

# Thermal Modelling of a 12U Cubesat Satellite

## CAD Design & FEM modelling

### Context

The Montpellier University Space Center (CSUM) is the French leader in the development and operation of nanosatellites developed by a public laboratory. It has acquired in-depth competences in the field of design, manufacturing, testing and operation of nanosatellites and their subsystems, as well as in the area of space project management and product assurance in the framework of university space projects.

The CSUM has an AIT (Assembly Integration and Test) Facility, a CDF (Concurrent Design Facility) and both UHF and S-band Ground Stations. The CSUM develops its own 1U, 3U and a futur 12U Cubesat platforms with the support of the Van Allen Foundation and the French and European space agencies.

The structure is growing fast, and more and more missions arrive every year. In this context, with the ongoing designing phase of it's next 12U satellite platform, we're looking for a 6 months intern with thermal knowledge to help our team to characterize the thermal satellite behavior in space.

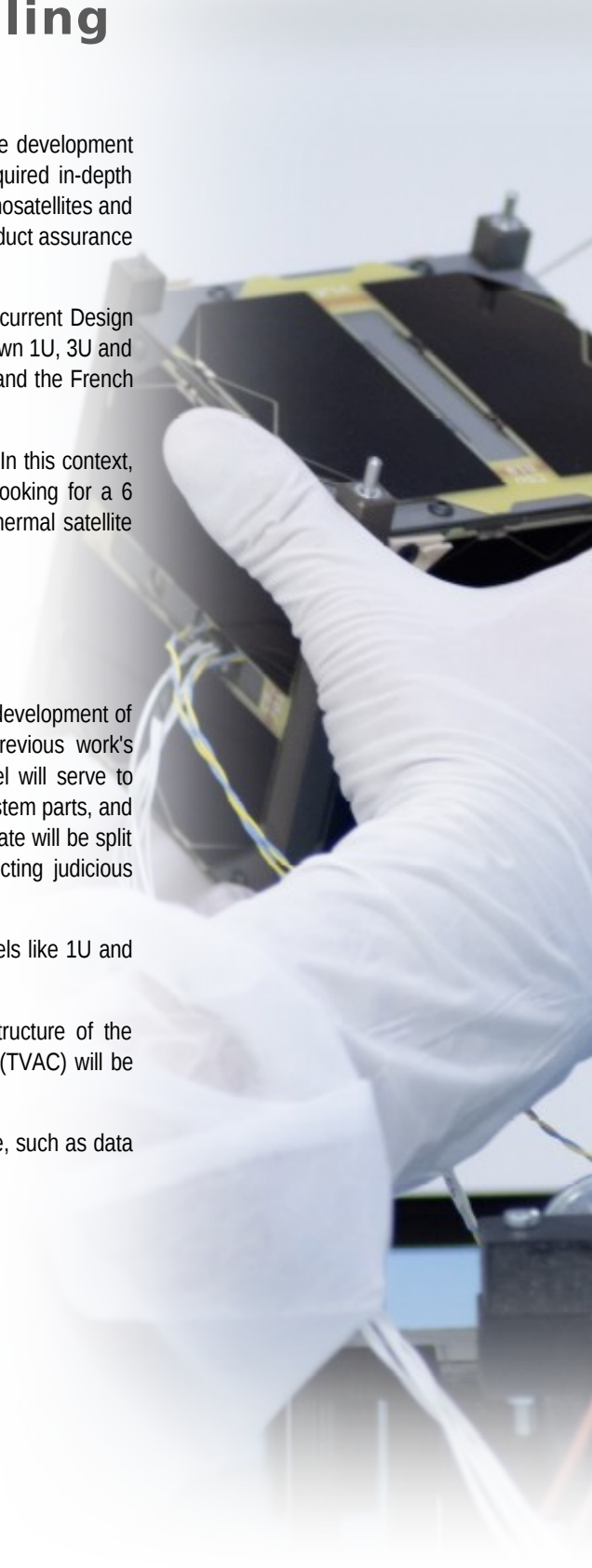
### Mission

The candidates will join the mission division team of the CSUM to help in the development of the 12-Unit satellite platform. Based on the satellite's specification and previous work's conclusions, the candidate will build a numerical thermal model. This model will serve to predict thermal behavior in orbit, characterize the impact of the different subsystem parts, and clarify the needs between cooling and hoting systems. The work of the candidate will be split between adapting the existing numerical model, build an FEM model, selecting judicious hypothesis, and leading a critical regard to analyse results.

To help his study, the candidate could possibly build up simpler thermal models like 1U and 3U satellites and compare his results with an in-orbit dataset.

The candidate will also participate in test campaigns on the preliminary structure of the satellite (STM = Structural and Thermal Model). A thermal vacuum chamber (TVAC) will be used to perform tests.

The candidates may also lead work aside from their required area of expertise, such as data analysis tools and software development.



## Skills & qualifications

You're currently involved in a scientific oriented cursus in a master's degree and you have the following qualifications :

### Main ones

- > Strong intuition in thermal aspects
- > CAD software user (**Solidworks** used)
- > FEM experience (**COMSOL** Multiphysics used)
- > Technical datasheets readings and comprehensions

### Profil sought

- > Great autonomy and Problem-solving mindset
- > Excellent written and oral communication skills in English language
- > Team skills - ability to work effectively in teams

### Bonus ones

- > Knowledge and/or experience in **Python** will be greatly appreciated
- > Experience with space domain and space culture
- > Knowledge in data treatment & analyses
- > Skills in Git & Gitlab environnement

## What can we offer?

Dynamic and challenging environment. Participating to the whole lifetime of a nanosatellite's project. Fully equipped facilities (mission control center, UHF antennas, S band antennas, cleanroom, TVAC, shaker, workshop).

Duration of the internship : 5-6 months

- Stipend : 4,35€/h
- 3 weeks closure time during summer holidays.

## How to apply?

Send your resume and cover letter via the following form:

<https://csum.umontpellier.fr/en/jobs-job-offers/>

Personnal mail if questions:

[virgil.mesle@umontpellier.fr](mailto:virgil.mesle@umontpellier.fr)

