

Workshop on Interstellar Matter 2025

Book of Abstracts

12-14 November 2025

Institute of Low Temperature Science,
Hokkaido University, JAPAN

PROGRAM (as of 29th Oct)

1st day: 12th, Wed

8:15– Registration

9:00–9:05 Opening remarks: Naoki Watanabe

Morning Session 1 (Observation) Chair: TBD

- 9:05–9:45 **1. Miguel Sanz-Novo (CSIC-INTA, Spain) Invited**
 “A molecular treasure trove in the Galactic Center: New discoveries toward the G+0.693-0.027 shocked molecular cloud”
- 9:45–10:05 **2. Takashi Shimonishi (Niigata University, Japan)**
 “Exploring molecular complexity in the low-metallicity ISM”
- 10:05–10:25 **3. Andrés Megías (Centro de Astrobiología (CAB), Spain)**
 “Predicting the composition of astronomical ices with machine learning”
- 10:25–10:45 Coffee Break

Morning Session 2 (Experiment) Chair: TBD

- 10:45–11:25 **4. Isabelle Kleiner (LISA/CNRS, France) Invited**
 “Spectroscopy of astrophysical molecules with large amplitude motions”
- 11:25–12:05 **5. Ian Sims (Université de Rennes, France) Invited**
 “Low temperature gas-phase studies of collisional excitation, reactivity and cluster formation for astrophysical applications”
- 12:05–12:25 **6. Nami Sakai (RIKEN, Japan)**
 “Laboratory spectroscopy of $^{13}\text{CH}_2\text{DOH}$ and its astronomical significance for tracing the formation of iCOMs”
- 12:25–14:00 Lunch

Afternoon Session 1 (Theory) Chair: TBD

- 14:00–14:40 **7. Tatsuhiro Murakami (Tokyo Metropolitan University, Japan) Invited**
 “Molecular dynamics simulations of interstellar chemical reactions”
- 14:40–15:00 **8. Maria Mallo (IFF-CSIC, Spain)**
 “Ion-molecule routes towards cycles in TMC-1”
- 15:00–15:20 **9. Paul Pirlot Jankowiak (RIKEN, Japan)**
 “Collisional excitation of H_2CO deuterated isotopologues by molecular hydrogen”
- 15:20–15:40 Coffee Break

Afternoon Session 2 (Model) Chair: TBD

- 15:20–16:00 **10.** Valentine Wakelam (CNRS, France) **Invited**
“Astrochemical model: The good, the bad, and the ugly”
- 16:00–16:20 **11.** Yuto Komichi (The University of Tokyo, Japan)
“Study on chemical evolution during molecular cloud formation based on 3-dimensional MHD simulations”
- 16:20–16:40 **12.** Maria Murga (Institute of Astronomy of Russian Academy of Sciences, Russia)
“Catalytic pathways to polycyclic aromatic hydrocarbons in AGB stellar envelopes”
- 16:40–18:20 Poster Session (100 min)

2nd day: 13th, Thu

Morning Session 1 (Model & Observation) Chair: TBD

- 9:00–9:20 **13.** Ryota Ichimura (NAOJ/SOKENDAI, Japan)
“Isotopomer-specific carbon isotope ratio of complex organic molecules in star-forming cores”
- 9:20–9:40 **14.** Judit Ferrer Asensio (RIKEN, Japan)
“ $c\text{-C}_3\text{H}_2$ deuteration towards pre-stellar and starless cores in the Perseus molecular cloud”
- 9:40–10:20 **15.** Asunción Fuente (CSIC-INTA, Spain) **Invited**
“The trail of sulphur: from molecular clouds to life (SUL4LIFE)”
- 10:20–10:40 Coffee Break

Morning Session 2 (Theory) Chair: TBD

- 10:40–11:00 **16.** Joan Enrique Romero (Leiden Institute of Chemistry, The Netherlands)
“Surface chemistry of CN radicals on interstellar ices: A route to molecular complexity”
- 11:00–11:20 **17.** Germán Molpeceres (IFF-CSIC, Spain)
“Theoretical studies of interstellar isomerism: Formic acid and beyond”
- 11:20–11:40 **18.** Eric Mates-Torres (Universitat Autònoma de Barcelona, Spain)
“Theoretical investigation of low-energy glycine formation and spectral masking in star-forming regions”
- 11:40–12:00 **19.** Berta Martíbez Bachs (Universitat Autònoma de Barcelona, Spain)
“Exploring nondiffusive pathways to acetaldehyde formation in interstellar ices: Insights from computational studies”

12:00–14:00 Lunch

Afternoon Session 1 (Experiment) Chair: TBD

14:00–14:20 **20.** Gleb Fedoseev (Xinjiang Astronomical Observatory, China)

“Surface hydrogenation of interstellar polyynes: Bridging the gap between observations of unsaturated carbon chains in TMC-1 and linear alkanes in comet 67P”

