# Tom Benest

*Ph.D. Student in Planetary Science*

Marseille, France tommy.benest@gmail.com (+33)6 64 18 89 60

## PROFILE

My research activity focus on the origins of the solar system and its giant planets. I work on the evolution of volatile species and the fate of the complex organic molecules in the protosolar nebula.
To do so, I modelled the evolution of the disk and the transport of the particles inside. The aim of my thesis is to assess the formation conditions of the planets and their moons in the Solar System, and therefore to prepare the scientific return of the ESA/JUICE and NASA/Europa-Clipper missions.

## EDUCATION

2022 – 2025
Marseille, France
**Ph.D. in Astrophysics and Planetary Science,** *LAM, Aix-Marseille Université*
Study of the formation of the Solar System and its Giant planets. Supervisor: Olivier Mousis.

2020 – 2022
Bordeaux, France
**Master Fundamental Physic and Application (equivalent to MSC Degree),** *Université de Bordeaux*
Specialisation: Nuclei, Plasma, and Universe.

2019 – 2020
Poitiers, France
**Bachelor in Physics,** *Université de Poitiers*

## PROFESSIONAL EXPERIENCE

2022 – 2025
Marseille, France
**Planetary Science Ph.D.,** *LAM, Aix-Marseille Université*
Study of the formation of the Solar System and its giant system. Modeling and simulation of protoplanetary disks to find constraints on the formation of planets such as Jupiter or Uranus, and their moons. Supervisor : Olivier Mousis.

03/2022 – 06/2022
Marseille, France
**2nd year Master internship,** *Laboratoire d'Astrophysique de Marseille*
Computer modeling and simulation of the transport and the irradiation of particles in a protoplanetary disk. Supervisor : Olivier Mousis.

02/2022
La Mongie, France
**Exoplanets direct imaging and transit photometry,** *Pic du Midi observatory*
Use of the Pic du Midi observatory's T50 telescope to capture transits of exoplanets and image objects in the Messier catalogue, as part of a 2nd year Master project.

04/2021 – 06/2021
Bordeaux, France
**1st year Master internship,** *Laboratoire d'Astrophysique de Bordeaux*
Exploitation of the code FARGO 3D with Python in order to simulate the AB-Aurigae system's protoplanetary disk. Supervisor: Emmanuel Di Folco.

## TEACHING EXPERIENCE

09/2024 – 10/2024
Marseille, France
**2 months internship supervision**
Co-supervision of a 2nd year Master student on the Evolution of the D/H ratio in the Protosolar Nebula.

02/2024 – 07/2024
Marseille, France
**5 months internship supervision**
Co-supervision of a 2nd year Master student for 5 months, focused on the Survival of the Organic Matter in the Circumjovian Disk.

01/2024 – 04/2024
Marseille, France
**Science watch mentoring**
Co-supervision of a master student for a Science Watch project, entitled Delivery of Organic Matter to the Icy Moons' Primodial Hydropshere.

10/2023
Observatoire de Haute-Provence, France
**SIMO internship mentoring**
Introductory training in observation methods at Haute Provence Observatory.
16h teaching of 1st and 2nd year students of fundamental physics Master on the use of T80 telescope and astronomical image processing.

## COURSES

06/2024
OHP, France
**Sample Returns Summer School**
Participant.

06/2023 **Moons of the Solar System Summer School**
OHP, France Participant.

## SKILLS

**Programming**
*Python, Fortran, LATEX*

**Expertise in Planetary Science**
*Protoplanetary disk, Planetary formation*

## LANGUAGES

**French**
*Native language*

**English**
*Fluent*

**Spanish**
*Beginner*

## PUBLICATIONS

2025 **The D/H ratio in Uranus as a marker of its formation conditions,**
*Astronomy & Astrophysics, in prep.*
**Tom Benest Couzinou** and Olivier Mousis.

2025 **Delivery of organic matter to the Galilean moons,** *Planetary Science Journal, in prep.*
**Tom Benest Couzinou**, Alizée Amsler Moulanier, and Olivier Mousis.

2024 **Journey of complex organic molecules: formation and transport in protoplanetary disks,** *Astronomy & Astrophysics.*
**Tom Benest Couzinou**, Olivier Mousis, Grégoire Danger, Antoine Schneeberger, Artyom Aguichine, and Alexis Bouquet.

08/2024 **Insights on the Formation Conditions of Uranus and Neptune from Their Deep Elemental Compositions,** *Planetary Science Journal.*
Olivier Mousis, Antoine Schneeberger, Thibault Cavalié, Kathleen E. Mandt, Artyom Aguichine, Jonathan I. Lunine, **Tom Benest Couzinou**, Vincent Hue, Raphaël Moreno.

06/2024 **Recipes for Forming a Carbon-Rich Giant Planet,** *Space Science Reviews.*
Olivier Mousis, Thibault Cavalié, Jonathan I. Lunine, Kathleen E. Mandt, Ricardo Hueso, Artyom Aguichine, Antoine Schneeberger, **Tom Benest Couzinou**, David H. Atkinson, Vincent Hue, Mark Hofstadter, Udomlerd Srisuchinwong.

## CONFERENCE, WORKSHOP & MEETING ATTENDANCE

09/2024 **EPSC 2024**
Berlin, Germany Europlanet Science Congress conference. Oral presentation and poster.

06/2024 **SF2A 2024**
Marseille, France Société Française d'Astronomie et d'Astrophysique conference. Oral Presentation.

04/2024 **EGU 2024**
Vienna, Austria European Geosciences Union conference. Poster presentation.

04/2024 **JUICE-SWI science meeting**
Göttingen, Germany Scientific meeting of the JUICE-SWI team. Oral presentation.

01/2024 – 11/2024 **Journal Club**
Marseille, France Host of the team's weekly Journal Club, a meeting to discuss scientific news and papers.

12/2023 **FACOM science meeting**
Toulouse, France Meeting with the consortium FACOM (FAte of the volatile COmpounds at the galilean Moons). Two oral presentations.

10/2023 **Workshop on the Origins and Habitability of the Galilean Moons**
Marseille, France LOC member. Poster presentation.

08/2023 **IPPW 2023**
Marseille, France International Planetary Probe Workshop. Poster presentation.

05/2023 **BEACON 2023**
La Palma, Spain Biennial European Astrobiology Conference organized by the European Astrobiology Institute. Poster presentation.

01/2023 **FACOM science meeting**
Marseille, France Meeting with the consortium FACOM (FAte of the volatile COmpounds at the galilean Moons). Oral presentation.