

Program: Oral Presentations

September 3, Sunday

17:00-19:00 **Welcome party** **Hotel Mystays Sapporo Aspen**

September 4, Monday

12:00-13:30 **Registration** **Lobby (Foyer)**

13:30-13:40 **Opening** **Room A**

13:40-14:20 **A Plenary Lecture** **Room A**

Chairperson: Gen Sazaki

13:40-14:20 4-A1-1 **Physicochemical Processes of OH Radicals on Ice at Low Temperatures**
Naoki Watanabe¹
¹ Institute of Low Temperature Science, Hokkaido University, N19-W8, Kita-ku, Sapporo 060-0819, Japan

14:40-15:50 **Surfaces and Interfaces of Ice 1** **Room A**

Chairperson: Emily Asenath-Smith

14:40-15:10 4-A2-1 **Ice Faces: A Molecular View of Growth and Interactions (Invited)**
Mary Jane Shultz¹, Emma Gubbins¹, Ziqing Xiong¹, Sahar Shata¹
¹ Tufts University

15:10-15:30 4-A2-2 **In-Situ Observations of Low- and High-Density Unknown Waters at Interfaces between Water and Ices Grown/Melted by Pressure**
Hiromasa Niinomi¹, Tomoya Yamazaki², Hiroki Nada³, Tetsuya Hama⁴, Akira Kouchi², Tomoya Oshikiri^{1,5}, Masaru Nakagawa¹, Jun Nozawa⁶, Satoshi Uda⁷, Yuki Kimura²
¹ Institute of Multidisciplinary Research for Advanced Materials, Tohoku University,
² Institute of Low Temperature Science, Hokkaido University
³ Faculty of Engineering, Tottori University
⁴ Komaba Institute for Science, Tokyo University
⁵ Research Institute for Electronic Science, Hokkaido University
⁶ Institute for Materials Research, Tohoku University
⁷ New Industry Creation Hatchery Center, Tohoku University

15:30-15:50 4-A2-3 **Measurements of Negative Surface Voltage Variation of Amorphous Solid Water with a Nanoscale Spatial Resolution by FM-AFM**
Takuto Tomaru¹, Hiroshi Hidaka¹, Naoki Watanabe¹
¹ Institute of Low Temperature Science, Hokkaido University

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- 16:10-17:10 **Surfaces and Interfaces of Ice 2** **Room A**
Chairperson: Shultz Mary Jane
- 16:10-16:30 4-A3-1 **Polycrystallinity Significantly Enhances Stress Build-Up During Freezing**
Dominic Gerber¹, Lawrence A. Wilen², Erice R. Dufresne¹, Robert Style¹
¹ Soft and Living Materials, Department of Materials, ETH Zürich, 8093 Zürich, Switzerland
² Center for Engineering Innovation and Design, School of Engineering and Applied Sciences, Yale University, New Haven, Connecticut 06520, USA
- 16:30-16:50 4-A3-2 **Growth and Form of Rippled Icicles**
Menno Demmenie^{1,2}, Lars Reus¹, Paul Kolpakov¹, Sander Woutersen², Daniel Bonn¹, Noushine Shahidzadeh¹
¹ Institute of Physics, University of Amsterdam, Science Park 904, Amsterdam 1098 XH, Netherlands
² Van 't Hoff Institute for Molecular Sciences, University of Amsterdam, Science Park 904, Amsterdam 1098XH, Netherlands
- 16:50-17:10 4-A3-3 **Ice Removal from Surfaces by Interfacial Crack Propagation**
Emily Asenath-Smith¹, Olivier Montmayeur¹, Travis Hilton¹, Jeffrey Allen², Robert Haehnel¹
¹ Cold Regions Research and Engineering Laboratory (CRREL), US Army Corps of Engineers Engineer Research & Development Center, 72 Lyme Road, Hanover NH, 03755, United States of America
² Information Technologies Laboratory, US Army Corps of Engineers Engineer Research & Development Center 3909 Halls Ferry Road, Vicksburg, MS 39180, United States of America
- 17:30-18:10 **Surfaces and Interfaces of Ice 3** **Room A**
Chairperson: Hiromasa Niinomi
- 17:30-17:50 4-A4-1 **Hydrogen Bonding in Water Enhanced by Local Electric Field in Polyelectrolyte Brushes**
Yoshihisa Harada¹, Kosuke Yamazoe², Yuji Higaki³, Jun Miyawaki⁴, Atsushi Takahara⁵
¹ Institute for Solid State Physics, The University of Tokyo, Kashiwa, Chiba 277-8581, Japan
² Japan Synchrotron Radiation Research Institute, Sayo, Hyogo 679-5198, Japan
³ Department of Integrated Science and Technology, Faculty of Science and Technology, Oita University, Dannoharu, Oita 870-1192, Japan
⁴ National Institutes for Quantum Science and Technology (QST), Aoba-ku, Sendai, Miyagi 980-8572, Japan
⁵ Research Center for Negative Emission Technologies, Kyushu University, Nishi-ku, Fukuoka 819-0395, Japan

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- 17:50-18:10 4-A4-2 **Adsorption Structures of Ammonia Molecules on Crystalline Ice**
Du Hyeong Lee^{1,2}, Heon Kang²
¹ Korea Polar Research Institute
² Seoul National University
- 14:40-15:50 **Ice and Snow in the Cryosphere 1** **Room B**
Chairperson: Robert Style
- 14:40-15:10 4-B2-1 **Measuring Microscale Mechanisms of Snow Melt, Rain-on-Snow, Drainage, and Imbibition Using Rapid Magnetic Resonance Profiling (Invited)**
Quirine Krol^{1,2}, Sarah Codd¹, Kevin Hammonds², Matthew Skuntz¹, Joseph D. Seymour¹
¹ Magnetic Resonance Laboratory, Montana State University
² Subzero Laboratory, Montana State University
- 15:10-15:30 4-B2-2 **Ice Particles in Clouds: Origins, Processing, and Cloud Lifetime**
Erik S. Thomson¹, Luisa Ickes², Luis F.E.d. Santos¹, Hannah C. Frostenberg²
¹ Department of Chemistry and Molecular Biology, University of Gothenburg, Gothenburg 41296, Sweden
² Department of Space, Earth and Environment, Chalmers University, Gothenburg 41296, Sweden
- 15:30-15:50 4-B2-3 **Direct Observation of Wet Snow Using X-Ray Tomography: First Results and Outlooks**
Frederic Flin¹, Pierre Latil¹, Iheb Haffar¹, Laurent Pezard¹, Jacques Rouille¹, Hayat Benkhelifa^{2,3}, Pascal Charrier⁴, Nicolas Lenoir⁴, Fatou-Toutie Ndoye², Jonathan Perrin⁵, Mario Scheel⁵, Timm Weitkamp⁵
¹ Univ. Grenoble Alpes, Universite de Toulouse, Meteo-France, CNRS, CNRM, Centre d'Etudes de la Neige, Grenoble, France
² Universite Paris-Saclay, INRAE, UR FRISE, F-92761 Antony, France
³ Universite Paris-Saclay, INRAE, AgroParisTech, 75005 Paris, France
⁴ Universite Grenoble Alpes, Grenoble INP, 3SR, CNRS, Grenoble, France
⁵ Synchrotron SOLEIL, 91190 Saint-Aubin, France
- 16:10-17:10 **Ice and Snow in the Cryosphere 2** **Room B**
Chairperson: Frederic Flin
- 16:10-16:30 4-B3-1 **Pattern Formation of Refrozen Melt Structures in Snowpack**
Nathan Jones¹, Adrian Moure¹, Xiaojing Fu¹
¹ Department of Mechanical and Civil Engineering, California Institute of Technology, 1200 E California Blvd., Pasadena, CA 91125, USA
- 16:30-16:50 4-B3-2 **A Physical Model of Gas Bubble Nucleation and Transport in Sea Ice**
Joseph Fishlock¹, Andrew Wells¹, Christopher MacMinn²
¹ Atmospheric, Oceanic & Planetary Physics, Dept. of Physics, University of Oxford
² Dept. of Engineering Science, University of Oxford
- 16:50-17:10 4-B3-3 **Effects of Sulfuric Acid on Sintering of Laboratory Simulated Polar Firn**
Evan N. Schehrer¹, Marika Feduschak¹, Khristian Jones¹, Kevin Hammonds¹
¹ Montana State University, Subzero Research Laboratory, Bozeman, MT, USA

