

Post-doctoral researcher on Astrodynamics and GNC

12 months (extendable)

Context

World leader in higher education and research in the field of aerospace engineering, ISAE-SUPAERO offers a complete and unique range of high-level scientific trainings including ISAE-SUPAERO engineering training, apprenticeship training, international Master of Science in Aerospace Engineering. ISAE-SUPAERO develops a research policy resolutely oriented towards the future needs of the aerospace and/or high-tech industries.

The scientific activity of the Department of Research and Educational Resources is organized within 6 training and research departments, including the Aerospace Vehicle Design and Operation Department (DCAS). The DCAS conducts training and research activities related to the development of engineering models, methods and tools for the design and operations of aeronautical and space vehicles. DCAS researchers are divided into 4 research groups (Design of Aeronautical Vehicles, Space Advanced Concepts Laboratory (SaCLaB), Decision and Control, Neuroergonomics and Human Factors).

DCAS research activities in the design and operation of space vehicles address the challenges of modelling, optimization and control of space vehicles, performance analysis, space mechanics, mission analysis, space systems operations as well as advanced concept architectures. DCAS space systems design activities are carried out in collaboration with the other research departments of ISAE-SUPAERO.

The SaCLaB is an interdisciplinary research team dedicated to future space concepts, supported by Airbus DS and Ariane Group and space agencies, with international collaborations. The research topics are as follows: orbital systems (in-orbit servicing, active debris removal), exploration (space bases, human-rover interaction), access to space (space transport systems, propulsion) and monitoring of the space. Some examples of scientific disciplines within SaCLaB are: astrodynamics, optimization, propulsion, systems engineering, artificial intelligence, robotics, neurosciences

ISAE-SUPAERO is recruiting a one-year (extendable) post-doctoral fellow at DCAS to join the SaCLaB team, in support of mission analysis and space mechanics activities, in order to participate to the development, testing and validation of SEMpy (Sun-Earth Moon in Python), opensource library in astrodynamics. One objective is also to go beyond SEMpy and contribute to the articulation of a systematic framework of software development. 60% will be dedicated to research, the rest is for miscellaneous tasks to support SaCLaB on teaching and administrative activities.

Missions

Within the SaCLaB, this post-doctoral position has two main missions: participation in research on interplanetary transfers (Earth-Moon, Earth-Mars and asteroids) and development and validation of the SEMpy code. Other research astrodynamics and GNC research topics will be considered. The position holder is expected to supervise students and trainees and may occasionally participate in ISAE-SUPAERO teachings. He/She will be able to promote research results through communications and publications in high-level journals.

Profile

The candidate holds a doctoral degree. He/She has acquired through his training or through his professional career (doctoral thesis) a strong culture and experience of software development for the space domain. Experience in space mechanics will be very appreciated.

Determining criteria in the selection of the candidate:

- Proficiency in object-oriented programming (Python)
- Best practices in software development: code versioning (git), testing, continuous integration
- Ability to conduct research and promote the results
- Ease and efficiency in teamwork, relational, listening and communication skills
- Fluency in written and oral expression in English

Contacts

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Application is opened until mid-June 2022.