

2024 Preliminary Program

August 21, Wednesday			
10:00-22:00	Registration		
19:00-21:00	Welcome Reception		
August 22, Thursday			
09:00-09:30	Opening Ceremony		
09:30-10:00	Plenary Session 1 Chair: Prof. Fengxia Hu, Institute of Physics Chinese Academy of Sciences Solid-State Energy Conversion: Applications and Perspectives Prof. Dr. Andrej Kitanovski, University of Ljubljana		
10:00-10:20	Coffee Break		
10:20-12:30	Session A1 Barocaloric Cooling and Materials	Session B1 Magnetocaloric Devices (1)	Session C1 Magnetocaloric Materials (1)
12:30-13:30	Lunch		
13:30-14:00	Plenary Session 2 Chair: Prof. Suxin Qian, Xi'an Jiaotong University Compression-Based Elastocaloric Cooling: Materials, Devices, and Systems Prof. Ichiro Takeuchi, University of Maryland		
14:00-14:30	Plenary Session 3 Chair: Prof. Suxin Qian, Xi'an Jiaotong University Thermoelectric Cooling Materials and Emerging Applications Prof. Jingfeng Li, Tsinghua University		
14:30-14:50	Coffee Break		
14:50-17:30	Session A2 Elastocaloric Materials and Devices	Session B2 Magnetocaloric Devices (2)	Session C2 Magnetocaloric Materials (2)
19:00-21:00	IIR Solid State Cooling and Heating group meeting		
August 23, Friday			
09:00-09:30	Plenary Session 4 Chair: Prof. Xiaoshi Qian, Shanghai Jiao Tong University Electrocaloric Cooling for A Sustainable World - Where Are We Now? Prof. Qiming Zhang, Pennsylvania State University		
09:30-09:50	Coffee Break		
09:50-12:30	Session A3 Electrocaloric Materials and Devices	Session B3 Magnetocaloric Devices (3)	Session C3 Magnetocaloric Materials (3)
12:30-13:30	Lunch		
13:30-14:00	Plenary Session 5 Chair: Prof. Dr. Andrej Kitanovski, University of Ljubljana Baotou Rare Earth Industry: A Strong Support for Magnetic Materials And Application Devices Prof. Dr. Huang Jiaohong, Baotou Research Institute of Rare Earths		
14:00-14:20	Coffee Break		
14:20-16:30	Session A4 Optical cooling and Materials	Session B4 Magnetocaloric Devices (4)	Session C4 Magnetocaloric Materials (4)

16:30-17:00	Closing Ceremony
19:00-21:00	Banquet
August 24, Saturday	
09:00-12:00	Technical Tour Rare Earth Museum Lab in Baotou Research Institute of Rare Earths Rare Earth Permanent Magnet Plant

August 22, Thursday

Session A1: Barocaloric Cooling and Materials	
Chair: Prof. Fengxia Hu, Institute of Physics Chinese Academy of Sciences	
10:20-10:40	Colossal barocaloric effects: refrigeration and heat storage (keynote) Prof. Bing Li, Shenyang National Laboratory for Materials Science (SYNL) Institute of Metal Research, Chinese Academy of Sciences
10:40-11:00	Design of barocaloric plastic crystals for room temperature solid-state refrigeration (171) (keynote) Hui Wang, Dean/Professor of Central South University
11:00-11:15	Research of Several Room-Temperature Barocaloric Composite Materials with High Thermal Conductivity Additives (37) Liutao Zhu, Southeast University
11:15-11:30	Colossal barocaloric effect reversibly driven by low pressure in 2D vdW plastic crystals (34) Yue Kan, Institute of Physics, Chinese Academy of Science
11:30-11:45	Performance Analysis of a Reverse Brayton Barocaloric Refrigeration Cycle Using (C₉H₁₉NH₃)₂CuBr₄ as Refrigerant (56)(online) Pravinth Balthazar, Mohammad S. Islam, Nick S. Bennett*, University of Technology Sydney

