

TECHNICAL PROGRAM DETAILS

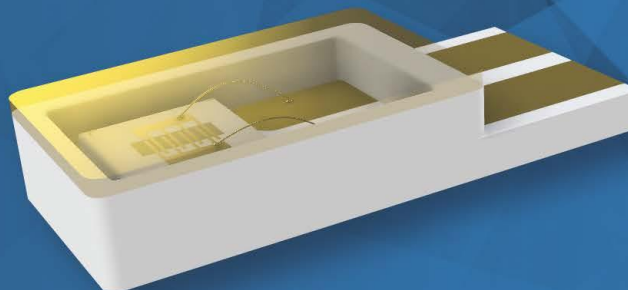


CEC
ICMC 25
RENO MAY 18-22



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- 4K, 1.4K and 300mK Calibrations Available
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AL630

GM Cryocooler with powerful cooling at 20 K for hydrogen liquefaction and fusion research.

Cooling capacity:
100 W @ 20 K

Power consumption:
12.7 kW @ 60 Hz

PT450

The world's most powerful 4.2 K pulse tube cryocooler.

Cooling capacity:
5.0 W @ 4.2 K and
65 W @ 45 K
(Integrated Motor)

Power consumption:
27 kW @ 60 Hz



PT205

Compact, low vibration, two-stage pulse tube cryocooler for applications in the 2.5 K range.

Cooling capacity:
10 mW @ 2.5 K and
100 mW @ 55 K

Power consumption:
1.3 kW @ 60 Hz



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Progress.**



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The new RJT-100 GM-JT Cryocooler delivers an impressive 9.0 W at 4.2 K.



RJT-100 Cryocooler
9.0 W @ 4.2 K

SHI's new RJT-100 expertly combines our highest-capacity Gifford-McMahon 4K Cryocooler with a Joule-Thompson expansion line to create the world's most powerful 4K Cryocooler. The advantages speak for themselves:

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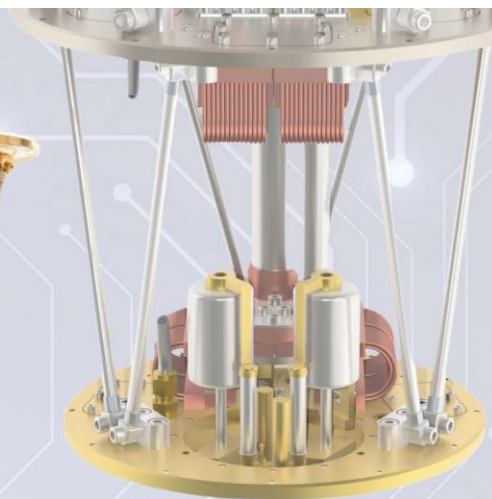
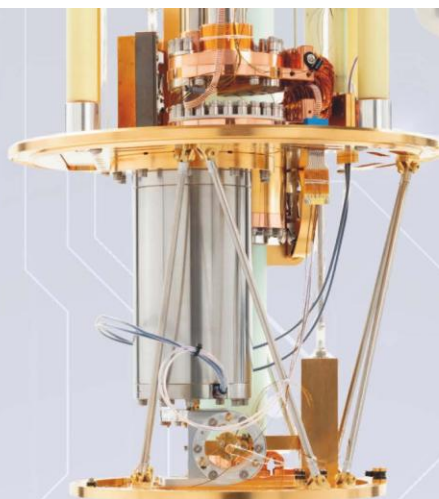
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The Joint College of Engineering for Florida A&M University and Florida State University



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Danaher Cryo is excited to announce our Adaptive Cooling Technology (ACT) pulse tube cryocooler technology. This state-of-the-art cryocooler works in synchrony with our patent-pending DIRECT* innovation to deliver the industry's most rapid cooldown performance.

Our cooling technology can be incorporated into nearly any cryocooler-driven system.

*Distributed Integrated Rapid Enhanced Cooling Technology



Danaher Cryo is currently developing DIRECT and ACT. Commercial release is expected in 2026.

Cryogen-free Measurement Systems to 18 Tesla with 30 mm / 50 mm sample space

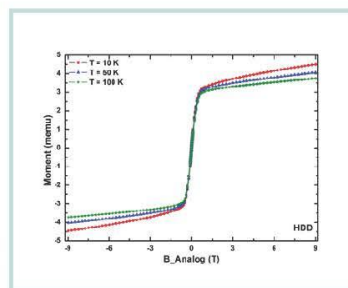
Specifications:

Temperature range from 1.5 K to 400 K
Sample in vacuum or exchange gas
Unique airlock and gate valve for rapid, cold sample change
mK stability across the full temperature range
20-bit power supply providing precise magnetic field control

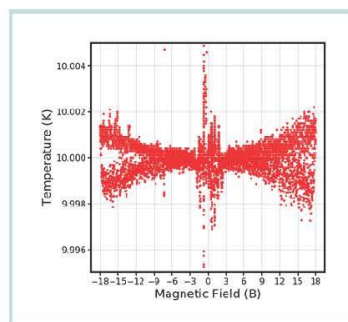
Compatible with:

VSM measurements up to 1000 K
AC and DC resistivity measurements for up to 700 K
AC susceptibility
Single and two-axis rotator
Thermal transport measurements
Static ^3He insert or ^3He rotator (300 mK)
Dilution Refrigerator (50 mK)

18 Tesla Cryogen-free magnet with 50 mm VTI



Magnetization as a function of magnetic field for HDD at T = 10 K, 50 K and 100 K



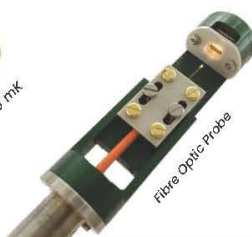
Temperature stability at mK level irrespective of applied field



Two-axis Rotator Probe



Static ^3He insert for temperature down to 300 mK



Fibre Optic Probe

Magnetic Resonance (MR) Systems for EPR, NMR and DNP

Variable Temperature Cryostat for EPR

No liquid cryogen
Closed cycle operation
Sample space \varnothing 40 mm
Base temperature < 2 K
Low vibration signature
High cooling power
Easy changing of frozen biological samples
Maintenance interval $> 20,000$ hrs



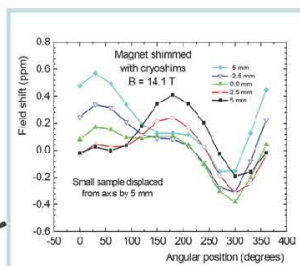
CF-VTC for CW and Pulsed Q- and X- Band EPR

NMR/EPR Magnet to 600 MHz

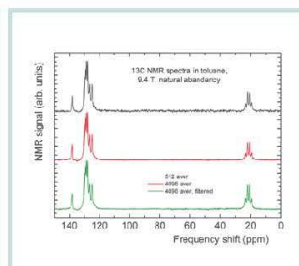
Fixed and variable field operation
 ≤ 1 ppm fixed-field central homogeneity
Multi-field option without compromises on resolution
 ~ 50 ppm variable-field central homogeneity
 < 0.01 ppm/hr drift in persistent mode
Rapid field stabilisation
Superconducting sweep coils



CF-VTC for CW X- Band EPR



Magnetic Field Profile



Magnetic Field Drift



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TECHNICAL PROGRAM INTRODUCTION

Timetable Views - QR Code Options

		
Schedule View	Compact View	Abstract View

Visit the online schedules for up-to-date sessions and presentation information.

Session Legend

- The first character of the session ID (**C** or **M**) represents the conference designation, C for the CRYOGENIC Engineering Conference (CEC) and M for the International Cryogenic MATERIALS Conference (ICMC).
- The second character (**1, 2, 3** or **4**) indicates the day of the conference: 1 for Monday, 2 for Tuesday, 3 for Wednesday, and 4 for Thursday.
- The third and fourth characters (**Or** or **Po**) indicate whether the presentation is in an oral or poster session.
- The fifth character (**1-5**) represents the time slot on that specific day (e.g., the first, second, third, or fourth time slot).
- The last character (**A-F**) differentiates between sessions held on the same day and time slot.
 - Session ID examples are: C1Po1A or M1Po3A (CEC and ICMC posters on Monday); M3Or1A or C3Or2A (ICMC and CEC Orals on Wednesday)

Each abstract included in the technical program will be assigned a final Presentation ID which consists of the session ID plus the order within the session.

- Presentation ID examples are: M1Or1A-01, M1Or1A-02, etc.; C3Or2A-01, C3Or2A-02, etc.

Detailed Technical Program – Print Version

Due to the unusually frequent changes in session details this conference cycle, a PDF version of the full technical program is available for download on the CEC/ICMC 2025 website. Limited printing services are offered at the Peppermill Business Center. Please refer to the "Additional Information" section of this booklet for hours of operation. If you plan to print a full copy of the technical program onsite, we recommend contacting the Business Center in advance.

PLENARY SPEAKERS

Monday, May 19, 2025, 8:15 AM – 9:00 AM (CEC)



John Davis
Zero Point Cryogenics Incorporated

John P. Davis is a Professor in the Department of Physics at the University of Alberta. His group specializes in cavity optomechanics and electromechanics at low-temperatures, as well as the study of both superfluid 4He and superfluid 3He in restricted dimensions. He obtained his Master's and Ph.D. from Northwestern University in Evanston, Illinois in 2003 and 2008, respectively, studying superfluid 3He. Before that he graduated summa cum laude in physics from Washington University in St. Louis, Missouri. He was awarded the Sloan Research Fellowship in 2013 and has won a number of awards at the University of Alberta. He is also Co-Founder and CTO of Zero Point Cryogenics, a North American manufacturer of dilution refrigerators and related cryogenic equipment.

Presentation Topic: "Novel Sub-Kelvin Cryogen-free Refrigeration at Zero Point Cryogenics"

Tuesday, May 20, 2025, 8:15 AM – 9:00 AM (ICMC)



Laura Greene
National High Magnetic Field Laboratory, Florida State University

Laura H Greene is the Chief Scientist of the National MagLab and Marie Krafft Professor of Physics at Florida State University where she investigates electronic properties of correlated quantum materials including unconventional superconductors. Her leadership roles include APS President (theme of science diplomacy and human rights), AAAS Board of Directors, and Vice President of the International Union of Pure and Applied Physics (IUPAP). Her honors include being a member of NAS, the American Academy of Arts and Sciences, a founding member of the Florida Academy of Science, Engineering and Medicine, Fellow of the Institute of Physics (UK), the AAAS, and the APS, the Oersted Medal, the Tallahassee Scientific Society Gold Medal, the APS Five Sigma Physicist Award for Advocacy in Science Policy, Guggenheim Fellowship, E.O. Lawrence Award, Maria Goeppert-Mayer Award, and Bellcore Award of Excellence. Beyond co-authoring over 200 publications and presenting over 700 invited talks, she is recognized for work in science diplomacy, diversity, ethics, human rights, and science policy. She served on President Biden's Council of Advisors on Science and Technology (PCAST) 2022-2026.

Presentation topic: "The National MagLab and Unsolved Mysteries in Superconductors"

Wednesday, May 21, 2025, 8:15 AM – 9:00 AM (ICMC)



Parag Kshirsagar
RTX Technology Research Center (RTRC)

Dr. Parag Kshirsagar: Senior Member IEEE, Member AIAA, and an Associate Director with RTX Technology Research Center (RTRC), East Hartford, Connecticut since 2006. He is currently leading technology focus area on electrification of aerospace and defense applications with programs related to extreme high power electrified aircraft propulsion, superconducting and cryogenically cooled motors and drives, and high voltage power distribution systems for its business units Collins Aerospace, Pratt and Whitney, and Raytheon. He has led programs on flight critical electromechanical systems for wings, rotors and engine applications as well as high speed magnetic bearing technology development for high power chiller applications. He received his Doctorate degree in Electrical Engineering from Virginia Polytechnic and State University (Virginia Tech), Blacksburg, Virginia in 2015 and Master's degree from Tennessee Technological University, Cookeville, Tennessee in 2003. He got his Bachelor's degree in Industrial Electronics from University of Pune, Pune, India in 2000.

Presentation topic: "High Power Electrification in Aerospace and Defense Applications Enabled by Cryocooled Systems"

Thursday, May 22, 2025, 8:15 AM – 9:00 AM (CEC)



Brad Cage
Pulsar Helium Inc.

Brad Cage joined Pulsar Helium, Inc. in February 2025 as the Vice President of Engineering. Mr. Cage has 25 years of experience in the oil and gas industry encompassing drilling, completion, production, and reservoir engineering before transitioning to the helium industry. Brad began his career in 1999 which includes positions at Marathon Oil, EOG Resources, Devon Energy, and Enerquest Oil & Gas. He has overseen engineering activities across multiple basins and has been responsible for improvements on almost every major play in the United States. He was instrumental in changing the operational design of programs improving production and economic results and bringing forward new plays. He has experience as a Reserves and Capital Budget Coordinator for companies. Brad has also done extensive research on reservoir rock & fluids interactions and the damage that could result from improper fluid chemistry. He is a leader in traditional and viscoelastic fluids testing. He is an expert in frac modeling and has extensive experience in reservoir analysis. Brad holds a Bachelor's of Science degree in Petroleum Engineering from Texas A&M University. He is a licensed Professional Engineer in the State of Oklahoma. He is a published co-author on papers regarding integrated reservoir characterization and viscoelastic fluid testing methods.

Presentation topic: "Securing America's Helium Future: Pulsar's Topaz Project and the Changing Landscape of US Helium Supply"

SPECIAL SESSIONS

Several special sessions have been organized this year to highlight topics which are of current special interest. These sessions will include many invited talks to provide overviews and perspectives in strong detail.

The list of special sessions is provided below, and additional details about the topics including presentation details can be viewed on the CEC/ICMC 2025 website at <https://www.cec-icmc.org/2025/special-sessions> or by scanning the QR code to the right.



CEC Special Sessions

Liquid Hydrogen Testing for Aircraft

C2Or2B, Tuesday, May 20, 2025, 11:15 AM – 12:45 PM

NASA's Cryogenic Fluids for Aerospace Propulsion Applications

C4Or1B, Thursday, May 22, 2025, 9:30 AM – 11:30 AM

ICMC Special Sessions

Materials for High Field Magnets

M3Or4B, Wednesday, May 21, 2025, 4:15 PM – 6:15 PM

Transportation I: Government Agencies and Industry Partners

M1Or2A, Monday, May 19, 2025, 11:15 AM – 12:15 PM

Transportation II-V: System Level; High Power Components, Thermal Management; Motors and Generators; Materials

M2Or4A, Tuesday, May 20, 2025, 4:15 PM – 6:15 PM

M3Or3A, Wednesday, May 21, 2025, 2:00 PM – 3:40 PM

M3Or4A, Wednesday, May 21, 2025, 4:15 PM – 6:20 PM

M4Or1A, Thursday, May 22, 2025, 9:30 AM – 11:00 AM

C1PL1 08:00 - 9:00

Opening | Plenary: John Davis [Novel Sub-Kelvin Cryogen-free Refrigeration at Zero Point Cryogenics] & CEC Awards

Session Chairs: Robert Duckworth, Oak Ridge National Laboratory, and Srinivas Vanapalli, University of Twente

C1Po1A 09:15 - 11:00

Hydrogen Cooling and Test Facilities

Session Chairs: Ian Richardson, Plug Power, and TBD

C1Po1A-01: Numerical simulation of active magnetic regenerative refrigeration for hydrogen liquefaction

Koji Kamiya, Akira Uchida, Kyohei Natsume, Saori Okihara, Takenori Numazawa and Tsuyoshi Shirai (*National Institute for Materials Science*)

C1Po1A-02: Active Magnetic Regenerative Refrigerator (AMR) with rotating permanent magnet for liquid hydrogen

Kyohei Natsume, Akira Uchida, Takatoshi Seki, Koji Kamiya (*National Institute for Materials Science*), Takenori Numazawa (-) and Koichi Matsumoto (*Kanazawa University*)

C1Po1A-03: Effect of helium-neon composition in Brayton refrigeration cycle for hydrogen liquefaction

Ho-Myung Chang, Seong Ho Ha (*Hong Ik University*), Hyung Jin Kim and Jong H. Baik (*GenH2*)

C1Po1A-05: Spallation Neutron Source Upgrade Status and Operational Success of the Cryogenic Moderator System

Brian Degraff, Aaron Coleman, David Proveaux Iii, Erik Iverson, Gregory Stephens, John Denison, Matthew Howell, Percy Harrell and Rocky Armstrong (*Oak Ridge National Laboratory*)

C1Po1A-06: Updated design of the ESS cryogenic moderator system

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Tereszowski Piotr, Segerup Mats (*European Spallation Source ERIC*), Attila Zsigmond Horváth (*European Spallation Source*), Philipp Arnold (*European Spallation Source ERIC*), Yannick Beßler (-), Rijneveld Peter (*DEMACO*) and Hendrie Derking (*Cryoworld BV*)

C1Po1A-07: Design of a Laboratory-Scale Hydrogen Liquefier Cold Box for Low-Altitude Economy and Modular

Deployment

Yicheng Li, Xinran Li, Cui Lv and Jihao Wu (-)

C1Po1A-08: Study on Zero Boil-Off of Liquid Hydrogen using a Single Stage GM cryocooler

Yutaro Koike (*Sumitomo Heavy Industries, Ltd. - Technology Research Center*), Jun Kondo (*Technology Research Center, Sumitomo Heavy Industries, Ltd.*), Takaaki Morie (*Sumitomo Heavy Industries, Ltd.*), Takashi Hirayama (*Sumitomo Heavy Industries, Ltd.*), Takehisa Tsurudome (*Sumitomo Heavy Industries, Ltd.*) and Yoshihiko Arakawa (*Technology Research Center, Sumitomo Heavy Industries, Ltd.*)

C1Po1A-09: Impact of wave breaking on heat and mass transfer in a horizontal circular tank under non-isothermal sloshing conditions.