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17:30-18:50	Ice and Snow in the Cryosphere 3	Room B
		Chairperson: Erik Thomson
17:30-17:50	4-B4-1	Investigation of Structure and Geochemical Composition of Ushkovsky Shallow Ice Core <u>Mstislav Vorobyev</u> ¹ , Vladimir Mikhailenko ¹ , Aleksandra Khairedinova ¹ , Julia Chizhova ^{1,2} , Maria Vinogradova ¹ ¹ Institute of Geography, Russian Academy of Sciences, Glaciology, Moscow, Russia ² Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry, Russian Academy of Science, Moscow, Russia
17:50-18:10	4-B4-2	Ice-Drilling Method of Continuously Coring with Air Reverse Circulation <u>Rusheng Wang</u> ¹ , Xinyu Lv ¹ , Zhihao Cui ¹ ¹ Polar Research Center, Jilin University
18:10-18:30	4-B4-3	International Efforts and Chinese Contributions on Mapping Subglacial Topography of the Antarctica Ice Sheet <u>Xiangbin Cui</u> ¹ ¹ Polar Research Institute of China
18:30-18:50	4-B4-4	Freezing Damage in Brittle Hydrogels Shaohua Yang ¹ , Dominic Gerber ² , Nicolas Bain ² , Laura de Lorenzis ² , Eric Dufresne ^{2,3} , <u>Robert Style</u> ² ¹ Beihang University, Beijing, 100191, China ² ETH Zürich, Zürich, 8093, Switzerland ³ Cornell University, Ithaca, NY 14850, USA

September 5, Tuesday

9:00-10:10	Crystal Growth of Ice 1	Room A
		Chairperson: Hiroki Nada
9:00-9:30	5-A1-1	Step-Bunching Instability of Growing Interfaces between Ice and Supercooled Water (Invited) <u>Ken-ichiro Murata</u> ¹ , Masahide Sato ² , Makio Uwaha ³ , Fumiaki Saito ¹ , Ken Nagashima ¹ , Gen Sazaki ¹ ¹ Institute of Low Temperature Science, Hokkaido University, N19-W8, Kita-ku, Sapporo 060-0819, Japan ² Emerging Media Initiative, Kanazawa University, Kakuma-machi, Kanazawa 920-1192, Japan ³ Center for General Education, Aichi Institute of Technology, Yakusa-cho, Toyota 470-0392, Japan
9:30-9:50	5-A1-2	Liquid-Cell Transmission Electron Microscopy of Ice Crystals and Bubble Behaviors in the Ice <u>Tomoya Yamazaki</u> ¹ , Yuga Yashima ¹ , Hiroyasu Katsuno ¹ , Hiroya Miyazaki ² , Takashi Gondo ² , Yuki Kimura ¹ ¹ Institute of Low Temperature Science, Hokkaido University ² Mel-Build Corporation

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- 9:50-10:10 5-A1-3 **Characterizing Faceted Snow Crystals with Electron Backscatter Diffraction**
Evan N. Schehrer¹, Kevin Hammonds¹
¹ Montana State University, Subzero Research Laboratory, Bozeman, MT, USA
- 10:30-11:50 **Crystal Growth of Ice 2** **Room A**
Chairperson: Luis MacDowell
- 10:30-10:50 5-A2-1 **Microscopic Ordering of Supercooled Water on the Ice Basal Face**
Kenji Mochizuki¹, Ken-ichiro Murata², Xuan Zhang¹
¹ Department of Chemistry, Zhejiang University, Hangzhou, 310028, P. R. China
² Institute of Low Temperature Science, Hokkaido University, N19-W8, Kita-ku, Sapporo 060-0819, Japan
- 10:50-11:10 5-A2-2 **Effect of Air Molecules on the Growth Kinetics of Ice from Water Studied by Molecular Dynamics Simulation**
Hiroki Nada¹
¹ Tottori University
- 11:10-11:30 5-A2-3 **Toward the Rational Design of Novel Cryoprotectants**
Gabriele C. Sosso¹, Fabienne Bachtiger¹, Matthew T. Warren¹, Matthew I. Gibson¹
¹ Department of Chemistry, University of Warwick, CV4 7AL, Coventry, United Kingdom
- 11:30-11:50 5-A2-4 **A Self-Oscillatory Growth Model of an Ice Crystal in Antifreeze Glycoprotein Solution**
Etsuro Yokoyama¹
¹ Gakushuin University
- 13:30-15:10 **Crystal Growth of Ice 3** **Room A**
Chairperson: Kevin Hammonds
- 13:30-13:50 5-A3-1 **Surface Phase Transitions, Anomalous Step Free Energies and Crystal Growth Rates of Ice in the Atmosphere**
Pablo Llombart^{1,2}, Eva G. Noya³, Luis G. MacDowell¹
¹ Universidad Complutense de Madrid, Spain.
² Instituto de Física Nicolás Cabrera, Madrid, Spain.
³ Instituto de Química Física Rocasolano, Madrid, Spain.
- 13:50-14:10 5-A3-2 **Temperature Dependence of the Growth Kinetics of Elementary Spiral Steps on Ice Prism Faces Grown in Vapor**
Genki Miyamoto¹, Akira Kouchi¹, Ken-ichiro Murata¹, Ken Nagashima¹, Gen Sazaki¹
¹ Institute of Low Temperature Science, Hokkaido University
- 14:10-14:30 5-A3-3 **Uptake Mechanism of Atmospheric-Concentration HCl Gas in Ice Crystals via Hydrochloric Acid Droplets**
Ken Nagashima¹, Ken-ichiro Murata¹, Gen Sazaki¹
¹ Institute of Low Temperature Science, Hokkaido University, Japan

