New Chiral Photonics Coupler Technology Could Assist in Enabling Tomorrow's Silicon Photonics

Advancement in using tapered coupler instead of lensing for low-loss integration of disparate photonic devices

PINE BROOK, NJ – 22 April, 2008: Silicon photonics, considered by many to be the future of computing, and a host of other new applications also built around high refractive index contrast structures as well, can now be more efficiently connected to mainstay low index contrast fiber thanks to a breakthrough by Chiral Photonics scientists.

In a recently issued patent, Chiral Photonics researchers describe the photonics behind their tapered coupler device, the Helica™ TC. The Helica TC consists of two concentric cores and a cladding. While the two cores have low index contrast, the outer core and the cladding have high contrast. At input the low index contrast cores facilitate low-loss connectivity to standard fibers. The fiber then tapers down over its length, eliminating the inner core by the output end. At the output end then, high index contrast enables low-loss connectivity to high index contrast structures such as planar waveguides.

This interconnect exploits a dual-core fiber design to allow light from a conventional low numerical aperture fiber to be efficiently endface-coupled into another waveguide with smaller mode field dimensions and higher numerical aperture. By permitting index-matching compounds to be used between the coupler and waveguide and eliminating the need for microlens-based coupling and air gaps, the Helica TC affords uniquely low loss and system stable integration. The technology supports both polarizing and polarization maintaining coupler variations.

High index contrast structures within photonic integrated circuits or planar lightwave circuits (PICs and PLCs) form the basis for a large fraction of the recent worldwide innovation in integrated optics. Via highly efficient lasers, extremely sensitive sensors, and waveguides moving vast amounts of data through small radius bends, these faster, smaller, and power-conserving PICs and PLCs promise to advance everything from consumer electronics to personal computing. PICs and PLCs stand to bring more sensitive and less invasive biomedical diagnostics, feed ever more information to wireless devices, and refine industrial processes from drug development to navigation systems.

Chiral Photonics released the Helica TC in late 2007. Developers of next-generation optoelectronics already employ it to couple standard fiber to planar waveguide devices and photonic nanostructures, as well as in other research. "We believe this is a significant enabling technology for planar nanophotonics and in the field of high index contrast photonics more generally," said Victor Kopp, Chiral Photonics' Director of R&D. "In addition to the endface and evanescent coupling devices we are currently supplying, we plan to use this technology to introduce a passive alignment solution for board-to-board and chip-to-chip interconnects."

About Chiral Photonics

Chiral Photonics, Inc. is the world-leading provider of in-fiber photonics. Chiral Photonics fulfills the photonic world's demand for performance and ease of integration by uniting the unparalleled functionality of optical fiber with low-cost, high-volume manufacturing across a full array of sensor, filter and laser products. Similarly, Chiral Photonics is developing a monolithic laser array solution to meet the emissive, high color quality needs of the projection display industry in a polymeric thin-film format.

Chiral Photonics was founded in 1999 by a team of recognized researchers and technology managers drawn from academia and industry. The company, in addition to its more than 30 patents issued and pending, has won numerous awards and grants including a Red Herring 100 designation and awards from the National Science Foundation which commended chiral technology as possibly, "one of the most significant recent advances in the field of polarization and wavelength control." Chiral Photonics has begun shipping its third commercial product, a tapered fiber coupler, the Helica TC.

Chiral Photonics is headquartered in Pine Brook, NJ. More information on Chiral Photonics can be found on the company's web site: www.chiralphotonics.com.

Contact Information:
Gary Weiner
Chiral Photonics
973-732-0030 Ext. 114
gweiner@chiralphotonics.com