



AstropAH

A Newsletter on Astronomical PAHs

Issue 125 • March 2026

JWST and the Aromatic Universe



Editorial

Dear Colleagues,

This is the 125th AstroPAH!

Our Picture of the Month, on the cover, pays tribute to the JWST's contributions to the study of aromatic species in the Universe. This contribution is highlighted in the new review, "Aromatic Species in the Molecular Universe", by our editor-in-chief, Alexander Tielens.

JWST also triggered the DAN-III network, which is featured in this month's *In Focus* "Gas-phase infrared spectroscopy at HFML-FELIX in the days of the DAN-III network", written by Piero Ferrari.

You can find Xander's publication in our *Abstracts* section along with publications on Bennu asteroid sample analysis, graph neural network prediction of PAH infrared spectra, and the 6.2 μm PAH feature behavior in active galaxies.

If you are interested in the exploration of the aromatic universe with JWST, consider attending the upcoming meeting in Canada this July. Please note that the regular registration deadline is approaching!

Looking for a job? PhD and postdoc positions are currently open at the University of Bern, Switzerland.

The last announcement is for the publication of the second issue of the Laboratory Astrophysics Newsletter. This issue is focused on Exoplanet research.

AstroPAH can help you promote your research. Please send your contributions to [our email address](#).

Thank you all for your contributions!

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Next issue: 30 April 2026.
Submission deadline: 17 April 2026.

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PAH Picture of the Month

Interstellar polycyclic aromatic hydrocarbon (PAHs) are an important component of the interstellar medium of galaxies, containing some 10% of the elemental carbon. The James Webb Space Telescope has provided a wealth of high-quality spectra and new insights in the characteristics of the interstellar PAH family (Tielens 2026).

Credits: Composition by Simon van Schuylenbergh (University of Western Ontario, London, Ontario, Canada). Background image of the [Orion Nebula](#) by ESA/Webb, NASA, CSA, PDRs4ALL ERS Team, Mahdi Zamani (ESA/Webb), and [JWST](#) image from NASA.

Gas-phase infrared spectroscopy at HFML-FELIX in the days of the DAN-III network

by Piero Ferrari

The DAN III network

Starting in 2010, the Dutch Research Council (NWO) launched the Dutch Astrochemistry Network (DAN) [1], aiming to bring together research groups in The Netherlands working on astronomy, molecular physics, surface science, and chemistry, with a common focus on astrochemistry. In order to increase the understanding of the origin and evolution of molecules in space and their role in the universe, the **DAN-I network** was composed of four major astrochemical themes:

- (i) gas-phase astrochemistry,
- (ii) the solid universe,
- (iii) from PAHs to chains, rings, and cages, and
- (iv) the prebiotic universe.

Given the success of DAN-I, the NWO decided in 2016 to extend the program with the **DAN-II network**, focusing on three major themes:

- (i) the gaseous molecular universe,
- (ii) the icy universe, and
- (iii) the aromatic universe.

Nowadays, the DAN program finds itself in its third edition, **the DAN-III network**, launched in 2023 triggered by the need for interdisciplinary research in astrochemistry in the era of the James Webb Space Telescope (JWST). Focusing on the infrared spectral range where JWST is most sensitive, the DAN-III network is built around seven research projects distributed over two main themes:

- (i) inheritance versus reset – gas and ice, aiming at understanding the processes by which gas and ices evolve from molecular clouds to planet-forming disk regions, and

- (ii) cosmic evolution of carbon – gas and PAHs, dedicated to the study of the evolution of carbon between small hydrocarbon molecules and aromatic species in various cosmic environments.

Through different events, including network meetings, conferences and science days, DAN-III has brought together many researchers working at Dutch universities and research institutes, providing unique possibilities to have fruitful discussions, share ideas and enhance collaborations among people passionate for science in general and astrochemistry in particular.

Astrochemistry research at HFML-FELIX

The FELIX Laboratory, since 2025 part of the newly founded NWO-I institute HFML-FELIX, located in Nijmegen, The Netherlands, has a long history of groundbreaking research in the context of PAHs and other carbon-bearing molecules for astrochemistry research. The facilities at HFML-FELIX provide unique possibilities for using gas-phase infrared spectroscopy as a tool to elucidate the presence, composition, and chemical dynamics of carbon-based molecules in space. At the core of the institute lie four infrared free electron lasers (FELs), FELIX 1 and 2, FELICE and FLARE, which together provide intense and tunable laser light over a wide spectral range, covering mid- and far-infrared wavelengths. Coupled to the FELs, various end user stations enable a variety of gas phase action spectroscopic techniques to record infrared spectra of neutrals and ions, under astrochemically relevant conditions [2, 3, 4, 5, 6]. An additional note concerns the work done at HFML-FELIX on ices, where surface science techniques are combined with infrared spectroscopy to elucidate the composition and dynamics of ices under interstellar conditions [7, 8].