Stuart Colville, Yeaw Chu Lee (*University of Plymouth*), Francesco Gambioli (*Airbus*), Deborah Greaves and Edward Ransley (*University of Plymouth*)

C1Po1A-10: Hydrogen permeability of fiber-reinforced thermoplastics under cryogenic conditions

Maximilian Grabowski and Christoph Haberstroh (-)

C1Po1A-11: Mega-Scale Liquid Hydrogen (LH2) Storage for Energy Storage & Transportation

Shanaka Kristombu Baduge, Upeka Gunarathne, Susiri Costa, Amila Premakumara and Sadeep Thilakarathna (*The University of Melbourne*)

C1Po1B 09:15 - 11:00

Aerospace Cryocoolers I: Pulse Tube and Stirling I

Session Chairs: TBD

C1Po1B-01: In-line and coaxial configuration performances of Stirling pulse tube cryocoolers for spaceflight

Alyssa Wang and Hannah Rana (*Center for Astrophysics Harvard & Smithsonian*)

C1Po1B-02: 1 W@28.2 K micro single-stage coaxial pulse tube cryocooler operating at 52 Hz using precooling

Chenglong Liu (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Bo Tian (-), Enchun Xing, Houlei Chen (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Jinghui Cai (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Qingjun Tang (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yanen Li (*Technical Institute of Physics and Chemistry, CAS*), Yuefeng Niu (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and 敏 高 (*中国科学院大学理化技术研究所*)

C1Po1B-03: Influence of the structure of multi-bypass configuration regenerator on the performance of Pulse Tube Cryocooler

Chenglong Liu (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Bin Yang (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Enchun Xing (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Geyang Li (*Technical Institute of Physics and Chemistry CAS*), Jinghui Cai (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Mingtao Pan (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Qingjun Tang (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and 敏 高 (*中国科学院大学理化技术研究所*)

C1Po1B-04: A high frequency lightweight coaxial pulse tube cryocooler operating at 70 K

Bo Tian, Chenglong Liu, Enchun Xing, Houlei Chen, Jinghui Cai, Miguang Zhao, Mingtao Pan, Qingjun Tang and Yanjie Liu (*1 Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po1B-05: Numerical and experimental investigation of the compressor coupling characteristic of a 20K thermal-coupled two-stage high-frequency pulse tube cryocooler

Bin Yang, Jia Quan (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Yuexue Ma (*Technical Institute of Physics and Chemistry, CAS*), Yanjie Liu, Miguang Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*) and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C1Po1B-06: Performance simulation and model verification for a 20K thermal-coupled two-stage high-frequency pulse tube cryocooler

Bin Yang (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Ziyao Liu (*Technical Institute of Physics and Chemistry, CAS*), Mingtao Pan (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Chenglong Liu (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Min Gao, Jia Quan (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Yuexue Ma (*Technical Institute of Physics and Chemistry, CAS*), Yanjie Liu, Miguang Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*) and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C1Po1B-07: Investigation on a thermal-coupled two-stage pulse tube cryocooler with multi-bypass working at 8 K

Mingtao Pan, Bin Yang, Enchun Xing, Bo Tian, Chenglong Liu, Yanen Li, Jia Quan and Miguang Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po1B-08: Theoretical and experimental investigation of the effect of the phase shifter on the compressor of pulse tube cryocoolers

Mingtao Pan, Enchun Xing, Yanen Li, Bin Yang, Chenglong Liu, Bo Tian, Nailiang Wang, Miguang Zhao and Qingsheng Fei (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po1B-09: Simulation and experimental of phase shifter in high frequency pulse tube cryocooler

Geyang Li (*Technical Institute of Physics and Chemistry CAS*), Tianshi Feng (*Technical Institute of Physics and Chemistry, CAS*), Menglin Liang, Qingjun Tang and Houlei Chen (*Technical Institute of Physics and Chemistry CAS*)

C1Po1B-10: Research on the Influence of Average Pressure on the Thermodynamic Cycle and Performance of Pulse Tube Cryocoolers

Houlei Chen (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Jia Quan (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*), Menglin Liang, Miguang Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Qingjun Tang (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and Tianshi Feng (*Technical Institute of Physics and Chemistry, CAS*)

C1Po1C 09:15 - 11:00

Non-Aerospace Cryocoolers I

Session Chairs: Peter Bradley, NIST, and Srinivas Vanapalli, University of Twente

C1Po1C-02: A new approach for low input and high capacity 4 K Gifford-McMahon cryocooler

Shinji Masuyama (*NIT, Oshima College*), Koji Kamiya, Kyohei Natsume and Takenori Numazawa (*NIMS*)

C1Po1C-03: Parametric thermal characterization of Sumitomo RDE-418D4 two-stage Gifford-McMahon cryocooler

Gilles Authelet, Tisha Dixit, Vadim Stepanov and Bertrand Baudouy (*CEA Paris-Saclay*)

C1Po1C-04: Development of a 4 K pulse-tube refrigerator (PTR) for quantum device cooling

Jiho Park, Hankil Yeom, Hyobong Kim, Junseok Ko (*Korea Institute of Machinery and Materials*), Sangkwon Jeong (*Korean Advanced Institute of Science and Technology*), Seokho Kim (*Changwon National University*) and Yunchul Chung (*Pusan National University*)

C1Po1C-05: Study on the multiple cooling output characteristics of a gas-coupled high-frequency pulse tube cryocooler

Biao Yang, Zhijian Zhang, Yihan Tian, Zhaozhao Gao, Liubiao Chen and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po1D 09:15 - 11:00

Sub K Helium Cycle Cryocoolers

Session Chairs: Xihuan Hao, Bluefors Cryocooler Technologies, Inc., and TBD

C1Po1D-01: Research on an efficient Joule-Thomson throttling refrigeration system based on cold compression cycle

Yuefeng Niu, Changzhen Shi, Chenglong Liu and Jinghui Cai (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China*)

C1Po1D-02: Design and experiments of 1 K superfluid 4He system for precooling the ultra-low temperature refrigerators

Jiarun Zou (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Science, Beijing 100190, China*), Ziyao Liu (*Technical Institute of Physics and Chemistry, CAS*), Zijie Pan (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Lingjiao Wei (*Technical Institute of Physics and Chemistry, CAS*), Maowen Zheng (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Haowen Guo (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Houlei Chen (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences, Beijing 100190, China*) and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C1Po1D-03: Simulation and experimental study of ultra-low temperature heat transfer characteristics of continuous heat exchangers in the dilution refrigerator

Haowen Guo (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Houlei Chen (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Jiarun Zou (*Technical Institute of Physics and Chemistry CAS*), Jingtao Liang, Lingjiao Wei (*Technical Institute of Physics and Chemistry, CAS*), Maowen Zheng (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Miguang Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Zijie Pan (*Technical Institute of Physics and Chemistry, CAS*) and Ruixing Li (*Technical Institute of Physics and Chemistry*)

C1Po1D-04: Design and performance evaluation of a closed-cycle ³He sorption cooler

Juan Wang, Lingjiao Wei, Miguang Zhao, Shubao Zhao, Xiang Fan (*Technical Institute of Physics and Chemistry, CAS*) and Yilin Lei (*Department of Mechanical Engineering, Michigan State University*)

C1Po1D-05: Design and analysis of sub-K continuous heat exchanger for dilution refrigerators

Abhishek Verma, Milind Atrey and Dipanshu Bansal (*Indian Institute of Technology Bombay*)

C1Po1D-06: Development of a heat exchanger with distributed Joule–Thomson effect for a closed-cycle cryocooler

Takeshi Shimazaki and Hisashi Nakagawa (*NMIJ, AIST*)

C1Po1E 09:15 - 11:00

Large Scale Refrigeration I: Helium

Session Chairs: Jeewan Subedi, Fermilab, and Sungwoon Yoon, Fermilab

C1Po1E-01: Evaluation of helium loss for a closed-loop cryogenic system

Feng-Zone Hsiao, Hsing-Chieh Li, Huang-Hsiu Tsai, Ping-Shun Chuang, Sheng-Hsiung Chang, Wen-Song Chiou and Wun-Rong Liao (*National Synchrotron Radiation Research Center*)

C1Po1E-02: Assessment of the existing cryogenic central plant for the Electron Ion Collider cryogenic loads at Brookhaven National Laboratory

Pratik Kumar Manubhai Patel (-), Yatming Than, Russell Feder (*Brookhaven National Laboratory*), Blaine Wissler (*Jefferson Lab*), Shirley Yang (-) and Nate Laverdure (*Thomas Jefferson National Laboratory*)

C1Po1E-03: A backup compressor system for the ESS accelerator cryoplant

Philipp Arnold (*European Spallation Source ERIC*), Emilio Asensi Conejero (-), Heiko Stuckenberg (*Aerzener Maschinenfabrik GmbH*), Jianqin Zhang, José Cardoso, Per Nilsson (*European Spallation Source ERIC*) and Wolfgang Hees (*European Spallation Source ESS AB*)

C1Po1E-04: LCLS-II Cryoplant Cooling Water System: Challenges and Remediation

Sae Vvawahare (*Stanford National Accelerator Laboratory*), Akanksha Apte (*Stanford University*), Biren Rama (-), Eric Fauve (*STANFORD*), Francisco Moguel, Jesse Peralta, John Pucci, Marcus Keenan (*SLAC*), Swapnil Shrishrimal (*SLAC National Accelerator Laboratory*) and Viswanath Ravindranath (-)

C1Po1E-05: Commissioning Results of The ESR 2 Compressors at JLab

Christopher Perry, Brendan White, Jonathan Creel (*Thomas Jefferson National Accelerator Facility*), Ritendra Bhattacharya (-) and Robert Norton (*Thomas Jefferson National Accelerator Facility*)

C1Po1F 09:15 - 11:00

Large Scale Refrigeration II

Session Chairs: Romain Bruce, Fermilab, and Tim Wallace, Fermilab

C1Po1F-01: Performance Investigation of Gas-Solid Heat Transfer from Room to Cryogenic Temperatures in Moving Solid-Phase Cold Storage

Yihong Li (*Technical Institute of Physics and Chemistry, CAS*), Xiaoyu Fan (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Junxian Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhikang Wang, Jiamin Du, Zhaozhao Gao (-), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen (-) and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po1F-02: “Keep it simple, stupid”: Redesigning a chaotic low pressure LN2 delivery system to NMR instrument

Benjamin Arline and Zhiyi Jiang (*Florida State University - NHMFL*)

C1Po1F-03: Design of a new 12x150A helium-cooled current lead for EIC

Frederic Micolon and Harlan Lovera (*Brookhaven national laboratory*)

C1Po1F-04: HL-LHC RF dipole crab cavities validation at TRIUMF

Alexey Koveshnikov, Benjamin Jon Matheson (-), David Kishi (*TRIUMF*), Devon Lang (-), Johnson Cheung, Philipp Kolb (*TRIUMF*), Robert Laxdal (-), Rowan Bjarnson and Zhongyuan Yao (*TRIUMF*)

M1Or1A 09:30 - 10:30

Low Temperature Properties of Non-Ferrous Metals and Alloys

Session Chairs: Ignacio Aviles Santillana, CERN and Karl Hartwig, Academic

9:30 AM M1Or1A-01: Microstructure and 77K mechanical properties of electron beam welded Cu101- Inconel 625 joints

Adam O'brien (-), Aniket Ingrole (*National High Magnetic Field Laboratory (NHMFL), Florida State University*), Anne-Marie Valente-Feliciano (-), Gregory Grose (*Thomas Jefferson National Accelerator Facility*), Jun Lu (-), Oleksandr Hryhorenko and Shreyas Balachandran (*Thomas Jefferson National Accelerator Facility*)

9:45 AM M1Or1A-02: Multiscale Modeling of Polycrystalline Niobium Sheets to Capture Anisotropic Evolution

Taejoon Park, Farhang Pourboghrat and Jinheung Park (*The Ohio State University*)

10:00 AM M1Or1A-03: Comparative Analysis on Recrystallization and Recovery of High and Low RRR Niobium

Zu Hawn Sung (-), Katrina Howard (*University of Chicago*), Daniel Bafia and Wieslawa Misiewicz (-)

10:15 AM M1Or1A-04: Development of thermal joints for conduction-cooling applications

Jacob Lewis (*Old Dominion University*) and Gianluigi Ciovati (*Jefferson Lab*)

C1Or2A 11:15 - 12:30**Large Scale Cryogenic Systems I: Operation & Design I**

Session Chairs: Maria Barba, Fermilab, and Sastry Pamidi, FAMU-FSU College of Engineering & The Center for Advanced Power Systems

- 11:15 AM **C1Or2A-01: Maintenance of SCL3 cryogenic helium plant for Korean heavy ion accelerator after 3 years operation**
Junghyun Yoo, Gyuho Lee, Hyun Chul Jo, Inmyung Park, Jae Hee Shin, Jaehak Han, Jinwook Kim, Min Ki Lee and Seojeong Kim (*Institute for Basic Science*)
- 11:30 AM **C1Or2A-02: LCLS-II Cryoplant Operational Availability: 3 Years of Operation**
Sae Vyahare (*Stanford National Accelerator Laboratory*), Akanksha Apte (*Stanford University*), Biren Rama (-), Eric Fauve (*STANFORD*), Francisco Moguel, John Pucci, Marcus Keenan (*SLAC*), Swapnil Shrishimal (*SLAC National Accelerator Laboratory*) and Viswanath Ravindranath (-)
- 11:45 AM **C1Or2A-03: Cold compressor performance and energy consumption improvements at Jefferson Lab's Central Helium Liquefiers**
Brian Mastracci, Jonathan Creel, Robert Norton and Thilan Wijeratne (*Thomas Jefferson National Accelerator Facility*)
- 12:00 PM **C1Or2A-04: TurboBrayton systems for low and high temperatures**
Pierre Barjhoux, Fabien Durand, Guillaume Delautre and Théophile Razat (*Air Liquide*)
- 12:15 PM **C1Or2A-05: Operation experience with a 1.8 K refrigeration unit during the 2024 LHC physics run at CERN**
Benjamin Bradu, Boyan Naydenov, Laurent Delprat and Marco Pezzetti (*CERN*)

C1Or2B 11:15 - 12:15**Non-Aerospace Cryocoolers II**

Session Chairs: Santhosh Kumar Gandla, Sumitomo (SHI) Cryogenics of America Inc, and TBD

- 11:15 AM **C1Or2B-01: A dynamic simulation model for gas guided pistons in Stirling machines**
Bruce Fischer, Michael Gschwendtner (*Auckland University of Technology*) and Alan Caughley (*Callaghan Innovation Christchurch*)
- 11:30 AM **C1Or2B-02: Improving energy efficiency and cryocooling performance through independent speed control of cryocoolers and compressors**
Adriana Klyszejko, Alex Renshaw, Lucjan Pajdzik, Amy Kennedy, Jonathan Shaxted and Thomas Rich (*Oxford Cryosystems Ltd*)
- 11:45 AM **C1Or2B-03: Exergy measurements between a 4 K pulse tube refrigerator and its compressor**
Ryan Snodgrass, Vincent Kotsubo, Logan Kossel and Joel Ullom (*National Institute of Standards and Technology*)
- 12:00 PM **C1Or2B-04: Parasitic Heat Load Reduction of Cryocoolers**
Wolfgang Stautner (*GE HealthCare – Technology & Innovation Center (HTIC)*), Vijay Soni (*GE HealthCare Technology & Innovation Center*) and Anbo Wu (-)

C1Or2C 11:15 - 12:00**Cryogenics for Quantum Applications**

Session Chairs: Franklin Miller, University of Wisconsin-Madison, and Ram Dhuley, Fermilab

- 11:15 AM **C1Or2C-01: Development of cryogenic infrastructures for quantum computing**
Florian Martin, Jean-Marc Bernhardt, Mathieu Szmigiel (*Air Liquide Advanced technologies*), Pascale Daguette (*Air Liquide*), Pierre Barjhoux and Simon Crispel (-)
- 11:30 AM **C1Or2C-02: Quantum Computer Test Facility at SLAC using existing Cryogenic Infrastructure**
Swapnil Shrishimal (*SLAC National Accelerator Laboratory*), Dirk Pflueckhahn (-), Eric Fauve (*STANFORD*), Francisco Moguel (*SLAC National Accelerator Laboratory*), Marcus Keenan (*SLAC*), Sae Vyahare (*Stanford National Accelerator Laboratory*), Akanksha Apte (*Stanford University*), John Pucci (*SLAC*), Biren Rama, Viswanath Ravindranath (-), Hong Hu, Tao Fang (*PsiQuantum*) and Mathew Hunt (-)
- 11:45 AM **C1Or2C-03: Ultra Compact Rack Cryostat System for Quantum applications**
Sebastian Schaile (*attocube systems AG*), Jens Höhne (*Pressure Wave Systems GmbH*), Florian Otto and Claudio Dal Savio (*attocube systems AG*)

M1Or2A 11:15 – 12:15

[Special Session] Transportation I: Government Agencies & Industry Partners

Session Chairs: Shreyas Balachandran, FAMU-FSU College of Engineering, and Parag Kshirsagar, Raytheon Technologies Research Center

- 11:15 AM **M1Or2A-01: [Invited] Advanced Cryogenic Cooling Concepts for Superconducting Technologies on Electric Transport Platforms**
Sastry Pamidi (*FAMU-FSU College of Engineering & The Center for Advanced Power Systems*)
- 11:35 AM **M1Or2A-02: [Invited] Impacts of Liquified-Petroleum-Gas (LPG) and Liquid-H2 Cryogenic Fuels to improve the Performance and Thermal Management of Aerospace Vehicles**
Chris Kovacs (*Scintillating Solutions LLC*) and Timothy Haugan (-)
- 11:55 AM **M1Or2A-03: [Invited] Non-functional superconducting system requirements in a marine environment**
Peter Ferrara and Theresa Vaites (*Naval Surface Warfare Center, Philadelphia Division*)

C1Po3A 14:00 - 16:00

Cryogenic Components I

Session Chairs: Robert Duckworth, Oak Ridge National Laboratory, and TBD

C1Po3A-01: Optimization design of the brake impeller for cryogenic hydrogen turbine expanders

Jiansheng Zuo, Changlei Ke, Hongmin Liu, Liqiang Liu, Nan Peng, Shun Qiu and Yanwei Liang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, China,*)

C1Po3A-02: Experiment research of intermittent flow cold storage surface heat exchanger

Wenhui Cui (*Technical Institute of Physics and Chemistry,CAS*), Han Zhou (*Zhongshan Institute of Advanced Cryogenic Technology*), Linghui Gong, Meimei Zhang (*Technical Institute of Physics and Chemistry,CAS*), Pengtong Meng, Qian Wang (*Zhongshan Institute of Advanced Cryogenic Technology*), Zhaoxue Zhang and Zhengyu Li (*Technical Institute of Physics and Chemistry,CAS*)

C1Po3A-03: Numerical simulation of active refrigeration for liquid helium storage

Liang Guo (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, China*), Qiming Jia (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Shaoqi Yang (-), Ye Chen (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, China*) and Xiujuan Xie (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po3A-05: Experimental study of two thermally-connected hydraulically- independent 20-tube neon pulsating heat pipes working in parallel

Tisha Dixit, Gilles Authélet, Vadim Stepanov, Théophile Benoit, Matthias Durochat, Thibault Lecrevisse, Philippe Fazilleau and Bertrand Baudouy (*CEA Paris-Saclay*)

C1Po3A-06: Design and optimization of return gaseous helium heater for 2 K cryogenic test bench

Xinbo Dong (*Institute of Advanced Science Facilities, Shenzhen (IASF)*), Huikun Su (*Institute of Advanced Science Facilities ,Shenzhen*), Haining Li (*Institute of Advanced Science Facilities(IASF)*), Zheng Sun (*Dalian Institute of Chemical Physics*), Jichao Dong (*Institute of Advanced Science Facilities, Shenzhen*), Xu Shi (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*), Yilun Liu (*Institute of Advanced Science Facilities (IASF)*) and Xilong Wang (*Institute of Advanced Science Facilities(IASF)*)

C1Po3A-07: Lumped Modeling of Cooling and Electric Devices in Aircraft

Jin Kwon, Michael Sumption, Xianhao Zhang (-) and Yang Guo (*The Ohio State University*)

C1Po3A-08: Dynamic Analysis and Optimization of Aerostatic Bearing-Rotor Systems in Cryogenic Turbo Expanders

Changlei Ke, Hongmin Liu, Jiansheng Zuo, Liqiang Liu, Nan Peng (-) and Shun Qiu (*Technical institute of physics and Chemistry,CAS*)

C1Po3B 14:00 - 16:00**LH2 and LNG I: Safety**

Session Chairs: Adam Swanger, NASA Kennedy Space Center, and Wesley Johnson, NASA Glenn Research Center

C1Po3B-01: A comparison of the toxicity and asphyxiation risk during bunkering of LH2, LNG and NH3 by means of a quantitative risk assessment

Jorgen Depken, Lars Baetcke (*Institute for Maritime Energy Systems, German Aerospace Center (DLR)*), Martin Kaltschmitt (*Institute of Environmental Technology and Energy Economics (IUE), Hamburg University of Technology (TUHH)*) and Sören Ehlers (*Institute for Maritime Energy Systems, German Aerospace Center (DLR)*)

C1Po3B-02: Impacts of temperature on nitrogen adsorption of common cryogenic purification materials

Glynne Saelid, Ian Richardson and Mazdak Shokrian (*Plug Power*)

C1Po3B-03: Numerical Simulation of the Protective Effectiveness of Bund Walls and the Impact of Key Parameters in Accidental Liquid Hydrogen Releases

Yanwei Liang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yongfeng Qu (*Centre Borelli, University of Paris-Saclay*), Nan Peng (*Technical Institute of Physics and Chemistry*), Changlei Ke (-), Liqiang Liu, Shun Qiu, Xiaohua Zhang, Kongrong Li, Hongmin Liu and Jiansheng Zuo (*Technical Institute of Physics and Chemistry*)

C1Po3B-04: Development of the Cool Fuel School: a comprehensive hands-on cryogenic hydrogen design and safety program

Jacob Leachman (-) and Zachary Beadle (*Washington State University*)

C1Po3B-05: Simulation experiment of vacuum insulation deterioration in liquid hydrogen tank due to minute air leaks

Suguru Takada (-), Hiroaki Kobayashi (*Japan Aerospace Exploration*), Masakazu Nozawa (*National Institute of Technology, Akita College*), Shigeyuki Takami and Shinji Hamaguchi (*National Institute for Fusion Science*)

C1Po3B-06: CFD simulation of cryogenic LH2 external releases: a multicomponent-multiphase approach

Alvaro Vidal (-)

C1Po3C 14:00 - 16:00**Liquid Air, CO2, Ar Liquefaction and Storage**

Session Chairs: David Montanari, Fermilab, and TBD

C1Po3C-01: A study of the whole life cycle carbon emission of liquid air energy storage system

Zhaozhao Gao, Jiamin Du, Liubiao Chen and Junjie Wang (*Technical Institute of Physics and Chemistry*)

C1Po3C-02: Ensuring High-Purity Liquid Argon for the LBNF FDC: Collaborative Cryogenics Research Between UNICAMP and Fermilab

