

---

Propositions accompanying the thesis

# The hunt for frozen organic molecules in space

## A laboratory approach

---

1. The first detection of COMs, other than  $\text{CH}_3\text{OH}$ , in JWST interstellar ice observations will emerge from extensive attempts to fit weak features in the 6 - 10  $\mu\text{m}$  region with laboratory data (Chapter 3, 4, 5, and McClure et al. 2023).
2. The spectroscopic infrared signatures of COMs in interstellar ice are important in determining their chemical origin in the ISM, as these can provide information regarding the chemical environment and formation site (Chapters 3, 4, and 5).
3. Monitoring the time behavior of an ice interference signal during and after ice deposition is a useful approach for identifying and tracking morphology changes in interstellar ice analogs. (Chapter 5)
4. The spectral range between 12.5 - 18.2  $\mu\text{m}$  represents a spectral fingerprint region for small fullerenes, allowing for the most insightful observations of the presence of these molecules in space. (Chapter 6)
5. The impact of the morphological transitions of carbon monoxide (CO) on interstellar ice chemistry is yet to be established.
6. Since baseline corrections in spectroscopy and astronomy are not always straightforward, researchers should make available the raw version of their data to guarantee the transparency of their analysis.
7. For spectroscopic data to effectively support astronomical observations, it is crucial that astronomers have easy access to them.
8. Beer making is as much art as it is science.
9. Being the daily supervisor of students during a Ph.D. is a mutually beneficial learning experience.
10. The qualities that may lead one to pursue a Ph.D. may not necessarily align with those needed for a successful career in academia.
11. The immense richness of Brazilian music deserves greater recognition and appreciation worldwide.

Marina Gomes Rachid  
Leiden, 9 May 2023