Rahyan Bellabiod

Master's Student in Inorganic, Physical, and Solid-State Chemistry

Contact

- **LinkedIn:** linkedin.com/in/rahyan-bellabiod
- **Phone:** +33 6 66 76 69 09
- **Email:** rahyan.bellabiod@universite-paris-saclay.fr
- **Address:** 17 rue las Rozas de Madrid, 91140, France

Research Interests

Astrochemistry and astrophysics, with a focus on material evolution in extreme environments & Observational Astrochemistry. My focus is on understanding the chemical processes occurring in extreme environments, such as star-forming regions in the outer reaches of galaxies.

Technical Skills

- **Spectroscopy:** FT-IR, UV-Vis, Raman, and NMR spectroscopy; in training: centimeter and millimeter spectroscopy.
- **Microscopy:** Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM).
- **Crystallography:** X-ray diffraction (XRD) and data analysis, experience in handling and characterizing crystal structures.
- **Laser Techniques:** Femtosecond laser irradiation and applications.
- **Programming & Data Analysis:** Python3, IDL9, CASA, CARTA for observational data analysis.
- **Other:** Fast learning, critical thinking, rigorous work, adaptability and efficiency under pressure, and strong team work ethic.

Professional Experience

Current Research Internship - Niigata University, Japan
October 2025 - December 2025 (3 months) supervised by Takashi Shimonishi

- **Project 1:** Identification of infrared sources similar to previously reported Peculiar Embedded Icy Objects (PEIO).
  - Extending the search for PEIO-like sources detected by *AKARI* (Onaka et al. 2021) and analyzed by *ALMA* (Takashi et al. 2021).
  - Conducting cross-matching and identification in *Spitzer*, *WISE*, and *SPHEREx* databases.
- **Project 2:** Training in ALMA data handling and chemical species detection.
  - Learning and applying data calibration, imaging, and spectral line analysis techniques with CASA and CARTA.

  - Developing skills for molecular detection and astrochemical interpretation of ALMA observations.

Research Internship - ISMO (Université Paris-Saclay) CNRS, France
April 2025 - June 2025 (3 months) supervised by Emmanuel Dartois

- **Project:** Laboratory Study of Interstellar Matter Analogs.
- **Key Achievements:**
  - Investigated the production and evolution of interstellar matter, specifically Polycyclic Aromatic Hydrocarbons (PAHs), using plasma-based techniques.
  - Conducted UV and IR characterization of synthesized materials.
  - Performed data analysis using Python3 programming.

Bachelor's Internship - Institute of Low Temperature Science (Sapporo, Japan)
May 2024 - August 2024 (3 months) supervised by Prof. Yuki Kimura

- **Project:** Investigated material evolution in the universe from a microscopic point of view, specifically studying nanoscale nucleation and growth of Ca oxide and Si oxide.
- **Key Achievements:**
  - Characterized samples using FT-IR spectroscopy, TEM, and SEM.
  - Contributed to understanding the mechanisms of material formation under astronomical conditions.
  - Co-authored conference presentation: *"In-situ IR Measurements of the Nucleation Processes of SiC Aiming to Elucidate the Mechanisms of Cosmic Dust Formation"*, JCCG-53, Tokyo, November 2024.

Bachelor's Internship - Nara Institute of Science and Technology (Nara, Japan)
May 2023 - July 2023 (2 months) supervised by Prof. Yoichiro Hosokawa and Dr. Yuka Tsuri

- **Project:** Studied the crystallization of dye molecules using femtosecond laser irradiation.
- **Key Achievements:**
  - Developed expertise in handling laser equipment.
  - Analyzed crystal structures using X-ray diffraction.
  - Results contributed to a joint UP-Saclay/NAIST PhD project.
  - Work to be presented at LAMP2025 Congress in Japan: *"Rhodamine B crystallization induced by Femtosecond-laser"* (co-author).

Future Project

Planned Internship - National Tsing Hua University, Taiwan
February 2026 - July 2026 (5 months) supervised by Daniel Harsono

- **Project:** Analysis of ALMA data toward young stellar objects and radiative transfer modeling.
- **Description:**
  - Analyze ALMA data toward young stellar objects.

- Perform radiative transfer modeling of sub-mm and IR (ALMA + JWST) observations.
- Work on (Radiative-)Hydrodynamical simulations of young disks.

Educational Background

Master's Degree in Inorganic, Physical, and Solid-State Chemistry
2024 - (In Progress)
Université Paris-Saclay, Orsay (France)
Double Degree Bachelor in Chemistry and Life Sciences
2021 - 2024
Université Paris-Saclay, Orsay (France)
Relevant Coursework in Chemistry: Quantum Chemistry, Chemical kinetics, Thermodynamics, Organic and Inorganic Chemistry, Spectroscopy, PhotoElectrochemistry, and Biochemistry.
The Double Degree program at Paris-Saclay University is a selective program offering full training in two different fields.

Languages

- French (Native)
- English (C1)
- Japanese (Beginner)
- Russian (Basic)