

## Program (in UTC)

In Coordinated Universal Time (UTC)

**17th, Wed.**

**0:00-0:05** Opening remarks: Naoki Watanabe (Hokkaido University, Japan)

*Morning Session 1 Chair: Tomoya Hirota*

**0:05-0:45** Brett McGuire (Massachusetts Institute of Technology, USA) Invited  
"The PAH Revolution: Cold, Dark Carbon at the Earliest Stages of Star Formation"

**0:45-1:05** Yuki Okoda (The University of Tokyo, Japan)  
"Compact Distributions of N-bearing species and HCOOH in the Protostellar Source B335"

**1:05-1:25** Giseon Baek (Kyung Hee University, Korea)  
"Complex organic molecules detected in twelve high mass star forming regions with ALMA"

**1:25-1:40** Coffee break

*Morning Session 2 Chair: Brett McGuire*

**1:40-2:00** Zwei Zhang (RIKEN, Japan)  
"Hot Disk Chemistry in Massive Star forming Regions"

**2:00-2:20** Takashi Shimonishi (Niigata University, Japan)  
"ALMA Discovery of Chemical Complexity at the Edge of our Galaxy"

**2:20-2:40** Nadia Murillo (RIKEN, Japan)  
"Studying the factors that determine multiplicity and chemical complexity in Perseus"

**2:40-3:00** Hideko Nomura (NAOJ, Japan)  
"Formation of complex organic molecules through ice mantle reactions"

**3:00-5:00** Lunch

*Afternoon Session 1 Chair: Germán Molpeceres*

**5:00-5:20** Victor Manuel Rivilla Rodriguez (CSIC/INTA, Spain)

"Molecular precursors of the RNA-world in the interstellar medium"

**5:20-5:40** Laura Colzi (CSIC/INTA, Spain)

"The GUAPOS project: A comprehensive study of peptide-like bond molecules"

**5:40-6:00** Albert Rimola (Universitat Autònoma de Barcelona, Spain)

"Quantum Chemical Simulations to Unveil the Interstellar Grain Surface Chemistry. Insights at an Atomistic Scale"

**6:00-7:30** Poster session

*Afternoon Session 2 Chair: Thanja Lamberts*

**7:30-8:10** Germán Molpeceres (Universität Stuttgart, Germany) Invited

"Machine Learning Meets Surface Astrochemistry"

**8:10-8:30** Stephan Schlemmer (Universität zu Köln, Germany)

"Misslons: Missing Ions in Laboratory"

**8:30-8:50** Frederik Doktor S. Simonsen (Aarhus Universitet, Denmark)

"Formation of water ice clusters on graphite"

**8:50-9:00** Coffee break

*Afternoon Session 3 Chair: Kensei Kitajima*

**9:00-9:40** Brian Hays (Université de Rennes 1, France) Invited

"The measuring the formation of products from reaction at low temperatures using chirped pulse Fourier transform spectroscopy in uniform flows"

**9:40-10:00** Cristina Puzzarini (Università di Bologna, Italy)

"Theory and Experiment for Elucidating Chemical Evolution in Space"

**10:00-10:20** Jesús Antonio Lique-Urrutia (Universitat Autònoma de Barcelona, Spain)

"Glycolaldehyde Formation on Interstellar Water Ice Surfaces. A Computational Quantum Chemical Approach"

## **18th, Thu.**

*Morning Session 1 Chair: Kenji Furuya*

**0:00-0:40** Rob Garrod (University of Virginia, USA) Invited

"Cold chemistry in hot cores: Non-diffusive grain-surface chemistry and its role in forming complex organic molecules in star-forming regions"

**0:40-1:20** Masashi Tsuge (Hokkaido University, Japan) Invited

"Icy grains are not spherical nor ellipsoidal"

**1:20-1:40** Y. L. Yang (University of Virginia, USA)

"Chemistry of Embedded Disks in Perseus: Prevalent Complex Organic Molecules and Shock-excited Sulfur-bearing Molecules"

