

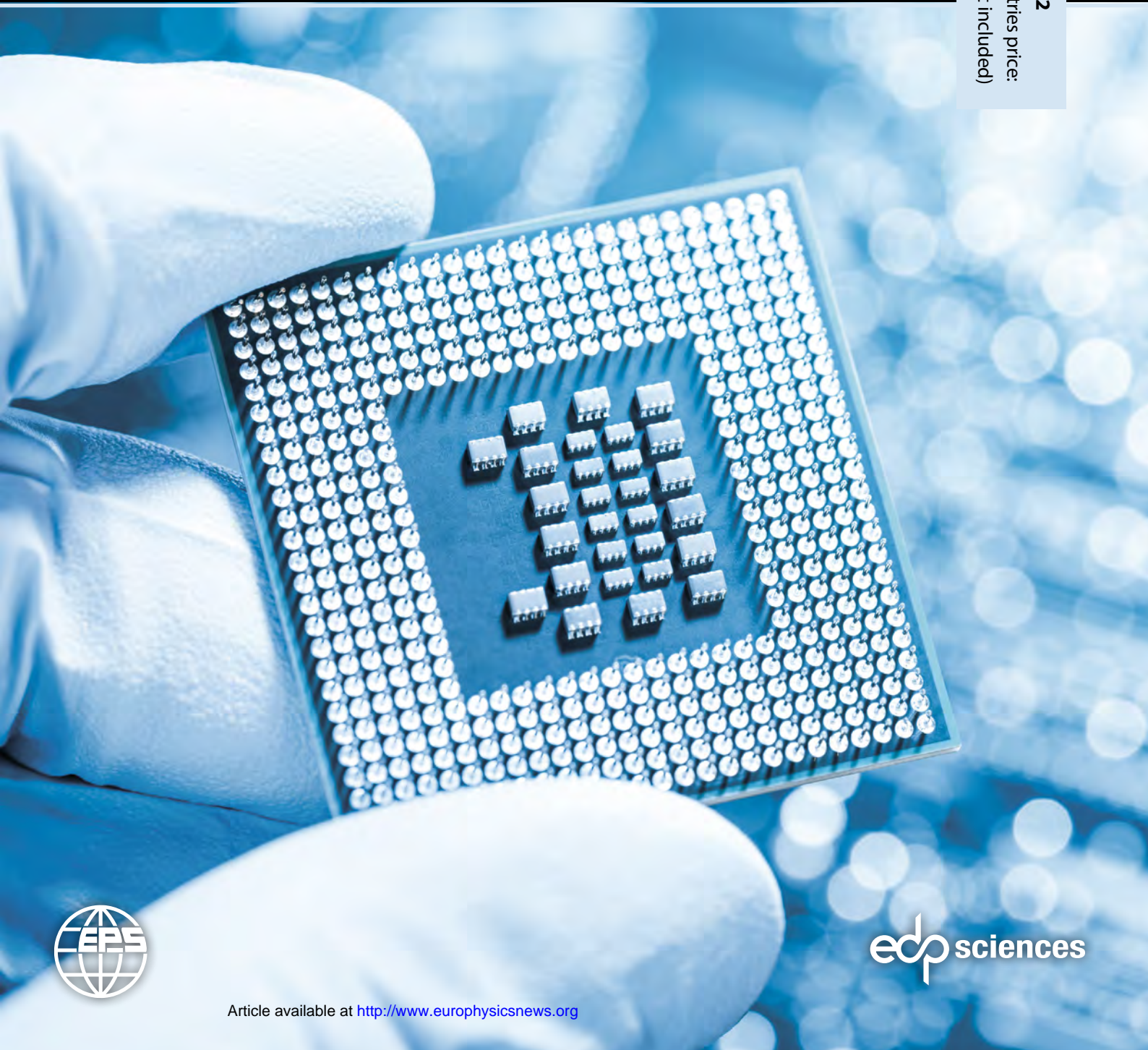
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THE MAGAZINE OF THE EUROPEAN PHYSICAL SOCIETY

**The evolution of IBM Research
Mobility and payload
Fantastic plastic makes the quantum leap
100 years of Philips Research
Is Open Access really good for science?**

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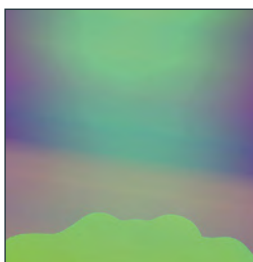
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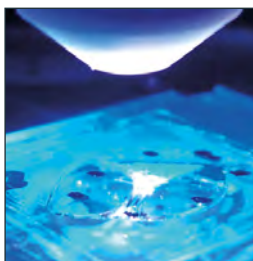
▲ PAGE 16