Roza Doubnik (*Fermilab*), Alan Hahn (*Fermi National Accelerator Laboratory*), Ana Amelia B. Machado, Cris Adriano, Daniel Correia (*"Gleb Wataghin" Institute of Physics, UNICAMP*), David Montanari (*Fermi National Accelerator Laboratory*), Dilson Cardoso (*CPqMAE - The Research Center on Advanced Materials and Energy, Federal University of São Carlos (UFSCar)*), Dirceu Noriler (*School of Chemical Engineering, UNICAMP*), Elisabete M. Assaf (*São Carlos Institute of Chemistry at the University of São Paulo.*), Ettore Segreto (*"Gleb Wataghin" Institute of Physics, UNICAMP*), Flor De Maria Blaszczyk (*Fermi National Accelerator Laboratory*), Helio Da Motta (*The Brazilian Center for Research in Physics (CBPF)*), Jose Mansur Assaf (*CPqMAE - The Research Center on Advanced Materials and Energy, Federal University of São Carlos (UFSCar)*), Magda B. Fontes (*The Brazilian Center for Research in Physics (CBPF)*), Mark Adamowski (*Fermi National Accelerator Laboratory*), Pascoal José Giglio Pagliuso (*"Gleb Wataghin" Institute of Physics, UNICAMP*), Robert Mrowca (*Fermi National Accelerator Laboratory*), Rosembergue G. Gonçalves (*CPqMAE - The Research Center on Advanced Materials and Energy, Federal University of São Carlos (UFSCar)*), Thiago P.m. Alegre (*"Gleb Wataghin" Institute of Physics, UNICAMP*) and Zack West (*Fermi National Accelerator Laboratory*)

C1Po3C-03: Thermodynamic Analysis of Cold Energy Replenishment in Liquid Air Energy Storage System

Zhikang Wang, Jiamin Du (-), Junxian Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yihong Li (*Technical Institute of Physics and Chemistry, CAS*), Xiaoyu Fan (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhaozhao Gao (-), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen (-) and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po3C-04: Development of a 10 ton/day air liquefaction system for liquid air energy storage

Sehwan In, Heechan Jeong, Hyungsoo Lim, Junyoung Park, Juwon Kim, Sehjin Park and Yong-Ju Hong (*Korea Institute of Machinery and Materials*)

C1Po3C-05: Investigation of cold energy transfer characteristics in the liquefaction unit of the liquid air energy storage system

Xiaoyu Fan (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Junxian Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yihong Li (*Technical Institute of Physics and Chemistry, CAS*), Zhikang Wang, Jiamin Du, Zhaozhao Gao (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po3C-06: Experimental investigation of CO₂ desublimation characteristics in flue gas on horizontal copper plate influenced by surface temperature and CO₂ concentration

Bo Zhao (*Institution of Refrigeration and Cryogenics, Zhejiang University*), Xinyu Lu, Limin Qiu and Xiaoqin Zhi (*Zhejiang University*)

C1Po3D 14:00 - 16:00

Thermophysical Properties and Transport Processes I

Session Chairs: TBD

C1Po3D-01: Design and performance analysis: characteristics of multi-dimension helium turbine brake wheels based on CFX simulation

Jiansheng Zuo, Changlei Ke, Hongmin Liu, Liqiang Liu, Nan Peng, Shun Qiu and Yanwei Liang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, China*),

C1Po3D-02: Study on Helium Adsorption Properties of Carbon Nanotubes in the Liquid Helium Temperature Range Based on the Monte Carlo Method

Zhijian Zhang, Biao Yang, Yihan Tian, Zhaozhao Gao, Liubiao Chen and Junjie Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po3D-03: Measurement of Apparent Thermal Conductivity of Insulation Materials at Cryogenic Temperatures

Zhijian Zhang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Biao Yang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhaozhao Gao (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C1Po3D-04: Transient Heat Transfer in Superfluid Helium from Localized Heating Spots on Spherical Surfaces

Yingxuan Hu (*Zhejiang University, Institute of Refrigeration and Cryogenics*), Shiran Bao, Limin Qiu (*Zhejiang University*), Xiaoqin Zhi (*浙江大学*) and Kai Wang (*Zhejiang University*)

C1Po3D-05: Simulation Research on the Transient Characteristics of the Helium Turbine Expander

Shixiong Chen, Chengfei Fan, Chenghao Dai, Qiyong Zhang and Pengcheng Yang (*Institute of Plasma Physics, Hefei*)

C1Po3D-06: Streamlined Heat Leak Estimation for Vacuum Jacketed Cryogenic Pump Assemblies

Chris Rista (*Barber-Nichols LLC*)

C1Po3D-07: Design considerations for valve dynamics of a positive displacement cryogenic pump

Brandon Demski and Luke Humphreys (-)

C1Po3D-08: A review of the technology practice and future opportunities of liquid hydrogen centrifugal pumps

Xinran Li, Cui Lv (*Technical Institute of Physics and Chemistry CAS*), Jihao Wu, Jin Shang (-) and Yicheng Li (*Technical Institute of Physics and Chemistry CAS*)

C1Po3D-09: Design and optimization of a Single-Phase heat exchanger for GM cryocooler coupled with parahydrogen conversion catalyst

Xinran Li, Yicheng Li, Cui Lv (*Technical Institute of Physics and Chemistry CAS*) and Jihao Wu (-)

M1Po3A 14:00 - 16:00

Materials Aspects of HTS

Session Chairs: Lance Cooley, FAMU-FSU College of Engineering, and Xuan Peng, Hyper Tech Research, Inc.

M1Po3A-01: Measurements of composite Bi-2212 Rutherford cable's mechanical properties.

Alessio D'agligiano (*FNAL*), Emanuela Barzi (*Fermilab*), Giorgio Vallone (*Lawrence Berkeley National Lab. (US)*), Igor Novitski (*Fermilab*), Jean-Francois Croteau (*Lawrence Berkeley National Laboratory*), Simone Donati (*Istituto Nazionale di Fisica Nucleare - Pisa*), Tengming Shen (*Lawrence Berkeley National Laboratory*) and Valerio Giusti (*University of Pisa / INFN Pisa*)

M1Po3A-02: Investigation of Leakage in Bi-2212 Rutherford Cables

Eric Hellstrom, Jianyi Jiang, Shaon Barua, Jozef Kvitkovic, Caitlynn Linville, Jamia Brown, Jakeyvan Jones, Daniel Davis, Youngjae Kim, Fumitake Kametani, Emma Martin, Ulf Trociewitz, David Larbalestier (*Applied Superconductivity Center - NHMFL*), Jean-Francois Croteau, Christopher Escobar and Tengming Shen (*Lawrence Berkeley National Laboratory*)

M1Po3A-03: The Effect of Calcium Doped Y-Ba-Cu-O (CaY123) Layer Thickness on the Flux Pinning in (CaY123 / BaZrO3 Doped Y-Ba-Cu-O) Multilayer Composite Films at a Wide Range of Temperatures and Applied Fields

Mary Ann Sebastian (*University of Dayton Research Institute & Air Force Research Laboratory RQQM WPAFB*), Aafiya Aafiya (*University of Kansas*), Abhijeet Choudhury, Benson Kunhung Tsai (*Purdue University*), Charles Ebbing (*University of Dayton Research Institute*), Haiyan Wang, Jialong Huang (*Purdue University*), Judy Wu (-), Mohan Panth (*University of Kansas*), Timothy Haugan (-) and Victor Ogunjimi (*University of Kansas*)

M1Po3A-04: Self-consistent solution of Eliashberg equations for metal hydride superconductors

Chumin Wang Chen and Tomas Javier Escamilla Lara (*Instituto de Investigaciones en Materiales, Universidad Nacional Autonoma de Mexico*)

M1Po3B 14:00 - 16:00**Mechanical and Thermal Properties of Materials at Low Temperature**

Session Chairs: Shreyas Balachandran, FAMU-FSU College of Engineering, and Robert Walsh, Materials Reliability Inc.

M1Po3B-01: Fatigue analysis of Stirling cryocooler flexure springs for long space mission lifetime

Raymond Feng and Hannah Rana (*Center for Astrophysics Harvard & Smithsonian*)

M1Po3B-02: Mechanical characterization of pure Nb at cryogenic temperatures

Md Shakil Mahmood, Arezoo Zare and Beadle Flesher Beadle (*School of Mechanical and Materials Engineering, Washington State University, and Hydrogen Properties for Energy Research Center, Washington State University*)

M1Po3B-03: Mechanical Properties of Stainless-Steel co-wind Tapes for REBCO magnets

Aniket Ingrole (*National High Magnetic Field Laboratory (NHMFL), Florida State University*) and Jun Lu (-)

M1Po3B-04: Assessing the Adhesion of Nanofibrous PVDFHFP as Passive Thermal Control Coatings for the Extraterrestrial Storage of Cryogenic Propellants

Chieloka Ibekwe (-), Adrien Neveu, Nan An, Xuanjie Wang (*Rensselaer Polytechnic Institute*), Jason Hartwig (*NASA Glenn Research Center*), Adam Swanger (*NASA Kennedy Space Center*) and Shankar Narayan (*Rensselaer Polytechnic Institute*)

M1Po3B-05: Inconel 625 flange development for Cu-based superconducting radio frequency cavities

Adam O'brien, Anne-Marie Valente-Feliciano, Gregory Grose, John Buttles, Oleksandr Hryhorenko, Shreyas Balachandran and Tom Prosper (*The Thomas Jefferson National Accelerator Facility*)

M1Po3C 14:00 - 16:00**Magnet Design and Applications I**

Session Chairs: Sonja Schlachter, Karlsruhe Institute of Technology, and Honghai Song, Canyon Magnet Energy

M1Po3C-01: The Design and Manufacturing of Superconducting Undulator Magnets Utilizing Additive Manufacturing & Plastic Components.

Ethan Anliker, Ibrahim Kesgin (-), Matthew Kasa (*Argonne National Laboratory*), Yuko Shiroyanagi (-) and Yuri Ivanyushenkov (*ANL*)

M1Po3C-02: Structural analysis and field mapping test setup of the quadrupole triplet magnet for HRS project

Hengkang Zheng, Xiaoji Du, Yamen Al-Mahmoud, Yoonhyuck Choi, David Greene, Junseong Kim, Ryan Koschay, Hai Nguyen, John Wenstrom, Ting Xu and Danlu Zhang (*Michigan State University*)

M1Po3C-03: Thermal Modeling of CCT Dipole Magnets wound using Defected REBCO Cables

Edward Collings (*The Ohio State University*), Michael Sumption and Milan Majoros (-)

M1Po3C-04: Researches on Superconducting Magnetic Drivers

Guomin Zhang (*Institute of Electrical Engineering, Chinese Academy of Sciences*)

M1Po3D 14:00 - 16:00**Insulation, Impregnation, and Polymeric Materials**

Session Chairs: Jonathan Demko, LeTourneau University, and Vincent Schenk, CERN

M1Po3D-01: Cryogenic properties of polyimide aerogel composites for thermal insulation

Rongjin Huang, Shen Zhao and Zhicong Miao (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

M1Po3D-02: Formation of thermal conductive hydrogel network in boron nitride/polyvinyl alcohol by directional freezing assisted salting-out method for cryogenic application

Junting Zhao (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry; Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences*), Zhengrong Zhou (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; Hunan Key Laboratory of High-Performance Intelligent Sensor and Detection System*), Tao Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry*), Rongjin Huang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry; Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences*), Hongwei Zhang and Zhicong Miao (*State Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

M1Po3D-03: Assessing the Feasibility of Adopting Molecular Dynamics in Designing Cryogenic Polymers

Susiri Costa and Shanaka Kristombu Baduge (*The University of Melbourne*)

C1Or4A 16:15 – 17:30

Thermophysical Properties and Transport Processes II

Session Chairs: Robert Duckworth, Oak Ridge National Laboratory, and Matthew Shenton, Washington State University

- 4:15 PM **C1Or4A-01: Validating effective thermal conductivity of glass microspheres in cryogenic storage insulation via finite element analysis**
Marc Dunham, Clara Mata, Matt Mortensen and Rob Hunter (3M)
- 4:30 PM **C1Or4A-02: Development of a test apparatus for thermal conductivity measurements of insulation materials with adsorbed nitrogen between 20 and 77 K**
Justin Jessop (*Washington State University*), Jacob Leachman (-) and Konstantin Matveev (*Washington State University*)
- 4:45 PM **C1Or4A-03: A compact, exchangeable and fast-cooling cryogenic system for HTS antennas**
Hongwei Zhang, Di Jiang, Feiyi Chen, Huiming Liu, Rongjin Huang, Yemao Han, Yuan Zhou, Yuqiang Zhao, Zhen Geng and Zhengrong Zhou (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)
- 5:00 PM **C1Or4A-04: Wicking dynamics of cryogenic liquids in superheated porous media**
Rick Spijkers (-) and Srinivas Vanapalli (*University of Twente*)
- 5:15 PM **C1Or4A-05: Lumped-element modeling of density wave oscillations in two-phase hydrogen flow**
Trinity Templeton, Jacob Leachman (-) and Konstantin Matveev (*Washington State University*)

C1Or4B 16:15 - 18:15

Large Scale Cryogenic Systems II: Operation & Design II

Session Chairs: Alexander Martinez, Fermilab, and Vrushank Patel, Fermilab

- 4:15 PM **C1Or4B-01: LBNF/DUNE Liquid Argon Roadmap**
Matt Maciazka (*Fermi National Accelerator Lab. (US)*), Adrien Parchet, Caroline Fabre (*CERN*), David Montanari, Ian Young (*Fermi National Accelerator Lab. (US)*), Johan Bremer (*CERN*), John Campbell (*Intelligas Consulting J.R. Campbell & Associates, Inc*), Mark Adamowski, Michael Delaney, Roza Doubnik and Trevor Nichols (*Fermi National Accelerator Lab. (US)*)
- 4:30 PM **C1Or4B-02: Overview and status of the Long-Baseline Neutrino Facility Far Detectors cryogenics system**
David Montanari (*Fermi National Accelerator Lab. (US)*), Adrien Parchet (-), Caroline Fabre (*CERN*), Ian Young (*Fermi National Accelerator Lab. (US)*), Johan Bremer (*CERN*), Mark Adamowski (*Fermilab*), Markus Graf (-), Matt Maciazka, Michael Delaney (*Fermi National Accelerator Lab. (US)*), Roza Doubnik (*Fermilab*), Trevor Nichols (*Fermi National Accelerator Lab. (US)*) and Zack West (*Fermi National Accelerator Laboratory, PO Box 500, Batavia IL 60510, United States*)
- 4:45 PM **C1Or4B-03: The Cryogenic System for the Mainz Energy-recovering Superconducting Accelerator (MESA)**
Timo Stengler, Daniel Simon, Florian Hug (*Johannes Gutenberg-Universität Mainz*), Hendrie Derking (*Cryoworld BV*) and Kurt Aulenbacher (*Johannes Gutenberg-Universität Mainz*)
- 5:00 PM **C1Or4B-04: Design status of the second target station cryogenic moderator system**
Jim Janney (-)

- 5:15 PM **C1Or4B-05: LCLS-II HE Cryogenic Distribution System Status**
Biren Rama, Katyayini Kumar Vemulkar, Renzhuo Wang, Scott Kaminsky and Taekyung Ki (*SLAC National Accelerator Laboratory*)
- 5:30 PM **C1Or4B-06: Design, fabrication and installation of the refurbished K500 cyclotron cryogenic distribution system for MSU chip testing facility**
Mathew Wright, Venkatarao Ganni, Nusair Hasan, Fabio Casagrande, Shelly Jones, Chinh Nguyen, Nathan Joseph and Brandon Laumer (*Michigan State University*)
- 5:45 PM **C1Or4B-07: 2 Kelvin helium distribution system for the Electron Ion Collider's 10 o'clock satellite refrigerator**
A. Rizzato, B. Wissler, J. Tschirhart, S. Yang and N. Laverdure (*Thomas Jefferson National accelerator facility*)
- 6:00 PM **C1Or4B-08: Progress on design and construction of a new Helium liquefaction system at LBL**
Li Wang and Soren Prestemon (*Lawrence Berkeley National Lab*)

C1Or4C 16:15 - 18:00

Liquid Hydrogen Storage

Session Chairs: Jordan Raymond, Stoke Space, and TBD

- 4:15 PM **C1Or4C-01: Validating a thermodynamic model for self-pressurization in liquid hydrogen tanks using novel tank trailer data**
Christian Wolf, Alexander Alekseev (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology, Garching/Germany; Linde GmbH, Clean Energy Technologies R&D, Pullach/Germany*), Daniel Siebe, Harald Klein, Laura Stops and Sebastian Rehfeldt (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology, Garching/Germany*)
- 4:30 PM **C1Or4C-02: Comparison of liquid hydrogen tank performance at different storage pressures and operational scenarios using a reduced-order model**
Kyle Appel (*Washington State University*), Jacob Leachman (-) and Konstantin Matveev (*Washington State University*)
- 4:45 PM **C1Or4C-03: On the Thermodynamic Boundaries of Cryogenic Liquid Storage in Closed Containers**
Thomas Just (*Technische Universität Dresden*), Christoph Haberstroh and Julian Will (-)
- 5:00 PM **C1Or4C-04: Towards Economic Zero Boil-Off Technology for Liquid Hydrogen Storage**
Harro Beens and Srinivas Vanapalli (*University of Twente*)
- 5:15 PM **C1Or4C-05: Development of novel non-vacuum insulation system for large-scale liquid hydrogen storage applications**
Kun Zhang, Neeharika Rajagiri (*Shell*), David Creech, John Jacobson (*CB&I*), James Fesmire (*GenH2*), Adam Swanger (*NASA KSC*), Ed Holgate and Casimir Van Doorne (*Shell*)
- 5:30 PM **C1Or4C-06: Thermal and Structural Modification to Repurpose Existing Full Containment (FCT) Liquefied Natural Gas (LNG) Tanks for Liquid Hydrogen (LH2) Storage**
Shanaka Kristombu Baduge (*The University of Melbourne*), Amila Premakumara, Susiri Costa, Hasala Sakvithi (*Graduate researcher*) and Upeka Gunaratne (*The University of Melbourne*)
- 5:45 PM **C1Or4C-07: Experimental Study on Thermodynamic Performance and Lossless Storage of a Vehicle-Mounted Horizontal LH2 Tank**
Chuancong Wan, Chaoyue Shi, Shaolong Zhu, Song Fang (*Zhejiang University*), Guoyou Shi, Shouqiang Shao, Dingfu Li (*Zhejiang Juhua Equipment Engineering Group Co., Ltd.*), Kai Wang and Limin Qiu (*Zhejiang University*)

M1Or4A 16:15 - 17:45

Insulation & Impregnation Materials: Polymeric Materials

Session Chairs: Shanaka Kristombu Baduge, The University of Melbourne, and Vincent Schenk, CERN

- 4:15 PM **M1Or4A-01: [Invited] Thermal Conductivity of Polymer Aerogels at Different Vacuum Levels for Cryogenic Insulation Applications**
Jonathan Demko, Gitogo Churu, Ryan Ehresman, Taylor Fiorenzi, Anna Libiez, Hudson Mcguire, Andrew Moore (*LeTourneau University*), Sadeq Malakooti, Wesley Johnson (*NASA Glenn Research Center*) and Stephanie Vivod (*NASA GRC*)

- 4:45 PM **M1Or4A-02: Composite cryogenic hydrogen insulated lightweight lined storage (C-CHILL)**
Sascha Stevens and Robert Kolozs (*Dynovas*)
- 5:00 PM **M1Or4A-03: [Invited] Quantifying the relation between strain energy release rate and heat generated in the CTD-101K epoxy resin magnet impregnated at cryogenic temperatures**
Jan Van Steenlandt, Anna Kario, Herman Ten Kate, Simon Otten, Sander Wessel, Laurent Warnet and Hans Van Oort (*University of Twente*)
- 5:30 PM **M1Or4A-04: Elimination of Training in Nb₃Sn and NbTi Superconducting Magnets**
Akihiro Kikuchi, Daniele Turrioni, Diego Arbelaez, Elena Tamagnini (-), Emanuela Barzi (*Ohio State University*), Ibrahim Kesgin (-) and Masaki Takeuchi (*RIMTEC*)

M2PL1 08:00 - 09:00

Plenary: Laura Greene [The National MagLab and Unsolved Mysteries in Superconductors] & ICMC Awards

Session Chairs: Ignacio Aviles Santillana, CERN and Shreyas Balachandran, FAMU-FSU College of Engineering

C2Po1A 09:15 - 11:00

Cryogenic Components II

Session Chairs: Wolfgang Stautner, GE HealthCare – Technology & Innovation Center (HTIC), and TBD

C2Po1A-01: Experimental Study on the Cavitation Characteristics of a Centrifugal Pump in Liquid Helium

Johannes Doll (*TU Dresden*) and Christoph Haberstroh (-)

C2Po1A-02: Research on Optimization Strategies for Heat Switches Based on Helium Adsorption Models

Teng Pan (*Technical Institute of Physics and Chemistry*), Jun Shen (*University of Chinese Academy of Sciences*), Ke Li (*Technical Institute of Physics and Chemistry*), Wei Dai (*University of Chinese Academy of Sciences*), Yanan Li and Zhengkun Li (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C2Po1A-03: Design and development of a control valve plug for precise control and measurement of cryogenic flow

