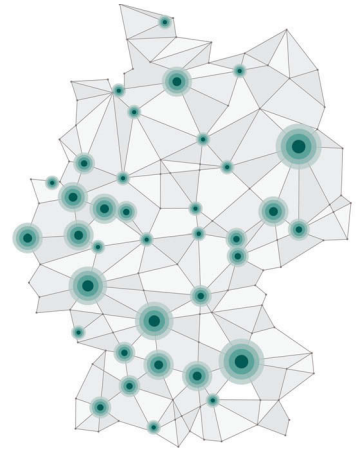




Contents



18 AGING

10 Focused: Martin Stratmann recommends bundling excellence into cross-regional networks.

18 Living in Fast Motion

The turquoise killifish, *Nothobranchius furzeri*, lives for only a few months, then its biological clock runs out. During that time, it passes through every phase of life, from larva to venerable old fish. Its brief life expectancy – unusual for a vertebrate – has long fascinated Dario Valenzano of the Max Planck Institute for Biology of Ageing in Cologne. In just ten years, he has turned it into a model organism for research on aging.

28 A Hint of Immortality

Eternal life? The freshwater polyp *Hydra* comes quite close to this ideal. In a long-term experiment initiated by former Director James W. Vaupel, Ralf Schaible from the Max Planck Institute for Demographic Research in Rostock investigates why, under certain circumstances, the polyp doesn't age.

34 Retirement Comes of Age

Compulsory retirement for mayors at 65? Too old to embark on a career as a firefighter at 30? Age limits seem out of tune with the times – even virtually discriminatory. Yet there is one age limit that most people are happy to hold onto: retirement age. Ulrich Becker, Director at the Max Planck Institute for Social Law and Social Policy in Munich, studies the characteristics of age-specific regulations and their legal intricacies.

ON THE COVER Practically all organisms and living things must submit to the natural aging process. But how does it occur? The researchers whose work we report on here are studying fish or a freshwater polyp that has nearly achieved immortality. And they grapple with the social consequences of aging in humans – when an active working life ends and retirement begins.

PERSPECTIVES

- 06** Insights and Exchange in Berlin
- 06** Springer Takes Over Open Access Journals
- 07** "Chaperones seal landfill sites"
- 08** New Max Planck Centre in Canada
- 08** Physics Until You Drop
- 09** Sweet Vaccines on Track for Application
- 09** On the Net

VIEWPOINT

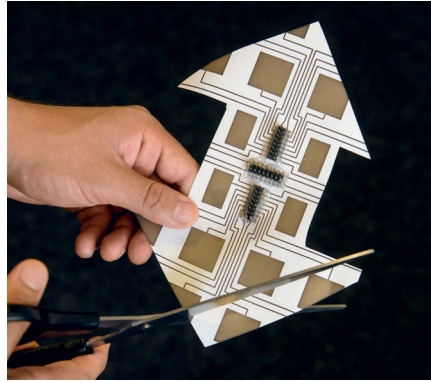
- 10** **We Have to Refocus Excellence**
How can we further advance German cutting-edge research vis-à-vis international competition? By improving excellence! Cutting-edge research and good basic education are not a contradiction.

FOCUS

- 18** Living in Fast Motion
- 26** Infographic: The Diversity of Aging
- 28** A Hint of Immortality
- 34** Retirement Comes of Age



46 Launched: Stuart Parkin is setting up a new department at the Max Planck Institute of Microstructure Physics.



54 Snipped: A pair of scissors can bring this sensor into nearly any shape and size.



60 Collected: In the Jena Experiment, researchers study how species diversity affects ecosystems.

SPECTRUM

- 40** Late Risers Are Cheated On More Frequently
- 40** A Black Hole Under the Gravitational Lens
- 40** Alzheimer's Spares Long-Term Musical Memory
- 41** A Multi-Purpose Sensor
- 41** The Neanderthal in Us
- 42** A Switch for Neurons
- 42** Hot Lava Flows on Venus
- 43** A New X-Ray Source for Medicine
- 43** Shorter Lives for the Bold
- 43** In Sync with the Leader
- 44** Diversity in Bloom
- 44** Quasar Quartet Puzzles Scientists
- 45** Customized Carbon
- 45** Actuators That Mimic Ice Plants
- 45** Gene Pattern Betrays the Culprit

PHYSICS & ASTRONOMY

- 46** **The Spin Doctor**
Personal Portrait: Stuart Parkin

MATERIALS & TECHNOLOGY

- 54** **Displays Straight from the Printer**
The prototypes are made from wood, paper and plastic. Cut, printed or pressed. That's just what research looks like when one's efforts are concentrated on a fully interconnected world in which, for example, computing devices are activated via skin-worn sensors.

ENVIRONMENT & CLIMATE

- 60** **Balance in the Biotope**
Biodiversity provides many ecological advantages. Using large-scale field tests, scientists carry out research on biodiversity in meadows and forests, and explore its impacts on ecosystems and the Earth's carbon balance.

CULTURE & SOCIETY

- 68** **The Master Plans of the Mandarins**
The ancient Chinese invented not only fireworks, porcelain and the wheelbarrow, but the precursor of post-its as well. But how is knowledge generated by actions? And what impact does this have on society?

REGULAR FEATURES

- 03** **On Location**
- 16** **Post from – Riyadh, Saudi Arabia**
Old Traditions in a New World
- 74** **Flashback**
When Computers Learned to Compute
- 76** **Community**
76 Nobel Knowledge at First Hand
76 What did you gain from the Meeting in Lindau?
- 78 Prince's Programme Provides Career Springboard
- 79** **Research Establishments**
- 79** **Imprint**