



### Cover image

A rack of transmission equipment, courtesy of France Telecom.

**Business News p160**

EDITOR: OLIVER GRAYDON

ASSOCIATE EDITORS: DAVID GEVAUX,  
AMBER JENKINS, RACHEL PEI CHIN WON

PRODUCTION EDITORS: SIMON GERRARD,  
CHRIS GILLOCH

COPY EDITOR: ANNA DEMMING

ART EDITOR: KAREN MOORE

# Terabit era

**W**elcome to our second Technology Focus, which this month is dedicated to the topic of optical communications. Whereas in January we described how photonics, in particular LED technology, is redefining the way we illuminate our homes, this time we describe how photonics is transforming the way we pipe data into the home. As consumers increasingly embrace digital data (be it voice-over-Internet-protocol (VoIP), telephony, MPEG videos, MP3 music or JPEG images from cameras), communications networks around the world are having to evolve to keep pace. In effect, two big changes are taking place. The first is that the capacity of intercontinental and national backbone networks needs to scale up enormously. On p157, NTT describe a vision of how optical networks may look in 2015. They expect that within the next 10 years core networks will need to be able to handle around 10–15 Tbit s<sup>-1</sup> — an order of magnitude more than they are capable of today.

In addition, the data-carrying capacity of an individual wavelength will reach the 100 Gbit s<sup>-1</sup> point, and it will be possible to route such wavelengths through the network transparently, with no need for conversion to the electrical domain until the destination point.

The second big change is in the access network where fibre is starting to replace telephone wires as the main communication medium entering the home. As the market analysis article and interview, on p149 and p162 respectively, report, carriers are now deploying fibre on a grand scale so that they can offer their customers next-generation multimedia services, such as video and music on demand, high-definition television, VoIP and high-speed Internet surfing. Offering a combination of these services means that consumers may need in excess of 50 Mbit s<sup>-1</sup> connections entering the home, which is hard for electrical connections to handle, but relatively easy for photonics. Last but not least, is the tantalizing glimpse of how photonics could soon be wiring up computers and electronics as the need for ever faster data interfaces continues. Intel presents its thoughts on the future on p153.

Don't forget to keep an eye out for our next technology focus in May, which will concentrate on display technology.

## MARKET ANALYSIS

- 149** **Driving fibre closer to the home**  
*Ken Twist*

## RESEARCH HIGHLIGHTS

- 151** **Fast silicon modulators and dispersion monitoring**

## INDUSTRY PERSPECTIVE

- 153** **Interconnects: Wiring electronics with light**  
*Andrew Alduino and Mario Paniccia*
- 157** **Networks: Optical-transport networks in 2015**  
*Masahiko Jinno, Yutaka Miyamoto and Yoshinori Hibino*

## BUSINESS NEWS

- 160** **Market recovery, equipment and more**

## PRODUCT HIGHLIGHTS

- 161** **Transceivers, lasers and optical switches**

## INTERVIEW

- 162** **Light pipe to the home**  
*Darsh Sandhu*

nature  
photonics