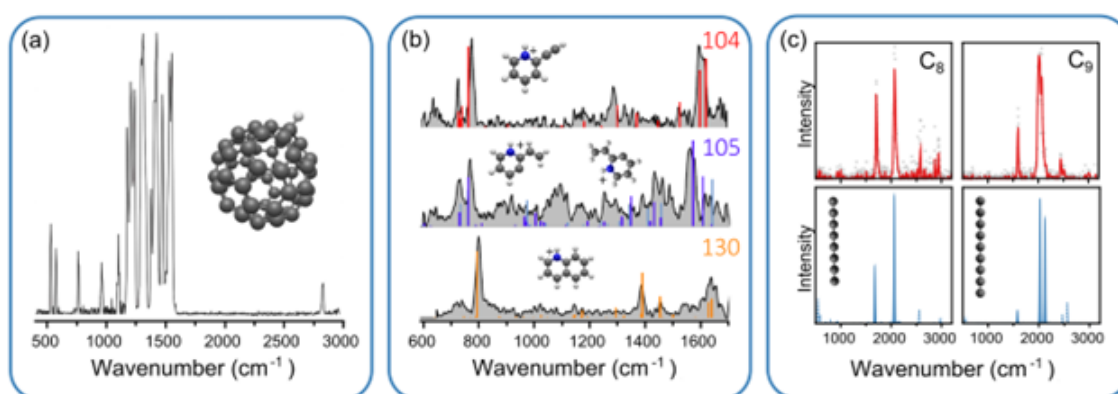


Figure 1 – Examples of laboratory astrochemistry studies at HFML-FELIX. (a) IR spectrum of gaseous $C_{60}H^+$. Adapted from Ref. [9]. (b) IR spectra of quinolizinium (m/z 130) and its reaction intermediates with m/z 104 and 105, from the precursors pyridine and acetylene. Adapted from Ref. [11]. (c) Comparison of measured IR spectra (top) and DFT calculated vibrational spectra (bottom) of linear carbon clusters. Adapted from Ref. [12].

For example, FELIX was used to measure the IR spectrum of gaseous $C_{60}H^+$, by coupling the FEL's light with a room temperature quadrupole ion trap [9, 10]. As shown in Figure 1a, the spectrum of $C_{60}H^+$ is much richer than that of C_{60} , due to the symmetry breaking

caused by the added proton, which lights up all infrared modes. Interestingly, a comparison with emission spectra observed in planetary nebulae suggests $C_{60}H^+$ as a contributor to many unexplained astronomical IR features. In addition, key reaction pathways for forming quinolizinium ($C_9H_8N^+$) from cationic pyridine ($C_5H_5N^+$) and neutral acetylene (C_2H_2) were uncovered at HFML-FELIX by performing kinetic and infrared spectroscopy experiments combining FELIX and a cryogenic 22-pole ion trap [11]. Using IR spectra as molecular fingerprints and the kinetic control provided by the ion trap, not only the final quinolizinium product was unambiguously identified, but also the intermediates involved in the reaction (see Figure 1b). Finally, using laser desorption starting from C_{60} powder as precursor allowed the formation of a distribution of neutral carbon clusters in a molecular beam, CN ($N=6-11$), which upon interaction with the FELIX radiation provided their key infrared signatures [12]. As presented in Figure 1c, CN clusters have sharp and very intense infrared features, which can be used for a targeted search of such all-carbon molecules in space. Complementary density functional theory (DFT) calculations helped assigning the clusters up to C_{10} as linear molecules. Noteworthy, in addition to the strong in-house research program in the field of laboratory astrochemistry, HFML-FELIX operates as a user facility, hosting scientific campaigns of national and international researchers, many of which target spectroscopic investigations of PAHs [13, 14, 15, 16].

The BUMA end-station: Gas-phase IR spectroscopy of neutral species

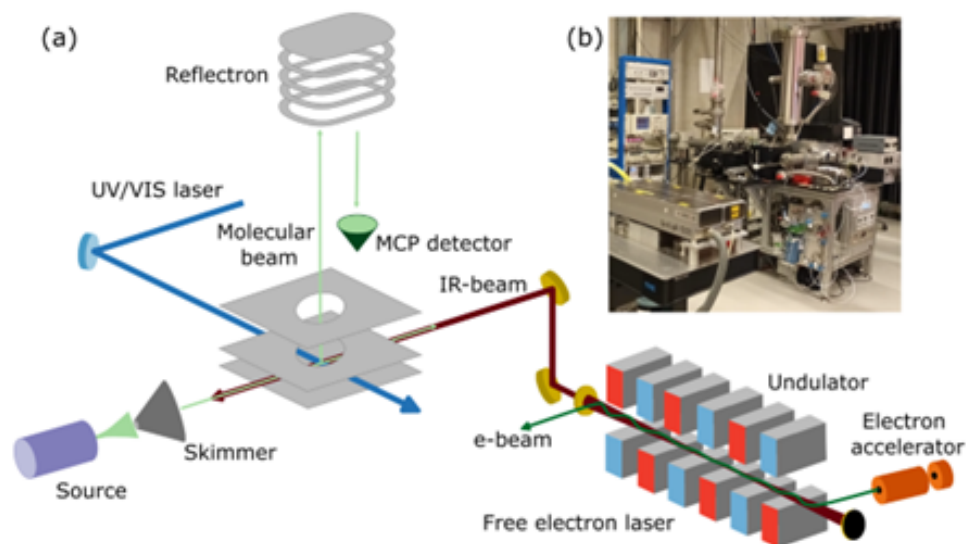


Figure 2 – Schematic representation of the molecular beam instrument BUMA located at the HFML-FELIX institute (Nijmegen, the Netherlands). The free electron laser FELIX is coupled to the instrument, interacting with the molecular beam head-on. A picture of the setup is presented. Adapted from Ref. [12].

