

Ethics, Economy and Social Change

New Max Planck Center launched with the University of Cambridge



Acclaim for Anglo-German initiative: Max Planck President Martin Stratmann (left) and Stephen Toope, Vice Chancellor of the University of Cambridge, at the launch of the joint venture.

How do moral and ethical convictions impact a local economy, and how do they influence the global capitalist system? These questions are at the heart of the research conducted at the Max Planck Cambridge Center for Ethics, Economy and Social Change, which was formally launched in early March. The collaborative project's search for answers will see researchers from the UK's elite University of Cambridge work together with scholars from the Max Planck Institute for Social Anthropology in Halle and the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen. At the inauguration ceremony, Max Planck President Martin Stratmann expressed his delight that "in this period of uncertainty caused by Brexit, we have established another highly visible collaboration with top British scientists." The Center's four Co-Directors – James Laidlaw and Joel Robbins from the University of Cambridge, and Max Planck researchers Chris Hann and Peter van der Veer – are aware of the considerable public interest in the ethical principles of capitalism generated by the global financial crisis. One of the aims of their work is to develop new approaches to respond to urgent social issues.

High Accolade for Science Historian

Max Planck Director Lorraine Daston receives Israel's Dan David Prize

Lorraine Daston, long-serving Director at the Max Planck Institute for the History of Science in Berlin, won a prestigious international award in recognition of her scientific work. She received the prize, which carries an endowment of 1 million US dollars (more than 800,000 euros), for her "groundbreaking research on the 'Ideals and Practices of Rationality'." In its statement, the jury noted that Prof. Daston's work had demonstrated, among other things, "how such seemingly universal concepts as 'fact' and 'proof' have changed since the 17th century." *Objectivity*, a book co-written by Lorraine Daston and Peter Galison, was singled out for particular

praise, which the jury called "one of the most discussed and reviewed works in the history of science."

Named after Israeli businessman Dan David, the prize is awarded each year to individuals with proven excellence in the sciences, arts, humanities, public service and business. This year, three scientists were honored in each of the following fields: history of science, bioethics and personalized medicine.

International recognition: Lorraine Daston has made a name for herself through her research into the cultural history of rationality.



“In ten years, we will know which animals can predict natural disasters”

Interview with Martin Wikelski on the Icarus antenna's successful voyage to the *International Space Station*

It is expected to launch by mid-year: Icarus – the first satellite-based program to research animal migration. With the help of tiny transmitters that send data to the *International Space Station (ISS)*, Martin Wikelski's team of scientists at the Max Planck Institute for Ornithology in Radolfzell hope to understand the factors that impact migratory patterns of different animal species. The Icarus program's two key components have been in space since mid-February, after a *Soyuz* rocket transported the Icarus antennas to the ISS. Martin Wikelski talks about experiencing his first countdown and what the future holds for the project.

Dr. Wikelski, you were at the rocket launch in Baikonur. How did you feel at that moment? There was an awful lot at stake.

Martin Wikelski: The spaceport in the heart of the Kazakh Steppe is quite a special place. When you stand beside the massive gates and the rocket comes rolling out of the hangar, you feel a bit uneasy. My colleagues and I put so much time and energy into developing Icarus – and it could all go up in smoke in a matter of seconds. After all, we know that not every launch is successful.

Now that the antenna has arrived safely at the ISS, what happens with it next?

For now, it is stored in the station's Russian module. Then, in August, the antenna will be mounted on the station's exterior. That will be another critical moment. If everything goes well during the spacewalk for the two Russian cosmonauts Oleg Artemyev and Sergei Prokopyev, we'll have overcome the last remaining major hurdle.

2018 is a decisive year for Icarus. What are you most looking forward to in the months to come?

The first data transmission from the ISS – no question! The moment we receive the first test data from the Space Station and know that the system works, I'll be the happiest man in the world. We will then

spend two months testing whether the antennas and on-board computer are functioning and making sure the data transmission is working properly. And then, in the fall or toward the end of the year, we can finally get going.