**1:40-3:20** Poster session

**3:20-5:00** Lunch

*Afternoon Session 1 Chair: W.M.C. Sameera*

**5:00-5:20** Izaskun Jimenez-Serra (CSIC/INTA, Spain)

"Formation, Abundance Distribution and Evolution of Complex Organic Molecules in Starless/Pre-stellar Cores"

**5:20-5:40** Juan García de la Concepción (Centro de Astrobiología, Spain)

"Formation of phosphorus monoxide (PO) in the interstellar medium: insights from quantum-chemical and kinetic calculations"

**5:40-6:00** Joan Enrique Romero (Universite Grenoble Alpes, France)

"A systematic computational study of radical-radical reactions on interstellar ice surfaces"

**6:00-6:20** Ni-En Sie (National Central University, Taiwan)

"The thickness and UV absorption effect on UV photolysis of CH<sub>4</sub> ice"

**6:20-7:30** Poster session

*Afternoon Session 2    Chair: Yuri Aikawa*

**7:30-7:50** Thanja Lamberts (Universiteit Leiden, The Netherlands)

"Carbon atom addition reactions in interstellar ices: How to marry laboratory and computational chemistry"

**7:50-8:10** Aurèle Germain (Università degli studi di Torino, Italy)

"Application of the Tight Binding GFN-xTB Method to Model Large Interstellar Amorphous Icy Grains"

**8:10-8:30** Stefano Ferrero (Universitat Autònoma de Barcelona, Spain)

"The energy dissipation process of hydrogenation reactions of atomic nitrogen on water ice surfaces"

**8:30-8:50** Coffee break

*Afternoon Session 3    Chair: Masashi Tsuge*

**8:50-9:30** Jean-Hugues Fillion (LERMA - Sorbonne Université et Observatoire de Paris, France) Invited

"Photon Stimulated Desorption from interstellar ice analogs: recent results using synchrotron radiation"

**9:30-10:10** Emmanuel Dartois (Institut des sciences moléculaires d'Orsay, France) Invited

"Non-thermal desorption of ice mantles: cosmic rays desorption of complex organic molecules"

**10:10-10:30** Kenji Furuya (NAOJ, Japan)

"Quantifying the chemical desorption of H<sub>2</sub>S and PH<sub>3</sub> from water ice surface"

## **19th, Fri.**

*Morning Session 1 Chair: Ralf Kaiser*

**0:00-0:40** Susanna Widicus Weaver (University of Wisconsin-Madison, USA) Invited

"The role of UV photolysis and thermal processing in interstellar ice chemistry"

**0:40-1:00** Atsuki Ishibashi (Hokkaido University, Japan)

"Water-promoted formation of methyl formate from methanol via methoxymethanol on ice"

**1:00-1:20** Zhen-Dong Sun (Shandong University, China)

"Calculation of the ortho-para conversion rate of gaseous methanol by the internal axis method"

**1:20-1:40** Coffee break

*Morning Session 2 Chair: Kaori Kobayashi*

**1:40-2:20** Ralf Kaiser (University of Hawaii, USA) Invited

"An Aromatic Universe - Low Temperature Molecular Mass Growth Processes to Polycyclic Aromatic Hydrocarbons (PAHs)"

**2:20-3:00** Shogo Tachibana (The University of Tokyo, Japan) Invited

"Hayabusa2 returned samples from C-type near-Earth asteroid (162173) Ryugu: Preliminary report of initial analysis"

**3:00-** Concluding remarks: Nami Sakai (RIKEN, Japan)

## Posters

In Coordinated Universal Time (UTC)