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- 14:30-14:50 5-A3-4 **Quantification of Anion and Cation Uptake in Ice Ih Crystals**
Jenee D. Cyran^{1,2}, Tiara Sivellls², Pranav Viswanathan²
¹ Boise State University
² Baylor Univeristy
- 14:50-15:10 5-A3-5 **Solute Interactions in Ice: Color Quenching and Crystallization Effects**
Daniel W. Tague¹, Timothy Schutt², Manoj Shukla², Gilbert Kosgei², Emily Asenath-Smith¹
¹ Cold Regions Research and Engineering Laboratory, US Army Corps of Engineers Engineer Research & Development Center, 72 Lyme Road, Hanover NH, 03755, United States of America
² Environmental Laboratory, US Army Corps of Engineers Engineer Research & Development Center 3909 Halls Ferry Road, Vicksburg, MS 39180, United States of America
- 15:30-16:40 **Ice Phases, Amorphous Ice, and Glass Transition 1** **Room A**
Chairperson: Katrin Amann-Winkel
- 15:30-16:00 5-A4-1 **Ultrafast Melting and Recrystallization Dynamics of Ice Revealed by Time-Resolved X-Ray Scattering at FELs (Invited)**
Kyung Hwan Kim¹
¹ Department of Chemistry, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk 37673, Republic of Korea.
- 16:00-16:20 5-A4-2 **Cooperative Molecular Dynamics of High-Density Water; Dielectric Study on Glycerol Water Mixtures Under High Pressure**
Kaito Sasaki^{1,2,3}, Yoshiharu Suzuki³
¹ Department of Physics, Tokai University, Kitakaname 4-1-1, Hiratsuka, Kanagawa 259-1292, Japan.
² Micro/Nano Technology Center, Tokai University, Kitakaname 4-1-1, Hiratsuka, Kanagawa 259-1292, Japan.
³ Research Center for Advanced Measurement and Characterization, National Institute for Materials Science (NIMS), Namiki 1-1, Tsukuba, Ibaraki 305-0044, Japan
- 16:20-16:40 5-A4-3 **Neutron Diffraction Study of the Hydrogen-Bond Symmetrization in Ice**
Kazuki Komatsu¹, Stefan Klotz², Shinichi Machida³, Takanori Hattori⁴, Asami Sano-Furukawa⁴, Keishiro Yamashita^{1,5}, Hiroki Kobayashi¹, Hayate Ito¹, Hiroyuki Kagi¹
¹ Geochemical Research Center, Graduate School of Science, The University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo 113-0033, Japan
² IMPMC, CNRS UMR 7590, Sorbonne Université, 4 Place Jussieu, F-75252 Paris, France
³ Neutron Science and Technology Center, CROSS, 162-1 Shirakata, Tokai, Ibaraki 319-1106, Japan
⁴ J-PARC Center, Japan Atomic Energy Agency, 2-4 Shirakata, Tokai, Ibaraki 319-1195, Japan
⁵ Institute of Physical Chemistry, University of Innsbruck, A-6020 Innsbruck, Austria

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- 9:00-10:10 **Clathrate Hydrates 1** **Room B**
Chairperson: Tsutomu Uchida
- 9:00-9:30 5-B1-1 **Exploring the Stability and New Structures of Gas Filled Ices Up to Mbar Pressures (Invited)**
Umbertoluca Ranieri¹, Simone Di Cataldo¹, Lorenzo Monicelli², Maria Rescigno^{1,2}, Richard Gaal², Livia E. Bove^{1,2,3}
¹ Università di Roma La Sapienza, Roma, Italy
² LQM, EPFL, Lausanne Switzerland
³ CNRS UMR7590, Paris, France
- 9:30-9:50 5-B1-2 **Ammonia and Clathrate Hydrates: Phase Behavior and Structural Implications, Including Incorporation**
Mathieu Choukroun¹, Elodie Gloesener¹, Tuan H. Vu¹, Helen E. Maynard-Casely², Ashley G. Davies¹, Arnaud Desmedt³, Christophe Sotin⁴
¹ Jet Propulsion Laboratory, California Institute of Technology
² Australia's Nuclear Science and Technology Organization
³ Institut des Sciences Moléculaires, CNRS UMR 5255, Talence, France
⁴ Laboratoire de Planétologie et Géosciences, CNRS UMR 6112, Nantes, France
- 9:50-10:10 5-B1-3 **Methane – Ethane Substitution in Clathrate Hydrates Studied by Raman Spectroscopy: Implications for the Carbon Cycle on Titan**
Elodie Gloesener¹, Tuan H. Vu¹, Mathieu Choukroun¹, Ashley G. Davies¹, Arnaud Desmedt², Christophe Sotin³
¹ Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, United States
² Institut des Sciences Moléculaires, CNRS UMR 5255, Talence, France
³ Nantes Université, Laboratoire de Planétologie et Géosciences, CNRS UMR 6112, Nantes, France
- 10:30-11:50 **Clathrate Hydrates 2** **Room B**
Chairperson: Hideo Tajima
- 10:30-10:50 5-B2-1 **Complete Low Pressure (80 bar) Cycling of Hydrogen in Pure Hydrogen Hydrate: Toward Gas Storage**
Chris A. Tulk¹, Jamie Molaison¹, Dennis Klug²
¹ Oak Ridge National Laboratory
² National Research Council of Canada
- 10:50-11:10 5-B2-2 **Formation of Mixed Hydrate to Separate CO₂ from R134a + CO₂ Gas Mixture for LNG Gasification Unit**
Yutaek Seo¹
¹ Seoul National University
- 11:10-11:30 5-B2-3 **Effect of Injecting Pressure on CO₂ Exchange Behaviors into C₃H₈ Hydrate**
Jonghyuk Lee¹, Junghoon Mok^{1,2}, Wonjung Choi³, Seongju Mun⁴, Yongwon Seo^{1,4,5}
¹ Department of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea
² Department of Chemical and Biological Engineering, Colorado School of Mines, CO 80401, USA
³ Department of Chemical Engineering, Changwon National University, Gyeongnam 51140, Republic of Korea

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⁴ Graduate School of Carbon Neutrality, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea

⁵ Corresponding Author

11:30-11:50 5-B2-4 **Crustal Fingering Facilitates Free-Gas Methane Migration Through the Hydrate Stability Zone**
Xiaojing Fu¹
¹ California Institute of Technology

13:30-15:10

Clathrate Hydrates 3

Room B

Chairperson: Yongwon Seo

13:30-13:50 5-B3-1 **On the Thermodynamic Stability of CH₄-CO₂ Binary Hydrates Under Multiple Coexistence of Water, Hydrate, and Guest Fluids.**
Hideki Tanaka¹
¹ Toyota Physical and Chemical Research Institute

13:50-14:10 5-B3-2 **Metastability of Carbon Monoxide and Nitrogen Gas Hydrates from First-Principles Calculations**
Ludovic Martin-Gondre¹, Claire Pétuya², Cyrielle Métails^{1,2,3}, Jacques Ollivier³, Arnaud Desmedt²
¹ UTINAM Institute, UMR6213 CNRS – Univ. Franche-Comté, Besançon, France
² ISM, UMR5255 CNRS – Univ. Bordeaux, France
³ Institut Laue Langevin, Grenoble, France

14:10-14:30 5-B3-3 **Rotations of Methane Molecules in Amorphous and Crystalline Hydrates**
Menghan Zhang¹, Hiroshi Akiba¹, Osamu Yamamuro¹
¹ Institute for Solid State Physics, University of Tokyo

14:30-14:50 5-B3-4 **Proton Conduction Mechanism in TBAB Semiclathrate Hydrate Obtained by NMR and QENS Measurements**
Jin Shimada¹, Takeshi Sugahara¹, Atsushi Tani², Takahiro Ueda³, Takeshi Yamada⁴, Takuo Okuchi⁵, Katsuhiko Tsunashima⁶, Takayuki Hirai¹
¹ Graduate School of Engineering Science, Osaka University
² Graduate School of Human Development and Environment, Kobe University
³ Graduate School of Science, Osaka University
⁴ Neutron Science and Technology Center, Comprehensive Research Organization for Science and Society
⁵ Institute for Integrated Radiation and Nuclear Science, Kyoto University
⁶ National Institute of Technology, Wakayama College

14:50-15:10 5-B3-5 **Homogeneous and Heterogeneous Nucleation of Clathrate Hydrates Under Non-Equilibrium Conditions with Time and Temperature Resolved Synchrotron X-Ray Diffraction**
John S. Tse¹, Robert Bauer¹
¹ Department of Physics and Engineering Physics
² University of

