

Courtesy of Intel Corp.

Optical interconnects
will become a game
changer if we can
combine the high
data rates, reach and
integration of photonic
channels with
practical pricing.

[COVER STORY]

# 24 Integrated Silicon Photonics: Harnessing the Data Explosion

With the digital universe expanding at an exponential rate, silicon photonics is poised to bring fiber optics to a much broader array of data transport applications. Researchers at Intel Labs describe a fully integrated optical data link that assembles all the core technologies needed to develop high-volume, low-cost fiber-optics.

Sean Koehl, Ansheng Liu and Mario Paniccia

#### 30 A Roadmap for Metamaterials

Metamaterials have rapidly advanced over the past few years—from being a paradigm for engineering unique electromagnetic properties to forming a material base for functional devices with tuneable, switchable and nonlinear capabilities. In the future, they will allow for dynamic quantum-effect-enabled systems.

Nikolay I. Zheludev

#### 36 The First Fibers to Homes

Thirty-five years ago this month, Japan's Ministry for International Trade and Industry announced plans to build the world's first fibered city. A two-way fiber-optic network called the Highly Interactive Optical Visual Information (Hi-OVIS) was far ahead of its time.

### 44 The Metamorphosis of the Transistor into a Laser

The transistor put us on the path to semiconductor electronics research. It led to the integrated circuit, optoelectronics, light-detecting devices, diode lasers, LEDs, and now further to the transistor laser—a true laser and three-terminal photonic transistor active element.

Milton Feng and Nick Holonyak Jr.

COVER PHOTO: An optical fiber connection is held up to the transmit module of Intel's 50 Gbps silicon photonics link. Courtesy of Intel Corp.



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Spacetime cloak could hide events; stimulated Raman scattering improves video of living tissue; 3-D self-assembling point-source microlasers; optical lift could steer solar sails.

Patricia Daukantas and Yvonne Carts-Powell

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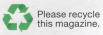
OPN talks with Alan Gara, IBM Fellow, Blue Gene chief architect and OFC/NFOEC keynote speaker.

## 20 The History of OSA

OSA presidents of the early 1960s. John N. Howard

Agência Brasil





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