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45/2
2014
Volume 45 • number 2
European Union countries price:
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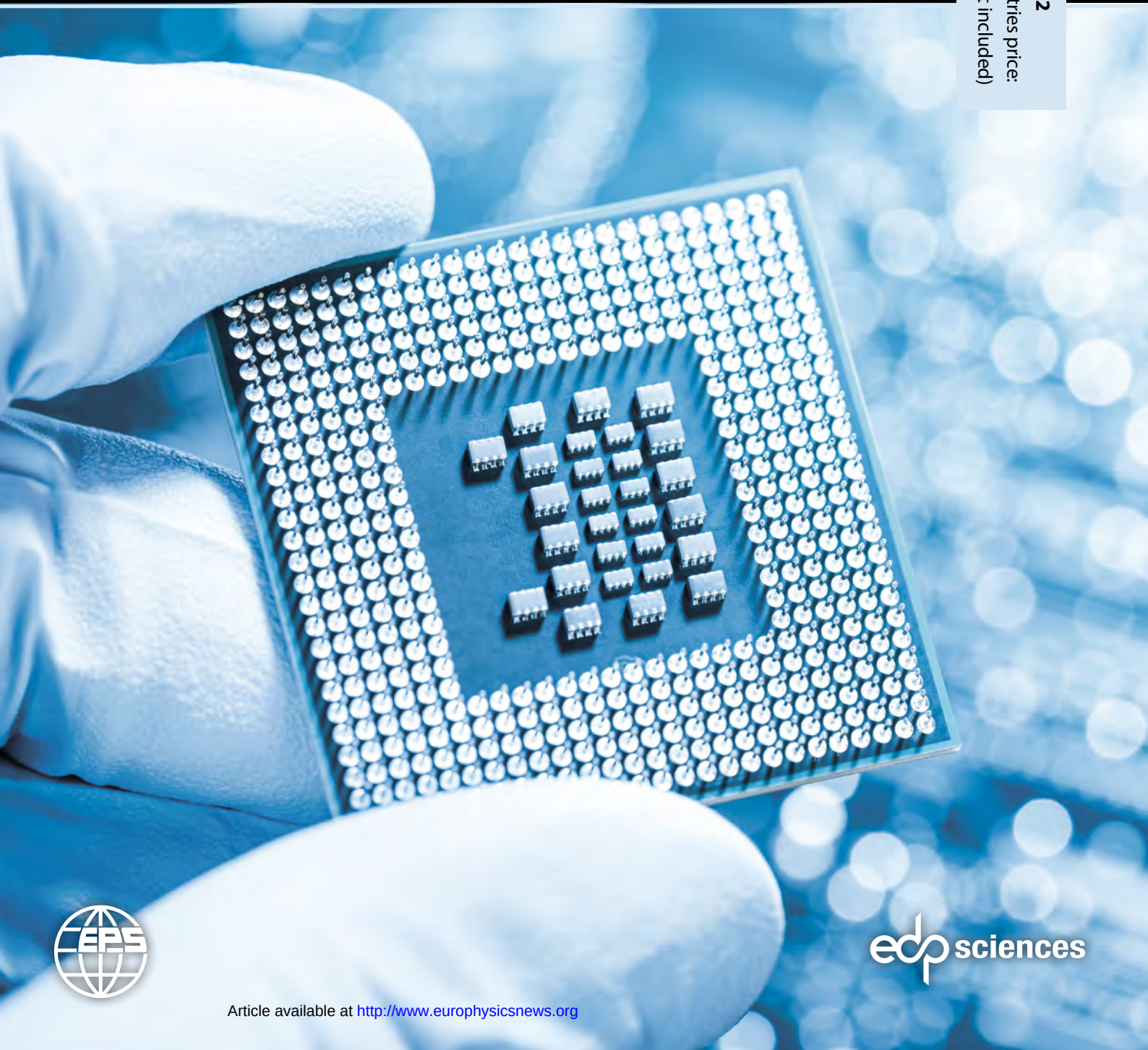

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Cover picture: eectronic technician with glowes holding chip. © iStockPhoto

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Plastic makes the quantum leap

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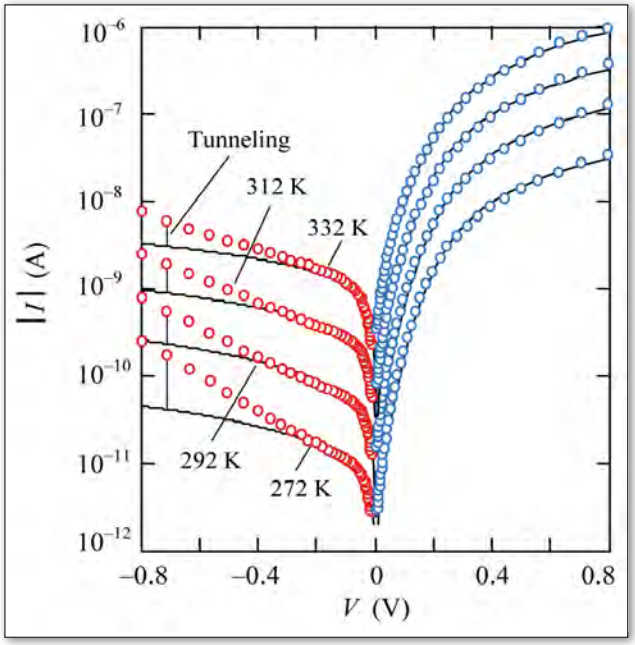
100 years of Philips Research

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.