



# Contents



## 18 MUSIC

### 18 Changing Tastes in Music Styles

Rock or *Schlager*? Classical or country? Pop or techno? Musical taste reveals quite a lot about an individual's personality and status. However, listening habits are changing. Melanie Wald-Fuhrmann and her team at the Max Planck Institute for Empirical Aesthetics in Frankfurt am Main are investigating the essence and roots of musical preferences and tracking shifts in musical taste.

### 26 Making Music with Muscles

Thomas Fritz from the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig knows how to make people happy and fearless – essentially as a kind of welcome side-effect. He conducts experiments using exercise machines with which you can make music. Simultaneously exercising and creating unique sounds not only reduces bodily exhaustion, it also puts the user in a good mood and lowers their anxiety and pain levels.

### 32 The Musical Score of Emotions

Music arouses emotions. But exactly what people feel when listening to a piece of music and how they express these feelings is influenced mainly by the times they live in and their culture. A research group led by Sven Oliver Müller at the Max Planck Institute for Human Development in Berlin has carried out research on the changing emotions in Europe's musical life.

**ON THE COVER** If the surveys can be believed, about a quarter of all Germans listen to music for one hour every day. Young people, in particular, do so in public – teens with more or less conspicuous headphones are an everyday sight in subways and on the streets. This is reason enough for our magazine to dive deeper into the subject of music. In this issue we look at listening habits, emotions and moods. The researchers turned up some surprising information.

## 46 Cooled down: For electron microscopy images, the proteins must first be shock frozen.

### PERSPECTIVES

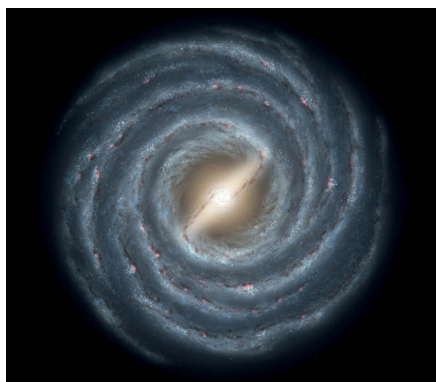
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For weeks the influx of refugees has continued to surge. Thousands of people have set out on foot in hopes of reaching Europe. The mass immigration of refugees will fundamentally change Germany. But the question is: How?

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## BIOLOGY & MEDICINE

- 46** **Nano-Sized Lethal Injection**  
In movies, 3-D effects are spectacular. And for researchers, too, three-dimensional images definitely have a certain appeal. For instance, electron microscopes enable them to determine the position of individual atoms with great precision – and to study the spatial structures of proteins.

## PHYSICS & ASTRONOMY

- 54** **Archaeology of the Milky Way**  
The universe has billions and billions of galaxies. One of them, our Milky Way, serves as a “model organism” for the formation and evolution of galaxies. It was recently found that quite a number of earlier ideas about our galaxy have to be revised.

## MATERIAL & TECHNOLOGY

- 62** **A Scientist with a Sweet Tooth**  
Personal Portrait: Peter Seeberger

## ENVIRONMENT & CLIMATE

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Life on Earth stagnated for billions of years in the stage of primitive single-celled organisms. Only when cells acquired a nucleus did things really take off, leading to diversification and the dazzling variety of life forms we see today. How, when and where did that happen?

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