

Direct write

Marshall Media Inc has successfully demonstrated 201GB ROM optical media 'direct write' technology capability, creating 70nm n lines between 40nm space tracks for use with next generation blue-violet laser diodes.

"The company's patented MMI-Burn Technology provides 15 times higher density than Blu-Ray and faster CD and DVD manufacturing with superior duplication quality. The company plans to incorporate the MMI-Burn technology into its automated On-Demand manufacturing and packaging system in 2005," said founding CEO, Charlie Marshall.

The present industry standard for the duplication process of a CD is 1-2 minutes, and for DVD, 12-14 minutes.

Major benefit of MMI-Burn is that it uses a 'non-contact' duplication process that places the content on each disc in a tenth of a second, at the same time providing 'master disc' quality for every disk.

ECOC without glitter

"We are growing some volume, but buying is not fast enough." Bookham's CEO, Giorgio Anania, was talking after the ECOC show in Sweden. His first comment was to regret that this fell on the US Labour day weekend. "At the end of September we would have seen more people. As it was there were no tourists, no bankers, and no 'world negative on high technology,' only those who want to do business, in an efficient place to see ten people in a day."

Noting the industry advancement of pluggable optics, he said, "Tunable lasers, plugability and subsystems are a big trend," but nothing was "very surprising."

"ECOC has shed the glitter and shows what is coming down the pipe, so customers can get a view and arrange sampling. Shows are becoming more down-to-earth, stands are small to cut costs, and we're hunkered down to a time of low spending, with more

restructuring expected. The battle lines, Anania felt "were between the top three to four players and then some 20-25 others."

Bookham used ECOC to highlight its modulated laser LMC10 Displayed for the first time in Europe, the LCM10p range is to meet present and future market needs especially where 10Gb/s is overlaid on 2.5Gb/s for increased capacity. Designed for 10Gb/s use, the product has a high power continuous wave laser co-packaged with an InP MZ modulator. Exceeding 80km for DWDM use at 10Gb/s is difficult for commercial EA lasers. Bookham's InP MZ performs like LiNbO₃ modulators with beyond 100km reach, but without any dispersion compensation.

A small footprint allows it to be used in system shelves so metro bay density is uncompromised. Bookham plans to add functionality, including an integrated VOA and power monitor so the range targets long-haul use.



Bookham's CEO, Giorgio Anania talks about ECOC 2004.

Among others at ECOC :-

Infineon Technologies AG had an intelligent laser diode driver (LDD) targeting SFF and SFP optical transceivers used for fibre based data storage and telecom systems. It integrates the LDD, PA and diagnostic unit controlling performance over a range of 155Mb/s-4.25Gb/s.

Pirelli showed its tunable optical components (laser, OADM). Adoption of nanotechnologies gives enormous compactness.

Transmode Systems AB, had a major enhancement to its 1100 WDM, with pluggable DWDM optics, allowing an upgrade path from CWDM to DWDM.

NTT Corp & NTT Electronics joint advance was development of light sources suitable for in-vivo optical coherence tomography, with NEL starting sales of a high-output, high-bandwidth super luminescent diode (SLD) light source.

Sunrise Telecom Inc showed its Micro OTDR module for verification of fibre networks during construction phase, or troubleshooting during maintenance.

Acree had its Nova demonstrator, a low-cost arrayed transceiver for access networks, electro-absorption modulator arrays for secure free-space optical communication and QW IR photo-detector arrays for thermal imaging.

The **European Conference for Optical Communications** moves to Glasgow in 2005 as does the **IPRM Conference**.

Control of GaN nano wires

A team at the Lawrence Berkeley National Laboratory and the University of California at Berkeley has been able control the direction in which a GaN nanowire grows, which is critical to determining electrical, thermal conductivity and other important properties. Peidong Yang, a Berkeley Labs Materials Sciences Division chemist and professor with UC Berkeley's Chemistry department, led the research.

Already, single-crystal GaN nano wires and tubes show promise in blue LEDs, short-wavelength UV nano-lasers, and nano-fluidic biochem sensors. The team grew single-crystal GaN nano-wires using MOCVD. The key

to the new control is the selection of a substrate.

"In nano wires made from the exact same GaN material grown on different substrates, the light emission of the wires was blue-shifted by 100meV. We believe the emission difference is a clear manifestation of the different crystal growth directions," says Yang.

The group used substrates of lithium aluminium oxide and magnesium oxide. The crystals of both materials are geometrically compatible with GaN crystals, but the LiAlO features a two-fold symmetry that matches the symmetry along one plane of the GaN crystals,

whereas the MgO has a three-fold symmetry that matches GaN symmetry along a different plane. When GaN vapour condenses on either substrate, the resulting nano-wires grow perpendicular to the substrate, aligned in a direction unique to each substrate.

Because of the different growth direction, cross-sections of the GaN nano-wires on lithium aluminium oxide form an isosceles triangle, while cross-sections of those grown on magnesium oxide are hexagonal. Yang believes his group are within a few months of being able to produce a LED, a transistor, or a hybrid nano-wire-thin film laser.