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15:30-16:40		Reactions on/in Ice 1	Room B
			Chairperson: Kitae Kim
15:30-16:00	5-B4-1	Insights from Structure and Chemical Reactivity of Water Adsorbed on Particle Surfaces (Invited) <u>Xiangrui Kong</u> ¹ , Ivan Gladich ^{2,3} , Nicolas Fauré ¹ , Erik S. Thomson ¹ , Luca Artiglia ⁴ , Markus Ammann ⁴ , Thorsten Bartels-Rausch ⁴ , Jan Pettersson ¹ ¹ Department of Chemistry and Molecular Biology, Atmospheric Science, University of Gothenburg, SE-41296 Gothenburg, Sweden ² European Centre for Living Technology (ECLT), Dorsoduro, Calle Crosera, 30124 Venice, Italy ³ Qatar Environment and Energy Research Institute, Hamad Bin Khalifa University, P.O. Box 31110, Doha, Qatar ⁴ Laboratory of Environmental Chemistry, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland	
16:00-16:20	5-B4-2	Experimental Characterization of the NO₂/N₂O₄ Hydrolysis Reaction Intermediates on Ice <u>Josée Maurais</u> ¹ , Clément Wespiser ¹ , Patrick Ayotte ¹ ¹ Université de Sherbrooke, Département de chimie, 2500 Boul. de l'université, Sherbrooke (Qc)	
16:20-16:40	5-B4-3	Isotopic Constraints on Snow Nitrate Photolysis in Inland East Antarctica: Knowns and Unknowns <u>Guitao Shi</u> ¹ , Aron M. Buffen ² , Ye Hu ¹ , Meredith G. Hastings ² ¹ East China Normal University ² Brown University	
17:00-19:00		Poster Session 1 (Odd Numbers)	Lobby (Foyer)
		Posters with odd numbers are presented.	

September 6, Wednesday

9:00-10:20		Ice Phases, Amorphous Ice, and Glass Transition 2	Room A
			Chairperson: Kim Kyung Hwan
9:00-9:20	6-A1-1	Polyamorphism in Vitrified Water Droplets: Nucleation of a Liquid in a Liquid <u>Johannes Bachler</u> ¹ , Johannes Giebelmann ¹ , Thomas Loerting ¹ ¹ Institute of Physical Chemistry, University of Innsbruck, Innrain 52c, 6020 Innsbruck, Austria	
9:20-9:40	6-A1-2	Revealing the Dynamics of High-Density Amorphous Ice Using X-Ray Photon Correlation Spectroscopy <u>Hailong Li</u> ^{1,4} , Marjorie Ladd-Parada ² , Aigerim Karina ² , Katrin Amann-Winkel ^{1,2,3} ¹ Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany ² Department of Physics, Stockholm University, Roslagstullsbacken 21, 10691 Stockholm, Sweden ³ Institute of Physics, Johannes Gutenberg University Mainz, Staudingerweg 7, 55128 Mainz, Germany	

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⁴ Department of Polymer Science & Materials, Dalian University of Technology, Dalian 116024, PR China

9:40-10:00 6-A1-3 **Topological Analysis on Amorphous Ices Using Persistent Homology**
Hayate Ito¹, Kazuki Komatsu¹
¹ Geochemical Research Center, Graduate School of Science, The University of Tokyo,

10:00-10:20 6-A1-4 **Structure and Phonon Excitations of Vapor-Deposited Amorphous Ice and Their Annealing Effects Studied by X-Ray/Neutron Scattering Techniques**
Osamu Yamamuro¹, Masashi Kunizawa¹, Xuejun Wu¹, Hiroshi Akiba¹, Kazutaka Ikeda², Maiko Kofu³
¹ Institute for Solid State Physics, University of Tokyo
² Institute of Materials Structure Science, High Energy Accelerator Research Organization
³ J-PARC Center, Japan Atomic Energy Agency

10:40-11:40 **Ice Phases, Amorphous Ice, and Glass Transition 3** **Room A**
Chairperson: Osamu Yamamuro

10:40-11:00 6-A2-1 **In-Situ Observation of Pressure-Induced Amorphization of Methane/Ethane Hydrates by Vibrational Spectroscopy**
Naoki Noguchi¹, Yui Shiraishi¹, Maho Kageyama¹, Yuu Yokoi¹, Saki Kurohama¹, Natsuki Okada¹, Hidekazu Okamura¹
¹ Graduate School of Technology, Industrial and Social Sciences, Tokushima University

11:00-11:20 6-A2-2 **A Systematic Study of the Influence of the Ice Formation Temperature on Spectroscopic Properties of Methanol Interstellar Ice Analogues**
Marta E. Podgórný¹, Anita Dawes¹
¹ School of Physical Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, United Kingdom

11:20-11:40 6-A2-3 **Accurate Crystal Structures of Ices from X-Ray and Electron Diffraction with Hirshfeld Atom Refinement**
Krzysztof Wozniak¹, Michal Chodkiewicz¹, Roman Gajda¹, Vitali Prakapenka², Przemyslaw Dera³
¹ University of Warsaw, Chemistry Department, Pasteura 1, 02093 Warszawa, Poland
² APS, Argonne National Laboratory, 9700 South Cass Avenue, Lemont, IL 60439, USA
³ Hawai'i Institute of Geophysics and Planetology, Université d'hawaï à mānoa, 1680 East-West Road, Honolulu, HI 96822, USA

9:00-10:20 **Reactions on/in Ice 2** **Room B**
Chairperson: Xiangrui Kong

9:00-9:20 6-B1-1 **The Inherent Chemical Reactions Occurring Within Ice and Their Consequential Implications and Potential Applications**
Kitae Kim^{1,2}
¹ Korea Polar Research Institute
² Department of Polar Science, University of Science and Technology

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- 9:20-9:40 6-B1-2 **Quantitative Study of Freezing Concentration in Polycrystalline Ice Crystals upon Ice Recrystallization**
Bomi Kim¹, Kitae Kim^{1,2}
¹ Korea Polar Research Institute (KOPRI), Incheon 21990, Republic of Korea
² Department of Polar Sciences, University of Science and Technology (UST), Incheon /21990, Republic of Korea
- 9:40-10:00 6-B1-3 **TEM Study on the Evolution of Micro-Cavities in Ice by Electron Radiolysis**
Yuki Nakano¹, Yuki Kimura¹, Tomoya Yamazaki¹, Yuta Sasaki²
¹ Institute of Low Temperature Science, Hokkaido University
² SCREEN Holdings Co., Ltd
- 10:00-10:20 6-B1-4 **Identification of a Permanent Reservoir of Bromine in Arctic Snow in the Form of Bromate (BrO₃⁻)**
Stefano Frassati^{1,2}, Elena Barbaro^{1,2}, Giulio Cozzi^{1,2}, Clara Turetta^{1,2}, Federico Scotto³, Alfonso Saiz-Lopez⁴, Kitae Kim⁵, Ward van Pelt⁶, Carlo Barbante^{1,2}, Andrea Spolaor^{1,2}
¹ Ca' Foscari University of Venice, Department of Environmental Sciences, Informatics and Statistics, Venice Mestre, Italy
² Institute of Polar Sciences – National Research Council (CNR-ISP), Venice Mestre, Italy
³ Institute of Atmospheric Sciences and Climate CNR-ISAC, Italy
⁴ Department of Atmospheric Chemistry and Climate, Institute of Physical Chemistry Rocasolano, CSIC, Madrid, Spain
⁵ Korea Polar Research Institute (KOPRI), Incheon 21990, Republic of Korea
⁶ Department of Earth Sciences, Uppsala University, Uppsala, Sweden
- 10:40-12:00 **Reactions on/in Ice 3** **Room B**
Chairperson: Patric Ayotte
- 10:40-11:00 6-B2-1 **Methanol Production Through the Impingement of Low-Energy CH₃⁺ Ions onto an Ice Surface at Low Temperature**
Yoichi Nakai¹, W.M.C. Sameera^{2,3}, Kenji Furuya⁴, Hiroshi Hidaka², Atsuki Ishibashi², Naoki Watanabe²
¹ RIKEN Nishina Center for Accelerator-based Science
² Institute of Low Temperature Science, Hokkaido University
³ Department of Chemistry, University of Colombo
⁴ National Astronomical Observatory of Japan
- 11:00-11:20 6-B2-2 **Visible Light Induced Photodesorption of Hydroxyl Radicals from Amorphous Solid Water**
Masashi Tsuge¹, Ayane Miyazaki¹, Ni-En Sie¹, W.M.C. Sameera¹, Yoichi Nakai², Tetsuya Hama³, Hiroshi Hidaka¹, Akira Kouchi¹, Naoki Watanabe¹
¹ Institute of Low Temperature Science, Hokkaido University
² Radioactive Isotope Physics Laboratory, RIKEN Nishina Center
³ Komaba Institute for Science, The University of Tokyo
- 11:20-11:40 6-B2-3 **Gas-Ice Partitioning Coefficients of Carbonyl SOA Precursors During Diffusional Ice Crystal Growth**
Jackson C. Seymore^{1,2}, Miklós Szakáll², Alexander Theis³, Subir Mitra³
¹ Max Planck Graduate Center, Institute for Chemistry, Mainz, Germany
² Johannes Gutenberg University, Institute for Atmospheric Physics, Mainz, Germany