The BUMA end-station at HFML-FELIX is a dedicated instrument to study neutral species under the cold and isolated conditions of molecular beams, thus mimicking interstellar environments. A schematic representation of BUMA is presented in Figure 2a [12]. The investigated species are brought into the gas-phase by either thermal heating or laser

desorption, after which supersonic expansion into vacuum with Ar or He as carrier gas leads to the formation of molecular beams of neutrals. The composition of the molecular beams is investigated by time-of-flight mass spectrometry, thus requiring the molecules to be ionized. At BUMA, this is achieved by a versatile combination of visible/(V)UV lasers, which depending on the studied species can lead to direct one-photon ionization or to resonant enhanced multiple-photon ionization (REMPI) schemes. At such, BUMA can be employed to record the visible/UV spectra of cold and isolated molecules [17]. Nevertheless, the uniqueness of BUMA is its coupling with the laser light of FELIX, providing tunable light in the very wide infrared range from 70 up to 3800 cm^{-1} (~ 2.6 to 150 μm). To record infrared spectra, the molecular beams are irradiated by FELIX a few hundred microseconds before ionization takes place, thus ensuring that information solely about neutrals is obtained. Hence, the BUMA instrument, shown in 2b, plays an important role in the DAN-III network, by providing key spectroscopic information of neutral molecules under astrochemically relevant conditions, relevant for the comparison with JWST data.

The research in laboratory astrochemistry conducted at BUMA is highlighted in the following with three examples. The relevance of PAHs in interstellar chemistry is illustrated by the so-called aromatic infrared bands or AIBs, composed of infrared emission features seen throughout many interstellar environments. The band positions of the dominant bands, observed roughly at 3.3, 6.2, 7.7, 11.2, and 12.7 μm , coincide with the vibrational frequencies of PAHs. Hence, it is well established that PAHs are the carriers of the AIBs, but a precise identification of which PAHs are responsible for these IR emissions remains elusive. At such, looking for substituted PAHs having distinct vibrational frequencies could allow more precise identification of AIBs carriers. In this respect, cyano-substituted PAHs (CN-PAHs) offer unique possibilities, given their detection in space by radioastronomy and microwave spectroscopy [18, 19], as well as possessing a C-N stretch frequency outside the range of conventional PAHs [20]. Figure 3 shows the gas-phase IR spectrum measured for 9-cyanoanthracene, in the wide 400 - 3200 cm^{-1} spectral range [21]. Below 2000 and above 3000 cm^{-1} many characteristic features of 9-cyanoanthracene are observed, but nonetheless at wavelengths where other PAHs are IR active. Unique to CN-PAHs, however, is the strong feature seen at 2207 cm^{-1} (4.531 μm), corresponding to the C-N stretch of this molecule. To correctly predict the C-N stretch frequency of 9-cyanoanthracene a new hybrid anharmonic quantum chemical methodology was developed, which importantly, could also be extended to other CN-PAHs, relevant for the future search in JWST data. Similarly, experiments can be extended to other neutral CN-PAHs, as well as to other substituted PAHs with unique IR signatures.

Under cold interstellar environments, weakly bound complexes of PAHs and small gaseous molecules can form, giving an initial gas condensation and providing a platform for potentially starting PAH chemistry. Their key spectroscopic signatures can be identified in molecular beams, where weakly bound species can be stabilized. For example, experiments at BUMA have been conducted on complexes of the prototypical neutral naphthalene and H_2O , as highlighted in Figure 4a [22]. Interestingly, the IR spectrum of Naph- H_2O is composed of a combination of narrow bands, such as the peaks seen at 476 and 784 cm^{-1} , and broad absorption features, most clearly observed below 300 cm^{-1} . Modelling using DFT calculations based on the lowest-energy conformation of the complex, depicted on Figure 4, panel (b), cannot grasp the observed features of the spectrum. Instead, Born–Oppenheimer molecular dynamics (BOMD) simulations accounting for the finite temperature of the molecular beam reproduce the experiment well (Figure 4c). As depicted in Figure 4c, even at the cold temperature of the molecular beam, estimated close to 40 K, the weakly

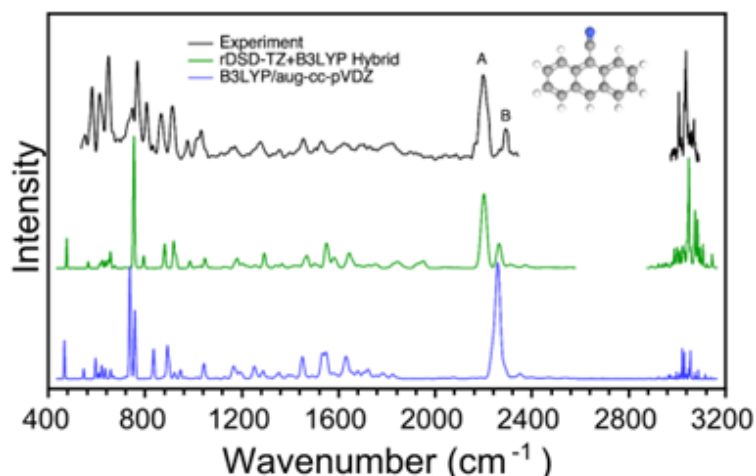


Figure 3 – Measured IR spectrum of gas-phase 9-cyanoanthracene (black), in comparison with computed vibrational spectra using a new hybrid method (green), and the conventional B3LYP functional (blue). Adapted from Ref. [21].

bound water is dynamic on the surface of naphthalene, leading to a broadening of the low-frequency vibrations involving the Naph-H₂O complex as a whole. However, features mostly due to vibrations of the naphthalene framework remain narrow. Therefore, gas-phase IR spectroscopy not only allows obtaining crucial spectroscopic signatures of complexes between PAHs and small gaseous species, but also access to their dynamics at finite temperatures. Currently, studies are being extended to other astrochemically relevant gases, such as CO₂ and H₂S.

