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10 Prepared: It is hoped that special services will help respond to the consequences of climate change.

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VIEWPOINT

10 The All-in-One Climate Package
Global warming is changing the world. Climate service providers seek to help decision makers from the realms of government, public service and private enterprise respond appropriately to this multifaceted change.

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18 ASTRONOMY

Cosmic Magnetic Fields

18 Protective Shields in the Solar System

In the planetary system, magnetic fields can be driven by snow formed from iron or metallic hydrogen. Measuring them provides researchers with insights into the processes that change the internal mechanisms of the planets. Ulrich Christensen, Director at the Max Planck Institute for Solar System Research in Göttingen, investigates the broad diversity of these magnetic fields.

26 Stars with Great Attraction

They are some of the most exotic objects in space: neutron stars. Incredibly dense and only 20 kilometers across, they rotate about their axes at breakneck speed, emitting cones of radiation out into space in the process. Some of these cosmic beacons have particularly strong magnetic fields. Michael Gabler from the Max Planck Institute for Astrophysics in Garching studies these magnetars – and so learns a thing or two about their nature.

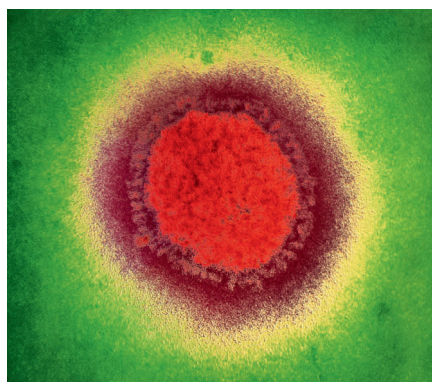
34 Forces that Rule in Galaxies

Magnetic fields spanning 100,000 light-years permeate entire galaxies and envelop their central black holes. Researchers working together with Rainer Beck, Silke Britzen and Sui Ann Mao at the Max Planck Institute for Radio Astronomy in Bonn are teasing the secrets out of these invisible force fields.

ON THE COVER We can't see them, but they are omnipresent: magnetic fields. They surround planets, permeate our Milky Way, and are present not only in galactic gas, but also in the suns formed from it. And magnetars, neutron stars having diameters of only about 20 kilometers, have the strongest magnetic fields in the universe. This artist's impression shows an aesthetic view of such an exotic object – a view that is invisible to telescopes.



48 Crafted: Elena Conti produces images of vital molecular machines.



54 Altered: The flu virus changes constantly, so we are in constant need of new vaccines.



70 Poached: Rhinoceros horn is highly sought after and is traded on the black market at horrendous prices.

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BIOLOGY & MEDICINE

- 48 Architect in the Cellular Cosmos**
Personal Portrait: Elena Conti

MATERIAL & TECHNOLOGY

- 54 Vaccines from a Reactor**
In the event of an impending global flu pandemic, vaccine production could quickly reach its limits. Scientists are therefore working on a fully automated method for production in cell cultures that could yield vaccines in large quantities in a crisis.

ENVIRONMENT & CLIMATE

- 62 Life on a Climate Roller Coaster**
Climate change is radically altering the Earth's plant and animal life. This is due not only to the rise in mean temperatures throughout the world, but also to the changes in temperature variability between both day and night, and summer and winter.

CULTURE & SOCIETY

- 70 The Black Market as a Gray Zone**
Counterfeiting in Argentina, the mining and trade in diamonds in Sierra Leone, the trade in rhinoceros horn and financial market crime – these are some of the topics researchers are addressing in an innovative project in economic sociology.

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