14:20–15:00 **21.** Ni-En Sie (Hokkaido University, Japan) **Invited**

“The first detection of sulfur atom behavior on the silicate surface”

15:00–15:20 Coffee Break

Afternoon Session 2 (Experiment) Chair: TBD

15:20–15:40 **22.** Franciele Kruczkiewicz (Leiden University, The Netherlands)

“Chemical complexity driven by H_2 and carbon atoms: formation of sulfur-bearing molecules H_2CS and CH_3SH ”

15:40–16:00 **23.** Yi-Hsuan Chiu (National Central University, Taiwan)

“X-ray irradiation of H_2S -containing interstellar ice analogues”

16:00–17:40 Poster Session (100 min)

18:30– Banquet (@FMI)

3rd day: 14th, Fri

Morning Session 1 (Experiment) Chair: TBD

- 9:00–9:20 **24.** Yasuhiro Oba (Hokkaido University, Japan)
 “Nucleobases in Bennu, Ryugu, and carbonaceous meteorites”
- 9:20–9:40 **25.** Ludovic Biennier (Institut de Physique de Rennes, France)
 “Laboratory investigation of shock-induced processing of cosmic carbon dust analogues”
- 9:40–10:20 **26.** Ralf I. Kaiser (University of Hawaii, U.S.A) **Invited**
 “Astrochemistry - the final frontier”
- 10:20–10:40 Coffee Break

Morning Session 2 (Experiment) Chair: TBD

- 10:40–11:20 **27.** Ilsa Cooke (University of British Columbia, Canada) **Invited**
 “Cosmic-ray bombardment of icy troilite (FeS)”
- 11:20–11:40 **28.** Shiori Inada (The University of Tokyo, Japan)
 “Mass spectrometric analysis of sublimation products from silicate dust”
- 11:40–12:00 Concluding Remarks: TBA
- 12:00–14:00 Lunch
- 14:00– Free Discussion and Lab Tour

Posters

Session 1: 12th,16:40–18:20

Session 2: 13th,16:00–17:40

1. Haruto Ishii (Toho University, Japan)
“Millimeter-wave spectroscopy of hydantoin in its vibrationally excited states”
2. Takahiro Oyama (RIKEN, Japan)
“Fourier-transform microwave spectroscopy of the fluorovinyl radical”
3. Mizuki Miyazaki (Shibaura Institute of Technology, Japan)
“Enrichment and Spectroscopy of CH₃OD as a Step Toward the First Characterization of CH₂DOD”
4. Kazuki Matsushita (Toho University, Japan)
“Microwave spectroscopy of Aminoacetonitrile”
5. Tomoki Ino (University of Toyama, Japan)
“Rotational spectroscopy of deuterated ethanol (CH₃CD₂OH) for astronomical detection”
6. Hiroto Nakasone (Kyoto University, Japan)
“ALMA Band 7 observations of water lines in the protoplanetary disk of V883 Ori”
7. Kotomi Taniguchi (NAOJ, Japan)
“Analyses of the aromatic infrared bands (AIBs) around the Wolf-Rayet Binary WR140”
8. Shota Notsu (The University of Tokyo, Japan)
“Synergies with PRIMA and GREX-PLUS - Observations of water line profiles from protoplanetary disks”
9. Toki Ikeda (Niigata University, Japan)
“The results of the protostar survey toward the outer Galaxy with ALMA: Detection of the protostellar outflows/jets and a hot molecular core”
10. Yao-Lun Yang (RIKEN, Japan)
“Organic ice chemistry in embedded protostars”
11. Yoshimasa Watanabe (Shibaura Institute of Technology, Japan)
“Oxygen isotope ratios in interstellar CH₃OH”
12. Hajime Tanuma (Tokyo Metropolitan University, Japan)
“Ion mobility measurements for H₃⁺, D₃⁺, HeH⁺, and HeD⁺ in He gas at 77.3 K”
13. Ryoma Kakuda (University of Toyama, Japan)
“Tentative assignment of the skeletal torsion excited state of methyl formate in the infrared spectra”
14. Kunihiro Okada (Sophia University, Japan)
“Commissioning of a new measurement system for ion—polar-molecule reactions under low-temperature conditions”

