



# Contents



## 18 MIGRATION

**10** In the corner: People have been publicly humiliated throughout history. The public aspect is a key factor.

### 18 Every Room Is Its Own Culture

Numerous refugees are seeking sanctuary or a new home in Germany. A project at the Max Planck Institute for the Study of Religious and Ethnic Diversity is taking a look at what needs and goals the refugees have and how firm a foothold they are gaining in their new life.

### 26 At the Margins

It's easy to overlook the marginalized. Research, too, has so far paid little attention to the phenomenon of social exclusion. Six Max Planck Institutes have now begun to address this issue and have joined forces to study the exclusion of migrants. Their aim is to uncover exclusion and develop fair rules to regulate migration.

### 34 A Model for Greater Togetherness

*La Convivencia* is viewed as a golden age of peaceful coexistence between Muslims, Jews and Christians in medieval Spain. Researchers at the Max Planck Institutes for Social Anthropology and for the History of Science are examining the myth of this period and its possible function as a model for today's world.

**ON THE COVER** It's just a passport with stamps on its pages – but it is what determines who may enter a given country. In the first instance, it is bureaucracy that regulates who may come and who should stay out. Migration, however, often follows different laws when people are fleeing or searching for a better life. Science is investigating the phenomenon, questioning the rules and exploring the conditions for peaceful coexistence of different cultures.

## PERSPECTIVES

- 06** Additional Positions for Excellent Female Scientists
- 06** Innovation to Improve Machine Text Comprehension
- 07** "Moral courage is needed everywhere"
- 08** Twofold Partnership with Harvard
- 08** Fourfold Success
- 09** Amazon Arrives in Cyber Valley
- 09** On the Net

## VIEWPOINT

- 10** **The Power of Humiliation**  
Rituals of degradation have been used throughout the ages as a means of exercising authority. But modern society has developed new methods for publicly stigmatizing outsiders, as our author describes.

## FOCUS

- 18** Every Room Is Its Own Culture
- 26** At the Margins
- 34** A Model for Greater Togetherness



**48** In the tunnel: Electrons dart across a 3.4-kilometer-long track at DESY, generating X-ray flashes.



**56** In the area: House mice are masters of adaptation. They are at home in the steppes and on tropical islands.



**64** In the lab: Unlike the name suggests, nanosensors require a large experimental setup.

## SPECTRUM

- 42** Beautifully Sad
- 42** Recipe for a Comet
- 43** Bacteria Replace Laboratory Animals
- 43** Revenge Is Sweet
- 43** Stop Signals in the Brain
- 44** El Niño Intensifies the Greenhouse Effect
- 44** Gravitational Waves from Neutron Stars
- 45** Light Makes Algae Sticky
- 45** Flying South Pays Off
- 45** Looking Deep into the Heart of Stars
- 46** On the Leash!
- 46** Sand Is a Paradise for Bacteria
- 46** Less Fertilizer Decreases Fine Particulate Matter
- 47** Less Stress, More Social Competence
- 47** Fibers Spun from Slime

## PHYSICS & ASTRONOMY

- 48 Crystals under Control**  
To alter properties of material with light as if with the wave of a magic wand: that is the mission of researchers working at the Max Planck Institute for the Structure and Dynamics of Matter. They are using lasers to change the behavior of crystals, fleetingly producing superconductors.

## BIOLOGY & MEDICINE

- 56 Mice Are Here to Stay**  
Wherever people live, there are mice. It thus seemed obvious to scientists at the Max Planck Institute for Evolutionary Biology that the small rodents would make an ideal model system for investigating how evolution works.

## MATERIALS & TECHNOLOGY

- 64 Biomolecules in Action**  
To date, there has been no method for observing exactly how enzymes and other biomolecules function. A group at the Max Planck Institute for the Science of Light has now succeeded in doing just that – using a plasmonic nanosensor.

## ENVIRONMENT & CLIMATE

- 72 Rooted in the Forest**  
Personal Portrait: Henrik Hartmann

## REGULAR FEATURES

- 03 On Location**
- 16 Post from – the Irish Sea**  
Braving the Forces of Nature
- 80 Flashback**  
Splitting Atoms in the Beer Cellar
- 82 Max Planck Community**
- 82** An Alternative View of Art
- 83** To Kuwait and Back
- 83** Research Summit in Mexico
- 84** The History of the Theory of Everything
- 85** Max Planck Schools Develop International Presence
- 85** Call for Meitner Group Applications
- 86** Successful Communication Event
- 87 Research Establishments**
- 87 Publisher's Information**