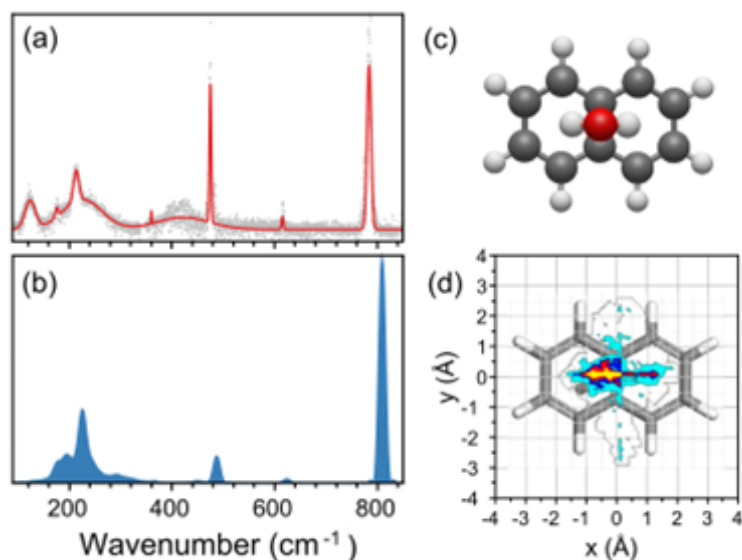


Figure 4 – (a) Measured IR spectrum of the Naph-H₂O complex. (b) Lowest-energy configuration of the Naph-H₂O complex predicted by DFT. (c) Computed vibrational spectrum of Naph-H₂O via molecular dynamics simulations at 40 K. (d) Computed displacement of water on the naphthalene surface at 40 K. Adapted from Ref. [22].

Beyond research on PAHs and carbon-bearing species, BUMA has been used to investigate other systems with astrochemical relevance. For example, the IR spectrum of the sulfur allotrope S₈ was recently recorded at BUMA, as shown in Figure 5 [23]. The pathway of sulfur from interstellar gas clouds to planets is a long-standing question. While

in low-density diffuse interstellar environments the observed atomic sulfur, expressed in its abundance ratio to atomic hydrogen, is close to the cosmic value, in dense molecular clouds, star-forming regions and in planet forming disks, the gas phase sulfur concentration is strongly depleted, by up to two orders of magnitude. This phenomenon is commonly referred to as “the sulfur puzzle” in astronomy. Sulfur allotropes are regarded as a possible sink of the missing sulfur, but a lack of spectroscopic information under astrochemically relevant conditions has prevented its dedicated search in space. Given the high symmetry of S_8 , depicted in Figure 5a, the allotrope does not possess a permanent dipole moment, making it invisible to radioastronomy. Thus, infrared spectroscopy is deemed as key in searching for this molecule. As shown in Figure 5b, the IR spectrum of S_8 is composed of three main features, with the band at 474 cm^{-1} ($21.1\ \mu\text{m}$) reachable by JWST. Nevertheless, the intensity of the bands is weak, which will make the detection of S_8 in space challenging.

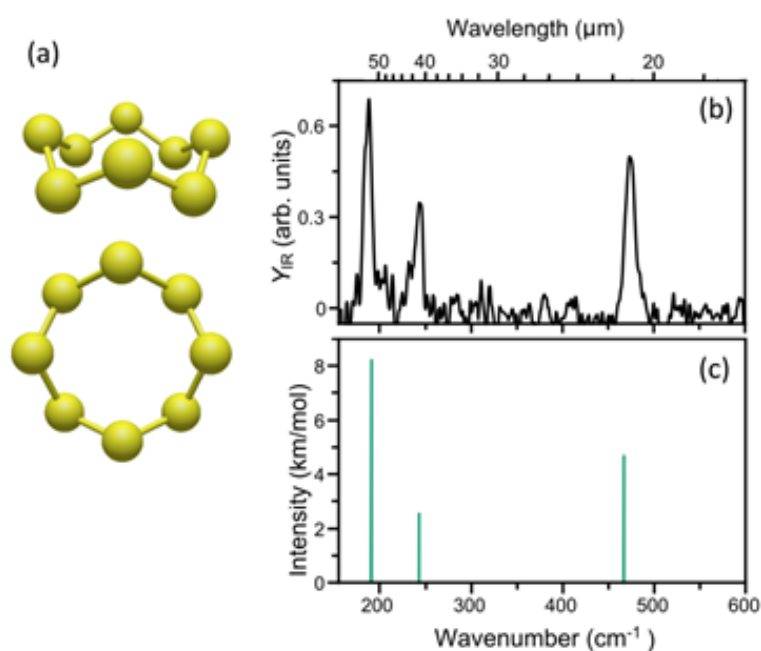


Figure 5 – (a) Geometry of the all-sulfur allotrope S_8 . (b) Measured infrared spectrum of gas-phase neutral S_8 . (c) DFT calculated vibrational spectrum of S_8 . Adapted from Ref. [23].