Austin Grake, Jonathon Howard, Nusair Hasan and Venkatarao Ganni (*Michigan State University*)

C2Po1A-04: Optimizing nozzle-impeller coupling to enhance efficiency in hydrogen Turbo-Expanders

Hongmin Liu (*Technical institute of physics and Chemistry, CAS*), Changlei Ke (*Technical Institute of Physics and Chemistry*), Xiaohua Zhang (*National Key Research and Development Program of China*), Liqiang Liu, Kongrong Li, Nan Peng (*Technical Institute of Physics and Chemistry*), Shun Qiu, Yanwei Liang, Jiansheng Zuo (-), and Yanan Li (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C2Po1A-05: Performance assessment of liquid hydrogen pump for the ESS cryogenic moderator system during initial commissioning using helium

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Theodoros Vasilopoulos (*European Spallation Source ERIC*), Attila Zsigmond Horváth (*European Spallation Source*), Iris Haag (*European Spallation Source ERIC*) and Gen Ariyoshi (*Japan Atomic Energy Agency*)

C2Po1A-06: Basic design of a 17 kW orifice type heater for the ESS cryogenic moderator system

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Attila Zsigmond Horváth (*European Spallation Source*) and Philipp Arnold (*European Spallation Source ERIC*)

C2Po1A-07: Pre-design and efficiency analysis of electric generator brake cryogenic helium turbine expander

Chenghao Dai (*Hefei Institutes of Physical Science, Chinese Academy of Sciences, University of Science and Technology of China*), Shixiong Chen (*Hefei Institutes of Physical Science, Chinese Academy of Sciences*), Chengfei Fan (*Hefei Institutes of Physical Science, Chinese Academy of Sciences, University of Science and Technology of China*) and Qiyong Zhang (*Hefei Institutes of Physical Science, Chinese Academy of Sciences*)

C2Po1A-08: Analysis of unbalance response of the rotor of a typical cryogenic turbine for helium refrigerator under thermal effect

Chengfei Fan, Shixiong Chen, Chenghao Dai and Qiyong Zhang (*Institute of Plasma Physics, HFIPS, Chinese Academy of Sciences*)

C2Po1A-09: Development of the linear Compressor of 152Hz Micro Pulse Tube Cryocooler

Yuhong Zhang (中国科学院理化技术研究所), Houlei Chen (*Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Jia Quan (-) and Tianshi Feng (*Technical Institute of Physics and Chemistry, CAS*)

C2Po1B 09:15 - 11:00**Large Scale Cryogenic Systems III: Operation & Design III**

Session Chairs: Roger Jon Rabehl, Fermilab, and Biren Rama, SLAC National Accelerator Laboratory

C2Po1B-01: LHC cryogenic system adaptation and recovery after a major insulation vacuum breakage in a final focusing superconducting magnet in 2023

Benjamin Bradu, Lionel Herblin, Michel Combe, Olivier Pirotte and Vanessa Gahier (*CERN*)

C2Po1B-02: The SCL3 linac operation and improvements following RAON's 2nd beam commissioning

Gyuhoo Lee, Hyunchoo Jo, Inmyung Park, Jaehak Han, Jaehee Shin, Jinwook Kim, Junghyun Yoo, Minki Lee and Seojeong Kim (*Institute for Basic Science*)

C2Po1B-03: Design of the Tunnel Transfer line of PIP-II Cryogenic Distribution System

Vrushank Patel (*Fermi National Accelerator Laboratory*), Alexander Martinez, Erik Voirin, Maciej Chorowski (-), Michał Stanlik (*Wrocław University of Science and Technology*), Paweł Duda (-), Pratik Patel (*Fermilab*), Ram Dhuley (*Fermi National Accelerator Laboratory*), Sungwoon Yoon (*Fermilab*), Tomasz Banaszkiewicz (*Wrocław University of Science and Technology*), Valeri Poloubotko (*Unknown*) and William Soyars (-)

C2Po1B-04: PIP-II Cryogenic Distribution System – status and outlook

Ram Dhuley (*Fermi National Accelerator Laboratory*), William Soyars, Paweł Duda (-), Tomasz Banaszkiewicz (*Wrocław University of Science and Technology*), Michał Stanlik (*Wrocław University of Science and Technology*), Vrushank Patel (-), Pratik Patel, Sungwoon Yoon (*Fermilab*), Alexander Martinez and Maciej Chorowski (-)

C2Po1B-05: Operational experience of QWR cryomodules for RAON

Youngkwon Kim (*Institute for Basic Science*), Hyojaee Jang (-), Jae Hee Shin (*Institute for Basic Science*), Minki Lee (-) and Yeonsei Chung (*Institute for Basic Science*)

C2Po1B-06: Introduction to the protection system for RAON cryogenic system

Seojeong Kim, Gyuhoo Lee, Hyun Chul Jo, Inmyong Park, Jae Hee Shin, Jaehak Han, Jinwook Kim, Junghyun Yoo and Min Ki Lee (*Institute for Basic Science*)

C2Po1C 09:15 - 11:00**Helium Management and Processing**

Session Chairs: Jonathan Demko, LeTourneau University, and TBD

C2Po1C-01: Helium inventory and losses in DALS after several cooldowns

He Sheng, Yaqiong Wang (*Institute of Advanced Science Facilities, Shenzhen*), Lei Xu (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*), Guanglong Cui (*Institute of Advanced Science Facilities, Shenzhen*), Xu Shi and Xilong Wang (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*)

C2Po1C-02: Development of a moisture removal device for helium cryogenic plants

Ping-Shun Chuang (-), Feng-Zone Hsiao (*National Synchrotron Radiation Research Center*), Hsing-Chieh Li (-), Huang-Hsiu Tsai, Sheng-Hsiung Chang, Wen-Song Chiou (*National Synchrotron Radiation Research Center*) and Wun-Rong Liao (*NSRRRC*)

C2Po1C-03: Changes in cooling strategies from 2005 to 2025 at temperatures from 3 K to 25 K using He or H₂ as coolants

Michael Green (-)

C2Po1C-04: Cryogenic purification of low purity helium with temperature swing adsorption and membrane separation

Cody Wilson, Chris Rampersaud, Michael Maurisak and Michael Morgan (*Ability Engineering Technology*)

C2Po1C-05: Integration and commissioning experience of Full Flow Purifier at Muon Campus

Benjamin Hansen (-), Giuseppe Gallo (*Fermi National Accelerator Lab. (US)*), Jeewan Subedi (-), Jerry Makara (*Fermilab*), Justin Tillman, Michael White (-), Terry Tope (*Fermilab*) and Vrushank Patel (-)

C2Po1C-06: Helium recovery system at IB3a

Benjamin Hansen (-), Dominika Porwisiak (*Fermi National Accelerator Laboratory*) and Michael White (-)

C2Po1D 09:15 - 11:00**Ortho-Parahydrogen Conversion**

Session Chairs: Sebastian Eisenhut, Technische Universität Dresden, and TBD

C2Po1D-01: Magnetic field acceleration of catalyzed para- to orthohydrogen conversion for cooling superconducting motors

Liam Turner (*Monash University*), Kyle Appel (*Washington State University*), Thomas J Hughes, Paul Webley (*Monash University*) and Jacob Leachman (-)

C2Po1D-02: Improving the activation of ortho-para hydrogen conversion catalysts for hydrogen liquefaction: Effects of pre-treatment on the performance of Ionex OP

Mojtaba Gohari Bahabadi (*Monash University and CSIRO*), Liam Turner (*Monash University*), Liangguang Tang (*Energy Business Unit, Commonwealth Scientific and Industrial Research Organisation (CSIRO)*) and Thomas J Hughes (*Monash University*)

C2Po1D-03: Screening of ortho-parahydrogen catalysts

Sebastian Eisenhut and Christoph Haberstroh (-)

C2Po1D-04: Experimental Investigation and Performance Evaluation of Catalysts-Filled Plate-Fin Heat Exchangers for Hydrogen Liquefaction

Junjie Teng, Xinyu Wei, Shaolong Zhu, Song Fang, Kai Wang and Limin Qiu (*Zhejiang University*)

C2Po1D-05: Test platforms for ortho-para hydrogen conversion at cryogenic conditions

Xinyu Wei, Junjie Teng, Song Fang, Shaolong Zhu, Kai Wang and Limin Qiu (*Zhejiang University*)

C2Po1D-06: Design and Optimization of Efficient Catalyst-filled Spiral Wound Heat Exchangers for Large-Scale Hydrogen Liquefaction Systems

Hanwei Zhang, Kai Wang, Limin Qiu, Shaolong Zhu, Song Fang and Ziyang Luo (-)

C2Po1E 09:15 - 11:00

Instrumentation, Visualization, and Controls I

Session Chairs: John Ketcham, Scientific Instruments, Inc., and Pratik Patel, Fermilab

C2Po1E-01: Irradiation tests of 3/2-way piezo valves at CERN

Juan Casas-Cubillos, Nikolaos Chatzipapas, Eivind Rostad and Nikolaos Trikoupi (*CERN*)

C2Po1E-02: Cernox® Cryogenic Temperature Sensor Performance after High Level Neutron Irradiation

Scott Courts and Brian Courts (*Lake Shore Cryotronics, Inc.*)

C2Po1E-03: Digital twin for the CRAFT helium cryogenic plant

Qiang Yu, Zhiwei Zhou, Zhigang Zhu and Ming Zhuang (*Institute of Plasma Physics, Chinese Academy of Sciences*)

C2Po1E-04: Commissioning and Initial Operations of the ESS Linac Cryomodule Cryogenic Controls: Achievements and Future Prospect

Adalberto Ferreira Melo Fonotura (*ESS ERIC*), Dominik Domagala (*S2innovation*), Emilio Asensi Conejero (*CERN*), Horus Cardona, Jianqin Zhang, Marek Skiba, Nishanthi Baskar, Nuno Elias (*European Spallation Source ERIC*), Pawel Halczynski (*Instytut Fizyki Jądrowej im. Henryka Niewodniczańskiego Polskiej Akademii Nauk, Kraków, Poland*), Per Nilsson, Peter Van Velze, Philipp Arnold (*European Spallation Source ERIC*), Wawrzyniec Gaj (*Instytut Fizyki Jądrowej im. Henryka Niewodniczańskiego Polskiej Akademii Nauk, Kraków, Poland*) and Wojciech Binczyk (*European Spallation Source ERIC*)

C2Po1E-05: Helium Flow Meter for Measuring SRF Cavity Power Dissipation

Kevin Jordan, Claire Jones, Dakota Christian, Gary Croke (*Jefferson Science Associates*), George Biallas (*Hyperboloid LLC*), Jerone Samari, Michael Tiefenback and Mike McCaughan (*Jefferson Science Associates*)

C2Po1E-06: More advancements with CCE pre-integration and automated PI tuning

Kristin Malenfant, Bryce O'bard, Kerry Frohling, Rj Victoria and Rath Ong (-)

C2Po1E-07: Real time heat load calculation software based on EPICS for Fermilab PIP-II CM tests

Sungwoon Yoon, Pierrick Hanlet, Jerry Makara, Liujin Pei, Shreya Ranpariya, Pratik Patel, Jun Dong, Dominika Porwisiak and Michael White (*Fermilab*)

C2Po1E-08: Design and Development of EPICS-based 6kW Helium Cryogenic Control System

Jincheng Zhang (中国科学院等离子体物理研究所), Zhiwei Zhou (-), Kai Yuan, Xiaofei Lu (中国科学院等离子体物理研究所) and Qiyong Zhang (*Hefei Institutes of Physical Science, Chinese Academy of Sciences*)

C2Po1F 09:15 - 11:00

Large Scale Cryogenic Systems IV: Operation & Design IV

Session Chairs: Romain Bruce, Fermilab

C2Po1F-01: Dynamic simulation and automatic control strategy design for the compressor system of 6kW Helium refrigerator

Yue Zhang (*University of Science and Technology of China*), Zhiwei Zhou, Xiaofei Lu (-), Qiyong Zhang (*Hefei Institutes of Physical Science, Chinese Academy of Sciences*) and Kai Yuan (-)

C2Po1F-02: Modeling and Dynamic Simulation for the Cold Box of 6kW Helium Refrigerator

Wenqing Cao (*University of Science and Technology of China*), Zhiwei Zhou (-), Qiyong Zhang (*Hefei Institutes of Physical Science, Chinese Academy of Sciences*), Xiaofei Lu and Kai Yuan (-)

C2Po1F-03: RAMI analysis of 6kW helium refrigerator system

Jialong Ye, Kai Yuan, Qiyong Zhang and Zhiwei Zhou (-)

C2Po1F-04: Numerical study of liquid medium based packed bed cold storage in liquid air energy storage system

Junxian Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhikang Wang (-), Yihong Li (*Technical Institute of Physics and Chemistry, CAS*), Jiamin Du (-), Xiaoyu Fan (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhaozhao Gao (-), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen (-) and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C2Po1F-05: Conceptual design of a replacement 2.1 K cold box for the Spallation Neutron Source Central Helium Liquefier

Brian Mastracci, Ritendra Bhattacharya, Corey Butler, Jonathan Creel (*Thomas Jefferson National Accelerator Facility*), Ryuji Maekawa, Matthew Howell, Aaron Coleman (*Oak Ridge National Laboratory*), Jacob Magnin and Robert Norton (*Thomas Jefferson National Accelerator Facility*)

C2Po1F-06: Model development and optimization of cryogenic mixed-refrigerant cycles with phase separators

Jakob Reichert, Friederike Boehm and Steffen Grohmann (*Karlsruhe Institute of Technology (KIT)*)

M2Or1A 09:30 - 11:00**Characterization of REBCO Conductors II**

Session Chairs: Jun-Ichi Shimoyama, Aoyama Gakuin University, and Judy Wu, University of Kansas

- 9:30 AM **M2Or1A-01: [Invited] Detection of Local Obstacles in Long REBCO Coated Conductors with Introduction of Machine Learning Based Analysis in High-Speed Reel-to-Reel Magnetic Microscopy**
Takanobu Kiss (-), Kazutaka Imamura (*Kyushu University*), Kohei Higashikawa (-) and Zeyu Wu (*Kyushu University*)
- 10:00 AM **M2Or1A-02: Critical transverse loading limits of REBCO CORC®-like cables for fusion**
Arend Nijhuis, A.h. Van Den Boogaard, Celal Soyarslan (*University of Twente*), Chao Zhou (*Institute of Plasma Physics, Chinese Academy of Sciences*), D.c. Van Der Laan (*Advanced Conductor Technologies and University of Colorado, Boulder*), Gulio Anniballi (*University of Twente*), Huan Jin (*Institute of Plasma Physics, Chinese Academy of Sciences*), Jeremy Weiss (*Advanced Conductor Technologies and University of Colorado, Boulder*), Jingtang Qin (*Institute of Plasma Physics, Chinese Academy of Sciences*), Kyle Radcliff (*Advanced Conductor Technologies and University of Colorado, Boulder*), Ruben Lubkemann (*Foundation SuperACT*), Veerle Ellenbroek (*University of Twente*) and W. Yu (*Institute of Plasma Physics, Chinese Academy of Sciences*)
- 10:15 AM **M2Or1A-03: Integrated Platform for 2D Reel-to-Reel Characterization of 2G-HTS Superconductor Combining Raman Spectroscopy, Color Machine Vision, and Curvature Profiling**
Goran Majkic (*Department of Mechanical Engineering, Texas Center for Superconductivity, and Advanced Manufacturing Institute, University of Houston*), Nathaly Andrea Castaneda Quintero (*University of Houston*), Chirag Goel (*Materials Science and Engineering, Department of Mechanical Engineering, Texas Center for Superconductivity, and Advanced Manufacturing Institute, University of Houston*) and David Mayerich (*Department of Electrical and Computer Engineering, University of Houston*)
- 10:30 AM **M2Or1A-04: FEM and Modelica Modelling of Current Sharing in Tape Stack Cables; Influence of ICR, ITR, Defect Number, Defect Patterns, and Thermal Boundary Conditions**
Minzheng Jiang, Edward Collings, Mike Sumption and Milan Majoros (-)
- 10:45 AM **M2Or1A-05: Nuclear transmutation effect by thermal neutron on degradation in superconductivity of ReBCO tapes**
Arata Nishimura and Yoshimitsu Hishinuma (*National Institute for Fusion Science*)

C2Or2A 11:15 - 12:00**Aerospace Cryocoolers II: JT Cryocoolers**

Session Chairs: Bradley Moore, NASA/Jet Propulsion Lab, and TBD

- 11:15 AM **C2Or2A-01: BAE Hybrid Cryocooler Solution for the ESA Athena Mission**
Ryan Taylor, Ben Drillick, Brian Buchholtz, Cameron Mock, David Glaister (*BAE Systems Inc.*), Michael Dipirro (-) and Yongsu Kim (*BAE Systems Inc.*)
- 11:30 AM **C2Or2A-02: Sorption Compressor Developments for Vibration-Free JT Cryocoolers**
Arvi Xhahi (*Nikhef / University of Twente*), Henk Bulten (*Vrije Universiteit (VU)*) and Marcel Ter Brake (*University of Twente, The Netherlands*)
- 11:45 AM **C2Or2A-03: Closed Loop He3 JT Stage Performance Demonstration**
Weibo Chen and Bradley Moore (-)

C2Or2B 11:15 - 12:45**[Special Session] Liquid Hydrogen Testing for Aircraft**

Session Chairs: Jordan Raymond, Stoke Space, and Adam Swanger, NASA Kennedy Space Center

- 11:15 AM **C2Or2B-01: [Invited] Design and Development of a State-of-the-Art Cryogenic Testing Platform for Liquid Hydrogen Applications**
Shanaka Kristombu Baduge, Susiri Costa, Amila Premakumara, Upeka Gunarathne, Hasala Sakvithi, Is Haaq Ahamed Mohamed Nazeem, Sachintha Thejan and Harindu Lochana (*The University of Melbourne*)
- 11:30 AM **C2Or2B-02: [Invited] Airbus Structures Test - Cryogenic Test Capability Development**
Harina Amer Hamzah (*Airbus Operations UK Ltd*)
- 11:45 AM **C2Or2B-03: [Invited] A vertically integrated cryogenic hydrogen testing laboratory**
Jacob Leachman (-)
- 12:00 AM **C2Or2B-04: [Invited] The Development of a Liquid Hydrogen Test Capability for Aviation and Beyond as a US National Asset**
Wesley Johnson (*NASA Glenn Research Center*), Stephanie Vivod (*NASA GRC*), Jeffery Chin, Alan Hewston (*NASA Glenn Research Facility*), Earl Adams, Benjamin Tomlinson (*NASA Armstrong Flight Research Facility*), Alex Mazhari (*NASA Ames Research Center*), Gary Hunter, Vadim Lvovich (*NASA Glenn Research Center*), Mike Meyer (-), Ian Jakupca, Sadeq Malakooti (*NASA Glenn Research Center*) and David Koci (*NASA GRC*)
- 12:15 AM **C2Or2B-05: Panel Discussion**

C2Or2C 11:15 - 12:45**Large Scale Cryogenic Systems V: Analysis and Modeling**

Session Chairs: Roza Doubnik, Fermilab, and Dominika Porwisiak, Fermilab

- 11:15 AM **C2Or2C-01: Analysis of quench safety and cryogenic energy recovery for FRIB High Transmission Beam Line magnets**
Nusair Hasan, Jonathon Howard, Venkatarao Ganni, Yoonhyuck Choi, Danlu Zhang, Xiaoji Du, Ting Xu and Fabio Casagrande (*Michigan State University*)
- 11:30 AM **C2Or2C-02: Advancing 1D thermo-hydraulic tools for large cryogenic facilities**
Roselyn Beckwith, Romain Bruce and Sergey Koshelev (*Fermilab*)
Jaroslaw Polinski and Maciej Chorowski (-)
- 11:45 AM **C2Or2C-03: Modelling two-phase He II flow for heat load limits in EuXFEL cryomodules for CW operation**
Aman Kumar Dhillon, Yury Bozhko, Rajinikumar Ramalingam, Emna Abassi, Kay Jenssch, Serena Barbanotti and Tobias Schnautz (*Deutsches Elektronen-Synchrotron DESY*)
- 12:00 AM **C2Or2C-04: System-scale dynamic simulation of the 400W@1.8 K Test facility at CEA Grenoble: experimental validation on steady state and transient configurations (towards new applications)**
J  r  me Pouvreau and Francois Bonne (*Univ. Grenoble Alpes, CEA, IRIG, DSBT*)
- 12:15 AM **C2Or2C-05: Development of a simulation code for analyzing pressure and temperature fluctuations in the J-PARC cryogenic moderator system**
Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Gen Ariyoshi (*Japan Atomic Energy Agency*) and Teshigawara Makoto (*JAEA*)

M2Or2A 11:15 - 12:45**Low Temperature Properties of Austenitic and Maraging Steels**