August 22, Thursday

Session A2: Elastocaloric Materials and Devices	
Chair: Prof. Suxin Qian, Xi'an Jiaotong University, Prof. Huilong Hou, Beihang University	
14:50-15:10	Caloric effect in NI-MN-SN-CO alloy prepared through additive manufacturing (Keynote) Prof. Xuexi Zhang, Harbin Institute of Technology
15:10-15:30	A compact two-stage elastocaloric refrigerator with 20 K temperature span (87)(Keynote) Prof. Suxin Qian, Xi'an Jiaotong University
15:30-15:50	Additively manufactured high-performance elastocaloric materials and the strain glass transition (163)(Keynote) Prof. Huilong Hou, Beihang University
15:50-16:05	Elastocaloric effects in all-d-metal Heusler alloys (179) Assistant Professor Zhiyang Wei, Great Bay University
16:05-16:20	Experimental Research on Compression-driven Multi-layer Tubular Elastocaloric Regenerator (75) GuoQu Zhou, Xi'an Jiaotong University
16:20-16:35	Nonreciprocal heat transfer enabled elastocaloric cooling (72) Jiongjiong ZHANG, Southern University of Science and Technology
16:35-16:50	Advanced elastocaloric air cooling by coil-bending with an energy-efficient performance (58) Xueshi Li, The Hong Kong University of Science and Technology
16:50-17:05	Elastocaloric solid-state refrigeration device based on natural rubber: comparison of materials on a single stage setup (26) SION Marianne, Tohoku University
17:05-17:20	Design and analysis of an elastocaloric energy conversion device (14) Yao Wang, Xi'an Jiaotong University
17:20-17:35	Study of the Elastocaloric Effect of Natural Rubber Under Multiple Cycles (88) Yunzhao Zhang, Tianjin University of Commerce

August 23, Friday

Session A3: Electrocaloric Materials and Devices

Chair: Prof. Xiaoshi Qian, Shanghai Jiao Tong University

09:50-10:10	Colossal Electrocaloric Effect in High-Entropy Ferroelectric Working Bodies (keynote) Prof. Xiaoshi Qian, Shanghai Jiao Tong University
10:10-10:30	Highly efficient thermal management materials and devices based on electrocaloric effect (57)(keynote) Prof. Rujun Ma, Nankai University
10:30-10:45	Thermoelectric cooling technology: material and applications (151) Prof. Min Zhou, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences
10:45-11:00	Progress on Power Electronics for Electrocaloric Heat Pump Systems (150) Stefan Mönch(a,b), Richard Reiner(a), Michael Basler(a), Kareem Mansour(a), Daniel Grieshaber(a), Patrick Waltereit(a), Rüdiger Quay(a,c), Kilian Bartholomé(d), (a) Fraunhofer Institute for Applied Solid State Physics (IAF) (b) University of Stuttgart, Institute of Electrical Energy Conversion (IEW) (c) Albert Ludwig University of Freiburg, Department for Sustainable Systems Engineering (INATECH)(d) Fraunhofer Institute for Physical Measurement Techniques (IPM)
11:00-11:15	The design and analysis of a compact thermoelectric heat exchanger (86) Dr. Katja Klinar, University of Ljubljana
11:15-11:30	Effect of temperature variation rate on the life of thermoelectric devices in PCR instruments (4) Junhao Yan, Huazhong University of Science and Technology
11:30-11:45	Solid-state thermoelectric cooling based on high-performance bismuth tellurides-based alloys (175) Chenguang Fu, Zhejiang University
11:45-12:00	Effects of interfacial compounds inducing by Ag interlayer on the Bi₂Te₃-based thermoelectric thin film cooler (48) Zeyu Liu, Huazhong University of Science and Technology

August 23, Friday

Session A4: Optical cooling and Materials

Chair: Biao Zhong, Technical Institute of Physics and Chemistry, CAS, Prof. Jun Zhang, Institute of Semiconductors, CAS

14:20-14:40	The effect of doping Yb³⁺ concentration on laser cooling characteristics in LuLiF₄ crystal (153) (keynote) Biao Zhong, Technical Institute of Physics and Chemistry, CAS
14:40-15:00	Laser Cooling of Semiconductors: Progress and Perspective (70) (keynote) Prof. Jun Zhang, Institute of Semiconductors, CAS
15:00-15:20	Rare earth ions doped fluoride crystals with low phonon energy for laser-induced cooling (keynote) Shanming Li, Shanghai Institute of Optics and Fine Mechanics, CAS
15:20-15:35	Optical refrigeration in Yb³⁺: YAP crystal (138) Chaoyu Wang, East China Normal University
15:35-15:50	Spectroscopy and laser-induced cooling characteristics of 4%Yb³⁺: YAG crystals (129) Jiayi Zhang, State Key Laboratory of Precision Spectroscopy, East China Normal
15:50-16:05	Efficient solid-state laser cooling with excitation of nano-second pulses (82) Associate Professor Guangzong Dong, Tiangong University

August 22, Thursday

Session B1: Magnetocaloric Devices (1)

Chair: Prof. Jun Shen, Beijing Institute of Technology

10:20-10:40	High-Performance Thermomagnetic Generator Controlled by a Magnetocaloric Switch (155)(keynote) Prof. Hu Zhang, University of Science and Technology Beijing
10:40-10:55	Exploring the tradeoff between magnetic circuit and thermal processes in thermomagnetic devices (126) Guilherme Hitoshi Kaneko, Meiji University
10:55-11:10	Advanced active magnetic regenerator with 3D mesh MnFePSi (125) Bowe Huang, Magneto B.V.
11:10-11:25	Numerical Simulation of Performance Influencing Factors of Active Magnetic Regenerators in the Temperature Range of 40~ 60 K (143) Yakun Liu, Beijing Institute of Technology
11:25-11:40	Machine Learning and high-throughput screening algorithms for optimization of the magnetocaloric effect in all-d Heusler alloys (165) Danil Baigutlin, Chelyabinsk State University
11:40-11:55	Oscillating Gadolinium thermal switch (152) Nada Petelin, University of Ljubljana
11:55-12:10	Room Temperature Magnetocaloric Materials (MnFe)_{1.9}(PSi) Fe-Rich Compounds for heat pump application (59) Hanggai H, Delft University of Technology