In summary, the BUMA end-station at HFML-FELIX provides unique opportunities to record far- and mid-infrared spectra of neutral molecules with astrochemical relevance. The wide spectral range accessible via its connection to the laser light of FELIX allows covering the wavelengths at which JWST is most sensitive, making it a hub for the research done in the Netherlands as part of the DAN-III network. Beyond the examples presented here, BUMA can be employed to investigate a variety of PAHs, such as various substituted species, sulfur-bearing PAHs, other weakly bound complexes of PAHs and PAHs clusters, as well as PAHs in excited triplet states. The DAN-III has now run for 3 years and will proceed until 2028, with further events in the coming months. For example, an upcoming network meeting will take place in Groningen by the end of March, where excited talks from PhD students, postdocs and senior scientists will highlight the progress so far achieved in the program, as well as starting the important discussions about the steps to follow for the future of astrochemistry research in the Netherlands.

Acknowledgements

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Dr. Piero Ferrari earned his PhD in Physics from KU Leuven in Belgium, under the supervision of Prof. Peter Lievens and Prof. Ewald Janssens. His PhD work focused on the study of the size-dependent properties of isolated metal clusters. Following, he performed two postdocs at KU Leuven, after received the junior and senior FWO grants from the Flemish government, before moving to HFML-FELIX (Nijmegen, The Netherland) first as a postdoc and currently as a research officer. His research focuses on the use of infrared spectroscopy to investigate gas-phase neutral species with astrochemical relevance.

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Abstracts

Nitrogen- and oxygen-rich organic material indicative of polymerization in pre-aqueous cryochemistry on Bennu's parent body

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Nitrogen-containing organic compounds play key biological roles, and their identification in primitive astromaterials such as meteorites can shed light on the origin of life. However, meteorites are typically contaminated by uncontrolled exposure to Earth. Here we show that pristine samples returned from asteroid Bennu contain polymeric organics exceptionally rich in nitrogen and oxygen. These polymers contain a variety of functional groups including amines, amides, N-heterocycles, and aliphatic and aromatic hydrocarbons, among others. They are seen in a carbonaceous vein with mineral inclusions and in multilayered organic sheets. Their morphology and composition indicate formation from pre-aqueous N-rich precursors and later modification during aqueous alteration. These findings demonstrate that asteroids like Bennu contain complex nitrogen-rich organic phases formed by pre-aqueous and aqueous processes, and they expand the known inventory of potential prebiotic extraterrestrial compounds.

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Graph Neural Network Prediction of Infrared Spectra of Polycyclic Aromatic Hydrocarbons

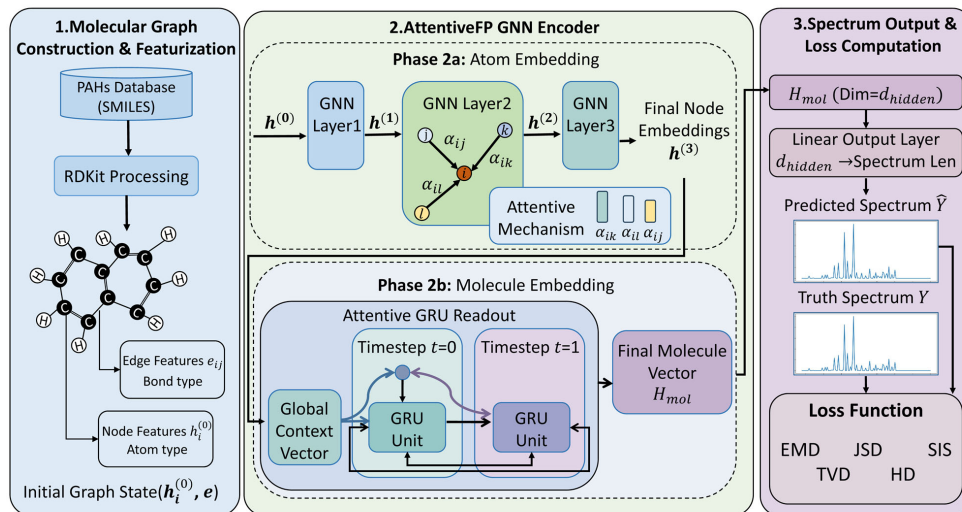
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We have developed a high-efficiency computational framework capable of predicting the absorption infrared spectra of Polycyclic Aromatic Hydrocarbons (PAHs) at speeds up to 10,000 times faster than conventional quantum chemical methods. This advancement significantly reduces the computational overhead typically associated with analyzing these complex molecules, which are critical to understanding interstellar chemistry.

The framework utilizes Graph Neural Networks (GNNs, see Figure), a specialized deep-learning architecture that interprets molecular structure by representing atoms as nodes and chemical bonds as edges. Through a process of iterative message-passing, the model synthesizes localized atomic data into a comprehensive, hierarchical molecular representation. Among the different GNN architectures evaluated: GCN, GAT, MPNN, and AFP, the Attentive Fingerprint (AFP) model demonstrated superior predictive performance. By optimizing the model with the Jensen-Shannon divergence as a loss function, we achieved heightened accuracy and numerical stability. While performance is currently optimized for PAHs containing 20–40 carbon atoms, this framework establishes a foundation for rapid spectral estimation in small- to medium-sized molecules.