Session Chairs: TBD

- 11:15 AM **M2Or2A-01: Numerical and Experimental Investigation of Deformation Induced Martensitic Transformation in Fused Filament Fabricated Austenitic Stainless Steel for Cryogenic Applications**
Daniela Schob, Jakub Tabin, Jakub Kawa  ko, Philipp Maasch, Robert Roszak and Lukas Richter (-)
- 11:30 AM **M2Or2A-02: Electromagnetic properties of austenitic stainless steels in cryogenic, high magnetic field environments**
Polina Ermoshkina, Amit Behera (*Commonwealth Fusion Systems*), Andreas Kulovits (-), Cody Dennett and Trevor Clark (*Commonwealth Fusion Systems*)

- 11:45 AM **M2Or2A-03: Low-Temperature Fatigue and Fracture Properties of Maraging C250 Steel**
Robert Walsh (*Materials Reliability Inc.*), Aniket Ingrole (*National High Magnetic Field Laboratory (NHMFL), Florida State University*), Shreyas Balachandran and Jun Lu (-)
- 12:00 AM **M2Or2A-04: First Approximation for Unified Fatigue Models for 316 Stainless Steel and IN718 Materials at 4K, 77K & 293K from Monotonic Material Properties**
Agnieszka Wusatowska-Sarnek, Andreas Kulovits (*Commonwealth Fusion Systems*), Michael Marotta, Raymond Kersey (*Advanced Fracture Mechanics Associates LLC*) and Taylor Pratt (*Commonwealth Fusion Systems*)
- 12:15 AM **M2Or2A-05: In-Situ Monitoring of Strain Field Evolution and Dissipative Effects at Cryogenic Temperatures (77K): Insights into Advanced Materials for Superconducting and Hydrogen Storage Applications**
Jakub Tabin, Adam Brodecki and Zbigniew Kowalewski (*Institute of Fundamental Technological Research PAS*)
- 12:30 AM **M2Or2A-06: In-Situ and In-Operando Monitoring of Laser and Electron Beam Welding Processes for Austenitic Stainless Steels**
Boyd Panton (*The Ohio State University*), Joris Hochanadel (*Los Alamos National Lab*), Richard Li (*The Ohio State University*) and Tate Patterson (*Idaho National Lab*)

C2Po3A 14:00 - 16:00

Magnet and Cryomodule Heat Load Management

Session Chairs: Lukas Graber, Georgia Tech, and TBD

C2Po3A-01: Heat load measurements for the PIP-II pHB650 cryomodule

Dominika Porwisiak, Benjamin Hansen, Donato Passarelli, Jacopo Bernardini, Jeewan Subedi, Jeremiah Holzbauer, Jerry Makara, Joseph Ozelis, Jun Dong, Michael White, Shreya Ranpariya, Sungwoon Yoon, Vincent Roger and Vrushank Patel (*Fermi National Accelerator Laboratory*)

C2Po3A-02: Cryogenic Performance in Factory Acceptance Testing of the Material Plasma Exposure eXperiment (MPEX) Magnet System

Robert Duckworth (-), Steven Kenney, Aftab Hussain, Earle Burkhardt (*Oak Ridge National Laboratory*) and Simon Keys (*Tesla Engineering*)

C2Po3A-03: Thermal analysis of a HTS magnet with effects of magnet field

Yong-Ju Hong, Sehwan In and Hankil Yeom (*Korea Institute of Machinery & Materials*)

C2Po3A-04: Cryogenic Cooldown Performance of the GE (HTIC) Compact 7 T MRI Magnet

Vijay Soni, Ernst Wolfgang Stautner, Anbo Wu, Justin Ricci, Minfeng Xu, Gene Conte, Christopher Van Epps, Michael Parizh, Mark Vermilyea, Yihe Hua, Seungkyun Lee, Teck Beng Desmond Yeo and Thomas Foo (*GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA*)

C2Po3A-06: Thermal design of conductive superconducting magnet for MRI system with thermal buffer

Jian Li, Li Kai Huang and Zhi Qiang Long (*SIEMENS Shenzhen Magnetic Resonance Ltd.*)

C2Po3B 14:00 - 16:00

Large Scale Cryogenic Systems VI: Operation & Design V

Session Chairs: Herman Ten Kate, - and Oscar Sacristan De Frutos, CERN

C2Po3B-01: CRMF Cryogenic System Overview

Biren Rama (-), Akanksha Apte (*Stanford University*), Eric Fauve (*STANFORD*), Javier Sevilla (*SLAC National Lab*), Marcus Keenan (*SLAC*), Martina Martinello (*SLAC National Lab*), Saeed Vyawahare (*Stanford National Accelerator Laboratory*), Swapnil Shrishrimal (*SLAC National Accelerator Laboratory*), Taekyung Ki (*SLAC National Lab*), Thomas Peterson (*SLAC National Accelerator Laboratory*) and Viswanath Ravindranath (-)

C2Po3B-02: Verification and optimization of cooldown operation mode for the ESS cryogenic moderator system during preliminary commissioning using helium

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Theodoros Vasilopoulos (*European Spallation Source ERIC*), Attila Zsigmond Horváth (*European Spallation Source*) and Iris Haag (*European Spallation Source ERIC*)

C2Po3B-03: Results of fundamental operational function tests for the ESS cryogenic moderator system during preliminary commissioning with helium

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Theodoros Vasilopoulos (*European Spallation Source ERIC*), Attila Zsigmond Horváth (*European Spallation Source*) and Iris Haag (*European Spallation Source ERIC*)

C2Po3B-04: Thermal fluctuation mitigation in the ESS cryogenic moderator system induced by proton beam injection or trip: cooling power control in Preliminary commissioning

Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Attila Zsigmond Horváth (*European Spallation Source*), Iris Haag and Theodoros Vasilopoulos (*European Spallation Source ERIC*)

C2Po3B-05: Numerical estimation of pressure drop of subcooled parahydrogen flow in the ESS Cryogenic Moderator System.

Vivek Sharma (*IIT Kharagpur India*), Hideki Tatsumoto, John Weisend (*European Spallation Source ERIC (ESS)*), Parthasarathi Ghosh (*IIT Kharagpur India*) and Gen Ariyoshi (*J-PARC, Japan Atomic Energy Agency*)

C2Po3C 14:00 - 16:00

New Devices, Novel Concepts, and Miscellaneous I

Session Chairs: TBD

C2Po3C-01: Thermodynamic and mechanical properties of solid-phase media for moving cryogenic energy storage packed beds

Zhaozhao Gao (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Junxian Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yihong Li (*Technical Institute of Physics and Chemistry, CAS*), Zhikang Wang, Liubiao Chen (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co.*) and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C2Po3C-02: Machine Learning Methods for Cryocooler Performance Optimization and Failure Prediction

Hannah Rana (*Center for Astrophysics Harvard & Smithsonian*)

C2Po3C-03: Quantum computer cryogenic cooling system

Marco Roveta (-) and Nicolò Falcone (*Criotec Impianti Srl*)

C2Po3C-04: Small Scale Joule Thomson Hydrogen Liquefaction – A Comparison of Two Liquefaction Cycles

Henrik-Gerd Bischoff (*Technische Universität Dresden*), Christoph Haberstroh (-) and Hans Quack (*TU Dresden*)

C2Po3D 14:00 - 16:00

New Devices, Novel Concepts, and Miscellaneous II

Session Chairs: Wolfgang Stautner, GE HealthCare – Technology & Innovation Center (HTIC), and TBD

C2Po3D-01: Design, manufacturing & commissioning of the high brightness liquid para-hydrogen moderator for the European Spallation Source

Yannick Bessler, Eberhard Rosenthal and Ghaleb Natour (*Forschungszentrum Juelich GmbH*)

C2Po3D-02: Experimental results from the cryogenic cooling of a rotor using an internal pump

Alan Caughley (*Callaghan Innovation*), Grant Lumsden (-), Michael Gschwendtner (*Auckland University of Technology*), Rodney Badcock (-) and Sangkwon Jeong (*Korean Advanced Institute of Science and Technology*)

C2Po3D-03: A deployable barrier preventing liquid oxygen accumulation and safety risks during liquid hydrogen transfers

Kyle Appel, Jacob Leachman and Matthew Shenton (*Washington State University*)

C2Po3D-04: Catalytic materials for ortho-parahydrogen conversion in a thermoacoustic cryocooler regenerator

Nathan Jorgensen, Jacob Leachman, Konstantin Matveev and Matthew Shenton (*Washington State University*)

C2Po3D-05: Federated Learning Framework to support AI-Driven Prescriptive Maintenance in Large-Scale Cryogenic Infrastructures at CERN

Paolo Cacace (*Sapienza Università e INFN, Roma I (IT)*), Diogo Reis Santos (*CERN*), Lorenzo Giusti (-) and Luigi Serio (*CERN*)

C2Po3D-06: The New Valve Era for Cryogenics– Design Considerations and Electric Solutions with focus on liquified Hydrogen and Helium

Ander Gabirondo and Leire Colomo Zulaica (*AMPO POYAM VALVES*)

C2Po3D-07: An integrated tool for helium recovery and evaporative cooling

Dogan Celik, Charles Yarborough and Stuart Feltham (*GE Healthcare*)

C2Po3D-08: Advances in small scale cryogenic magnetic refrigeration

Robin Ihnfeldt (*General Engineering & Research LLC*)

C2Po3D-09: A Liquid Air Energy Storage (LAES) System Utilizing Upgraded LNG Cold Energy for Air Liquefaction

Jiamin Du, Zhikang Wang, Junxian Li, Yihong Li, Xiaoyu Fan, Zhaozhao Gao, Liubiao Chen and Junjie Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

M2Po3A 14:00 - 16:00

Cryogenic Electronics, Detectors, and Topological Materials

Session Chairs: Santosh Chetri, Florida State University, and TBD

M2Po3A-01: Ultrafast Optically Pulse Triggered Microwave/Terahertz Emission from an Array of Inductively Charged Superconducting Rings

Tom Bullard (*Bluehalo*), Anil Patnaik, Kyle Frische, Nathan Lehman (*Air Force Institute of Technology*) and Timothy Haugan (*Air Force Research Laboratory*)

M2Po3A-02: Characterization of 850 nm Power Over Fiber Converter at Cryogenic Temperatures

Cody Kaminsky, Adish Mittal, Madhav Gulati, Andrew Kim and Lukas Graber (*Georgia Institute of Technology*)

M2Po3A-03: Low-Temperature Energy Storage: Flexible Supercapacitors with Cotton Fiber and Silver Nanowires

Si-Zhe Li (*Technical Institute of Physics and Chemistry, CAS*), Gui-Wen Huang and Hong-Mei Xiao (*中国科学院理化技术研究所*)

M2Po3A-04: Higher order topology in hydrogenated graphite

Nadina Gheorghiu (*Previously with AFRL*), Charles R. Ebbing (*University of Dayton Research Institute*), George Y. Panasyuk (*National Research Council Senior Research Associate*) and Timothy J. Haugan (*Aerospace Systems Directorate of the Air Force Research Laboratory (AFRL)*)

M2Po3B 14:00 - 16:00

Cryogenic Testing, Standards, Procedures, and Measurements

Session Chairs: Oscar Sacristan De Frutos, CERN, and Herman ten Kate, University of Twente

M2Po3B-01: Development of a thermal conductivity test bench at cryogenic temperatures

Stefan Hoell, Michael Guinchard and Oscar Sacristan De Frutos (*CERN*)

M2Po3B-02: Design and uncertainty analysis of cryogenic spectral emissivity measurement system

Zichun Huang, Bixi Li (*Technical Institute of Physics and Chemistry*), Hao Zhang (*Technical Institute of Physics and Chemistry, CAS*), Hengcheng Zhang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Liancheng Xie and Fuzhi Shen (-)

M2Po3B-03: Magnetoresistance analysis and calibration of zirconium oxynitride sensor for low-temperature thermometry

Zhen Geng, Yemao Han (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Zhicong Miao, Liancheng Xie, Di Jiang (-), Hongwei Zhang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yuqiang Zhao (-), Rongjin Huang and Laifeng Li (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

M2Po3B-04: Experimental assessment of the parasitic thermal load on cryogenic envelope for superconductive cables

Giovanni Mangiulli (*Politecnico di Torino*), Laura Savoldi (-), Luca Davide Marocco (*Politecnico di Milano*), Luca Sessarego (*Università di Genova*), Pietro Corsaro (*ASG Superconductors*), Stefania Farinon (*INFN e Università Genova (IT)*), Tommaso Botto and Umberto Melaccio (*ASG Superconductors*)

M2Po3B-05: Design and development of near field emissivity measuring device for superconducting materials

Bixi Li, Zichun Huang, Liancheng Xie, Hengcheng Zhang, Fuzhi Shen and Hao Zhang (*Technical Institute of Physics and Chemistry*)

M2Po3B-06: Electrical Conductivity Measurements of Pressurized Gaseous Helium at 77 K

Spencer Martin, William Touza (*Florida State University*), Arup Kumar Das (*Indian Institute of Technology (BHU) Varanasi*) and Peter Cheetham (-)

M2Po3B-07: Force Measurements for Axial Superconducting Magnetic Bearing

Himanshu Bahirat (*IIT Bombay*), Milind Atrey (-) and Mukesh Goyal (*BARC*)

M2Po3C 14:00 - 16:00

Nb-Based Superconductors

Session Chairs: Karl Hartwig, Academic, and Zu Hawn Sung, Fermilab

M2Po3C-01: Investigating the microstructure of cold-worked and annealed SRF Niobium using Shannon Entropy

Trent Boritz (*Florida State University*), Eric Taleff (*University of Texas at Austin*), Peter Lee (*Florida State University*), Philip Eisenlohr (*Michigan State University*), Santosh Chetri (*Florida State University*) and Shreyas Balachandran (*Thomas Jefferson National Accelerator Facility*)

M2Po3C-02: Enhancing Flux Expulsion Through Microstructural Control in Superconducting Radiofrequency Cavities Made from Cold-Worked Niobium

Bashu Khanal (-), Gianluigi Ciovati, Pashupati Dhakal, Shreyas Balachandran (*Thomas Jefferson National Accelerator Facility*), Peter Lee and Santosh Chetri (*Applied Superconductivity Center, NHMFL-FSU, Tallahassee*)

M2Po3C-03: Impact of retained cold work on the microstructure and fabrication of SRF Nb cavities

Santosh Chetri (*Applied Superconductivity Center, NHMFL, FSU*), Bashu Khanal (-), Matthew Carl, Nathan Lannoy (*ATI Specialty Alloys & Components*), Pashupati Dhakal (*Jefferson Lab*), Peter Lee (*Florida State University*), Shreyas Balachandran (*Thomas Jefferson National Accelerator Facility*) and Trent Boritz (*Florida State University*)

M2Po3C-04: Characterization of NbTi wires for the electron-ion collider project

Jun Lu, Aniket Ingrole (*National High Magnetic Field Laboratory, USA*), Holger Witte (*Brookhaven National Laboratory*), Jeremy Levitan, Noah Gavin (*National High Magnetic Field Laboratory, USA*), Peng Xu and Ye Bai (*Brookhaven National Laboratory*)

M2Po3C-05: Progress of APC and high Cp Nb3Sn conductors in Hyper Tech

Xuan Peng (-), Fang Wan (*Fermi National Accelerator Lab*), Matt Rindfleisch (*Hyper Tech Research*), Mike Sumption, Mike Tomsic (-) and Xingchen Xu (*Fermi National Accelerator Lab*)

M2Po3D 14:00 - 16:00

AC Loss Modeling and Measurements

Session Chairs: Justin Scheidler, NASA Glenn Research Center and Michael Sumption, Ohio State University

M2Po3D-02: Modelica Modelling of HTS Dipole Magnet windings, and the influence of cable defects on Thermal and Electrical Sharing in the Cross Section

Minzheng Jiang, Edward Collings and Mike Sumption (-)

M2Po3D-03: Modeling and Analysis of Magnetization in ReBCO Coated Tape Conductor and Helical Wound Tape Conductors

Tushar Garg, Milan Majoros, Michael Sumption and Edward Collings (*The Ohio State University*)

M2Po3D-04: AC loss models of standard and non-standard arrangements of Y-Ba-Cu-O tapes in stacks

George Y. Panasyuk (*NRC Senior Researcher*), Charles R. Ebbing (*University of Dayton Research Institute*), John P. Murphy (*UDRI*), Nadina Gheorghiu (*Previously with UES, Inc.*), Michael D. Sumption (*Ohio State University*) and Timothy J. Haugan (*AFRL*)

M2Po3E 14:00 - 16:00

Characterization of REBCO Conductors I

Session Chairs: Sonja Schlachter, Karlsruhe Institute of Technology, and TBD

M2Po3E-01: Thermal and Mechanical Characterization of REBCO HTS Tapes and Stacks for Magnet Design in the Muon Collider Study

Michael Guinchard, Oscar Sacristan De Frutos and Stefan Hoell (*CERN*)

M2Po3E-02: Contact resistance effect on current sharing in defected superconducting REBCO tape stack cables: FEM modeling

Edward Collings (*The Ohio State University*), Michael Sumption, Milan Majoros and Minzheng Jiang (-)

M2Po3E-03: Mechanical characterization and critical current irreversibility limit of different ReBCO tapes

W.a.j. Wessel, A. Nijhuis (*University of Twente, Faculty of Science & Technology*), A.h. Van Den Boogaard, C. Soyarslan (*University of Twente, Faculty of Engineering Technology*), E. Garibaldi, G. Anniballi (*University of Twente, Faculty of Science & Technology*), J. Leferink (*Foundation SuperACT*), J. Rietberg, N. Dusschoten (*University of Twente, Faculty of Science & Technology*), R. Lubkemann (*Foundation SuperAct*) and V. Ellenbroek (*University of Twente, Faculty of Science & Technology; University of Twente, Faculty of Engineering Technology*)

M2Po3E-04: Friction Coefficient Measurements for High-Temperature Superconducting Magnet Design

Aniket Ingrole (*National High Magnetic Field Laboratory (NHMFL), Florida State University*) and Jun Lu (-)

M2Po3E-05: Measurement of Transverse Resistance for Stacks of Non-insulated REBCO Tapes

Emanuela Barzi (*Ohio State University*), Laura Savoldi (*Politecnico di Torino*), Alex Zlobin (*Fermilab*), Daniele Turrioni (*FNAL*), Elena Tamagnini (*Politecnico di Torino*) and Xiaorong Wang (*LBNL*)

C2Or4A 16:15 - 17:00**Large Scale Refrigeration III: Beam-Line Energy Physics**

Session Chairs: Benjamin Hansen, Fermilab, and Alexander Martinez, Fermilab

- 4:15 PM **C2Or4A-01: Design of satellite cryogenic plants for the Electron-Ion Collider at Brookhaven National Lab**
Blaine Wissler, Shirley Yang, Alessandro Rizzato, Nate Laverdure, Warren Johnson (*Jefferson Lab*), Roberto Than, Pratik Patel (*Brookhaven National Lab*)
- 4:30 PM **C2Or4A-02: New Helium Refrigerator for Institute of High Energy Physics**
Jean-Marc Bernhardt, Jérôme Legrand, Aurelien Zancanaro (*Air Liquide Advanced Technologies*), Chuanjia Zhang, Feng Chen (*Air Liquide Cryogenic China Science*) and Shaopeng Li (*IHEP.CAS.CHINA*)
- 4:45 PM **C2Or4A-03: Performance of the 2K cryogenic refrigerators for SHINE**
Jean-Marc Bernhardt (*Air Liquide Advanced Technologies*), Nicolas Chantant (-), Noelle Besse (*Air Liquide Advanced Technologies*), Pascale Dauguet (*Air Liquide*) and Yannick Fabre (-)

C2Or4B 16:15 - 18:00**Instrumentation, Visualization, and Controls II**

Session Chairs: Austin Capers, Scientific Instruments, and Jason Hartwig, NASA Glenn Research Center

