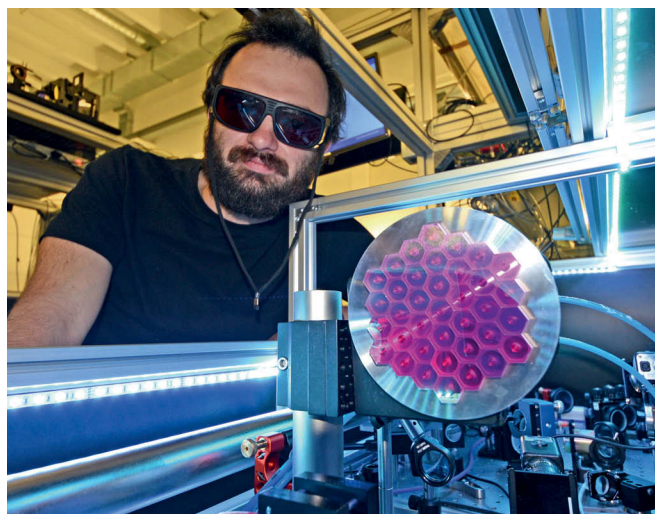


A New X-Ray Source for Medicine

A light source for hard, brilliant X-rays makes even tiny structures in material visible

Bone fractures, tumors or arteriosclerosis – doctors today use X-ray examinations to detect numerous diseases. And X-ray images could soon provide even more information. Physicists at Ludwig-Maximilians-Universität (LMU) in Munich and the Max Planck Institute of Quantum Optics are now producing particularly brilliant X-ray light with sharply defined but variable wavelengths in a relatively compact device. They use extremely intense laser pulses to force electrons from gaseous hydrogen atoms onto a wave band, causing the particles to emit the desired light. This X-ray radiation makes it possible to resolve structures measuring little more than 10 micrometers and having various compositions – and this can be done not only in the field of medicine, but also in biology and materials science. Previously, radiation of the quality needed for this could only be produced in large and expensive synchrotron facilities. (PHYSICAL REVIEW LETTERS, May 14, 2015)

Using laser light to produce X-ray flashes: Konstantin Khrennikov and his colleagues use the ATLAS laser system at Ludwig-Maximilians-Universität to produce brilliant X-ray light.



Shorter Lives for the Bold

Differences in personality influence survival in field crickets



A cricket in front of its burrow. For identification, the researchers marked it with a painted spot on its back.

Humans have a distinct personality: they are fearful, bold, cautious or adventurous. Animals have these traits, too. Researchers at the Max Planck Institute for Ornithology in Seeviesen have now found differences in risk behavior, and thus potentially different personalities, among individuals

in a population of wild field crickets. They marked all crickets within a fenced-in meadow area and studied their behavior. One criterion for risk tolerance was the minimum distance at which the animals initiate escape when a potential threat approaches. The analyses showed that the crickets vary widely in their individual flight initiation distance and how far they are willing to venture from their burrows. It's not yet entirely clear whether boldness offers advantages with regard to searching for food or a partner, but it definitely also has disadvantages: bold field crickets die younger than less daring individuals, as predators such as shrews and birds prey on them more frequently. (BEHAVIORAL ECOLOGY, April 22, 2015)

In Sync with the Leader

A person who says the right thing at the right time frequently becomes the leader of a group

Great leaders are often also great communicators. A special connection develops between leaders and their followers: according to scientists at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, the leader's so-called temporoparietal junction between the temporal and parietal lobes of the cerebral cortex begins to synchronize with the same brain region in their followers. In other words, the rhythms of the leader's and the group's brain activity begin to match.

The temporoparietal junction is important for empathy and for understanding others' mental states. Based on the brain activity, the Max Planck researchers even predicted who a group would elect as its leader, and when. According to their findings, the synchronization of the brain activity is based more on leaders' communication skills and less on how much they talk. The researchers therefore conclude that, among a group of peers, the individual who says the right thing at the right time usually emerges as the leader. (PNAS, March 23, 2015)