Program: Oral Presentations

³ Max Planck Institute for Chemistry, Particle Chemistry Department, Mainz, Germany

11:40-12:00 6-B2-4 **Revealing the Interfacial Dynamics Between Antifreeze Proteins and the Ice-Water Interface at Single-Molecule Level Through Subzero Nanoscopy**

Sanne Giezen¹, Ilja Voets^{1,2}, Roderick Tas^{1,2}

¹ Technical University Eindhoven

² Institute for Complex Molecular Systems

13:30-18:00 **Excursion**

18:00-20:00 **Banquet** **Hotel Mystays Sapporo Aspen**

September 7, Thursday

9:00-10:20 **Ice Phases, Amorphous Ice, and Glass Transition 4** **Room A**

Chairperson: Livia Bove

9:00-9:20 7-A1-1 **Hydrogen-Ordered States of Ice V-XIII Revisited: β -State Between the Two**

Keishiro Yamashita¹, Thomas Loerting¹

¹ Institute of Physical Chemistry, University of Innsbruck

9:20-9:40 7-A1-2 **Is a Hydrogen-Ordered Phase Corresponding to Ice IV Experimentally Accessible?**

Hiroki Kobayashi¹, Kazuki Komatsu¹, Hiroyuki Kagi¹

¹ Geochemical Research Center, Graduate School of Science, the University of Tokyo

9:40-10:00 7-A1-3 **Ice XIX: The Second Hydrogen-Ordered Daughter Phase of Ice VI**

Tobias M. Gasser¹, Alexander Thoeny¹, Thomas Loerting¹

¹ University of Innsbruck

10:00-10:20 7-A1-4 **Kinetics of the Hydrogen Order-to-Order Transition in Ice XV/XIX**

Alexander Thoeny¹, Tobias Gasser¹, Thomas Loerting¹

¹ University of Innsbruck

10:40-11:50 **Mechanical, Dielectric, and Optical Properties of Ice 1** **Room A**

Chairperson: Chao Qi

10:40-11:10 7-A2-1 **The Mechanical Properties of Freshwater Ice (Invited)**

Ian Baker¹

¹ Thayer School of Engineering, Dartmouth College

11:10-11:30 7-A2-2 **Ice Creep and Behavior of Ice Borehole**

Pavel Talalay^{1,2}, Jialin Hong¹

¹ Jilin University

² China University of Geosciences, Beijing

Program: Oral Presentations

- 11:30-11:50 7-A2-3 **Ice of H₂O with Some Additives: Experimental Observations on Mechanical Properties**
Frederik Guyon¹
¹ Center for Scientific and Technological Studies of Aquitaine - French Atomic Energy Commission
- 13:30-14:50 **Mechanical, Dielectric, and Optical Properties of Ice 2 Room A**
Chairperson: Ian Baker
- 13:30-13:50 7-A3-1 **What Controls Crystallographic Preferred Orientations (Fabrics) of Deformed Ice: Constraints from Laboratory Experiments**
David J. Prior¹, Chao Qi², Lisa Craw³, Andrew Cross⁴, Sheng Fan¹, David Goldsby⁵, Travis Hager⁵, Qinyu Wang²
¹ University of Otago
² Chinese Academy of Sciences
³ University of Tasmania
⁴ Woods Hole Oceanographic Institute
⁵ University of Pennsylvania
- 13:50-14:10 7-A3-2 **The Impacts of Impurities and Stress State on Polycrystalline Ice Deformation and Fabric Evolution**
Ayobami Ogunmolasuyi¹, Ian Baker¹
¹ Dartmouth College
- 14:10-14:30 7-A3-3 **Effect of High-Pressure Sintering on Snow Density Evolution: Experiments and Results**
Jialin Hong¹, Pavel Talalay¹, Teng Man²
¹ Polar Research Center, College of Construction Engineering, Jilin University, Changchun 130026, China
² School of Engineering, Westlake University, Hangzhou, Zhejiang 310024, China
- 14:30-14:50 7-A3-4 **Effects of Impact Heating on Porous Icy Bodies Like Comets**
Haruka Sasai¹, Masahiko Arakawa¹, Minami Yasui¹, Kei Shirai¹
¹ Graduate School of Science, Kobe University
- 15:10-15:50 **Mechanical, Dielectric, and Optical Properties of Ice 3 Room A**
Chairperson: Ayobami Ogunmolasuyi
- 15:10-15:30 7-A4-1 **Ice Multiplication Associated with Freezing of Supercooled Water Droplets**
Alexey A. Kiselev¹, Amelie Assenbaum², Alice Keinert¹, Thomas Leisner¹
¹ Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Karlsruhe, Germany
² Leibniz-Institute for Tropospheric Research, Leipzig, Germany
- 15:30-15:50 7-A4-2 **Dielectric-Infrared Spectrum of Ice and Atomic Dynamics Behind It**
Vasily Artemov¹
¹ École Polytechnique Fédérale de Lausanne