- 4:15 PM **C2Or4B-01: The Use of Temperature Sensors for Liquid Hydrogen Testing at NASA Glenn Research Center**
Wesley Johnson (*NASA Glenn Research Center*), Mark Kubiak, Eric Carlberg, Erin Tesny, Keith Johnson and Dustin Dombrowski (-)
- 4:30 PM **C2Or4B-02: Cernox® versus germanium cryogenic temperature sensor stability comparison over the 1 K to 27 K temperature range**
Scott Courts (*Lake Shore Cryotronics, Inc.*) and Brian Courts (-)
- 4:45 PM **C2Or4B-03: Particle Levitation Velocimetry for boundary layer measurements in high Reynolds number liquid helium turbulence**
Yinghe Qi and Wei Guo (*National High Magnetic Field Laboratory, FSU*)
- 5:00 PM **C2Or4B-04: Accelerator cavity quench spot detection using particle tracking velocimetry**
Yousef Alihosseini, Yiming Xing and Wei Guo (*Mechanical Engineering Department, FAMU-FSU College of Engineering, Florida State University; National High Magnetic Field Laboratory*)
- 5:15 PM **C2Or4B-05: Replacement and expansion of the cryogenic control system for the Electron Ion Collider at Brookhaven National Laboratory**
Patrick Talty, Adam Zarcone, Brian Van Kuik (*Brookhaven National Laboratory*), Jonathan Creel (*Thomas Jefferson National Accelerator Facility*), Len Masi, Rob Michnoff (*Brookhaven National Laboratory*), Robert Norton (*Thomas Jefferson National Accelerator Facility*), Roberto Than and Russell Feder (*Brookhaven National Laboratory*)
- 5:30 PM **C2Or4B-06: Fermilab PIP-II CDS & CM Cryogenic Controls System**
Pratik Patel (*Fermilab*), Ahmed Faraj, Alexander Martinez (-), Ram Dhuley (*Fermi National Accelerator Laboratory*), Sungwoon Yoon, Vrushank Patel and William Soyars (-)
- 5:45 PM **C2Or4B-07: The design of a flow boiling visualization experiment for liquid hydrogen**
Ian Wells (-), Jacob Leachman, Sophia Abi-Saad and Yulia Gitter (*Washington State University HYPER Lab*)

C2Or4C 16:15 - 18:00**Cryogenic Components III**

Session Chairs: Maria Barba, CEA (Commissariat à l'Énergie Atomique), and Ram Dhuley, Fermilab

- 4:15 PM **C2Or4C-01: Development of a two-phase, variable nozzle jet-pump for pressure control in liquid hydrogen systems**
Yulia Gitter (*Washington State University HYPER Lab*), Jacob Leachman (-) and Konstantin Matveev (*Washington State University*)
- 4:30 PM **C2Or4C-02: Design and testing of a submersible laboratory-sized cryogenic liquid hydrogen pump**
Henrik-Gerd Bischoff (*Technische Universität Dresden*), Christoph Haberstroh (-) and Johannes Doll (*TU Dresden*)
- 4:45 PM **C2Or4C-03: Lightweight, high-flow valve for cryogenic propellant management on aircraft and spacecraft**
Lucas O'Neill and Elliot Goodman (*Creare LLC*)

- 5:00 PM **C2Or4C-04: Enhanced Power Control and Maintenance-Free Turbine Retrofit in a Cryogenic Hydrogen Process for Tritium Removal**
Johannes Schreiber, Stefan Bischoff and Peter Baumann (*Linde Kryotechnik AG*)
- 5:15 PM **C2Or4C-05: Development and validation of a 1D oil-injected screw compressor model for helium cryogenic system applications**
Scott Anthony, Nusair Hasan, Venkatarao Ganni and Abraham Engeda (*Michigan State University*)
- 5:30 PM **C2Or4C-06: Modeling and Analysis of Graded Heat Exchangers for Cryogenic Power System of Electric Aircraft Using the AeroCryoX**
Chul Han Kim (*FAMU-FSU College of Engineering*), M. Tahir Khan Niazi (*FAMU-FSU College of Engineering*), Peter Cheetham and Sastry Pamidi (*FAMU-FSU College of Engineering*)
- 5:45 PM **C2Or4C-07: Gas bearing turbo compressor and expander technology for cryogenic applications**
Christof Zwyssig, Patrik Fröhlich, Raphael Moser and Martin Bartholet (*Celeroton AG*)

C2Or4D 16:15 - 17:45

Aerospace Applications I

Session Chairs: Mark Zagarola, Creare LLC, and TBD

- 4:15 PM **C2Or4D-01: Investigation of chill-down process of cryogenic tank**
Seungwhan Baek (-) and Seojeong Kim (*IBS*)
- 4:30 PM **C2Or4D-02: Efficiency of CryoFILL Liquefaction Tests**
Ali Kashani (*ASRC Federal*), Daniel Hauser, Kiyotaka Yamashita (*NASA Glenn Research Center*), Ramaswamy Balasubramaniam (*Case Western Reserve University*), Ryan Grotenrath and Wesley Johnson (*NASA Glenn Research Center*)
- 4:45 PM **C2Or4D-03: Development of a method for estimating tank internal conditions during cryogenic fluid filling**
Shin Sakai (*The University of Tokyo*), Hirokazu Otsubo, Motoyuki Kimata (*Toyota Motor Corporation*), Takehiro Himeno (*The University of Tokyo*) and Tomohito Enoki (*Toyota Motor Corporation*)
- 5:00 PM **C2Or4D-04: Cryogenic droplet-spray impact and rewetting dynamics in tank chilldown applications**
Bhushan Patil and Chih-Jen Sung (*School of Mechanical, Aerospace and Manufacturing engineering, University of Connecticut*)
- 5:15 PM **C2Or4D-05: Cryogenic Two-Phase Flow Boiling Correlations for Terrestrial and Reduced Gravity**
Jason Hartwig (-), Sunjae Kim (*Purdue*), Vishwanath Ganesan (-) and Issam Mudawar (*Purdue*)
- 5:30 PM **C2Or4D-06: Electrospun Polyvinylidene fluoride co-hexafluoropropylene (PVDF-HFP) for Passive Thermal Management in Space**
Chieloka Ibekwe, Xuanjie Wang, Adrien Neveu (*Rensselaer Polytechnic Institute*), Jason Hartwig (*NASA Glenn Research Center*), Adam Swanger (*NASA Kennedy Space Center*) and Shankar Narayan (*Rensselaer Polytechnic Institute*)

M2Or4A 16:15 - 18:15

[Special Session] Transportation II: System Level

Session Chairs: Michael Sumption, Ohio State University, and Peter Ferrara, Naval Surface Warfare Center, Philadelphia Division

- 4:15 PM **M2Or4A-01: [Invited] Pratt and Whitney's HySIITE concept: a novel aircraft engine enabled by liquid hydrogen**
Jacob Snyder (*Pratt and Whitney*)
- 4:35 PM **M2Or4A-02: [Invited] Current Status of Development of Fully Superconducting Propulsion Systems for Aircrafts in Japan**
Masataka Iwakuma (-), Hiroshi Miyazaki (*Kyushu University*), Kazuhisa Adachi (*SWCC*), Miyuki Nakamura (*Faraday Factory Japan*), Hidetoshi Kasahara (*Eagle Industry Co., Ltd.*) and Teruo Izumi (-)
- 5:05 PM **M2Or4A-03: [Invited] The "IZEA-light" zero-emission aviation conceptual design**
Lance Cooley (*NHMFL/FSU*), L. Cattafesta (*Illinois Institute of Technology, Chicago, Illinois USA*), Peter Cheetham (*FAMU-FSU College of Engineering*), J. Gladin (*Georgia Institute of Technology*), Wei Guo (*Florida State University, National High Magnetic Field Laborato*), Jiangbiao He (*University of Tennessee*), Dan Ionel (*University of Kentucky*), Chul Kim (-), H. Li, Juan Ordóñez (*FAMU-FSU College of Engineering*), Sastry Pamidi (*The Florida State University*) and Jim Zheng (*University at Buffalo*)

- 5:35 PM **M2Or4A-04: [Invited] Overview and Progress Update on a Superconducting Powertrain for CHEETA**
Thanatheepan Balachandran (*HInetics Inc*), Chris Kovacs (*Scintillating Solutions LLC*), Phillip Ansell (*Univeristy of Illinois at Urbana-Champaign*), Wolfgang Stautner (*GE HealthCare – Technology & Innovation Center (HTIC)*), Uijong Bong (*Hinetics, Inc.*), Jianqiao Xiao, Samith Sirimanna (*HInetics Inc*), Noah Salk (-), Phoenix Bauer, Raatan Venkataraman (*HInetics Inc*), Timothy Haugan, Michael Sumption (-) and Kiruba Haran (*University of Illinois*)
- 5:55 PM **M2Or4A-05: [Invited] Motor configuration selection for a new technical challenge to develop a 5 MW cryogenic motor and drive**
Justin Scheidler, Aaron Anderson, Joel Krakower, Peter Kascak and Thomas Tallerico (*NASA Glenn Research Center*)

M2Or4B 16:15 - 18:15

Growth & Characterization of REBCO and Iron-based Superconductors

Session Chairs: Eric Hellstrom, Florida State University, and Takanobu Kiss, Kyushu University

- 4:15 PM **M2Or4B-01: [Invited] High quality FF-MOD REBCO films prepared from ready-made REBCO**
Jun-Ichi Shimoyama, Kazutoyo Sagara, Keigo Horiguchi and Takanori Motoki (*Aoyama Gakuin University*)
- 4:45 PM **M2Or4B-02: Role of Ca diffusion in BaZrO₃ nanorods/YBa₂Cu₃O_{7-x} multilayer nanocomposite films**
Judy Wu (*University of Kansas*), Mary Ann Sebastian (*US Air Force Research lab*), Victor Ogunjimi, Aafiya Aafiya (*University of Kansas*), Jianan Shen (*Purdue University*), Timothy Haugan (-) and Haiyan Wang (*Purdue University*)
- 5:00 PM **M2Or4B-03: Charge carrier density and critical current density variations of superconducting layers of GdBCO and EuBCO coated conductors as a result of high pressure oxygenation**
Tetiana Prikhna ((1) *V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine*, (2) *Institut de Ciencia de Materials de Barcelona, CSIC*, (3) *Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden e. V.*), Aiswarya Kethamkuzhi (*Institut de Ciencia de Materials de Barcelona, CSIC*), Roxana Vlad (*ICMAB-CSIC*), Myroslav Karpets (*National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute*), Robert Kluge (*Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden e. V.*), Semyon Ponomaryov (*V.E. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine*), Viktor Moshchil (*V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine*), Xavier Obradors (*Institut de Ciencia de Materials de Barcelona, CSIC*), Bernd Büchner (*Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden e. V.*), Joffre Gutierrez Royo (*ICMAB - CSIC*), Sabine Wurmehl (*Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden e. V.*) and Teresa Puig Molina (*Institut de Ciencia de Materials de Barcelona, CSIC*)
- 5:15 PM **M2Or4B-04: Increased nonreciprocal current in iron-based superconductor antiferromagnet interface**
Christopher Luth, Luke Sloan, Matthew Disiena, Rajveer Jha and Sanjay Banerjee (*The University of Texas at Austin*)
- 5:30 PM **M2Or4B-05: [Invited] Advances in iron-based superconductors for high-field applications**
Chiheng Dong (*Institute of Electrical Engineering, Chinese Academy of Sciences*), Chao Yao (*Institute of Electrical Engineering, Chinese Academy of Sciences*), Meng Han, Dongliang Wang, Xianping Zhang and Yanwei Ma (*Institute of Electrical Engineering, Chinese Academy of Sciences*)
- 6:00 PM **M2Or4B-06: Systematic Studies to Enhance Flux Pinning of (BaZrO₃/YBa₂Cu₃O_{7-x})_N Multilayer Thin Films for the Full Landscape of T = 5K to 77K**
Mary Ann Sebastian (*University of Dayton Research Institute & Air Force Research Laboratory RQQM WPAFB*) and Timothy Haugan (-)

08:00 - 09:00

Plenary: Parag Kshirsagar [High Power Electrification in Aerospace and Defense Applications Enabled by Cryocooled Systems] & Cryogenic Society of America, Inc. Awards and Cryogenics Best Paper Award

Session Chairs: Michael Sumption, Ohio State University and Sonja Schlachter, Karlsruhe Institute of Technology

C3Po1A 09:15 - 11:00**Cryogenic Test Facilities**

Session Chairs: Zachary Beadle, Washington State University, and Greg Tatkowski, Fermilab

C3Po1A-01: Cryogenic Testing of HL-LHC Q1/Q3 Cryo-Assemblies at Fermilab

Roger Jon Rabehl (*Fermi National Accelerator Lab. (US)*), Guram Chlachidze (-), Maria Barba (*Fermilab*) and Sandor Feher (-)

C3Po1A-02: Operational experience of the NML cryogenic plant at the FAST facility

Joaquim Creus Prats (-), Tim Wallace, Aleksandr Romanov, Alexander Martinez, Benjamin Hansen, James K Santucci, Jay Theilacker, Jerry Makara, Joseph Hurd, Liujin Pei, Michael White and Rick Bossert (*Fermilab*)

C3Po1A-03: Structural Design of Distribution Valve Box of S3FEL Test Facility Cryogenic System

Lei Yang, Yaqiong Wang, Xiaohe Lu, Guanglong Cui, Huikun Su (*IASF*), Xu Shi, Zheng Sun (*DICP*) and Xilong Wang (*IASF*)

C3Po1A-04: Fabrication of the HFVMTF Double-Bath Cryostat

Romain Bruce (*Fermilab*), Sr. Ph.d Oshinowo, Gueorgui Velez (-), Michael Maurisak (*Ability Engineering Technology*), Terry Tope (*Fermilab*), Tuan Vo (*Ability Engineering Technology*) and Vladica Nikolic (*Fermilab*)

C3Po1A-05: Cryogenic binary fluid test bench for studying transport phenomena

Wouter Eppink, Abhishek Purandare and Srini Vanapalli (*University of Twente*)

C3Po1B 09:15 - 11:00**Instrumentation, Visualization, and Controls III**

Session Chairs: Austin Capers, Scientific Instruments, and Pratik Patel, Fermilab

C3Po1B-01: Visualization of film condensation onset and microscale cryogenic condensate film

Bhushan Patil, Chih-Jen Sung and Kyle Twarog (*School of Mechanical, Aerospace and Manufacturing engineering, University of Connecticut*)

C3Po1B-02: Design of a test facility for evaluating liquid hydrogen fuel level probes

Sophia Abi-Saad (*Self*) and Jacob Leachman (-)

C3Po1B-03: How digital twins can help with operator training, an example with ATLAS and CMS detector's cryogenics at CERN

Lorenzo Luc Jimenez (-), Antoine Majorel (*Ecole Nationale Supérieure des Mines de Paris (FR)*), Benjamin Bradu and Vanessa Gahier (*CERN*)

C3Po1B-04: The cooling mechanism of liquid nitrogen cooling system

Hsing-Chieh Li, Jui-Che Huang, Huang-Hsiu Tsai, Wun-Rong Liao, Ping-Shun Chuang and Feng-Zone Hsiao (*National Synchrotron Radiation Research Center*)

C3Po1B-05: Performance test and optimization of the control system for the ESS cryogenic moderator system

Attila Zsigmond Horváth (*European Spallation Source*), Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Theodoros Vasilopoulos and Iris Haag (*European Spallation Source ERIC*)

C3Po1B-06: Development of the 17 kW orifice-type heater control system for thermal compensation induced by nuclear heating at the ESS hydrogen moderators

Attila Zsigmond Horváth (*European Spallation Source*), Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*) and Theodoros Vasilopoulos (*European Spallation Source ERIC*)

C3Po1C 09:15 - 11:00**Thermophysical Properties and Transport Processes III**

Session Chairs: Kyle Appel, Washington State University, and TBD

C3Po1C-02: Numerical Simulation Study on the Precooling Process of a Propane Storage Tank in a Liquid Air Energy Storage System

Jiamin Du, Junxian Li, Zhikang Wang, Yihong Li, Xiaoyu Fan, Zhaozhao Gao (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Wei Ji (*Zhonglv Zhongke Energy Storage Technology Co., Ltd.*), Liubiao Chen and Junjie Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C3Po1C-03: Modeling of the Cryogenic Liquid Regasification Process with Consideration of Evaporation and Superheating

Ziemowit Malecha (-), Arkadiusz Brenk (*Wrocław University of Science and Technology*) and Maciej Chorowski (-)

C3Po1C-04: Completion of vapor-liquid equilibrium measurements of the helium-neon system at temperatures below 36 K

Julian Schunk, Marius Malthaner and Steffen Grohmann (*Karlsruhe Institute of Technology (KIT)*)

C3Po1C-05: Experimental study on inclined two-phase flow cooling of multi-stranded aluminum cable

Yang Guo (*The Ohio State University*), Chris Kovacs (*Scintillating Solutions LLC*), Edward Collings (*The Ohio State University*), Jin Kwon, Michael Sumption and Timothy Haugan (-)

C3Po1C-06: Three-dimensional simulations for evolving thermodynamic scaling laws in cryogenic cavitating fluid transients

Arjun Garva, Arpit Mishra (*Indian Institute of Technology Kharagpur, India*) and Parthasarathi Ghosh (*IIT Kharagpur India*)

C3Po1C-07: Study on the flow nucleate boiling heat transfer of slush nitrogen

Qidong Wang, Xinyu Lu and Tao Jin (*Zhejiang University*)

C3Po1C-08: Modeling of thermal performance in self-pressurized liquid helium tanks

Liang Guo, Ye Chen (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, China*), Wei Wu (*Technical Institute of Physics and Chemistry, CAS*), Qiming Jia (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Shaoqi Yang (-) and Xiujuan Xie (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C3Po1D 09:15 - 11:00

Liquid Hydrogen Transfer Components

Session Chairs: Johannes Doll, TU Dresden, and Konstantin Matveev, Washington State University

C3Po1D-01: Simulation and experiment of a hydrogen pump with an integrated closed impeller

Ziwei Li, Jihao Wu and Cui Lv (-)

C3Po1D-02: Performance improvement of a hydrogen condensation heat exchanger applying intermittent reciprocating flow

Tsuyoshi Shirai (*University of Tsukuba*), Akira Uchida, Koji Kamiya, Kyohei Natsume (*National Institute for Materials Science*), Masayoshi Ishida (*University of Tsukuba*) and Takenori Numazawa (*National Institute for Materials Science*)

C3Po1D-03: Top Load Cryogenic Large Size Ball Valves With Focus on Liquified Hydrogen and Helium

Ander Gabirondo and Leire Colomo Zulaica (*AMPO POYAM VALVES*)

C3Po1D-05: Fundamental insights into liquid hydrogen flow boiling: bubble dynamics and flow characteristic parameters

Shaolong Zhu, Haoran Gan, Kai Wang, Limin Qiu (*Zhejiang University*) and Xinyu Lu (*Zhejiang University, CN*)

C3Po1D-06: Dynamic Characteristics of Transfer Processes in Port-Based Liquid Hydrogen Receiving Terminals

Xinyu Lu, Kai Wang, Shaolong Zhu, Haoran Gan and Limin Qiu (*Zhejiang University, CN*)

C3Po1D-07: Optimization of liquid hydrogen tank-to-tank transfer: A comparative study of six transfer systems

Haoran Gan, Song Fang, Shaolong Zhu, Shiran Bao, Limin Qiu and Kai Wang (*Zhejiang University*)

C3Po1D-08: Stress Distribution and Sealing Performance Analysis of Metal Sealing Joints in Liquid Hydrogen Pipelines

Yihan Tian, Chen Cui, Zhijian Zhang, Zhaozhao Gao, Biao Yang, Liubiao Chen and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C3Po1D-09: Simulation Study on the Thermal Insulation Performance of Liquid Hydrogen Transport Pipelines

Yihan Tian, Zhijian Zhang, Zhaozhao Gao, Biao Yang, Chen Cui, Liubiao Chen, Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and Jia Guo (-)

C3Po1E 09:15 - 11:00

Magnetic Coolers

Session Chairs: Peter Kittel, University of California, Berkeley, and Franklin Miller, University of Wisconsin-Madison

C3Po1E-02: Design of a Three-Stage Continuous Adiabatic Demagnetization Refrigerator for Ultra-Low Temperature Applications

Changhyung Lee (*Changwon National University*), Hankil Yeom (*Korea Institute of Machinery & Materials*), Jangdon Kim (*Changwon National University*), Jongho Choi, Kideok Sim (*SuperGenics Co. Ltd., Changwon, South Korea*) and Seokho Kim (*Changwon National University*)

C3Po1E-03: Design and fabrication of CPA salt pill for adiabatic demagnetization refrigerator

Jangdon Kim, Changhyung Lee, Seokho Kim (*Changwon National University*), Jongho Choi and Kideok Sim (*SuperGenics Co. Ltd.*)

C3Po1E-04: Design and testing of a tin superconducting heat switch for adiabatic demagnetization refrigerators

Shubao Zhao, Lingjiao Wei, Guopeng Wang, Xiang Fan (*Technical Institute of Physics and Chemistry, CAS*), Jia Quan (-), Zijie Pan, Houlei Chen, Miguang Zhao and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C3Po1F 09:15 - 11:00

Aerospace Applications II

Session Chairs: TBD

C3Po1F-01: Conceptual design of a lab-scale low-noise He-II liquefier using a pulse-tube cryocooler with a Joule-Thomson cycle

Timo Weckerle, Lennard Niclas Busch, Steffen Grohmann and Xhesika Koroveshi (*Karlsruhe Institute of Technology (KIT)*)

C3Po1F-02: A 100 mW@4.0 K hybrid 4He Joule-Thomson cryocooler for space applications

