Technological and scientific fields: Artificial Intelligence, Massive data processing technologies, Advanced data analysis, Astrophysics, Astrochemsitry

Location: Torrejón de Ardoz, Madrid, Centro de Astrobiología (CAB, CSIC-INTA), https://cab.inta-csic.es/

Research Group/PI: Chemical complexity in the interstellar medium and star formation / Víctor M. Rivilla

PROJECT SUMMARY

The improved sensitivities of the state-of-the-art astronomical facilities, such as the Atacama Large Millimeter/submillimeter Array (ALMA) and the James Webb Space Telescope (JWST), are revolutionizing the discovery of new molecules in space. However, we are still just scraping the tip of the iceberg. We are far from knowing what is the complete catalogue of molecules that astrochemistry can offer, as well as the complexity they can reach. While the instrumental capabilities have been improving exponentially, the tools to analyze and interpret the complex datasets that they provide are still in their infancy. To overcome the current severe limitations that traditional analysis techniques are suffering, the development of new innovative and efficient tools is mandatory. This project, Artificial Intelligence Integral Tool for AstroChemical Analysis (AI-ITACA), proposes to develop multiple cutting-edge machine learning techniques to fully exploit the massive datasets provided by current telescopes. These new analysis tools will allow us to make a crucial leap in the characterization of the level of chemical complexity in the interstellar medium, and in our understanding of the contribution that interstellar chemistry might had in the origin of life.

PROFESSIONAL PROFILE

Minimum requirements:

Bachelor degree in a scientific discipline.
High level of oral and written English.
Previous experience in the development of Machine Learning tools.
Previous experience in programming languages such as Java and Python,
Previous experience in advanced data anlaysis and database management.

Merits to be considered:

Knowledge of SQL for database administration and management will be positively considered.
Basic knolewdge in astrophysics will be also considered.

WHAT IS OFFERED

The candidate will develop several advanced Machine Learning tools to be applied to the stydy of the chemical complexity in the interstellar medium, and its impact on prebiotic chemistry. The work will be done at the Centro de Adtrobiología (CAB) within a multidisciplinary environment in which researchers from different fields (astrophysics, chemistry, geology, biology) interact to address the complex problem of the origin of life. The contract includes an exhaustive Training Plan (240 ECTS credits) based on shorts stays at cutting-edge international research centres (e.g., University of Leiden), courses on advance data analysis, and astrophysics/astrochemistry/astrobiology schools.

Contract conditions:

Indefinite contract for a University Graduate associated with the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (37.000 € - 41.000 €).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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