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The pharmaceutical industry is shying away from the development of new drugs – especially when it comes to diseases affecting people in developing countries. Peter H. Seeberger analyzes the reasons for this and presents some approaches to solving the problem.

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18 MATERIALS SCIENCE

Nanoelectronics

18 Calculating with Carbon

Flexible, printable and affordable – these are the properties molecular electronics promise. Scientists at the Max Planck Institute for Polymer Research are paving the way to optimizing organic substances for use in solar cells, light-emitting diodes and memory chips, and are using molecular materials to develop electronic components for the future.

26 Quantum World in a Cube

Nanostructures surprise scientists again and again with exotic quantum effects. Using ultrasensitive instruments, experts at the Max Planck Institute for Solid State Research explore the peculiar properties of electrons in the tiniest dimensions. They are interested in, for example, current transport without resistance in superconducting nanostructures, and the fundamentals of spintronics.

34 Chips from a Sheet

Graphene is considered a versatile superhero of materials science. With a thickness of just one atomic layer, these carbon layers have extraordinary mechanical and electronic properties. How the chemical structure determines the material's physical behavior is one of the questions scientists at the Max Planck Institutes for Polymer Research and for Solid State Research are investigating.

ON THE COVER: The network of carbon atoms in graphene is reminiscent of chicken wire. The irregular wave structure is thought to be one possible reason why graphene is so stable. It's more tear-resistant than any other material, and possesses unusual electronic properties.



48 Middle way: Sandra Kortner manages to reconcile family life with her career as a nuclear physicist.



64 Solution path: Mathematics helps resolve the conflict surrounding herbicides used in Colombia.



72 Trade route: Traditional traders profit from Vietnam's economic boom only to a limited extent.

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Personal Portrait: Sandra Kortner

BIOLOGY & MEDICINE

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The sculpins at the Max Planck Institute for Evolutionary Biology are no beauties. Nevertheless, these fish, which were first discovered in the Lower Rhine in the 1990s, fascinate researchers.

ENVIRONMENT & CLIMATE

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It was difficult to determine whether the government of Colombia harmed Ecuadorian farmers by spraying herbicides on coca plantations near the border. Scientists at the Max Planck Institute for Dynamics of Complex Technical Systems simulated how the substances drift.

CULTURE & SOCIETY

- 72** **No Network, No Business**
Vietnamese markets aren't just places for goods to change hands; they also comprise complex webs of social relationships and political structures. These aspects are a key focus of researchers at the Max Planck Institute for Social Anthropology in Halle.

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