Schematic of the GNN architecture.

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Variations in the 6.2 μm Polycyclic Aromatic Hydrocarbon Band in Active Galactic Nucleus- and Starburst-dominated Galaxies

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Polycyclic aromatic hydrocarbons (PAHs) are fundamental to understanding the interstellar medium (ISM) of several astrophysical objects. Normally present in Starburst (SB) galaxies, they have also been more frequently detected in active galaxy nuclei (AGNs), suggesting an inner dusty torus that can shield the radiation from the central black hole. In this work, we analyze the 6.2 μm PAH band of SB-, AGN- and mixed-dominated spectra from 175 IDEOS database galaxies. After fitting of the band, the sources were distributed into the Peeters' A, B and C classes according to their profile peak positions. Class A objects are predominant in 80% of the entire sample, which could indicate the presence of PAHs with nitrogen incorporation. The water ice absorption at 6.0 μm was also studied in eleven objects, and it affected the PAH band poorly. A prominent second spectral feature after 6.3 μm is present in ten galaxies. Fitting both PAH profiles at 6.2 μm changes all the fit results: the first profile is consistently blue-shifted and classified as class A due to the presence of the second component. Further studies are needed to better comprehend these PAH trends in galactic environments.

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<https://iopscience.iop.org/article/10.3847/1538-4357/ae45a5>

<https://arxiv.org/abs/2603.18901>

Aromatic Species in the Molecular Universe

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Interstellar polycyclic aromatic hydrocarbon (PAHs) are an important component of the interstellar medium of galaxies, containing some 10% of the elemental carbon. Their vibrational emission dominates the mid-infrared spectra of galactic and extragalactic objects. PAHs control the heating of interstellar neutral gas and the charge balance of molecular clouds. PAHs are formed in the outflows from late type stars through chemical processes akin to those in sooting flames and then further processed in the interstellar medium by UV photolysis and strong shock waves. PAHs are also formed through ion–molecule reactions and neutral–radical reactions in dense cloud cores. The James Webb Space Telescope has provided a wealth of high-quality spectra that have provided new insights in the characteristics of the interstellar PAH family. Their analysis is supported by dedicated laboratory and quantum chemistry studies, feeding into detailed molecular physics models relevant to astronomical environments. Laboratory studies have also provided deeper insight in the chemical evolution of PAHs in the interstellar medium. This paper will review progress in the field and chart its future.

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Meetings

Exploring the aromatic universe in the JWST era

Regular registration deadline approaching

London, ON, Canada
6 - 10 July, 2026

<https://www.aromaticuniverse.space>

Dear colleagues,

We are pleased to announce that registration is now open for “Exploring the Aromatic Universe in the JWST Era”, which will take place at Western University (London, Ontario, Canada) on 6–10 July 2026, and we encourage participants to register soon as the regular registration deadline is approaching.

Important dates:

- Wed April 15, 2026: Regular registration closes
- Mon June 15, 2026: Poster abstract submission closes
- Mon June 15, 2026: Late registration closes

A list of confirmed invited speakers and additional details are available at

<https://www.aromaticuniverse.space>

If you have any questions, please contact us. We eagerly await your submissions and look forward to welcoming you to London, Ontario, in July 2026.

Sincerely,

The Science Organizing Committee

E-mail for contact: aromaticuniverse1@gmail.com



Announcements

PhD in Molecular Astrophysics and Star Formation (4 years)

Department of Chemistry, Biochemistry
and Pharmaceutical Sciences (DCBP)
at Universität Bern

Advertised by Maria Drozdovskaya

PROJECT DESCRIPTION

How chemically complex do molecules in star-forming regions get and how do they form? Unbiased spectral surveys executed with the most powerful interferometers such as the Atacama Large Millimeter/submillimeter Array (ALMA) allow us to robustly identify 100s of molecules and constrain their abundances in regions containing infant stars. Meanwhile, state-of-the-art physicochemical models permit us to disentangle the individual chemical pathways towards chemical complexity and identify the most conducive physical environments.

The first goal is to observationally study star-forming regions with ALMA, in order to identify chemically complex molecules, their isotopologs, and their abundances. The second goal is to model the physical processes of star and protoplanetary disk formation alongside chemical process that produce and destroy complex organic molecules. ALMA data and initial modelling framework are already available. By the end of the project, you are expected to defend your PhD thesis and emerge with dual expertise in, both, radio observations and physicochemical modelling. You will immediately become part of international consortia with ample opportunity to collaborate and build your network. This is a fixed-term, 4-year position funded by the European Research Council (ERC) 2025 Consolidator Grant (CoG).

You will join a brand-new ambitious Molecular Astrophysics Group at the Department of Chemistry, Biochemistry and Pharmaceutical Sciences (DCBP) at Universität Bern (UniBe), founded on May 1st, 2026. With us, you will have a major impact on shaping the group's culture and approach to science for the coming years. As a member of a new and growing research group, you will benefit from close supervision by your supervisor and more senior group members, and short internal decision making. Powerful computers to facilitate work on ALMA data will be made available. The Molecular Astrophysics Group will be an international team with scientific excellence, mutual empowerment, and collective resilience as its core values.

