POLITECNICO DI MILANO

# PhD in SCIENZE E TECNOLOGIE ENERGETICHE E NUCLEARI / ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY - 39th cycle

## THEMATIC Research Field: MICRO AND NANOSTRUCTURED MATERIALS

| Monthly net income of PhDscholarship (max 36 months) |
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| **€ 1400.0**<br>In case of a change of the welfare rates during the three-year period, the amount could be modified. |

| Context of the research activity | |
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| **Motivation and objectives of the research in this field** | Fabrication of innovative nanostructured thin films and surfaces, their physical characterization (e.g. morphology, structure and electronic/optical properties) and computational modelling. Focus of the new PhD program will in one of the following topics:<br>a) nanomaterials for applications in nuclear fission and fusion systems;<br>b) nanomaterials for photovoltaic, catalysis, sensing and thermoelectric applications;<br>c) nanomaterials for superintense laser-matter interaction;<br>d) novel carbon-based nanomaterials<br>e) atomic scale surface science of novel 2D nano-heterostructures. |
| **Methods and techniques that will be developed and used to carry out the research** | Material production by physical deposition techniques (e.g. pulsed laser ablation); material characterization mainly by spectroscopy and scattering techniques (Raman, Brillouin, X-ray) and high-resolution microscopy techniques (scanning tunneling and atomic force microscopy, scanning electron microscopy). Suitable theoretical and numerical models for materials and plasmas description. |
| **Educational objectives** | Education of people to be launched in the world of research and technology in the field of physics and engineering of materials, able to manage interdisciplinary issues, perform and interpret complex experiments and |

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| | issues, perform and interpret complex experiments and produce new equipment. |
| **Job opportunities** | Private and public R. &D. Highly qualified positions in a wide range of industries related with production, development and use of materials. |
| **Composition of the research group** | 3 Full Professors<br>4 Associated Professors<br>2 Assistant Professors<br>10 PhD Students |
| **Name of the research directors** | A. LI BASSI, M. PASSONI, C. CASARI |

| **Contacts** |
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| Email: andrea.libassi@polimi.it<br>Ph: +39-022399-6316<br>Email: matteo.passoni@polimi.it<br>Ph: +39-022399-3267<br>Email: carlo.casari@polimi.it<br>Ph: +39-022399-6331<br><br>http://www.nanolab.polimi.it<br><br>List of 5 Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research<br>1. Università Milano Bicocca (Italy)<br>2. Università degli studi di Torino (Italy)<br>3. CNR: Istituto di Scienza e Tecnologia dei Plasmi and Institute for Microlectronic and Microsytems (Italy)<br>4. European Research Council &European Innovation Council<br>5. EUROfusion (EU) |

| **Additional support - Financial aid per PhD student per year (gross amount)** | |
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| **Housing - Foreign Students** | -- |
| **Housing - Out-of-town residents (more than 80Km out of Milano)** | -- |

| **Scholarship Increase for a period abroad** | |
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| **Amount monthly** | 700.0 € |
| **By number of months** | 6 |

| **Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information** |
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| ***Educational activities:*** Financial aid per PhD student is available for purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences, instrumentations and computer, etc. This amount is equal to 10% of the annual gross amount, for 3 years.<br><br>***Teaching assistantship:*** Availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.<br><br>*Computer availability:* individual use.<br>*Desk availability:* individual use. |