



## Postdoc Positions Available

### Electromagnetic Fields and Photonics Group Department of Information Engineering of the University of Brescia

We are pleased to announce the availability of two junior postdoc/research studentship positions at our group on the following research themes:

**a) Study of nonlinearities in periodically poled silicon waveguides for new mid-infrared laser sources**

The aim of the project is to extend silicon photonics functionalities, by endowing silicon waveguides with novel nonlinear responses through the application of strain. We will apply the concept of quasi-phase matching to second order optical nonlinearities in silicon photonics waveguides, thus opening the way to the practical application of  $\chi^2$ -based silicon photonics. The postdoc researcher will be involved in the development of a novel theoretical framework describing stress distributions in distributed in the silicon waveguides, and how such distribution are translated into second-order nonlinear susceptibility tensors, as well as in the modelling of frequency conversion in periodically poled silicon in the presence of both a second- and third-order nonlinearity. *Nature of funding: 2009 Cariplo Foundation grant on "Scientific and Technological Research on Advanced Materials"*

**b) Nonlinear cross-polarization interactions in photonic devices and systems**

This project is devoted to exploring theoretical aspects and industrial applications of polarization cross-interactions among different optical signals propagating in both deterministic and random nonlinear optical fibers. We will consider counter-propagating waves in single-mode fibers with identical or different carrier frequencies, and co-propagating channels with different frequencies. Particular applications will be nonlinear polarization interactions among multiple channels in wavelength-division-multiplexed (WDM) transmissions, and polarization attraction effects in fiber optics Raman amplifiers. *Nature of funding: "Scientific Research Projects of Relevant National Interest" (PRIN 2008)*

Both positions mainly involve theoretical analysis and numerical modelling work. However the two activities are carried out in the frame of national collaborative projects with leading Italian laboratories where related experimental demonstration activities will be performed. Therefore candidates who have demonstrated abilities (for example in their PhD thesis work) in carrying out both theoretical and experimental research are particularly sought for.

Expected starting date: from April 2010 onward. The initial contract will be for one year, with possibility of renewal to a second year. The net monthly salary will be of about 1250euros.

Please email applications (by March 31<sup>st</sup>, 2010; late applications might also be considered), including a motivation letter and a CV to:

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