Ziyao Liu (*Technical Institute of Physics and Chemistry, CAS*), Bin Yang (*Technical Institute of Physics and Chemistry, Chinese Academy of Science*), Zijie Pan, Yuexue Ma (*Technical Institute of Physics and Chemistry, CAS*), Jia Quan, Jianguo Li, Yanjie Liu (*Technical Institute of Physics and Chemistry*), Guotong Hong and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C3Po1F-03: Performance optimization of a 4K hybrid JT cooler for space application

Yuexue Ma (*Technical Institute of Physics and Chemistry, CAS*), Ziyao Liu, Jia Quan, Jianguo Li, Yanjie Liu, Juan Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*) and Jingtao Liang (*Technical Institute of Physics and Chemistry, CAS*)

C3Po1F-04: Study on Cryogenic Fluid Circulation Loops for Efficient Heat Transfer of Small Cooling Capacities in the 4-20 K Temperature Range

Liubiao Chen, Zhijian Zhang, Biao Yang, Yihan Tian, Zhaozhao Gao and Junjie Wang (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C3Po1F-05: Development and preliminary testing of cryogenic pump for TVS test

Isang Yu (*korea aerospace research institute*) and Seungwhan Baek (-)

C3Po1F-06: Development and projected capabilities of Chamber D

Hunter Kuehnel (*Amentum*) and Stephen Baker (*NASA Johnson Space Center*)

C3Po1F-07: Thermal Control Units for Space Vacuum Chambers

Nicolò Falcone (*Criotec Impianti*), Adriano Mussinatto and Marco Roveta (-)

C3Po1F-08: Power requirements and energy recovery in Stirling and pulse tube cryocoolers for space missions

Ojas Khadakban and Hannah Rana (*Center for Astrophysics Harvard & Smithsonian*)

M3Or1A 09:30 - 10:30

Magnetic Design and Applications II

Session Chairs: Jun Lu, NHMFL and Arend Nijhuis, University of Twente

9:30 AM M3Or1A-01: Design and test of the HTS magnet of the robust and low maintenance magnetic billet heater "RoWaMag"

Sonja Schlachter, Andrej Kudymow (*Karlsruhe Institute of Technology*), Anis Smara (*THEVA Dünnschichttechnik GmbH*), Mathias Noe (*Karlsruhe Institute of Technology*), Ralph Lietzow (*Karlsruhe Institute of Technology KIT*), Stefan Kreuzer and Wolfgang Goor (*Bültmann GmbH*)

9:45 AM M3Or1A-02: Design, fabrication, and testing of the quadrupole triplet magnet for the HRS project

Danlu Zhang, David Greene, Hai Nguyen (*Michigan State University*), Hengkang Zheng (*Facility for Rare Isotope Beams, Michigan State University, East Lansing, MI 48824, USA*), John Wenstrom, Junseong Kim, Ryan Koschay, Ting Xu, Xiaoji Du, Yamen Al-Mahmoud (*Michigan State University*) and Yoonhyuck Choi (*Facility for Rare Isotope Beams at Michigan State University*)

10:00 AM M3Or1A-03: Simulations of a modified CLIQ System using Split MgB₂ Coils and Simultaneous Joule Heating Using a Lumped Parameter Model

Xianhao Zhang, Michael Sumption and Milan Majoros (-)

10:15 AM M3Or1A-04: Development of the CCT superconducting magnets for the STCF interaction region

Shaoqing Wei, Fang Liu, Lu Gao (*Institute of Plasma Physics (IPP), Chinese Academy of Sciences (CAS)*) and Zhan Zhang (*Institute of Energy, Hefei Comprehensive National Science Center*)

C3Or2A 11:15 - 12:30

Remote Cooling and Regenerative Coolers

Session Chairs: Peter Bradley, NIST, and Srinivas Vanapalli, University of Twente

11:15 AM C3Or2A-01: Integrated remote cooling system using a GM cryocooler

Joseph Koch, Santhosh Kumar Gandla (*Sumitomo (SHI) Cryogenics of America Inc*) and Stephen Dunn (-)

- 11:30 AM **C3Or2A-02: Cryogenic helium circulation cooling system with high capacity GM Cryocooler**
Eric Seitz (*Sumitomo (SHI) Cryogenics of America, Inc.*) and Santhosh Kumar Gandla (*Sumitomo (SHI) Cryogenics of America Inc*)
- 11:45 AM **C3Or2A-03: Performance Test and Analysis of a High-Capacity Stirling Type Pulse Tube Cryocooler with Orthogonal Room Temperature Displacers**
Shuai Chen (*Lihan Cryogenics Co., Ltd.*), Shengli Huang, Haibing Li (*Lihan Cryogenics Co., Ltd., Shenzhen*), Xiaotao Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry*) and Wei Dai (*Technical Institute Of Physics and Chemistry, Chinese Academy of Sciences*)
- 12:00 AM **C3Or2A-04: Numerical Investigation of Alternative Regenerators in Regenerative Cryocoolers Operating Below 20K**
Zhengkun Li (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Haibing Li (*Lihan Cryogenics Co., Ltd., Shenzhen*), Wei Dai (*Technical Institute Of Physics and Chemistry, Chinese Academy of Sciences*), Xiaotao Wang (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry*) and Xupeng Ding (*Key Laboratory of Cryogenic Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)
- 12:15 AM **C3Or2A-05: Comparison study on a large-scale free-piston Stirling cryocooler**
Guoyao Yu (-), Hangyu Ma (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Ercang Luo, Haojie Sun and Wei Dai (-)

C3Or2B 11:15 - 12:45

Large Scale Refrigeration IV: Performance and Optimization

Session Chairs: Philipp Arnold, European Spallation Source ERIC, and Al Zeller, Michigan State University

- 11:15 AM **C3Or2B-01: Development and verification of a steady-state operating methodology for wide-range operation of 2K cold compressor system**
Jonathon Howard, Venkatarao Ganni, Nusair Hasan and Fabio Casagrande (*Michigan State University*)
- 11:30 AM **C3Or2B-02: Development and verification of a transient operating methodology for pump-down operation of 2K cold compressor system**
Jonathon Howard, Venkatarao Ganni, Nusair Hasan and Fabio Casagrande (*Michigan State University*)
- 11:45 AM **C3Or2B-03: Optimising cryogenic solutions for STEP: addressing cooling challenges and enhancing energy efficiency**
David Aliaga (*UKAEA*), Jack Acres (*UKIFS*) and Paul Richardson (*UKAEA*)
- 12:00 AM **C3Or2B-04: Performance Testing of the 4kW ESR 2 Refrigerator at JLab**
Christopher Perry, Brendan White, Jonathan Creel (*Thomas Jefferson National Accelerator Facility*), Ritendra Bhattacharya (-), Robert Norton and Thilan Wijeratne (*Thomas Jefferson National Accelerator Facility*)
- 12:15 AM **C3Or2B-05: Impact of Power Outage for Large scale cryogenic system operation**
Swapnil Shrishrimal (*SLAC National Accelerator Laboratory*), Eric Fauve (*STANFORD*), Viswanath Ravindranath (-), John Pucci (*SLAC*), Akanksha Apte (*Stanford University*), Marcus Keenan, Francisco Moguel (*SLAC*), Saeed Vyawahare (*Stanford National Accelerator Laboratory*), Biren Rama (-) and Boris Ilinets (*SLAC National Accelerator Laboratory*)
- 12:30 AM **C3Or2B-06: Conceptual cryodistribution system layout and modeling for Infinity One**
Ben Hamilton, Dhananjay Ravikumar, Mark Vanderlaan and Yusra Nadir (*Type One Energy*)

M3Or2A 11:15 - 12:45

High Purity Aluminum for Low Temperature Conductor Applications

Session Chairs: Chris Kovacs, Scintillating Solutions LLC, and Herman ten Kate, University of Twente

- 11:15 AM **M3Or2A-01: [Invited] The effects of monotonic and cyclic plastic strain at 4.2K on the electrical resistivity of bulk Al High Purity Aluminum"**
Karl Hartwig (-)
- 11:45 AM **M3Or2A-02: Developing practical Cryogenic high purity aluminum (HPAL) conductor to enable high speed power density motors and generators.**
Chris Kovacs (*Hyper Tech Research Inc.*), Jin Kwon (-), Matt Rindfleisch (*Hyper Tech Research*), Mike Sumption, Mike Tomsic, Xuan Peng (-) and Yang Guo (*The Ohio State University*)

- 12:00 PM **M3Or2A-03: The Ultrafine Copper-Clad Super-High-Purity Aluminum Wires**
Akihiro Kikuchi (*National Institute for Materials Science*), Akinori Akaike (*Meiko Futaba Co., Ltd.*), Hiroki Yamada (*Hydro Aluminium Japan KK*), Hiroyo Segawa (*National Institute for Materials Science*), Junya Imani (*Meiko Futaba Co. Ltd*), Makoto Akiyama (*Meiko Futaba Co., Ltd.*), Takafumi Kayano (*Meiko Futaba Co., Ltd*), Toshiyuki Kato (*Hydro Aluminium Japan KK*) and Yasuo Iijima (*National Institute for Materials Science*)
- 12:15 PM **M3Or2A-04: Investigating the impact of tensile stress-induced/annealing-affected dislocation and grain boundary on the performance of High Purity Aluminum Wire by EBSD.**
Yang Guo (*The Ohio State University*), Chris Kovacs (*Scintillating Solutions LLC*), Edward Collings (*The Ohio State University*), Jin Kwon, Michael Sumption (-), Tushar Garg (*The Ohio State University*), Xianhao Zhang and Xuan Peng (-)
- 12:30 PM **M3Or2A-05: Impact of anomalous magnetoresistance and cyclic deformation on RR values of HPAL composites at low temperatures**
Jin Kwon (-), Chris Kovacs (*Air Force Research Laboratory*), Michael Sumption (*The Ohio State University*), Xuan Peng (-) and Yang Guo (*The Ohio State University*)

C3Or3A 14:00 - 15:15

Cryogenic Test Facility Commissioning

Session Chairs: Eric Fauve, Stanford University, and Biren Rama, SLAC National Accelerator Laboratory

- 2:00 PM **C3Or3A-01: Commissioning of the DALS Test Facility Cryogenic System**
Huikun Su (*Institute of Advanced Science Facilities ,Shenzhen*), Haining Li (*Institute of Advanced Science Facilities(IASF)*), Xinbo Dong (*Institute of Advanced Science Facilities, Shenzhen (IASF)*), Yaqiong Wang (*Insitute of Advanced Science Facilities, Shenzhen*), Zheng Sun (*Dalian Institute of Chemical Physics*), Lei Xu and Xilong Wang (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*)
- 2:15 PM **C3Or3A-02: Testbed for high current and high voltage characterization of gaseous helium cooled HTS power cables for electric transport systems**
Paul Mensah (-), Spencer Martin, Chul Kim (*Florida State University*), Peter Cheetham (*FAMU-FSU College of Engineering*) and Sastry Pamidi (-)
- 2:30 PM **C3Or3A-03: First cool down of the vertical test cryostat for DALS SRF cavities**
Xu Shi, Zheng Sun, Lei Xu (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*), Xinbo Dong, Sheng He, Xingzhong Sun, Yaqiong Wang (*Institute of Advanced Science Facilities(IASF)*) and Xilong Wang (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences*)
- 2:45 PM **C3Or3A-04: INFN DarkSide-20k AAr cryogenic purification system**
Marco Roveta (-) and Nicolò Falcone (*Criotec Impianti Srl*)
- 3:00 PM **C3Or3A-05: Experimental investigation of moisture freeze-out in a cryogenic heat exchanger for helium purification**
Duncan Kroll, Nusair Hasan, Venkatarao Ganni and Brandon Laumer (*Michigan State University*)

C3Or3B 14:00 - 16:00

New Devices, Novel Concepts, and Miscellaneous III

Session Chairs: Franklin Miller, University of Wisconsin-Madison, and John Weisend, European Spallation Source ERIC (ESS)

- 2:00 PM **C3Or3B-01: High pressure burst tests at cryogenic temperatures**
Eberhard Rosenthal, Yannick Beßler (-), Stephan Schoenen, Holger Willms and Ghaleb Natour (*Forschungszentrum Juelich GmbH*)
- 2:15 PM **C3Or3B-02: Cryogenics in the drilling of deep, multi kilometer geothermal wells**
Maciej Chorowski, Tomasz Banaszekiewicz, Wojciech Gizicki, Jakub Kielar (*Wrocław University of Science and Technology*), Agnieszka Piotrowska (*Wrocław University of Science and Technology*), Zbigniew Rogala, Michal Stanclik, Katarzyna Strzelecka (*Wrocław University of Science and Technology*), Elisa Cannone (*Istituto di Geoscienze e Georisorse, CNR*), Antonio Galgaro (*Department of Geosciences, UNIPD*), Kevin Mallin (*TERRA GEOSERV LIMITED*), Adele Manzella (*Istituto di Geoscienze e Georisorse, CNR*), Nicola Mutinelli (*R.E.D. SRL*), Riccardo Pasquali (*TERRA GEOSERV LIMITED*), Luc Pockele (*R.E.D. SRL*), Arno Romanowski (*PREVENT GMBH*), Pawel Slupski (*Department of Geosciences, UNIPD*) and Olaf Steinmeier (*Fraunhofer IAPT*)

- 2:30 PM **C3Or3B-03: A methodology for evaluating MEMS switch reliability at cryogenic temperatures**
Elizabeth Sorenson (*National Institute of Standards and Technology; University of Colorado at Boulder*), Peter Bradley, Damian Lauria and Li-Anne Liew (*National Institute of Standards and Technology*)
- 2:45 PM **C3Or3B-04: Development of hydrogen-filled traveling-wave thermoacoustic engine for powering pulse-tube and traveling-wave refrigerators**
Matthew Shenton, Jacob Leachman and Konstantin Matveev (*Washington State University*)
- 3:00 PM **C3Or3B-05: Large diameter helium pulsating heat pipe as promising thermal link for cryocooler-cooled superconducting magnet systems**
Bertrand Baudouy, Tisha Dixit, Marc Daval, Gilles Authélet, Vadim Stepanov, Charles Mailleret and Florian Gouit (*CEA Paris-Saclay*)
- 3:15 PM **C3Or3B-06: Compact nitrogen pulsating heat pipes – Experimental thermal analysis with numerical insights**
Marcin Opalski (*CEA Paris-Saclay, Wrocław University of Science and Technology*), Tisha Dixit, Gilles Authélet, Vadim Stepanov, Théophile Benoit (*CEA Paris-Saclay*), Sławomir Pietrowicz (*Wrocław University of Science and Technology*) and Bertrand Baudouy (*CEA Paris-Saclay*)
- 3:30 PM **C3Or3B-07: 50 Years of Innovation: Cryogenics and Superconductivity in Biomedical Applications**
Quansheng Shu (*Cryospc*), Ray Radebaugh (*NIST*) and Robert L Fagaly (*Retired - Tristan*)
- 3:45 PM **C3Or3B-08: Optimizing cryoprobe tip geometry for enhanced cryoablation efficacy: A numerical simulation approach**
Arpit Mishra, Arjun Garva (*Indian Institute of Technology Kharagpur*) and Parthasarathi Ghosh (*IIT Kharagpur*)

C3Or3C 14:00 - 14:45

Aerospace Cryocoolers III: Pulse Tube and Stirling II

Session Chairs: TBD

- 2:00 PM **C3Or3C-01: ABI life test cryocooler system 2025 update**
Harold Dzigiel (*Northrop Grumman Corporation*), Alexander Krimchansky (*NASA*), Chris Sullivan (*L3Harris Technologies*), Derrick Early (*NASA*), Michael Norris (*Northrop Grumman Corporation*) and Steve Clark (*L3Harris Technologies*)
- 2:15 PM **C3Or3C-02: A Novel 3D Printed Regenerator Filler for Large Stirling and Pulse-Tube Cryocoolers**
Proshat Mehdizad (-), Ali Ghavami (*Georgia Tech*), Carl Kirkconnell, Robert Hon (*West Coast Solutions*) and S. Mostafa Ghiaasiaan (*Georgia Tech*)
- 2:30 PM **C3Or3C-03: Experimental research on a highly compact miniature coaxial pulse tube cryocooler at 80 K**
Zhixiang Yang, Yijing He, Xiaoqin Zhi and Limin Qiu (*浙江大学*)

C3Or3D 14:00 - 15:30

Large Scale Cryogenic Systems VIII: Fusion Systems

Session Chairs: Michael White, Fermilab, and TBD

- 2:00 PM **C3Or3D-01: ITER Cryogenic System Commissioning and Performance Testing**
Marie Cursan, Alexander Litvinovich, Antoine Escoleira, David Grillot, Dongseong Park, Franck Baracco (*ITER Organization*), Grigory Kouzmenko (*F4E Fusion For Energy*), Guillaume Vincent (*ITER Organization*) and Jian Cui (*ITER*)
- 2:15 PM **C3Or3D-02: ITER LHe plants first tests results**
Jean-Marc Bernhardt (*Air Liquide Advanced Technologies*), Yannick Fabre, Daniel Wilhelm, David Jessup (*Air Liquide*), Guillaume Vincent (*ITER Organisation*), Harold Richemond, Lois Perrot (*Air Liquide*), Marie Cursan (*ITER Organisation*) and Paul Boutot (*Air Liquide*)
- 2:30 PM **C3Or3D-03: Analysis of a cryogenic refrigerator solution for the ITER Isotope Separation System**
Matthias Dremel, Fabien Seyvet, Grigory Kouzmenko (*Fusion for Energy*), Ian Bonnett (*ITER Organization*), Marc Simon (*Fusion for Energy*) and Robert Michling (*ITER Organization*)
- 2:45 PM **C3Or3D-04: Overview of Design Developments for Condensable Vapor Devices for ITER**
Ketan Choukekar, Jared Tippens, Charles Smith (*Oak Ridge National Laboratory*), Bhumika Joshi, Kirit Patel, Hireen Kanzaria, Dhawal Panchal, Hardik Vyas and Rajat Kalla (*INOX India Limited*)

- 3:00 PM **C3Or3D-05: Cooling the SPARC fusion device – A large-scale helium refrigerator designed for transient loads and high availability**
Markus Diehl, Elias Mai (*Linde Kryotechnik AG*), Andrew Dalesandro and Alec Mitkov (*CFS Commonwealth Fusion Systems*)
- 3:15 PM **C3Or3D-06: Performances of the JT-60SA cryogenic system in the integrated commissioning test**
Kazuya Hamada (*National Institutes for Quantum Science and Technology*), Chistine Hoa (*ITER organization*), Guy Phillips (*Fusion for Energy*), Haruyuki Murakami (*National Institutes for Quantum Science and Technology*), Isao Abe (*ITER organization*), Katsuhiko Tsuchiya, Katsumi Kawano, Kazuma Fukui, Kiichi Ohtsu, Koji Takahashi (*National Institutes for Quantum Science and Technology*), Louis Zani, Manfred Wanner (*Fusion for Energy*), Ryota Sakurai (*National Institutes for Quantum Science and Technology*), Sam Davis, Valerio Tomarchio (*Fusion for Energy*) and Yoshihiro Onishi (*National Institutes for Quantum Science and Technology*)

M3Or3A 14:00 - 15:40

[Special Session] Transportation III: High Power Components, Thermal Management

Session Chairs: Lance Cooley, FAMU-FSU College of Engineering, and Sastry Pamidi, FAMU-FSU College of Engineering & The Center for Advanced Power Systems

- 2:00 PM **M3Or3A-01: [Invited] Cryogenic Thermal Management of Power Conversion Devices on Liquid Hydrogen Fueled Electric Aircraft**
Yai Pioth Yai Deng, Chul H. Kim, Peter Cheetham and Sastry Pamidi (*Florida State University*)
- 2:20 PM **M3Or3A-02: [Invited] Liquid hydrogen cooling of superconducting motor AC windings**
Grant Lumsden (*Robinson Research Institute, Victoria University of Wellington*), Alan Caughley (*Callaghan Innovation*), Rodney Badcock (*Robinson Research Institute, Victoria University of Wellington*), Swarn Kalsi (*Kalsi GPS*) and Zhenan Jiang (-)
- 2:40 PM **M3Or3A-03: [Invited] Lightweight cryoresistive and superconducting aerospace power transmission cables: experiments and theory**
Chris Kovacs (*Scintillating Solutions LLC*), Yang Guo (*The Ohio State University*), Jin Kwon, Minzheng Jiang, Xianhao Zhang, Michael Sumption (-), Matt Rindfleisch (*Hyper Tech Research*), Gage Avonce (*Hyper Tech Research Inc.*), Tom Bullard (*UES Inc.*), Timothy Haugan (-) and Phillip Ansell (*Univeristy of Illinois at Urbana-Champaign*)
- 3:00 PM **M3Or3A-04: [Invited] Cryogenic Bus Bar Design for Electric Aircraft Power Distribution**
Muhammad Tahir Mehmood Khan Niazi (*Florida State University*), Peter Cheetham (*FAMU-FSU College of Engineering*) and Spencer Martin (*Florida State University*)
- 3:20 PM **M3Or3A-05: [Invited] A high power two-pole quick connect junction between lightweight cryoresistive and superconducting aerospace power transmission cables**
Chris Kovacs (*Scintillating Solutions LLC*), Yang Guo (*The Ohio State University*), Jin Kwon, Minzheng Jiang, Xianhao Zhang, Michael Sumption (-), Matt Rindfleisch (*Hyper Tech Research*), Timothy Haugan (-) and Phillip Ansell (*Univeristy of Illinois at Urbana-Champaign*)

