



PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 41st cycle

THEMATIC Research Field: DEVELOPMENT OF INSTRUMENTS FOR SPACE EXPLORATION

Monthly net income of PhDscholarship (max 36 months)

€ 1500.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

The design of instruments for space exploration is experiencing epochal changes because of the challenges due to the introduction of additive manufacturing processes and the massive usage of new AI data processing techniques. Design phases traditionally driven by designer's experience such as optomechanical structures optimization and numerical models validation, can potentially become automatic processes leveraging on the emerging data processing technologies.

Methods and techniques that will be developed and used to carry out the research

The research will focus on the design of optomechanical structures and thermal models' validation. Both processes are commonly based on experienced designers who translate the problems on parametric analysis that through a minimization process provide the optimal parameter set. Starting from this approach the feasibility and advantages of automatic systems will be investigated. The study will be applied to systems and test data available from instruments recently developed or currently under design in the laboratory.

Educational objectives

The candidate will eventually fully master the modelling tools and methods required for the analysis of the measuring systems. Applications to space and industrial environments will be considered. The capability of designing test set-ups and test procedures, developing data processing techniques for measurement validation and uncertainty reduction will be among the developed



	skills
Job opportunities	List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research: INAF (National Institute of Astrophysics), CNR (Italian National Research Council), UNIPD (University of Padua), ASI (Italian Space Agency), ESA (European Space Agency)
Composition of the research group	1 Full Professors 1 Associated Professors 1 Assistant Professors 4 PhD Students
Name of the research directors	Prof. Diego Scaccabarozzi

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	750.0 €
By number of months	6

Stage and period abroad	
Institution or company where the candidate will spend the period abroad (name and brief description)	
By number of months abroad	0

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of € 6.114,50.</p> <p>Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 750 euro/month- net amount). Additionally, PhD candidates who spend at least 3 months abroad are</p>



eligible for an extra reimbursement of €3,000 to cover travel expenses.

Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD candidate. 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.