The evolution of IBM Research



▲ PAGE 23

Plastic makes the quantum leap



▲ PAGE 27

100 years of Philips Research

EPS EDITORIAL

03 Hello EPN // V.R. Velasco

NEWS

04 Historic sites: Niels Bohr Institute
06 Historic sites: the Cathedral

HIGHLIGHTS

09 Graphite/CdMnTe Schottky diodes and their electrical characteristics
Einstein's conversion from a static to an expanding universe
10 Multifractal analysis of breast cancer IR thermograms
Optimising custody is child's play for physicists
Hamiltonian walks and applications to protein folding
11 MINOS: a vertex tracker for in-beam spectroscopy of exotic nuclei
Quasi-effective medium theory for multi-shell systems?
12 Elucidating biological cells' transport mechanisms
Sharpening the focus in quantum photolithography
13 Carbon dating uncovers forged Cubist painting
Subrecoil cavity cooling towards degeneration
14 How hypergravity impacts electric arcs
Finding and verifying quantumness in "classical" states
15 Ferroelectric tunnel junction for memory and logic design
Einstein's forgotten model of the universe

FEATURES

16 The evolution of IBM Research
C. Sciacca and C. Rossel
22 Physics in daily life: mobility and payload
L.J.F. (Jo) Hermans
23 Fantastic plastic makes the quantum leap
T. Stöferle and R.F. Mahrt
26 Letter: about "scientific consensus on climate change"
A. Bettini
27 100 years of Philips Research
D. van Delft

OPINION

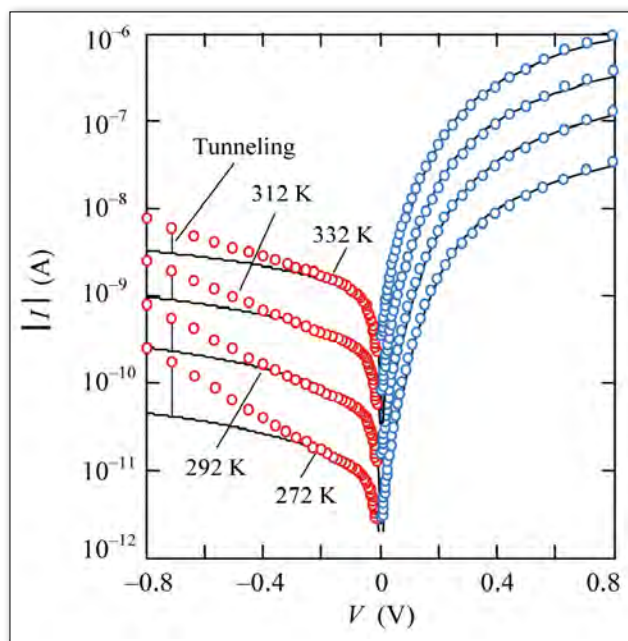
32 Is Open Access really good for science? // A Kastberg

Highlights from European journals

CONDENSED MATTER

Graphite/CdMnTe Schottky diodes and their electrical characteristics

CdTe is a basic material for X- and γ -ray detectors, which are widely used in various areas. However, the leakage current in these devices at room temperature is too large, which precludes a high energy resolution in the measured spectra. In the 1990s, Cd_{1-x}Zn_xTe alloy with a wider band gap was proposed as a solution, but hopes pinned on it were not fully fulfilled. The search for new materials for the detectors continues and Cd_{1-x}Mn_xTe is considered a promising material.



▲ Comparison of the calculation results (solid lines) with the measured I-V curves (circles) of the graphite/CdMnTe diode at different temperatures.

The main obstacle hindering the application of Cd_{1-x}Mn_xTe in the detectors is the lack of Cd_{1-x}Mn_xTe-based diodes. In this paper we show that Schottky diodes fabricated by the deposition of colloidal graphite have good rectifying properties and low reverse currents. Their I-V curves are described analytically in terms of the generation-recombination theory based on the Shockley-Read-Hall statistics. It is shown that tunneling is responsible for the increase of the leakage currents at higher voltages and ways of its elimination are proposed. ■

■ **L.A. Kosyachenko, R. Yatskiv, N.S. Yurtsenyuk, O.L. Maslyanchuk and J. Grym,**
'Graphite/CdMnTe Schottky diodes and their electrical characteristics', *Semicond. Sci. Technol.* **29**, 015006 (2014)

HISTORY

Einstein's conversion from a static to an expanding universe

Albert Einstein accepted the modern cosmological view that the universe is expanding, only long after several of his contemporaries had demonstrated it with astrophysical observations.

Until 1931, physicist Albert Einstein believed that the universe was static, in line with his 1917 model. Now, the author explains how Einstein changed his mind and adopted the notion of an expanding universe following many encounters with some of the most influential astrophysicists of his generation.

He then fiercely resisted the view that the universe was expanding. For example, in 1922, Alexander Friedman showed that Einstein's equations were viable for dynamical worlds. And, in 1927, Georges Lemaître, concluded that the universe was expanding by combining general relativity with astronomical observations.

▼ Einstein and Lemaître photographed around 1933. Credit: Archives Lemaître, Université Catholique, Louvain.

