Technology and Stanford University. The Times Higher Education World University Ranking first appeared in its current form in 2010. The latest edition lists a total of 980 institutions in 79 countries. LMU is once again the best of the German contingent, sharing the 30th rung on the ladder with the École Polytechnique Fédérale de Lausanne.

The new LMU movie

The new LMU movie hits the screen just in time for the new Winter Semester. In evocative images it treats a theme that is at the heart of LMU’s mission, and gives a vivid impression of the University and the people who work and study here. Shot on location on campus and at institutions with which the University cooperates closely, it features individuals who really do teach, study and carry out research here. The film is now showing in both German and English versions on LMU’s YouTube channel at: www.en.lmu.de/about_lmu

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