WHAT YOU WILL DO

- Analyze ALMA data and learn data reduction pipelines
- Develop physical models of star formation and networks for interstellar chemistry
- Lead publications in high-impact journals
- Contribute to and lead future observing proposals
- Present results at international conferences and consortia meetings

REQUIREMENTS

- MSc degree in a natural science or engineering (astronomy, astrophysics, chemistry, physics, or another relevant field)
- Programming experience (e.g., Python)
- Interest in chemical composition and physicochemical processes transpiring in star-forming regions
- Competence in spoken and written English (C1 or higher)
- Exposure to basic astronomy is preferred

START DATE

June 1st, 2026 or later by agreement

APPLICATION INSTRUCTIONS

Applications will be considered on a rolling basis until filled. Apply by March 31st, 2026 for full consideration. Send the following documents in a single PDF to maria.drozdovskaya@unibe.ch

1. Motivation Letter (2 pg. max), including reasons for pursuing a PhD in general and for choosing the research field of molecular astrophysics
2. CV
3. Complete list and transcripts of all Bachelor- and Master-level courses, with a translation if not in English, German, French, Russian, or Dutch (notarized translation is not needed)
4. Contact information of 2 references (that may be contacted for a reference letter at a later stage)

Deadline: Rolling basis (31 March 2026 for full consideration)

E-mail for contact: maria.drozdovskaya@unibe.ch

Postdoc in Molecular Astrophysics with JWST (1 yr)

Department of Chemistry, Biochemistry and Pharmaceutical Sciences (DCBP) at Universität Bern

Advertised by Maria Drozdovskaya

PROJECT DESCRIPTION

What is the chemical composition of interstellar ices in molecular clouds, protostellar regions, and protoplanetary disks? With JWST, this can now be determined at an unprecedented accuracy.

The idea is to assemble an inventory of interstellar ice species and their abundances across the full evolutionary range of star- and planet-forming regions. Upon agreement, a specific evolutionary stage and corresponding JWST data set will be selected for a focused project achievable within the 1-yr timeframe. This is a short-term (1-yr with a potential extension depending on funding) postdoc opportunity, which could be ideal for a more experienced postdoc in need of bridge funding or an ambitious early postdoc, while applying for own independent funding, for example. Ample support will be provided for such pursuits of independent funding. As a more senior member of the group, you will be given significant autonomy and will help develop future research areas. You will have the opportunity to become part of international consortia with many opportunities to collaborate and expand your network. The initial fixed-term, 1-year position is funded by the European Research Council (ERC) 2025 Consolidator Grant (CoG).

You will join a brand-new ambitious Molecular Astrophysics Group at the Department of Chemistry, Biochemistry and Pharmaceutical Sciences (DCBP) at Universität Bern (UniBe), founded on May 1st, 2026. With us, you will have a major impact on shaping the group's culture and approach to science for the coming years. As a more experienced member of a new and growing research group, you will be expected to take on roles with more responsibilities, while benefiting from more facetime with your supervisor and short internal decision making. Powerful computers to facilitate work on JWST data will be made available. The Molecular Astrophysics Group will be an international team with scientific excellence, mutual empowerment, and collective resilience as its core values.

WHAT YOU WILL DO

- Reduce and analyze JWST data
- Lead publications in high-impact journals
- Present results at international conferences and consortia meetings
- Co-supervise MSc/PhD students (optional)

REQUIREMENTS

- PhD degree in a relevant field (astronomy, astrophysics, chemistry, physics)
- Research experience backed by a publication record
- Programming skills (e.g., Python)
- Interest to pursue independent funding
- Research experience with JWST data and/or molecular astrophysics

START DATE

June 1st, 2026 or later by agreement

APPLICATION INSTRUCTIONS

Applications will be considered on a rolling basis until filled. Apply by March 31st, 2026 for full consideration. Send the following documents in a single PDF to maria.drozdovskaya@unibe.ch

1. Motivation Letter (2 pg. max), including reasons for pursuing a PhD in general and for choosing the research field of molecular astrophysics
2. CV
3. Complete list and transcripts of all Bachelor- and Master-level courses, with a translation if not in English, German, French, Russian, or Dutch (notarized translation is not needed)
4. Contact information of 2 references (that may be contacted for a reference letter at a later stage)

Deadline: Rolling basis (31 March 2026 for full consideration)

E-mail for contact: maria.drozdovskaya@unibe.ch

Postdoc in Molecular Astrophysics with JWST (3 yrs)

Department of Chemistry, Biochemistry
and Pharmaceutical Sciences (DCBP)
at Universität Bern

Advertised by Maria Drozdovskaya

PROJECT DESCRIPTION

What sets the chemical composition of planet-forming materials? By studying the composition of the earliest sites of star and planet formation with JWST, we can begin to unravel how natal environments predetermine planetary composition.

The goal is to observationally study prestellar cores and protostellar environments with JWST, in order to obtain a chemical inventory of the interstellar ices therein. To start, NIRCAM and NIRSpec data are already available for reduction and analysis. Of particular interest to the project are complex organic species and their precursors. Over the course of the project, emphasis will be placed on securing statistically significant samples. As a postdoctoral researcher, you will be given significant autonomy and will help develop future research areas. You will immediately become part of international consortia with ample opportunity to collaborate and expand your network. This is a fixed-term, 3-year position funded by the European Research Council (ERC) 2025 Consolidator Grant (CoG).

