DIPARTIMENTO DI FISICA "E.Fermi"
UNIVERSITÀ DI PISA
CORSO DI DOTTORATO IN FISICA
Largo B.Pontecorvo,3 - Edificio B-C
56127 PISA - ITALY

CORSO DI DOTTORATO IN FISICA
AVVISO DI SEMINARIO

Venerdi 25 Giugno 2010
ore 11:30

Dipartimento di Fisica
Sala 248 - I piano - Ed. C

Prof. A.Clarkson

Optoelectronics Research Centre
University of Southampton

"High Power Thulium Fibre Lasers: Recent Developments and Future Prospects"

Abstract: Progress in scaling output power and brightness from cladding-pumped fiber lasers and amplifiers has been dramatic. To date most of the attention has focused on Yb-doped silica fiber sources operating in the ~ 1 μm wavelength regime. Recent demonstrations of cladding-pumped Yb fiber lasers with single-mode output powers in the kilowatt regime and with very high overall efficiency serve as an impressive demonstration of the power scaling potential of fiber technology. Tm-doped silica fiber lasers also offer the prospect of very high output power with a number of added attractions. A particularly useful feature of Tm-doped silica fibers is the very broad emission spectrum, which allows flexibility in operating wavelength from ~1725 nm to ~ 2100 nm. This is by far the broadest range of operating wavelengths reported for any rare earth doped fiber laser. The combination of flexibility in operating wavelength and high output power is useful for a range of applications and provides an excellent starting point for nonlinear frequency conversion to the mid-infrared spectral regime. A further attraction of Tm-doped fibers is the ability to scale to much larger mode areas than for Yb-doped fibers whilst maintaining single-mode operation by virtue of the longer operating wavelength. This is a feature that has so far received little exploration, but promises to yield levels of performance in cw and pulsed mode of operation that far exceed the capabilities of Yb-doped fiber sources. Scaling to much higher power looks feasible, but there will be a number of challenges, particularly for more complicated master-oscillator power-amplifier (MOPA) architectures. This presentation will review recent progress for both oscillator and MOPA architectures and will consider the prospects for further improvement in performance.

M.Tonelli