Icarus will allow scientists the first-ever opportunity to observe thousands of animals on their journeys around the globe – over months and years, 24/7. What are the most pressing questions that Icarus can answer?

The most significant thing for me would be migratory birds. Their numbers are falling dramatically around the world. We often don't know where they disappear to or why. Unless we find answers fast, so we can take countermeasures, it will soon be too late for many species. The same applies to heavily exploited fish populations and many marine mammals in our oceans. We also urgently need to learn more about how animals spread pathogenic agents. How does bird flu travel to Europe? Which animals carry the Ebola virus? This is why we want to track the flight paths of waterfowl in Asia and fruit bats in Africa. Both are possible carriers of these pathogens. And last but not least, in ten years, we'll know which species can predict natural disasters. Initial scientific data on earthquakes and volcanic eruptions suggests that certain animals can sense such events hours ahead of time. If we can provide solid evidence of these abilities, it could soon save the lives of hundreds of thousands of people.

Looking to the future now – what will Icarus look like in ten years?

To begin with, the numbers of research projects using Icarus will increase significantly in the coming years. I imagine that, by 2028, several thousand projects will be able to collect scientific data thanks to the Icarus system. Our transmitters, which by then will be even smaller, could be fitted to hundreds of thousands of animals. In addition, in ten years, Icarus will probably not only be installed on the ISS



Martin Wikelski

but also on a series of other satellites. This will also allow us to survey areas that Icarus is currently unable to cover. Above all, additional satellites will enable us to examine regions of particular scientific interest above the 55th parallel in Europe, Asia and North America.

As soon as Icarus is up and running, a lot will also change for you personally. How will it affect your everyday work?

I will be able to work on my own research projects again, thank goodness! Unfortunately, during the last few years, I've sometimes had to put my scientific work on the back burner in favor of Icarus. That should certainly change now. Starting in July, I will take a sabbatical for science and go back to focusing completely on my research. Interview: Harald Rösch

Rust Protection from Nanocapsules

New technology prevents metal from corrosion



Effective anti-corrosion protection: An environmentally friendly plastic coating with self-healing properties is designed to protect iron components against rust.

Costs resulting from corrosion total some 3.3 billion US dollars annually. Currently, varnishes, enamel, rubber and metallic surface layers are applied to materials to prevent rust damage, but these often contain harmful substances and do not provide long-term protection. German company Enviral has now acquired a license for a brand new anti-corrosive technology that was developed at the Max Planck Institute of Colloids and Interfaces and is based on “smart” pigments. The process enables anti-corrosive coatings to repair damage, similar to the self-healing mechanism of human skin. To achieve this, micro- and nanovessels are filled with organic corrosion inhibitors, encapsulated in a polyelectrolyte shell and subsequently embedded in the coating. If the protective layer is damaged – by scratches or fissures, for instance – the embedded vessels at the site of the flaw open, releasing the corrosion inhibitors and immediately protecting the damaged area. Enviral plans to further develop the smart pigments and promote their production and marketing.

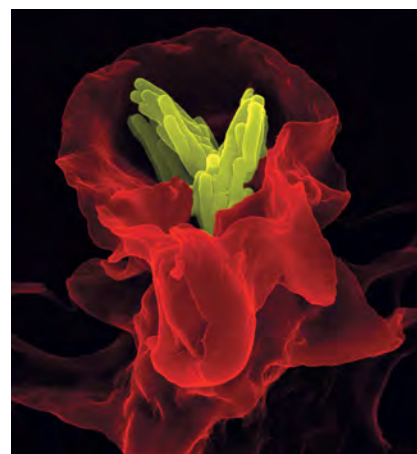
Potential Tuberculosis Vaccine Draws Closer