15. Arijit Roy (Physical Research Laboratory, India)
“Making the interstellar minerals behind the shock front”
16. Yuki Nakano (Hokkaido University, Japan)
“Sulfur-bearing species in molecular clouds and PPDs as possible precursors for hydrated and dehydrated minerals in meteorites”
17. Yuta Hirakawa (JAMSTEC, Japan)
“Analytical development for identifying femtomole-level organophosphorus compounds using IC/HRMS for organic astrochemical samples”
18. Ian F. Mochida (The University of Tokyo, Japan)
“Understanding the surface structure of amorphous water: quantifying the surface coverage of dangling OH bonds”
19. Rashida Aslam (University of Palermo, Italy)
“CO infrared band profiles as a probes of interstellar ice condensation conditions”
20. Reo Sato (The University of Tokyo, Japan)
“Three-step structural transformation of vapor-deposited ice (H₂O) at 120 K”
21. Satorre Miguel Àngel (Universitat Politècnica de València, Spain)
“Water ice: Experimental density and refractive index at low temperatures”
22. Yukiko Yarnall (NASA, USA)
“Laboratory measurements of band strengths and optical constants of D₂O ices along with new measurements on H₂O ices”
23. Yu-Jong Wu (NYCU/NSRRC, Taiwan)
“Visible absorption spectra of mass-selected cyanobenzene and iso-cyanobenzene cations in solid neon”
24. Anastassiia Topchieva (Russian Academy of Science, Russia)
“Modeling the composition of ices in protoplanetary disks with luminosity outbursts”
25. David Navarro-Almida (CSIC-INTA, Spain)
“Fine-tuning the complex organic molecule formation: Sulphur and CO ice as regulators of surface chemistry”
26. Haruka Washinoue (RIKEN, Japan)
“Flare-driven X-ray ionization and chemistry in protoplanetary disks”
27. Yuto Komichi (The University of Tokyo, Japan)
“A simple and accurate framework for treating ortho-to-para ratio of molecular hydrogen in astrochemical models”
28. Alicja Bulik (Universitat Autònoma de Barcelona, Spain)
“CO₂ on interstellar iced grains: insights into adsorption and spectral features”
29. Debdata Banerjee (IISER-Kolkata, India)
“Unveiling the physical properties of Fe-doped cosmic silicate nanostructures from a computational perspective”

30. Maria Murga (Institute of Astronomy of Russian Academy of Sciences, Russia)
"The impact of a multi-population dust model with temperature distributions on astrochemical simulations"
31. Gerard Pareras (Universitat Autònoma de Barcelona, Spain)
"Sulphur chemistry on transition-metal dust grains: Insights from CS hydrogenation"
32. Yu Komatsu (Ibaraki University, Japan)
"Quantum chemical surface reactions producing carbamic acid as a glycine precursor"
33. Guillermo M. Muñoz Caro (INTA-CSIC, Spain)
"Physical properties and photochemistry of interstellar ice analogs forming complex organic molecules with sulfur"
34. Kentaro Noguchi (The University of Tokyo, Japan)
"*In situ* measurement of the crystal structure of nanometer-sized vapor-deposited ice growing under polar mesospheric conditions"
35. Antonio Jiménez-Escobar (INAF-Osservatorio Astronomico di Palermo, Italy)
"Sinergy of VUV and X-ray radiation"
36. Arisa Iguchi (Hokkaido University, Japan)
"Methylamine formation by radical–radical reactions on diluted ice surface at 10 K"
37. Yu-Jung Chen (National Central University, Taiwan)
"Sulfur-chain growth and oxidation pathways in electron-irradiated H₂S and H₂O+H₂S ices"
38. Atsuki Ishibashi (The University of Tokyo, Japan)
"Molecular formation by transient diffusion of reaction products on cold ice surfaces"
39. Bruno Escribano (CSIC-INTA, Spain)
"X-ray Irradiation of H₂S-containing ice and analysis using density functional theory"
40. Carina Hobbs (University of British Columbia, Canada)
"Probing O(³P) behaviour on interstellar ice analogues using the PSD-REMPI method"
41. Tamaki Endo (Hokkaido University, Japan)
"The surface diffusion of nitrogen atoms on amorphous solid water at low temperatures"
42. Héctor Carrascosa (CSIC-INTA, Spain)
"HMT derivatives as relics of the radicals formed at low temperatures"
43. Takuya Majima (Kyoto University, Japan)
"Fast heavy-ion-induced reactions on alcohol ice and droplet surfaces"
44. Carlos del Burgo Olivares (CSIC-INTA, Spain)
"Interstellar origin of complex molecules detected in meteorites: Experimental evidence from irradiated ices"
45. Yoichi Nakai (RIKEN, Japan)
"Interaction of low-energy CH₃⁺ ion with methanol solid in low temperature environment"

- 46.** Hiroshi Hidaka (Hokkaido University, Japan)
“Methanol formation via transient-diffusion-driven sequential reactions by methane deposition onto OH adsorbed amorphous solid water at low temperatures”
- 47.** Hidemasa Teraoka (The University of Tokyo, Japan)
“Development of high-pressure RHEED and IR spectroscopy for understanding the structure of vapor-deposited ice under terrestrial atmospheric conditions”
- 48.** Ziwei Zhang (RIKEN, Japan)
“Orion SrcI's disk investigated through sulfur-bearing molecules”
- 49.** Shaoshan Zeng (RIKEN, Japan)
“Isomerism beyond thermodynamics: Discovery of cis-NMF in the ISM”