



Contents



20 DIGITAL SOCIETY

20 Early alert system for fake news

Controlling fake news in social media more efficiently and precisely – this is the goal of scientists at the Max Planck Institute for Software Systems. For this purpose, they are combining artificial intelligence processes with the evaluation of signals that reflect human judgment.

26 Photo without a face

We have hardly any control over where information about us, or even photos with our likeness, are made public. However, in future we may at least be able to prevent photos of us being published on other people's Facebook pages when we are not involved. The technology for this purpose was developed by researchers at the Max Planck Institute for Software Systems in Saarbruecken.

32 Rules for robots

Artificial intelligence is advancing rapidly – literally as well as figuratively: robotic nurses could soon be moving into our homes. However, their behavior is still open to negotiation. Researchers at the Max Planck Institute for Innovation and Competition in Munich are investigating how legal means can ensure that artificial intelligence adheres to human values.

ON THE COVER The digitalization of our society is advancing ever more rapidly – and requires brand new security strategies: how can we effectively control fake news in social media, for example? How can we ensure that robotic nurses equipped with artificial intelligence will act as intended by the inventor? And what about photos of us that appear on platforms such as Facebook? Max Planck researchers are looking to find solutions to these problems.

12 No democracy: most African states are ruled by dictators.

PERSPECTIVES

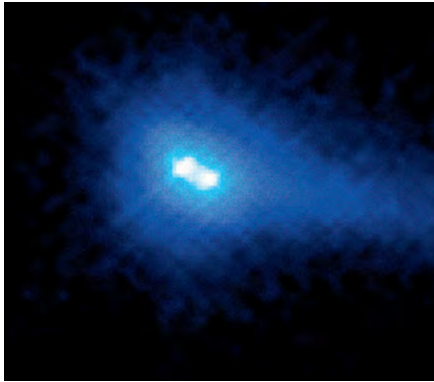
- 06 An important visitor in Vancouver and Ottawa
- 06 Fields Medal for Peter Scholze
- 07 "Our limit value is unacceptably high"
- 08 Award for pioneering achievements in paleogenetics
- 08 A journey through time in Dahlem
- 09 Award for an animal-friendly technique
- 10 Max Planck Day
- 11 The heads of the first Dioscuri Centers
- 11 On the net

VIEWPOINT

- 12 **The decline of democracy in Africa**
Africa is a continent of dictators. Elections are manipulated, the opposition suppressed. According to our author, Europe and the U.S. turn a blind eye far too often.

FOCUS

- 20 Early alert system for fake news
- 26 Photo without a face
- 32 Rules for robots



48 No category: some celestial bodies don't fit into traditional systems.



54 No body: organ-like structures can be cultivated in the lab.



70 No textbook: researchers are investigating how children learn actively and independently.

SPECTRUM

- 40** Birth of a planet
- 40** Neutrino from a remote galaxy
- 41** An eye for character
- 41** Self-healing seed pods
- 41** Egg cell seeks sperm
- 42** Fatty tissue causes stress
- 42** Early dentistry for horses
- 43** A puppet show with facial expressions
- 43** Electrons ride plasma wave
- 44** In the gravity field of the black hole
- 44** Vaccines without eggs
- 45** Parrots think in economic terms
- 45** Our fractured African roots
- 46** Rendezvous in the Stone Age
- 46** Art in the midst of competition and cooperation

PHYSICS & ASTRONOMY

- 48** **The oddballs of the solar system**
Small bodies orbiting the Sun are traditionally classified either as comets or as asteroids. However, some small cosmic objects don't fit into either of these categories – and are making astronomers think again.

BIOLOGY & MEDICINE

- 54** **A grain of brain**
Scientists are able to make highly specialized cells in the human body turn back into divisible all-rounders. These can be used to cultivate organ-like structures such as brain-oids in the lab, which can in turn be used to research diseases such as Parkinson's.

ENVIRONMENT & CLIMATE

- 62** **A nose for feelings**
Personal portrait: Jonathan Williams

CULTURE & SOCIETY

- 70** **The nature of children's curiosity**
Active, independent learning is known to be a particularly efficient way of acquiring knowledge. Researchers are developing sophisticated tests which they intend to use to track children's learning strategies.

REGULAR FEATURES

- 03** **On location**
- 18** **Post from – Nijmegen, the Netherlands**
Between baby and doctorate
- 78** **Flashback**
In the blazing inferno of the Sun
- 80** **Max Planck Community**
80 Digital worlds at the Harnack House
80 18 Max Planck scientists secure high levels of EU funding
81 Step by step to greater sustainability
82 Strengthened and focused
82 Pathways in science
- 83** **Research Establishments**
- 83** **Publisher's information**