You will join a brand-new ambitious Molecular Astrophysics Group at the Department of Chemistry, Biochemistry and Pharmaceutical Sciences (DCBP) at Universität Bern (UniBe), founded on May 1st, 2026. With us, you will have a major impact on shaping the group's culture and approach to science for the coming years. As a more experienced member of a new and growing research group, you will be expected to take on roles with more responsibilities, while benefiting from more facetime with your supervisor and short internal decision making. Powerful computers to facilitate work on JWST data will be made available. The Molecular Astrophysics Group will be an international team with scientific excellence, mutual empowerment, and collective resilience as its core values.

WHAT YOU WILL DO

- Reduce and analyze JWST NIRCAM and NIRSpec data
- Develop and apply data reduction pipelines
- Lead publications in high-impact journals
- Contribute to and lead future observing proposals
- Present results at international conferences and consortia meetings
- Co-supervise MSc/PhD students (optional)

REQUIREMENTS

- PhD degree in a relevant field (astronomy, astrophysics, chemistry, physics)
- Research experience backed by a publication record
- Programming skills (e.g., Python)
- Interest to develop leadership skills and work autonomously
- (preferred) Research experience with JWST data and molecular astrophysics
- (preferred) Experience developing pipelines for observational data reduction

START DATE

June 1st, 2026 or later by agreement

APPLICATION INSTRUCTIONS

Applications will be considered on a rolling basis until filled. Apply by March 31st, 2026 for full consideration. Send the following documents in a single PDF to maria.drozdovskaya@unibe.ch

1. Motivation Letter (1 pg. max)
2. CV
3. Publication List
4. Contact information of 3 references (that may be contacted for a reference letter at a later stage)

Deadline: Rolling basis (31 March 2026 for full consideration)

E-mail for contact: maria.drozdovskaya@unibe.ch

The second issue of the Laboratory Astrophysics Newsletter is out!

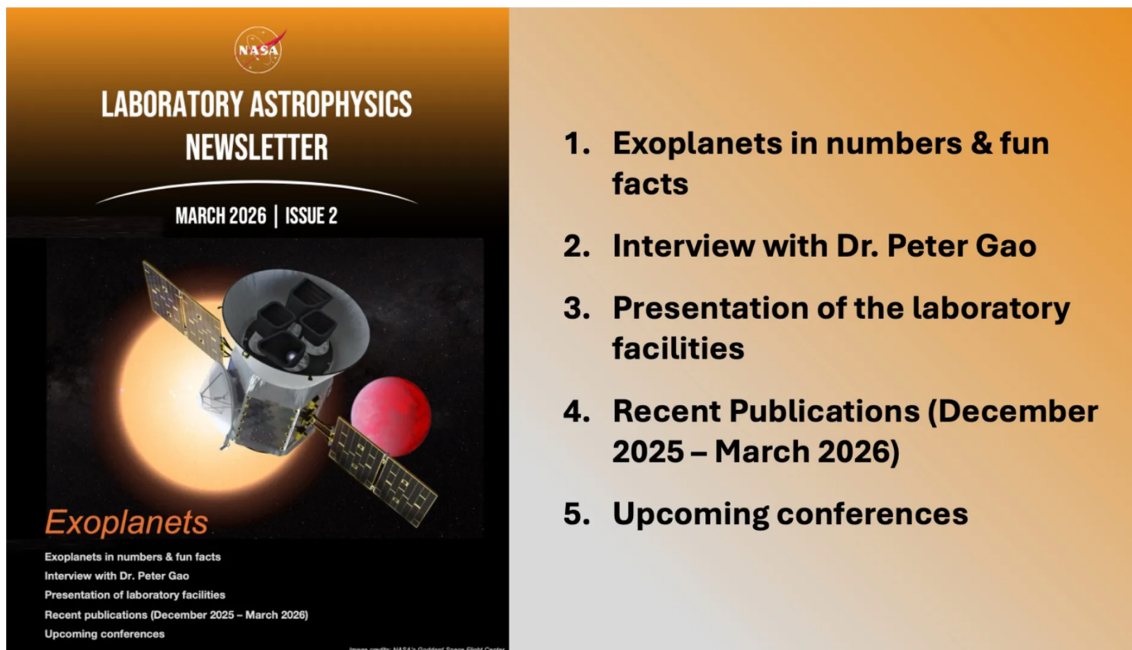
Advertised by

Joe Roser, Ella Sciamma-O'Brien, Michel Nuevo,
Lora Jovanovic, Partha Bera, Aaron McKinnon

The goal of the Lab Astro Newsletter is to enhance communication and interactions between experimentalists, theoreticians, modelers, and observers in the fields of Astrophysics and Planetary Science around the world.

This new issue focuses on **Exoplanets**. It includes an interview with Dr. Peter Gao, a description of experimental facilities that conduct exoplanet research, a list of recent publications in the field of Laboratory Astrophysics, and a list of upcoming meetings.

The newsletter can be found [here](#)



Cover and contents of the Laboratory Astrophysics Newsletter's second issue.

Keep an eye out for our next issue, in June 2026!

AstroPAH Newsletter

<http://astropah-news.strw.leidenuniv.nl>

astropah@strw.leidenuniv.nl

Next issue: 30 April 2026

Submission deadline: 17 April 2026