17th Wed. **6:00-7:30**

18th Thu. **1:40-3:20, 6:20-7:30**

1. Yuri Aikawa (The University of Tokyo, Japan)  
"HCO<sup>+</sup> and ionization structure observed by ALMA"
2. Mitsunori Araki (Tokyo University of Science)  
"Testing Dust-Surface Formation Model of Prebiotic Molecule CH<sub>3</sub>NCO in Star-Forming Cores Sagittarius B2 (M) and (N)"
3. Gianni Cataldi (NAOJ, Japan)  
"Can grain-surface chemistry explain the surprisingly low C/CO ratio in the HD 32297 debris disk?"
4. Izumi Endo (The University of Tokyo, Japan)  
"Nitrogen inclusion in organic dust in novae revealed by laboratory synthesis of Quenched Nitrogen-included Carbonaceous Composite (QNCC)"
5. Izuru Fukuda (Tokyo University of Science, Japan)  
"Development of Cavity Enhanced Absorption Spectrometer Aiming to Measure Optical Absorption Bands of Interstellar Molecules"
6. Tetsuya Hama (The University of Tokyo, Japan)  
"Experimental measurement of the absorption cross section of dangling OH bonds in water ice"
7. Tomoyuki Hanawa (Chiba University)  
"Cloudlet capture model for the origin of asymmetric molecular line emissions from in the young stellar objects"
8. Tomoya Hirota (NAOJ, Japan)  
"Submillimeter H<sub>2</sub>O masers in high-mass star-forming regions"

9. Hoga Furukawa (University of Toyama, Japan)  
"Microwave spectroscopy of isothiazole"
10. Chao-Hui Huang (National Central University, Taiwan)  
"Energetic processes caused by sub-keV electrons impacting on H<sub>2</sub>O+CO ice mixtures"
11. Hyeon-Deuk Kim (Kyoto University, Japan)  
"Anomalous Properties of Condensed Hydrogen Molecules under Extreme Thermodynamic Conditions Revealed by the Non-Empirical Quantum Molecular Dynamic Simulation Method"
12. Kensei Kitajima (Hokkaido University, Japan)  
"A new electrochemical property of ice: negative charge transport triggered by reactions of surface OH radicals with electrons"
13. Beatrice Kulterer (University of Bern, Switzerland)  
"Mono-deuterated methanol in prestellar cores"
14. Signe Kyrkjebø (Aarhus University, Denmark)  
"Early stages of water cluster growth observed with low-temperature scanning tunnelling microscopy"
15. Berta Martínez-Bachs (Universitat Autònoma de Barcelona, Spain)  
"Computational Investigation on the Potential Energy Surface of the Formation Route of Formamide from Reaction between NH<sub>2</sub> and H<sub>2</sub>CO on Interstellar Water Ice Surface"
16. Ayane Miyazaki (Hokkaido University, Japan)  
"Detection of photodesorption OH radicals from H<sub>2</sub>O ice surface by visible light"
17. T. Nagasawa (The University of Tokyo, Japan)  
"An infrared spectroscopic approach towards understanding the orientation of dangling OH bonds on amorphous solid water"
18. Yoichi Nakai (RIKEN, Japan)  
"Methanol production via interactions of low-energy CH<sub>3</sub><sup>+</sup> ions with ASW surface: experimental investigation of ion-surface reactions"

