2013/2014 CALL FOR APPLICATIONS
DOCTORAL SCHOOL IN ENGINEERING
"Mechanical and Industrial Engineering"
University of Rome "Roma Tre"

1 PhD Position in FP7 large-collaborative project.
In the framework of the FP7 large project ISTRESS (http://www.stm.uniroma3.it/iSTRESS), entitled "Pre-standardisation of incremental FIB micro-milling for intrinsic stress evaluation at the sub-micron scale", one PhD position is available in the Department of Engineering at the University of Rome, Roma Tre (Material Science group).
The PhD project is entitled: **Assessment of stress gradient in nanostructured and amorphous materials: high resolution experiments and modeling**.
The project aims at developing innovative high resolution and automated procedures for the measurement of micro- and nano-scale residual stresses in amorphous materials and thin films.

Starting date:
January 1st, 2014

Scholarship description:
The main concept of this project iSTRESS is to develop and promote pre-standardization of an innovative, highly reproducible and automated family of protocols for the measurement and analysis of residual stress at the sub-micron-scale, which affect the properties and lifetime of a wide range of micro/nanostructured and amorphous materials, thin films, MEMS devices and engineering coatings. Despite these urgent industry requirements, the assessment of the residual stress in sub-micron volumes is still an extremely challenging task, especially in the case of nano-crystalline, strongly textured, complex multiphase or amorphous materials and thin films.
The methodology will be based on incremental focused ion beam (FIB) micro-milling, combined with high-resolution in situ Scanning Electron Microscope (SEM) imaging, a full field strain analysis by digital image correlation (DIC) and analytical/numerical models for residual stress calculation.
The main activities of the PhD student will be focused on the implementation of automated procedures for DIC/FEM calculations after FIB micro-milling, with advanced applications on Bulk Metallic Glasses and multi-layered thin films.

The student will be effectively introduced in the research/industry network of the project iSTRESS, which comprises high level academic, multi-national industry partners (Bosch, Thales, Tescan) and a large number of associated industry partners (including Rolls-Royce, EDF and GLOBALFOUNDRIES).

Eligible PhD candidates must preferably have a background in at least one of the following fields: materials science, physics, mechanical engineering, structural engineering, microelectronics, process engineering.
Candidates with a different background from those listed above, but that have experimental or theoretical experience in one of the following topics: Finite Element Analysis for the modeling of mechanical behavior of materials, Matlab programming, nanomechanical testing of materials, Electron Microscopy.

How to apply:
For pre-selection and additional information: send your motivation letter + detailed CV + 2-3 names of referees (name, email) to dr. Marco Sebastiani: seba@stm.uniroma3.it
Online application forms available from the end of July at: http://host.uniroma3.it/uffici/ricerca/