10 On the net: Hackers attempt to influence elections in democratic countries.

PERSPECTIVES

06 Coping with the Past to Celebrate Its Anniversary
06 Support for Open Access
07 “Establishing the principle of excellence was a milestone”
08 New Ties to the Netherlands and China
08 Technology Transfer across the Atlantic
09 The Dilemma of Animal Research
09 On the Net

VIEWPOINT

10 Cyber Attacks on Free Elections
Wouldn’t it be much easier and more convenient to vote from our home computers or smartphones? It’s better that we don’t, as even without online elections, there are many possibilities for manipulation.

FOCUS

18 Gravitational Waves on Home Computers
26 Stacking Data
34 Treasure Hunt in the Data Jungle

18 BIG DATA

Gravitational Waves on Home Computers
The Einstein@Home project makes it possible for anyone to search for gravitational waves on their own PC, laptop or smartphone and thus become scientific explorers themselves. The software also detects pulsars. Researchers from the Max Planck Institute for Gravitational Physics are significantly involved in this citizen science project.

Stacking Data
For historians, big data is not an entirely new phenomenon. Even in the 18th and 19th centuries, scholars, scientists and state authorities collected huge quantities of data, and analyzing all this raw material posed a challenge back then just as it does today. A group at the Max Planck Institute for the History of Science looks at the methods used in the past – many of them unexpected – and examines how changes in data processing has ultimately brought about changes in science and society.

Treasure Hunt in the Data Jungle
Researchers normally formulate a hypothesis before beginning an experiment and collecting data. Scientists at the Max Planck Institute for Informatics are turning this scientific principle on its head. Their software can analyze existing datasets and retrospectively extract hypotheses and unexpected correlations. These, in turn, give scientists important clues for asking new questions.

ON THE COVER. We live in the Information Age. The amount of data flowing through networks is increasing exponentially. Structuring and using this big data, as experts refer to it, in a meaningful way is becoming more and more challenging. New technologies are needed to manage the torrent.
In the magnetic field: The MRI delivers live images of the tongue movements of a horn player.

In the ring: Researchers use this circular track to observe the swarm behavior of locusts.

Under the spell: Scientists have measured the effect of art on body and mind for the first time.

SPECTRUM

40 Radio Burst from a Dwarf Galaxy
40 Virtual Liver Could Reduce Need for Animal Research
41 Speed Dating among Birds
41 Early Forestry in the Amazon
42 A 50,000-Year Connection to Country
42 Green Chemistry from the Mussel Foot
43 Holograms for Biomedicine
43 New Biomarkers for Bowel Cancer Treatment
43 Steel with a Bone Structure
44 Most People Don’t Want to Know Their Future
44 Dark Matter Not Found
45 A Connection to Others’ Thoughts
45 Growth despite Fasting
45 Older but Bolder

MATERIALS & TECHNOLOGY

54 Live View of the Focus of Disease
Doctors and patients can thank magnetic resonance imaging – and not least a Max Planck researcher – for the fact that many diseases can now be diagnosed far more effectively than they could 30 years ago. That researcher now wants to bring those images to life.

ENVIRONMENT & CLIMATE

62 Why Animals Swarm for Swarms
These days, everyone is talking about swarm intelligence. But are swarms really smarter than individuals? And what rules, if any, do they follow? Scientists are using new computational techniques to impose order on the seeming chaos of swarms.

CULTURE & SOCIETY

70 The Power of Art
How do people react, mentally and physically, to poetry and prose? Researchers have actually succeeded in rendering the effect of poetic and rhetorical language measurable – even in such intangible categories as elegance, or with such curious phenomena as the trash film cult.

REGULAR FEATURES

03 On Location
16 Post to – California, USA
I’m trying to find a good balance
78 Flashback
A Quantum of Energy
80 Max Planck Community
80 Making It Easier to Plan a Career
81 OpenCon 2017 in Berlin
Award-Winning Research Video
82 Shaw Prize for Simon D.M. White
83 Research Establishments
83 Publisher’s Information

BIOLOGY & MEDICINE

46 Exploring the Microbial Cosmos
Personal Portrait: Ruth Ley