19. Thanh Nguyen (Hokkaido University, Japan)  
"Experimental and computational studies on the physicochemical behavior of phosphine induced by reactions with H and D atoms on interstellar ice grains"
20. Shota Notsu (RIKEN, Japan)  
"X-ray-induced chemistry of water and related molecules in low-mass protostellar envelopes"
21. Naoki Numadate (The University of Tokyo, Japan)  
"First direct detection of OH radicals photodesorbed from liquid organic surface by using laser-induced fluorescence technique"
22. Satoshi Ohashi (RIKEN, Japan)  
"FAUST III. Misaligned rotations of the envelope, outflow, and disks in the multiple protostellar system of VLA 1623 $\zeta$ -2417"
23. Kunihiro Okada (Sophia University, Japan)  
"Experimental study toward the measurements of rotational state dependence of interstellar ion-polar molecule reactions at low temperatures"
24. Yoko Oya (The University of Tokyo, Japan)  
"Chemical Differentiation and its Relation with the Physical Structures in Disk-Forming Regions of Young Low-Mass Protostellar Sources"
25. Anshika Pandey (Banaras Hindu University, India)  
"Formation of 3-Pyrolline in Interstellar Space: A Computational Study"
26. Akant Vats (Banaras Hindu University, India)  
"DFT study on hydrogenated and deuterated derivatives of interstellar fullerenes"
27. Jessica Perrero (Universtitat Autònoma de Barcelona, Spain)  
"Formation of acetaldehyde on mixed-ice grain surfaces"
28. P. V. G. M. Rathnayake (The University of Sydney, Australia)  
"PyQMMM for modelling chemical processes in the interstellar medium"



29. Eri Saiga (The University of Tokyo, Japan)  
"Star Formation Feedback to a Parent Cloud: The Elias 29 Case"
30. Nami Sakai (RIKEN, Japan)  
"Measurements of Microwave Spectra of Methanol Isotopologues in ALMA Band 6 Frequency Range"
31. R. Sato (The University of Tokyo, Japan)  
"Development of the RHEED apparatus for in situ structural analysis of water ices in low-temperature and ultrahigh vacuum conditions"
32. Richard Schömig (Universität Stuttgart, Germany)  
"WA Theoretical, Neural-Network Assisted Study of Methane Formation under Astrophysical Conditions"
33. Taha Selim (Radboud University, The Netherlands)  
"Unraveling Molecular Collisions in Protoplanetary Disks"
34. Bethmini Senevirathne (University of Gothenburg, Sweden)  
"H and D diffusion on interstellar water ices"
35. Atsuki Ishibashi (Hokkaido University, Japan)  
"Development of a high-sensitivity and non-destructive detection system for trace amounts of adsorbates on ice"
36. Satyam Srivastav (Banaras Hindu Univ, India)  
"Interstellar Branched Chain Molecules"
37. Kotomi Taniguchi (NAOJ, Japan)  
"Nitrile Chemistry in a Disk Structure around the G24.78+0.08 A1 Hyper-compact HII region"
38. Lorenzo Tinacci (Univerisité Grenoble Alpes, France)  
"A New Approach to the Compute Accurate Binding Energy Distribution of Molecules at Ice Interstellar Grain Models: the Case of NH<sub>3</sub>"

39. Takuto Tomaru (Hokkaido University, Japan)  
"STM and Non-Contact-AFM observation of Si(111) by a self-made Qplus sensor at low temperatures"
40. Masashi Tsuge (Hokkaido University, Japan)  
"Diffusive hydrogenation of CO embedded in amorphous solid water at temperature up to 70 K"
41. Masashi Tsuge (Hokkaido University, Japan)  
"Ortho-to-para nuclear spin conversion of H<sub>2</sub> on interstellar bare grain analogues"
42. Withdraw
43. Yoshimasa Watanabe (Shibaura Institute of Technology, Japan)  
"Development of Spectrometer Using Superconductor Mixer Receiver (SUMIRE)"
44. Tomohiro Yoshida (NAOJ, Japan)  
"A new measurement method of isotopologue ratios in protoplanetary disks: a case study of the <sup>12</sup>CO/<sup>13</sup>CO ratio in the TW Hya disk"
45. Yichen Zhang (RIKEN, Japan)  
"Multi-tracer Observations for Multi-scale Accretion Structures in Massive Star Formation"
46. Shaoshan Zeng (RIKEN, Japan)  
"Inventory of Nitrogen-bearing organics towards G+0.693-0.027"
47. Akemi Tamanai (RIKEN, Japan)  
"Experimental Molecular Emission Spectroscopy of Ethylene Oxide in ALMA Band 6"