

Internship / Master Thesis Proposal – 4 to 6 months

Title: Testing and Integration for the IonSat project

Context of the internship

The Centre Spatial de l'École polytechnique (Space center of École polytechnique, CSEP), created in 2010, proposes and supervises space projects for École Polytechnique students. It developed one of the first French student nanosatellites: X-CubeSat, launched into orbit on May 17, 2017. Through its projects, the CSEP brings together and coordinates students, teachers, researchers and some industrial partners within French and European space agencies. It is financially and operationally supported by the education patronage program *Espace, science et défis du Spatial* (Space, Science and Challenges), led by Professor Pascal Chabert.

IonSat is a 6U CubeSat project using an electric propulsion engine, dedicated to demonstrating the feasibility of nanosatellite missions in Very Low Earth Orbit (300km). It is at the frontier of space applications, and is positioned in the NewSpace philosophy. With a strong educational vocation, the project is currently led by twenty students, supported by numerous space actors: startups (ThrustMe), industries (Thalès Alenia Space) and agencies (CNES, Onera).

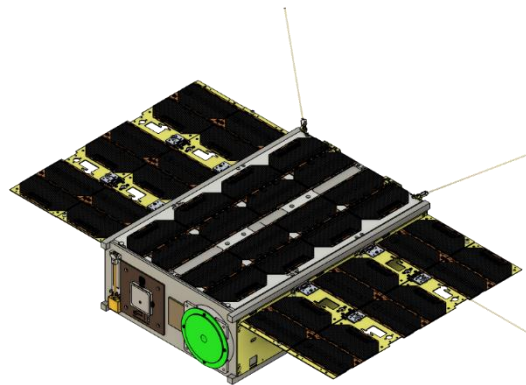


Illustration of IonSat, viewed from the front and top

Internship description

As part of the Critical Mission Design phase, the Integration and Test activities need to be planned and the testing of the engineering model (EM) and qualification models (QM) has to start.

As a Satellite Test Intern, the main responsibility will be testing a variety of CubeSat components as well as 3rd party items that will be used during the mission. The intern has to propose and detail a set of standard

tests to improve the quality and the integration process as part of a continuous improvement process. To do so, it is required to have adequate insight into electrical engineering. The internship will focus on:

- Hands-on testing of satellite hardware
- Inspection and testing of purchased components
- Contributing to the development and improvement of the testing processes and strategy
- Full ownership of manual and automation testing tasks
- Understanding of satellite subsystems software functionality.
- Plan the satellite assembling, Electronic and mechanic subsystems assembling, until the completion of the entire satellite
- Process improvement and assembly efficiency
- Prepare a high quality standard documentation and reports for phase C & phase D of the project;
- Monitor adherence to budgets, and initiate action to minimize non-conformance cost;
- Execute functional tests to verify the performance and reliability of purchased subsystems.
- Reporting of test results.
- Report and document anomalies and resolve them in co-operation with the IonSat team,

The intern will work with one CSEP full-time engineer, when necessary, the intern will receive the help of the space team of the Laboratory of Plasmas Physics, specialized in conception of space-ready magnetometers and on-board electronics. There are also frequent contacts with experts from the French aerospace agencies (CNES, ONERA) and companies (Thalès Alenia Space, ThrustMe) partners of the IonSat Project.

Technical Requirements

- Bachelor's degree in Electrical/Electronic, Aerospace, Mechanical Engineering or related field.
- Knowledge of electronics and ability to work with measurement instruments (multimeter, oscilloscope, signal generator, power supplies, vector network analyzer, etc.).
- Experience in testing and documentation processes.
- Experience in manual and automated testing processes and test tools (C, C++).
- Experience in electronics design, schematics and assembly drawings.
- English & French language proficiency.
- Knowledge in aerospace systems or mechanical systems is a plus.
- PCB design and good soldering skills are a plus.
- Experience in multidisciplinary projects: mechanical, electrical, RF, control systems, data systems, would be an important advantage.

Behavioural Requirements

- Self Motivation and Autonomy.
- Team player, attentive to timeline.
- Affinity with the Space industry.

Internship duration: between 4 and 6 months, from March or April 2022



If you are interested, send your CV and a cover letter, clearly indicating your motivation and availability dates.

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