



# PhD in SCIENZE E TECNOLOGIE ENERGETICHE E NUCLEARI / ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY - 38th cycle

**THEMATIC Research Field: EXPERIMENTAL STUDY OF INNOVATIVE FULLY/PARTIALLY PREMIXED HYDROGEN BURNERS**

<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>To explore new concepts in combustion systems and to improve understanding of the premixed and partially premixed hydrogen combustion. The main objectives of the research are:</p> <ul style="list-style-type: none"> <li>- to study the effect of the hydrogen injection strategy on the flow field</li> <li>- to study the effect of the hydrogen injection strategy on the flame stability and pollutant emissions</li> <li>- to develop diagnostic and data analysis tools to characterize the hydrogen combustion and flame stability</li> </ul> <p>Furthermore, the research aim to provide a detailed data base useful for CFD validations and the development of 100% H<sub>2</sub> low emissions burners/combustors. The above tasks require extensive use of advanced optical diagnostic techniques for in situ measurements in reacting and non-reacting environments.</p>
<b>Methods and techniques that will be developed and used to carry out the research</b>	<p>Several optical diagnostic techniques (LDV, Stereo-PIV, Background Oriented Schlieren, flame imaging and spectroscopy) are available and specific applications will be explored to better characterize the combustion process, the turbulent mixing and the flow field structure. Advanced mathematical tools for data reduction and data analysis are also needed to carry out the research activity.</p>
<b>Educational objectives</b>	



	To deepen knowledge in the thermo-fluid dynamic phenomena related to combustion systems. Up-to-date skill in advanced optical/laser diagnostic techniques, advanced data analysis tools and research methodologies applied in the fields of experimental fluid mechanics and combustion system.
<b>Job opportunities</b>	Candidates have the possibility of training periods in internationally recognised laboratory, in Europe or USA, and contacts with industrial partners. Satisfactory post-doctoral placement in Industry or University should be easy.
<b>Composition of the research group</b>	0 Full Professors 1 Associated Professors 1 Assistant Professors 0 PhD Students
<b>Name of the research directors</b>	Prof. Fabio Cozzi

<b>Contacts</b>	
<i>Prof. Fabio Cozzi</i>	
<i>email: fabio.cozzi@polimi.it</i>	
<i>Tel. +39 02 2399 8616</i>	
<i>Fax. +39 02 2399 8566</i>	

<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>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<b>Educational activities:</b> 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.