A promising vaccine is being tested on patients with recurrent tuberculosis

Tuberculosis remains one of the world’s most dangerous infectious diseases. Healthcare professionals and policymakers are particularly troubled by the increasing number of multiresistant pathogens. Researchers at the Max Planck Institute for Infection Biology laid the scientific foundation for a potential new vaccine that is now entering the decisive Phase III clinical drug trials. The vaccine, called VPM1002, is currently being tested in a study involving some 2,000 participants in India. This study began early this year and is slated to run until mid-2020. Researchers are testing the potential vaccine on patients who have already suffered from tuberculosis and successfully undergone treatment. For reasons that

are currently unknown, around 10 percent of these patients contracted the disease again within a year. In the trial, a portion of the participants are inoculated with VPM1002 a few weeks after being discharged as healthy. “If the vaccine candidate can reduce the reinfection rate in this particularly challenging group and proves to be well tolerated, it will have cleared a major hurdle on the path to approval,” explained Stefan Kaufmann from the Max Planck Institute for Infection Biology, who made a significant contribution to developing the scientific concept for VPM1002.

Immune system in action: A white blood cell (shown in red) ingests tuberculosis bacteria (yellow), confining them. However, the bacteria can survive for years in these phagocytic cells.



Foundation for Heidelberg Research Network

Max Planck Society and Baden-Württemberg agree on a new building for the joint “Biology at the nanoscale” project

The Baden-Württemberg State Ministry of Science has agreed to support the collaboration between Heidelberg University and the Max Planck Institute for Medical Research in Heidelberg. Minister for Science, Research, and the Arts Theresia Bauer, Max Planck President Martin Stratmann and President of Heidelberg University Bernhard Eitel signed a declaration of intent to this effect in early March. The document details the federal state’s commitment to provide 25 million euros to fund the construction. The new building will be erected on the “Heidelberg 4 Life” life sciences innovation campus, directly adjacent to the Max Planck Institute. It will become home to the planned “Biology at the Nanoscale” research network, which was born of an initiative by Nobel Prize laureate Stefan Hell. The University and the Max Planck Institute hope to use the research network to expand their collaboration in basic research in bioscience and biomedicine. Additional partners, including the German Cancer Research Center (DKFZ) and local clinical researchers, will also be integrated into the network. The scientists also aim to cultivate industry contacts so that their discoveries can be quickly translated into medical applications.



Innovation in sight: Bernd Bukau and Bernhard Eitel from Heidelberg University, Baden-Württemberg’s Minister of Science Theresia Bauer, and Martin Stratmann and Stefan Hell from the Max Planck Society (from left) after signing the agreement.

On the Net



Flight and Trauma

Some 20 to 30 percent of refugees suffer from severe depression or post-traumatic stress disorder. A short film by the Max Planck Institute of Psychiatry uses animated images to show that insomnia, obsessive brooding and physical complaints such as headaches and shortness of breath can be symptoms of a mental illness. The film aims to relieve the pressure on those affected and encourage them to seek help. The two-minute film is available in ten languages, for example German, English, French, Italian, Arabic, Dari and Kurdish.
<http://bit.ly/2M2GbV3>

Passion for Science

This is the motto of the Max Planck Schools – an innovative national network for excellent graduate education. Preparations to launch the first three Schools are in full swing. The Max Planck Schools will issue a call for applications in the fall of 2018, and the first students will commence their studies 2019. Applications will also be open to students with a bachelor’s degree, who can then complete a two-year master’s degree followed by a three-year PhD program. The Schools have a joint website where those interested can find detailed information about the program.
<https://www.maxplanschools.de/en>

Copy and Original

Through his copies of Italian paintings and frescoes, Johann Anton Ramboux (1790-1866) left a lasting imprint on art history research. Generations of artists and art researchers have relied on Ramboux’s museum of copies. Before photography became the main form of documenting works of art, his drawings, tracings, lithographs and watercolors were often the only accessible source of these works. The Max Planck Society’s Kunsthistorisches Institut in Florenz created an online exhibition juxtaposing Ramboux’s copies with the original works.
<http://photothek.khi.fi.it/documents/oak/00000331>