



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

**THEMATIC Research Field: DIAGNOSTICS DEVELOPMENT FOR PLASMA-WALL INTERACTION STUDIES IN THE DIVERTOR TOKAMAK TEST (DTT) EXPERIMENT.**

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

<b>Context of the research activity</b>	
<b>Motivation and objectives of the research in this field</b>	<p>The study of plasma wall interactions (PWI) is a central issue for the development of future fusion reactors. In this regard, one of the main experiments is the Divertor Test Tokamak (DTT), a fusion machine under construction at ENEA-Frascati. Materials must resist the harsh fusion environment; surface degradation must be contained to avoid polluting the core plasma with impurities from the walls of the fusion chamber. It is thus of extreme importance to characterize the main aspects of PWI (i.e. erosion, deposition, thermal loads, etc.) by a proper and complete diagnostic system. In this framework, mainly through an experimental approach, the PhD project focuses on three aspects: (i) study of the PWI in a tokamak environment, with reference to the DTT experiment; (ii) join the diagnostics development team and start the design and the integration of the PWI diagnostic in DTT; (iii) support the design of PWI diagnostic with measurements and materials characterization in a laboratory environment. The study is supported by ENEA in the framework of the call for service DTT-DIA07-PWI.</p>
<b>Methods and techniques that will be developed and used to carry out the research</b>	<p>The design of suitable diagnostics, either experimentally or through numerical codes, will be in the framework of the DTT diagnostic design team. During the project there</p>



	will be the chance to learn from many skilled and experienced researcher. Characterization of candidate materials proposed for the DTT experiment will be conducted in the ENEA Liquid Metals and Plasma-Wall Interaction laboratory. Facilities such as Thermal Desorption Spectroscopy (TDS), Laser Induced Desorption Spectroscopy (LIDS), as well as several UHV ovens will be available for the scope.
<b>Educational objectives</b>	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 produce new equipment.
<b>Job opportunities</b>	Private and public R. &D. Highly qualified positions in a wide range of industries related with production, development and use of materials.
<b>Composition of the research group</b>	3 Full Professors 4 Associated Professors 2 Assistant Professors 11 PhD Students
<b>Name of the research directors</b>	Matteo Passoni

<b>Contacts</b>	
Email :	matteo.passoni@polimi.it
Phone :	+39-022399-3267

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

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	700.0 €
<b>By number of months</b>	0



**Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information**

**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.

**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.

Computer availability: individual use.

Desk availability: individual use.