Program: Oral Presentations

10:40-11:50		Ice and Life 1	Room B
			Chairperson: Ido Braslavsky
10:40-11:10	7-B2-1	Analysis of Antifreeze Proteins from Japanese Organisms (Invited) <u>Sakae Tsuda</u> ¹ ¹ Graduate School of Frontier Sciences, The University of Tokyo	
11:10-11:30	7-B2-2	Ice-Cold and Crystal-Clear: Pinning and Surfing of Ice-Bound Antifreeze Proteins Imaged One by One with Subzero Nanoscopy Roderick Tas ¹ , Tim Hogervorst ¹ , Sanne Giezen ¹ , Daniëlle van den Broek ¹ , Romá Suris Valls ¹ , <u>Ilja Voets</u> ¹ ¹ Eindhoven University of Technology	
11:30-11:50	7-B2-3	Observation of Dynamics of Ice-Crystals on the Surface of Antifreeze Proteins by Using Time-Resolved X-Ray Diffraction Analysis <u>Tatsuya Arai</u> ^{1,2} , Yang Yue ¹ , Kazuhiro Mio ² , Sakae Tsuda ^{1,2} , Yuji Sasaki ^{1,2} ¹ Graduate School of Frontier Sciences, The University of Tokyo ² AIST-UTokyo Advanced Operando Measurement Technology Open Innovation Laboratory (OPERANDO OIL)	
13:30-14:50		Ice and Life 2	Room B
			Chairperson: Tatsuya Arai
13:30-13:50	7-B3-1	Monitoring Ice Growth in Aqueous Solutions with Atomic Force Microscopy in the Presence of Ice-Binding Proteins <u>Ido Braslavsky</u> ¹ , Michael Chasnitsky ¹ , Daniel Waiger ¹ , Ron Tzur ¹ , Naomi Gillis ¹ , Yinon Rudich ² , Sidney R. Cohen ³ ¹ The institute of Biochemistry, Food Science, and Nutrition, The Robert H. Smith Faculty of Agriculture, Food, and Environment, The Hebrew University of Jerusalem, Rehovot 7610001, Israel ² Department of Earth and Planetary Sciences, Weizmann Institute of Science, Rehovot 7610001, Israel ³ Department of Chemical Research Support, Weizmann Institute of Science, Rehovot 7610001, Israel.	
13:50-14:10	7-B3-2	Ice-Binding Proteins for Cryopreservation <u>Daniëlle van den Broek</u> ^{1,2} , Tim Hogervorst ^{1,2} , Ilja Voets ^{1,2} ¹ Department of Chemical Engineering and Chemistry, Laboratory of Self-Organizing Soft Matter, Eindhoven University of Technology ² Institute for Complex Molecular Systems, Eindhoven University of Technology	
14:10-14:30	7-B3-3	Effect of Dehydration on Cryopreservation Process using Aquaporin4-Overexpressing Cells <u>Sumire Mastuo</u> ¹ , Kenji Yamazaki ² , Masato Yasui ³ , Youichiro Abe ³ , Tsutomu Uchida ² ¹ Graduate school of engineering, Hokkaido University, N13-W8, Kita-ku, Sapporo 060-0628, Japan ² Faculty of Engineering, Hokkaido University, N13-W8, Kita-ku, Sapporo 060-0628, Japan ³ School of Medicine, Keio University, 35, Shinanomachi, Shinjuku-ku, Tokyo 160-8582, Japan	

Program: Oral Presentations

- 14:30-14:50 7-B3-4 **Cryopreservation of Trehalose-Transporter Expressing Cells Adhered on Glass**
Koki Watanabe¹, Takahiro Kikawada^{2,3}, Kenji Yamazaki⁴, Tsutomu Uchida⁴
¹ Graduate School of Engineering, Hokkaido University
² National Agriculture and Food Research Organization (NARO)
³ Graduate School of Frontier Sciences, The University of Tokyo
⁴ Faculty of Engineering, Hokkaido University

- 16:10-18:10 **Poster Session 2 (Even Numbers)** **Lobby (Foyer)**
Posters with even numbers are presented.

September 8, Friday

- 9:00-10:10 **Theoretical and Computational Works on Ice 1** **Room B**
Chairperson: Kenji Mochizuki
- 9:00-9:30 8-B1-1 **The Most Potent Snow Makers (Invited)**
Valeria Molinero¹, Yuqing Qiu^{1,2}, Ingrid de Almeida Ribeiro¹, Konrad Meister^{3,4}
¹ Department of Chemistry, The University of Utah, Salt Lake City, UT 84112, United States
² Department of Chemistry, University of Chicago, Chicago, Illinois 60637, United States
³ Max Planck Institute for Polymer Research, 55128 Mainz, Germany
⁴ Department of Chemistry and Biochemistry, Boise State University, Boise, Idaho 83725, United States
- 9:30-9:50 8-B1-2 **The Balance Principle on the Hydrogen Bond Network of Ice**
Masakazu Matsumoto¹, Takuma Yagasaki², Hideki Tanaka³
¹ Research Institute for Interdisciplinary Science, Okayama University
- 9:50-10:10 8-B1-3 **Confinement Effects on the o-H₂O <-> p-H₂O Nuclear Spin Isomers Interconversion Mechanism and Rates**
Patrick Ayotte¹, Thomas Putaud^{1,2}, Pierre-Alexandre Turgeon¹, Clément Wespiser¹, Jean-Claude Chartrand¹, Jonathan Vermette¹, Yulia Kalugina^{1,3}, Pierre-Nicholas Roy³, Xavier Michaut²
¹ Université de Sherbrooke
² Sorbonne Université
³ University of Waterloo
- 10:30-11:30 **Theoretical and Computational Works on Ice 2** **Room B**
Chairperson: Masakazu Matsumoto
- 10:30-10:50 8-B2-1 **Fast Crystal Growth of Ice VII Owing to the Decoupling of Translational and Rotational Ordering**
Xuan Zhang¹, Yifeng Yao¹, HongYi Li², Andre Python², Kenji Mochizuki¹
¹ Department of Chemistry, Zhejiang University, Hangzhou, 310012, P. R. China
² School of Mathematical Sciences, Zhejiang University, Hangzhou, 310012, P. R. China

Program: Oral Presentations

10:50-11:10	8-B2-2	Surface Premelting of Ice Ic using Molecular Dynamics Simulation <u>Ikki Yasuda</u> ¹ , Noriyoshi Arai ¹ , Kenji Yasuoka ¹ ¹ Keio University
11:10-11:30	8-B2-3	Pore-Scale Modeling of Wet Snow Metamorphism <u>Adrian Moure</u> ¹ , Xiaojing Fu ¹ ¹ California Institute of Technology
11:30		Closing Room B

Program: Poster Presentations

September 5, Tuesday

17:00-19:00

Poster session 1 (odd numbers)

Lobby (Foyer)

Posters with odd numbers are presented.

September 7, Thursday

16:10-18:10

Poster session 2 (even numbers)

Lobby (Foyer)

Posters with even numbers are presented.

- P-01 **Temperature-Dependent Dissociation Degree of Nitric Acid at the Air-Ice Interface Linked to the Hydrogen-Bonding Structure of the Ice**
Yanisha Manoharan¹, Luca Longetti¹, Luca Artiglia¹, Markus Ammann¹, Thorsten Bartels-Rausch¹
¹ Paul Scherrer Institute
- P-02 **Interactions of Small Molecules with the Growth Fronts of Ice Crystal Faces**
Emma F. Gubbins¹, Ziqing Xiong¹, Sahar Shata¹, Mary Jane Shultz¹
¹ Laboratory for Water and Surface Studies, Pearson Chemistry Laboratory, Tufts University, 62 Talbot Ave., Medford, MA 02155
- P-03 **Non-Energetic Chemical Pathways of Sulfur Bearing Species with Hydrogen Atoms on Interstellar Ice**
Thanh Nguyen¹, Yasuhiro Oba¹, W.M.C. Sameera^{1,2}, Akira Kouchi¹, Naoki Watanabe¹
¹ Institute of Low Temperature Science, Hokkaido University
² Department of Chemistry, University of Colombo
- P-04 **Evolution of Crystalline Misorientations in Polycrystalline Samples of Pure Ice**
Carlos Leonardo Di Prinzio^{1,2}, Pastor Ignacio Achaval¹, Guillermo Andres Aguirre Varela^{1,2}
¹ Facultad de Matemática Astronomía Física y Computación (FaMAF) Universidad Nacional de Córdoba, Argentina
² Instituto de Física "Enrique Gaviola" (IFEG) Córdoba, Argentina
- P-05 **In-Situ Observation of Pit on Ice Crystal Surfaces by Confocal Optical Microscopy**
Carlos Leonardo Di Prinzio^{1,2}, Pastor Ignacio Achaval¹, Guillermo Andres Aguirre Varela^{1,2}
¹ Facultad de Matemática Astronomía Física y Computación (FaMAF) Universidad Nacional de Córdoba (UNC), Córdoba (5000) Argentina
² Instituto de Física "Enrique Gaviola" (IFEG) Córdoba (5000), Argentina
- P-06 **Graph Neural Networks Classify Molecular Geometry and Deign Novel Order Parameters of Ice and Water**
Satoki Ishiai¹, Katsuhiko Endo¹, Kenji Yasuoka¹
¹ Keio university

