Postdoctoral Position in Experimental Astrochemistry

A two-year postdoctoral position in experimental astrochemistry is available in the Space Chemistry Group at the HUN-REN Atommagkutató Intézet (ATOMKI), under the direction of PI Prof. Nigel J. Mason.

The Research Group

You will join an active and growing team of researchers having expertise in various aspects of molecular astrophysics, who are developing and making use of a suite of experimental systems to study ion and electron collision-induced molecular destruction, synthesis, and sputtering in astrophysical ice analogues. Some examples of our group's recent research interests include investigating the role of sulphur ions in the surface chemistry of the Galilean moons of Jupiter, and the energetic synthesis of biomolecules from simple precursors; thereby coupling astrochemistry with planetary science and astrobiology.

Some examples of recent publications can be found below:

- DV Mifsud, et al. *Physical Chemistry Chemical Physics*, 2022, **24**, 10974-10984
- DV Mifsud, et al. *Geophysical Research Letters*, 2022, **49**, e2022GL100698
- AV Ivlev, et al. *The Astrophysical Journal*, 2023, **944**, 181
- J Zhang, et al. *Monthly Notices of the Royal Astronomical Society*, 2024, **533**, 826-840.

Research Project Specifics

Your research project will investigate key questions in experimental astrochemistry; particularly:

(1) How does the morphology of ice depend on the conditions under which it is formed? How is this morphology changed by temperature cycling?

(2) How does the morphology of the ice influence its radiation-induced destruction and the associated formation of new molecules?

These experiments will be combined with simulations of such processes to test the validity of laboratory experiments with actual astrophysical conditions.

The work forms part of a wider astrochemistry and planetary science programme involving collaborations across Europe and beyond. You will, therefore, also participate in joint projects with visitors to ATOMKI and conduct experiments in partner laboratories.

Candidate Requirements

The ideal candidate will have a PhD degree (or equivalent) in physics, chemistry, materials science, engineering, or a related discipline. Previous experience with ultrahigh-vacuum chambers and spectroscopic techniques (e.g., FTIR, UV-vis, Raman) is necessary. Previous knowledge of astrochemistry, planetary science, and / or astrobiology is highly desirable. Previous publications in the field are not necessary but are advantageous. The candidate must be fluent in spoken and written English, although knowledge of Hungarian is not expected. The successful candidate will be offered support and encouragement to pursue further postdoctoral fellowships and funding schemes.

How to Apply

Interested candidates are kindly invited to apply for the position by contacting Prof. Nigel J. Mason directly (n.j.mason@atomki.hu) with a CV (resume) and a short cover letter. Applicants should also cc Dr Zoltán Juhász (zjuhasz@atomki.hu), Dr Béla Sulik (sulik@atomki.hu), and Dr Duncan V. Mifsud (mifsud.duncan@atomki.hu) in their initial email.

Applications will be accepted until Friday, 4th April 2025 at 17:00 CET. Shortlisted candidates will be invited to an online interview that will take place in mid-April, with the successful candidate being notified shortly thereafter.

HUN-REN Atommagkutató Intézet

ATOMKI is located in Debrecen, Hungary's second-largest city. The Institute was founded in 1954 by Sándor Szalay; a pioneer in the field of nuclear physics. Today, ATOMKI is Hungary's national accelerator centre and has an international reputation for excellence in the fields of particle, nuclear, atomic, and molecular physics; as well as ion beam analytics, environmental science, and cultural heritage science. The Institute hosts a suite of accelerators that can be used as a Solar Wind Simulator, since they are able to provide a wide selection of ions having energies analogous to the solar wind and galactic cosmic rays (300 eV – 30 MeV).