M3Or3B 14:00 - 15:45

AC Loss

Session Chairs: George Panasyuk, NRC Senior Researcher, and TBD

- 2:00 PM **M3Or3B-01: A low AC loss, fast ramp HTS solenoid prototype for compact fusion energy system**
Yuhu Zhai (*Princeton Plasma Physics Laboratory*)
- 2:15 PM **M3Or3B-02: AC Loss in Round, Multifilamentary Superconducting Strands at High Frequencies**
Michael Sumption (-)
- 2:30 PM **M3Or3B-03: Test Results for the Commissioning of NASA's AC Loss Superconducting Coil Test Rig**
Jason Hartwig (-), Frederick Van Keuls (*HX5, LLC*), Justin Scheidler, Gerald Brown (*NASA Glenn Research Center*), Andrew Raineri (*University of Akron*), Paul Passe (*HX5, LLC*), David Hervol (*HX5*) and Liam Brown (-)
- 2:45 PM **M3Or3B-04: AC-loss Analysis in Stacks of Non-insulated REBCO Tapes**
Alex Zlobin (*Fermilab*), Elena Tamagnini (*Politenico di Torino*), Emanuela Barzi (*Ohio State University*) and Laura Savoldi (*Politenico di Torino*)

- 3:00 PM **M3Or3B-05: Tradeoffs Curves and Penalty Functions for AC losses and J_c relevant to high-power-density motor applications and their use in comparing various superconductors and normal metal conductors**
Jin Kwon, Edward Collings (-) and Michael Sumption (*The Ohio State University*)
- 3:15 PM **M3Or3B-06: Flux Jumping in High Magnetic Fields for Stack Tape Cables and its Mitigation**
Tushar Garg (*The Ohio State University*), Jan Jaroszynski, Eun-Sang Choi (*National High Magnetic Field Laboratory FSU*), Milan Majoros, Mike Sumption and Edward Collings (*The Ohio State University*)
- 3:30 PM **M3Or3B-07: Research and development of reel-to-reel REBCO multi-filamentary tape**
Zhan Zhang (*Institute of Energy(IE) Hefei Comprehensive National Science Center(HCNSC)*), Chao Zhou (*University of Twente*), Shaoqing Wei (*Institute of High Energy Physics*) and Zuoguang Li (*Institute of Energy(IE) Hefei Comprehensive National Science Center(HCNSC)*)
- 3:45 PM **M3Or3B-08: Superconducting Coil Pack Manufacturing and Risk Reduction Testing for NASA's AC Loss Test Rig**
Frederick Van Keuls (*HX5, LLC*), Justin Scheidler (*NASA Glenn Research Center*), Jason Hartwig (-), Andrew Raineri (*University of Akron*) and Paul Passe (*HX5, LLC*)

C3Or4A 16:15 - 18:00

LH2 and LNG II: Storage and Utilization

Session Chairs: Konstantin Matveev, Washington State University, and TBD

- 4:15 PM **C3Or4A-01: Upgrades and initial weathering test results of the liquefied natural gas testbed at NASA Kennedy Space Center**
Adam Swanger (*NASA*), Ajchariya Harrison (*Astrion*), Andrew Kelly, Julie Foroosh (*NASA*) and William Reaves (*Noetic Strategies*)
- 4:30 PM **C3Or4A-02: Novel concept of cryo-adsorbed hydrogen energy storage system**
Nir Tzabar and Avshalom Davidesko (*Ariel University*)
- 4:45 PM **C3Or4A-03: Transient system-level cryogenic thermal management models of liquid hydrogen-fueled electric aircraft**
Youngjun Choi (*Florida State University*), Peter Cheetham (*FAMU-FSU College of Engineering*), Sastry Pamidi and Chul Kim (-)
- 5:00 PM **C3Or4A-04: New design data for ortho-parahydrogen converters**
Sebastian Eisenhut and Christoph Haberstroh (-)
- 5:15 PM **C3Or4A-05: Process simulation and techno-economic assessment of hydrogen liquefaction plants with integrated ortho-para conversion**
Laura Stops (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology*), Benjamin Kanz (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology; TUMCREATE Ltd.*), Khang Do (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology, Garching, Germany*), Alexander Alekseev (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology; Linde GmbH, Clean Energy Technologies R&D, Pullach, Germany*), Sebastian Rehfeldt and Harald Klein (*Technical University of Munich, TUM School of Engineering and Design, Department of Energy and Process Engineering, Institute of Plant and Process Technology*)
- 5:30 PM **C3Or4A-06: Effect of sloshing conditions on the boil-off rate of cryogenic liquid in membrane tank**
Le-Duy Nguyen, Kyu Hyung Do, Myungbae Kim and Taehoon Kim (*Korea Institute of Machinery and Materials*)
- 5:45 PM **C3Or4A-07: Fully submerged cryogenic fuel pump for LNG-powered vessels**
Kim Skatun (*Engineer*) and Siri Kleivane (-)

C3Or4B 16:15 - 17:00**Large Scale Cryogenic Systems VII: Commissioning**

Session Chairs: Parminder Banga, Bluefors Cryocooler Technologies, Inc., and Xihuan Hao, Bluefors Cryocooler Technologies, Inc.

- 4:15 PM **C3Or4B-01: Operation of CERN's major tests facility with upgraded cryogenic infrastructure for superconducting magnets, power links, inner triplets String and radio-frequency cavities for HL-LHC**
Jordan Gery, Remi Mauny, Aleksandra Onufrena, Antonio Perin, Frederic Ferrand, Nicolas Guillotin, Olivier Pirotte, Thierry Dupont, Thomas Barbe and Vanessa Gahier (*CERN*)
- 4:30 PM **C3Or4B-02: Upgrade of the CERN cryogenic test facility for the HL-LHC superconducting magnets and superconducting links**
Olivier Pirotte, Andrew John Lees, Antonio Perin, Arnaud Vande Craen, Franco Julio Mangiarotti, Frederic Savary, Gaelle Ninet, Herve Prin, Luca Dassa, Marco Buzio, Nicolas Guillotin, Remi Mauny, Stephan Russenschuck, Thomas Barbe, Vanessa Gahier and Gerard Willering (*CERN*)
- 4:45 PM **C3Or4B-03: Commissioning results of the ESS cryogenic moderator system using helium**
Hideki Tatsumoto (*European Spallation Source ERIC (ESS)*), Arriagada Jaime (*European Spallation Source ERIC*), Attila Zsigmond Horváth (*European Spallation Source*), Iris Haag, Philipp Arnold and Theodoros Vasilopoulos (*European Spallation Source ERIC*)

C3Or4C 16:15 - 18:15**Aerospace Cryocoolers IV**

Session Chairs: Jun Dong, Fermilab, and Greg Tatkowski, Fermilab

- 4:15 PM **C3Or4C-01: Characterization of SWaP COTS rotary coolers for space application**
Christophe Vasse, Simon-Didier Venzal and Emillien Durupt (*Thales*)
- 4:30 PM **C3Or4C-02: BAE Low Cost, High Capacity, Scalable Cryocooler Solutions**
Ryan Taylor, Brian Buchholtz, Cameron Mock (*BAE Systems Inc.*) and David Glaister (*Ball Aerospace*)
- 4:45 PM **C3Or4C-03: Reliability approach for high-availability cryocoolers**
Hidde Schot, Daniel Willems, Garnt De Jonge and Jeroen Mullié (*Thales Cryogenics*)
- 5:00 PM **C3Or4C-04: British (Ball) Aerospace Cryogenic Thermal Margins**
David Glaister (*Ball Aerospace*) and Carlita Gorham (*BAE Systems*)
- 5:15 PM **C3Or4C-05: Advances in Cryocooler Control Electronics for Linear Cryocoolers**
Richard Kaszeta, Mark Zagarola, Jessie Greenhalgh, James Gregoire (*Creare LLC*), Jason Baxter, Noah Hudson, Wyatt Jackson, Carl Kirkconnell (*West Coast Solutions, Inc.*), Doug Mansfield and Cliff Fralick (*Sunpower*)
- 5:30 PM **C3Or4C-06: BAE Modular Advanced Cryocooler Control Electronics (MACCE)**
Ryan Taylor, Cameron Mock, Dave Kristof, David Duval (*BAE Systems Inc.*), David Glaister (*Ball Aerospace*) and James Simons (*BAE Systems Inc.*)
- 5:45 PM **C3Or4C-07: The road to 1K – Iris Technology's continued development of high power CCEs**
Rj Victoria, Horacio Estabridis, Kathy Trengove, Kerry Frohling and Kristin Malenfant (*Iris Technology Corporation*)
- 6:00 PM **C3Or4C-08: Numerical investigation & optimisation of a small-scale travelling-wave thermoacoustic Stirling cryocooler**
Holly Butson, Michael Gschwendtner (*Auckland University of Technology*), Alan Caughley (*Callaghan Innovation*), Rodney Badcock and Grant Lumsden (*Paihau-Robinson Research Institute*)

M3Or4A 16:15 - 18:20**[Special Session] Transportation IV: Motors and Generators**

Session Chairs: Chris Kovacs, Scintillating Solutions LLC, and Justin Scheidler, NASA Glenn Research Center

- 4:15 PM **M3Or4A-01: [Invited] 3D Numerical Modelling of AC Loss of Multifilamentary MgB₂ Wires at 20 K**
Zhenan Jiang, Yukai Qiao (*Victoria University of wellington*), Mark Ainslie (*King's College London*), Rodney Badcock, Yueming Sun and Nicholas Strickland (*Victoria University of wellington*)

- 4:45 PM **M3Or4A-02: [Invited] A Double Rotor Flux Switching Machine with HTS Field Coils for All Electric Aircraft Applications**
Chris Kovacs (*Scintillating Solutions LLC*), Keith Corzine, Leila Parsa (*U. of California Santa Cruz*) and Timothy Haugan (-)
- 5:05 PM **M3Or4A-03: [Invited] Development of a 1 MW+ High power density induction motor for electric aircraft propulsion using Cryogenic Aluminum Windings**
Michael Sumption (-)
- 5:25 PM **M3Or4A-04: [Invited] The thermal management of superconducting and aluminum conductors in motors, generators and cables for electric aircraft**
C.g. Cantemir (*The Ohio State University*), Chris Kovacs, Dave Doll (*Hyper Tech Research Inc.*), Jin Kwon, Matt Rindfleisch, Mike Sumption, Mike Tomsic and Xuan Peng (-)
- 5:45 PM **M3Or4A-05: [Invited] Superconducting Electric Machine with Cryogenically Cooled Stator for CHEETA**
Thanatheepan Balachandran (*HInetics Inc*), Uijong Bong (*Hinetics, Inc.*), Samith Sirimanna, Noah Salk, Jianqiao Xiao, Phoenix Bauer, Raatan Venkataraman, Kevin Uvodich (*HInetics Inc*) and Kiruba Haran (*University of Illinois*)
- 6:05 PM **M3Or4A-06: A sustainable flight demonstrator using a retrofit high-temperature superconducting (HTS) brushless DC motor in an RC plane**
Ishan Ambastha (*Greenwich High School*), David Daggett, Xiao-Dong Zhou and Nengneng Xu (*University of Connecticut*)

M3Or4B 16:15 - 18:15

[Special Session] Materials for High Field Magnets

Session Chairs: Ignacio Aviles Santillana, CERN and Robert Walsh, Materials Reliability Inc.

- 4:15 PM **M3Or4B-01: [Invited] Quality assurance testing of materials for the 40 T superconducting magnet project**
Jun Lu, Aliya Hutley, Amari Garrett (*National High Magnetic Field Laboratory, USA*), Aniket Ingrole (*National High Magnetic Field Laboratory (NHMFL), Florida State University*), Dmytro Abrahimov (*NHMFL*), Hongyu Bai (*National High Magnetic Field Laboratory*), Jan Jaroszynski (*National High Magnetic Field Laboratory FSU*), Jeremy Levitan (*NHMFL*), Jozef Kvitkovic (*Applied Superconductivity Center - NHMFL*), Noah Gavin (*National High Magnetic Field Laboratory, USA*) and William Marshall (*National High Magnetic Field Laboratory*)
- 4:40 PM **M3Or4B-02: [Invited] Composite materials for electrical insulation of superconducting coils**
Vincent Schenk (-), Christian Scheuerlein and Roland Piccin (*CERN*)
- 5:05 PM **M3Or4B-03: [Invited] Cryogenic Performance of Superconducting Magnet Structural Materials in SPARC**
Dina Yuryev, Agnieszka Wusatowska-Sarnek, Andreas Kulovits, Claire Saunders, Cody Dennett, Deepthi Tammana, Lex Palmer and Taylor Pratt (*Commonwealth Fusion Systems*)
- 5:25 PM **M3Or4B-04: [Invited] Cryogenic mechanical properties of large forgings for high field fusion magnets**
Markus Kind (*Rolf Kind GmbH*), Berta Ruiz Palenzuela, Enrique Rodriguez Castro (*University Carlos III (ES)*), Ignacio Aviles Santillana and Stefano Sgobba (*CERN*)
- 5:50 PM **M3Or4B-05: [Invited] Advancing Cryogenic Material Testing for High-Field Superconducting Magnets**
Oscar Sacristan De Frutos, Stefan Hoell and Michael Guinchard (*CERN*)

08:00 - 09:00

Plenary: Brad Cage [Securing America's Helium Future: Pulsar's Topaz Project and the Changing Landscape of US Helium Supply] & Closing

Session Chairs: Robert Duckworth, Oak Ridge National Laboratory, and Srinivasa Vanapalli, University of Twente

C4Or1A 09:30 - 10:30

Adiabatic Demagnetization Refrigerators

Session Chairs: Srinivasa Vanapalli, University of Twente, and John Weisend, European Spallation Source ERIC (ESS)

- 9:30 AM **C4Or1A-01: The first continuous sub-millikelvin refrigerator**
Hiroshi Fukuyama and Ryo Toda (*Cryogenic Research Center, The University of Tokyo*)

- 9:45 AM **C4Or1A-02: Space-oriented adiabatic demagnetization refrigerator adapted for quantum applications**
Adele Leon, Anthony Attard (*Univ. Grenoble Alpes, CEA, IRIG-DSBT, 38000 Grenoble, France*), Christophe Marin (*Univ. Grenoble Alpes, CEA, IRIG-Pheliqs, 38000 Grenoble, France*), Jean-Louis Durand, Jean-Marc Duval and Sylvain Martin (*Univ. Grenoble Alpes, CEA, IRIG-DSBT, 38000 Grenoble, France*)
- 10:00 AM **C4Or1A-03: Research on temperature control of Adiabatic Demagnetization Refrigerators**
Peng Zhao (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Ke Li (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*), Yanan Li (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences*), Wei Dai and Jun Shen (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)
- 10:15 AM **C4Or1A-04: Design and performance testing of the 3-stage ADR**
Yanan Li, Ke Li, Peng Zhao, Teng Pan and Wei Dai (*Technical Institute of Physics and Chemistry, Chinese Academy of Sciences*)

C4Or1B 09:30 - 11:30

[Special Session] NASA's Cryogenic Fluids for Aerospace Propulsion Applications

Session Chairs: Peter Bradley, NIST, and Wesley Johnson, NASA Glenn Research Center

- 9:30 AM **C4Or1B-01: [Invited] Fuel Cell-Based Hydrogen Aircraft Architecture**
Vadim Lvovich (*NASA Glenn Research Center*), Christopher Hartman (*Analytical Mechanics Associates*), David Koci, H. Douglas Perkins, Ian Jakupca, Patrick Hanlon (*NASA Glenn Research Center*), Thomas Hallock (*NASA Langley Research Center*), Thomas Lavelle, Wesley Johnson and Zhimin Zhong (*NASA Glenn Research Center*)
- 9:45 AM **C4Or1B-02: [Invited] NASA Cryogenic Fluid Management Portfolio Project – Overview and 2024-2025 Highlights**
Jeremy Kenny (-)
- 10:00 AM **C4Or1B-03: [Invited] NASA Cryogenic Fluid Management Portfolio Project - Modeling and Technologies Portfolio Overviews**
Erin Pisciotta (-)
- 10:15 AM **C4Or1B-04: [Invited] Cryocooler Technology Developments at NASA**
Sean Kenny (-)
- 10:30 AM **C4Or1B-05: [Invited] NASA Cryogenic Fluid Management Portfolio Project's Demonstrations Portfolio overview**
Allyson Thomas (-) and Jeremy Kenny (*NASA Marshall Space Flight Center*)
- 10:45 AM **C4Or1B-06: [Invited] NASA's Human Landing Systems Program (HLS) Cryogenic Propulsion Systems Status and Overview**
Reid Ruggles and Juan Valenzuela (*NASA*)
- 11:00 AM **C4Or1B-07: Panel Discussion**

M4Or1A 09:30 - 11:00

[Special Session] Transportation V: Materials

Session Chairs: Eric Hellstrom, , Florida State University, and Peter Cheetham, Center for Advanced Power Systems

- 9:30 AM **M4Or1A-01: [Invited] Supply Chain of REBCO and Bi-2212 conductors for high-field magnets**
Lance Cooley (*NHMFL/FSU*)
- 9:50 AM **M4Or1A-02: [Invited] REBCO Magnets for Fusion Propulsion**
Honghai Song (-), Brandonlee Santos, Stephen Van Sciver, Xiaoyan Shi and Youri Viouchkov (*Canyon Magnet Energy*)
- 10:20 AM **M4Or1A-03: [Invited] AeroCryoX: A Comprehensive Library of Cryogenic Power System Component Models for Designing Electric Aircraft**
Chul Han Kim, M. Tahir Khan Niazi, Peter Cheetham and Sastry Pamidi (*FAMU-FSU College of Engineering*)
- 10:40 AM **M4Or1A-05: [Invited] Liquid Hydrogen for Sustainable Energy Systems: Latest Development, Challenges and Opportunities**
David Mensah Sackey, Paul Iyanda (*FAMU-FSU College of Engineering, Department of Electrical & Computer Engineering*), Chul Han Kim (*Center for Advanced Power Systems, Florida State University*), Peter Cheetham and Sastry V. Pamidi (*FAMU-FSU College of Engineering, Department of Electrical & Computer Engineering*)

M4Or1B 09:30 - 10:45

Hydrogen Technology and Compatible Materials

Session Chairs: Shreyas Balachandran, Florida State University, and TBD

- 9:30 AM **M4Or1B-01: Carbon-fiber Composite Cryogenic Tank for Liquid Hydrogen: Thermo-structural Analyses**
Sreenivasa Voleti, Matthew Kennedy, Abbas Alahyari and Wenping Zhao (*RTX Technologies Research Center*)
- 9:45 AM **M4Or1B-02: Investigating the effect of cryogenic conditions on the elastic behaviour of fibre-reinforced polymer composite materials under tensile loading**
Nassos Spetsieris, Michael Gower and Stefanos Giannis (*National Physical Laboratory*)
- 10:00 AM **M4Or1B-03: Piezometric properties of 3D-printed composites at cryogenic temperatures**
Satyajit Mojumder, Reagan Dodge and Zachary Beadle (*Washington State University*)
- 10:15 AM **M4Or1B-04: Thermal performance of common bulk-fill cryogenic insulation materials in helium and hydrogen background gasses**
Adam Swanger (*NASA*)
- 10:30 AM **M4Or1B-05: Investigating dual electrospinning as a means of enhancing passive thermal control coatings for cryogenic propellant storage in extraterrestrial environments**
Adrien Neveu (*Rensselaer Polytechnic Institute*), Adam Swanger, Chieloka Ibekwe, Jason Hartwig, Nan An (-), Shankar Narayan (*Rensselaer Polytechnic Institute*) and Xuanjie Wang (-)



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International Cryogenic Materials Conference 2026

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Important Dates



Abstract Submission Deadline
January 26 (Mon.), 2026



Acceptance Notification
April 1 (Wed.), 2026



Sponsorship & Exhibition Application Deadline
April 3 (Fri.), 2026



Early Registration Deadline
May 22 (Fri.), 2026



Paper Submission Deadline
June 29 (Mon.), 2026

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