Program: Poster Presentations

- P-07 **A Molecular Dynamics Study of Low-Angle Tilt Grain Boundary Energies in Ice Bicrystals**
Carlos Leonardo Di Prinzio^{1,2}, Esteban Druetta¹, Julián Roberto Fernández³
¹ Facultad de Matemática Astronomía Física y Computación (FaMAF) Universidad Nacional de Córdoba (UNC), Córdoba (5000) Argentina
² Instituto de Física "Enrique Gaviola" (IFEG) Córdoba (5000), Argentina
³ Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), (C1425FQB) CABA, Argentina
- P-08 **Side-Branch Formation and its Direction During Growth of Snow Crystals**
Wataru Shimada¹, Touma Yoshii¹, Kazuki Ohtake¹
¹ University of Toyama
- P-09 **Grain Growth with Mobile Bubbles in Ice: Experiments and Numerical Simulation**
Carlos Leonardo Di Prinzio^{1,2}, Pastor Ignacio Achaval¹, Guillermo Andres Aguirre Varela^{1,2}
¹ Facultad de Matemática Astronomía Física y Computación (FaMAF) Universidad Nacional de Córdoba (UNC), Córdoba (5000), Argentina
² Instituto de Física "Enrique Gaviola" (IFEG) Córdoba (5000), Argentina
- P-10 **Impact Strength of Porous Icy Bodies in High-Velocity Oblique Collision: Implication for Catastrophic Disruption of Kuiper Belt Objects in Outer Solar System**
Minami Yasui¹, Masato Nakamura¹, Masahiko Arakawa¹
¹ Graduate School of Science, Kobe University
- P-11 **Experimental Study on Collisional Disruption of Differentiated Icy Planetesimals**
Shunki Ishii¹, Yuki Eguchi¹, Minami Yasui¹, Masahiko Arakawa¹, Yukari Toyoda¹
¹ Graduate School of Science, Kobe University
- P-12 **Preliminary Results of Dielectric Profile Measurements of Ice Cores from the Flank of the Dalk Glacier, Antarctica**
Nan Zhang^{1,2}, Si yu Lu^{1,2,3}, Pavel Talalay^{1,2}, Yun Chen Liu^{1,2}, Bo Han^{1,2}
¹ Construction Engineering College, Jilin University
² Institute for Polar Science and Engineering, Jilin University
³ Polar Research Institute of China
- P-13 **Cellulose Nanofibrils Tune the Mechanical, Optical, and Thermal Properties of Ice**
Kiera L. Thompson Towell¹, Olivier Montmayeur¹, Emily Asenath-Smith¹
¹ Cold Regions Research and Engineering Laboratory (CRREL), US Army Corps of Engineers Engineer Research & Development Center
- P-14 **High Pressure Plastic Phases of Water and Water-Ammonia Mixtures**
Maria Rescigno^{1,3}, Umbertoluca Ranieri⁴, Stefan Klotz², Sandra Ninet², Frédéric Datchi², Richard Gaal³, Livia E. Bove^{1,2,3}
¹ Sapienza University
² IMPMC
³ EPFL
⁴ University of Edinburgh

Program: Poster Presentations

- P-15 **Ultra-High Vacuum Cryogenic Transmission Electron Microscopy of Ices Indicates the Possible Formation of Hydrogen-Ordered Ices**
Tomoya Yamazaki¹, Akira Kouchi¹, Ken-ichiro Murata¹, Hiroyasu Katsuno¹, Hiroki Nada², Tetsuya Hama³, Yuki Kimura¹
¹ Institute of Low Temperature Science, Hokkaido University
² Faculty of Engineering, Tottori University
³ Komaba Institute for Science, The University of Tokyo
- P-16 **Study of Concentration-Cooling Rate Map of Ice in Aqueous Polymer Solutions by X-Ray Diffraction Measurements**
Yuka Arai¹, Risa Otagiri¹, Kaito Sasaki^{2,3}, Rio Kita^{2,3}, Takeru Ito⁴, Yoshiaki Oda⁵, Naoki Shinyashiki^{2,3}
¹ Course of Physics, Graduate School of Science, Tokai University
² Department of Physics, School of Science, Tokai University
³ Micro/Nano Technology Center, Tokai University
⁴ Department of Chemistry, School of Science, Tokai University
⁵ Technology Joint Management Office, Tokai University
- P-17 **Pressure Dependence of Dynamics in High-Density Amorphous Ice**
Aigerim Karina¹, Hailong Li^{2,3}, Tobias Eklund^{2,4}, Katrin Amann-Winkel^{1,2,4}
¹ Department of Physics, Stockholm University, 10691 Stockholm, Sweden
² Max Planck Institute for Polymer Research, 55128 Mainz, Germany
³ Department of Polymer Science & Materials, Dalian University of Technology, Dalian 116024, PR China
⁴ Institute of Physics, Johannes Gutenberg University Mainz, 55128 Mainz, Germany
- P-18 **Structure and Dynamics of Vapor-Deposited Amorphous Ice**
Tobias Eklund^{1,2,3}, Christina Tonauer⁴, Aigerim Karina⁵, Hailong Li^{2,6}, Thomas Loerting⁴, Felix Lehmkuhler⁷, Peter Zalden³, Katrin Amann-winkel^{1,2}
¹ Institute of Physics, Johannes Gutenberg University, Mainz, Germany
² Max Planck Institute for Polymer Research, Mainz, Germany
³ European XFEL, Schenefeld, Germany
⁴ Institute of Physical Chemistry, University of Innsbruck, Austria
⁵ Department of Physics, Stockholm University, Sweden
⁶ School of Chemical Engineering, Dalian University of Technology, China
⁷ Deutsches Elektronen-Synchrotron, Hamburg, Germany
- P-19 **Temperature and Pressure Effects on the Transformation of Ices**
John S. Tse¹, Robert Bauer¹, Takanori Hattori², Shinichi Machida³, Kazuki Komatsu⁴
¹ Department of Physics and Engineering Physics
² Materials and Life Science Division, J-PARC Center
³ Comprehensive Research Organization for Science and Society (CROSS) Neutron Science and Technology Center
⁴ The University of Tokyo
- P-20 **Effects of Anti-Freeze Glycoproteins on Long-Term Storage of Cryopreserved Trehalose-Transporter Expressing Cells and on Ice Recrystallization**
Tsutomu Uchida¹, Tsubasa Hohana¹, Sakae Tsuda², Takahiro Kikawada^{3,4}
¹ Faculty of Engineering, Hokkaido University, N13-W8, Kita-ku, Sapporo 060-8628, Japan
² Graduate School of Frontier Sciences, The University of Tokyo, 6-2-3 Kashiwanoha, Kashiwa, 277-0882, Japan
³ Institute of Agrobiological Sciences, National Agriculture and Food Research Organization, 1-2 Owshi, Tsukuba 305-8634, Japan

Program: Poster Presentations

⁴ Graduate School of Frontier Sciences, The University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, 277-8562, Japan

- P-21 **Lichen Species Produce Highly Active and Stable Ice Nucleators**
Rosemary Eufemio^{1,2}, Ingrid de Almeida Ribeiro³, Todd L. Sformo⁴, Gary A. Laursen⁵, Valeria Molinero³, Janine Fröhlich-Nowoisky⁶, Mischa Bonn⁷, Konrad Meister^{1,7}
¹ Department of Chemistry and Biochemistry, Boise State University, Boise, ID 83725, USA
² Biomolecular Sciences Graduate Program, Boise State University, Boise, ID 83725, USA
³ Department of Chemistry, The University of Utah, 84112 Salt Lake City, UT, United States
⁴ Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK 99775, USA
⁵ High Latitude Mycological Research Institute, University of Montana, Missoula, MT 59801, USA
⁶ Max Planck Institute for Chemistry, 55128 Mainz, Germany
⁷ Max Planck Institute for Polymer Research, 55128 Mainz, Germany
- P-22 **The Role of Antifreeze Proteins in Cellular Membrane Stabilization**
Emily C. Vernon^{1,2}, Arthur L. DeVries³, Konrad Meister^{1,4}
¹ Department of Chemistry and Biochemistry, Boise State University, Boise, ID 83725, USA
² Biomolecular Sciences Graduate Program, Boise State University, Boise, ID 83725, USA
³ Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801, USA
⁴ Max Planck Institute for Polymer Research, 55128 Mainz, Germany
- P-23 **Studying the Decisive Factors for Maximum Freezing Efficiency of Bacterial Ice Nucleators**
Galit Renzer¹, Ralph Schwidetzky¹, Mischa Bonn¹, Konrad Meister^{1,2}
¹ Max Planck Institute for Polymer Research, 55128 Mainz, Germany
² Boise State University, 83725 Boise, Idaho, United States
- P-24 **Sources of Perchlorate in Antarctic Snow**
Su Jiang¹, Guitao Shi², Bo Sun¹
¹ Polar Research Institute of China
² East China Normal University
- P-25 **Sulfate Concentration and Electrical Conductivity of Firn Cores at Vostok (Central Antarctica) as Proxy of Volcanic Activity over the Past 2,200 Years**
Arina N. Veres¹, Alexey A. Ekaykin¹, Liudmila P. Golobokova², Tamara V. Khodzher², Olga I. Khuriganowa², Alexey V. Turkeev¹
¹ Arctic and Antarctic Research Institute
² Limnological Institute of Siberian Branch of RAS
- P-26 **Toward New Impregnation-Refreeze Products for Tomography of Snow Samples?**
Iheb Haffar¹, Frederic Flin¹, Pierre Latil¹, Laurent Pezard¹, Jacques Rouille¹, Pascal Charrier², Nicolas Lenoir²
¹ Univ. Grenoble Alpes, Université de Toulouse, Meteo-France, CNRS, CNRM, Centre d'Etudes de la Neige, Grenoble, France
² Université Grenoble Alpes, Grenoble INP, 3SR, CNRS, Grenoble, France

Program: Poster Presentations

- P-27 **Guest Gas-Induced Structural Transformation of Tetra-n-butylammonium Chloride Semi-Clathrates**
Junkyu Lim¹, Joonseop Lee², Yongwon Seo^{1,3}
¹ Department of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea
² Korea Shipbuilding & Offshore Engineering, Gyeonggi 13591, Republic of Korea
³ Graduate School of Carbon Neutrality, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea
- P-28 **Effect of Functional Group in Dicarboxylate Anions on the Latent Heat Storage Properties of Semiclathrate Hydrates**
Kazuhiro Minamikawa¹, Jin Shimada¹, Takeshi Sugahara¹, Katsuhiko Tsunashima², Takayuki Hirai¹
¹ Graduate School of Engineering Science, Osaka University
² Department of Applied Chemistry and Biochemistry, National Institute of Technology, Wakayama College
- P-29 **Investigating the Possibility of C₃F₈ as a Gaseous sH Hydrate Former**
Sungwoo Kim¹, Eunae Kim², Gyeol Ko³, Tsutomu Uchida⁴, Yongwon Seo^{1,5}
¹ Department of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology (UNIST)
² Particulate Matter Research Center, Research Institute of Industrial Science & Technology
³ Korea Shipbuilding & Offshore Engineering
⁴ Division of Applied Physics, Hokkaido University
⁵ Graduate School of Carbon Neutrality, Ulsan National Institute of Science and Technology (UNIST)
- P-30 **Effect of Gas and Water Flow Velocities on Flow Patterns and Gas Uptake of Hydrate Slurries in a Scaled-Up Vertical Plug Flow Reactor**
Ryoka Seki¹, Ryosuke Ezure^{1,2}, Hiroyuki Komatsu¹, Hideo Tajima¹
¹ Graduate School of Science and Technology, Niigata University, 2-8050 Ikarashi, Nishi-ku, Niigata 950-2181, Japan
² National Institute of Technology, Anan College, 265 Aoki Minobayashi, Anan 774-0017, Japan
- P-31 **Raman Spectroscopic Investigation of Clathrates Formation Including C₃F₈ with Various Help Gases**
Tsutomu Uchida¹, Eunae Kim², Sungwoo Kim³, Yongwon Seo^{3,4}
¹ Division of Applied Physics, Faculty of Engineering, Hokkaido University, Sapporo 060-8628, Japan
² Particulate Matter Research Center, Research Institute of Industrial Science & Technology, Jeollanam-do 57801, Republic of Korea
³ Department of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea
⁴ Graduate School of Carbon Neutrality, Ulsan National Institute of Science and Technology, Ulsan 44919, Republic of Korea
- P-32 **Evaluation of Mass Transfer During Clathrate Gas Hydrates Formation by Using Dimensionless Number**
Ryosuke Ezure^{1,2}, Daiki Nakano², Ryoka Seki², Hiroyuki Komatsu², Hideo Tajima²
¹ National Institute of Technology, Anan College, 265 Aoki Minobayashi, Anan, Tokushima, 774-0017, Japan
² Graduate School of Science and Technology, Niigata University, 2-8050 Ikarashi, Niigata 950-2181, Japan

Program: Poster Presentations

- P-33 **Pressure-Induced Phase Transformations and Their Pressure Hystereses of Nitrogen Hydrate**
Ryohei Yonezawa¹, Asa Katsumata¹, Yusuke Yasui¹, Tomoaki Kimura¹, Masafumi Sakata¹, Shigeo Sasaki¹, Takayuki Nagae², Ken Niwa³
¹ Graduate school of Natural Science and Technology, Gifu University
² School of Pharmacy, Tokyo University of Pharmacy and Life Sciences
³ Graduate School of Engineering, Nagoya University
- P-34 **Supercooling Suppression in the Tetrahydrofuran Clathrate Hydrate Formation**
Hironobu Machida¹, Takeshi Sugahara², Izumi Hirasawa³
¹ Panasonic Corporation
² Osaka University
³ Waseda University
- P-35 **Rheological Properties of SF₆ Gas Hydrate Slurry with Surfactant in Horizontal Circular Pipe**
Hideo Tajima¹, Tomoya Sagawa¹, Ryosuke Ezure^{1,2}, Hiroyuki Komatsu¹
¹ Graduate School of Science and Technology, Niigata University
² National Institute of Technology, Anan College
- P-36 **DFT Calculations of Raman Spectra and NMR Shielding Constants for Large Clusters of Methane Hydrate**
Akira Hori¹
¹ Faculty of Engineering, Kitami Institute of Technology,
- P-37 **Freezing-Induced Acidity Change: Mechanisms and their Possible Impacts on Polar Chemistry**
Radim Štůsek¹
¹ Department of Chemistry, Faculty of Science, Masaryk University, 62500 Brno, Czech Republic
- P-38 **Spectroscopic and Microscopic Study of Freeze-Concentrated Solutions**
Lukáš Veselý¹, Kamila Závacká², Radim Štůsek¹, Vilém Neděla², Dominik Heger¹
¹ Department of Chemistry, Faculty of Science, Masaryk University, 625 00 Brno, Czech Republic
² Institute of Scientific Instruments of the ASCR, Královopolská 147, 61264 Brno, Czech Republic
- P-39 **Exploring the Impact of the Ice Matrix on the Photophysical Behavior of Phenolic Compounds**
Marie Garncarzová¹, Dominik Heger¹
¹ Department of Chemistry, Faculty of Science, Masaryk University, 62500 Brno, Czech Republic