August 22, Thursday

Session B2: Magnetocaloric Devices (2)

Chair: Prof. Dr. Oliver Gutfleisch, Technical University of Darmstadt

14:50-15:10	On the magnetocaloric metrics under AC magnetic field (97) (keynote) Prof. Akhmed Aliev, Amirkhanov Institute of Physics of Dagestan Federal Research Centre, Russian Academy of Sciences
15:10-15:25	Simulation Research on Stages Matching and Timing Sequence Optimization of a Double-stage Adiabatic Demagnetization Refrigerator(ADR) in Ultra-low Temperature Range (116) Zhuo Chen, Beijing Institute of Technology
15:25-15:40	Numerical Optimization of salt pill in an adiabatic demagnetization refrigerator (113) Dr. Wenshuai Zheng, Beijing Institute of Technology
15:40-15:55	Improvements on the first magnetic cooling device produced in series: "Polaris" (62) Max Fries, MAGNOTHERM Solutions GmbH
15:55-16:10	Influence of Velocity Pattern of Heat Exchange Medium Flow on Enhancement of Temperature Span for An Active Magnetic Regenerator (78) Ren Matsushita, Meiji University
16:10-16:25	Comparison between Simulation and Measurements of an Apparatus for a Thermomagnetic Motor (77) Guilherme Hitoshi Kaneko, Meiji University
16:25-16:40	Successful integration of a Magnetic Refrigeration System into a refrigerated display cabinet: from simulations to first experimental results (66) Dr. Sergiu LIONTE, Magnoric

August 23, Friday

Session B3: Magnetocaloric Devices (3)

Chair: Prof. Yan WANG, Baotou Research Institute of Rare Earths

09:50-10:10	TFORC studies of magnetocaloric materials: models, experiments and beyond (keynote) Prof. Victorino Franco, University of Seville
10:10-10:30	Magnetic refrigeration: from room temperature to extremely low temperature (keynote) Prof. Zhenxing Li, Beijing Institute of Technology
10:30-10:45	Influence of the indium thermal interface on the heat transfer in mechanical thermal switch at cryogenics temperature and external magnetic field (74) Konstantin Kolesov, Kotelnikov Institute of Radioengineering and Electronics (IRE) of Russian Academy of Science
10:45-11:00	Large-scale magnetic cooling unit for industrial applications (64) Dr. Sergiu LIONTE, Magnoric
11:00-11:15	Giant irreversibility of the inverse magnetocaloric effect in the Ni₄₇Mn₄₀Sn_{12.5}Cu_{0.5} Heusler alloy (67) Assistant Professor Yurii Koshkidko, Institute of Low Temperature and Structure Research, Polish Academy of Sciences
11:15-11:30	A magnetocaloric cooling device with layering microchannel magnetic regenerators (69) Jierong Liang, MAGNOTHERM Solutions GmbH
11:30-11:45	Seasonal COP of a magnetocaloric heat pump for the built environment based on MnFePSi (33) Diego Pineda Quijano, Delft University of Technology

August 23, Friday

Session B4: Magnetocaloric Devices (4)	
Chair: Prof. Yan WANG, Baotou Research Institute of Rare Earths	
14:20-14:40	Magnetocaloric hydrogen liquefaction-From materials to prototypes (110) (keynote) Dr. Tino Gottschall, Helmholtz-Zentrum Dresden-Rossendorf
14:40-15:00	A full solid-state conceptual magnetocaloric refrigerator based on hybrid regeneration(19)(keynote) Yuan Lin, Institute of Physics, Chinese Academy of Sciences
15:00-15:15	Reversible Magnetocaloric Effect Characterized by Low-Cost Lock-In Infrared Thermography (68) Prof. Victorino Franco, University of Seville
15:15-15:30	Navigating the heat maze: a showcase tutorial of TCCbuilder software (5) Dr. Katja Klinar, University of Ljubljana
15:30-15:45	Comparative Performance Study of Active Magnetic Regenerative System using Mono/Hybrid Nanofluids (178) Sumit Kumar Singh, Gangneung-Wonju National University
15:45-16:00	Numerical and experimental study of a reversible thermomagnetic motor (63) Dr. Sergiu LIONTE, Magnoric
16:00-16:15	High frequency magnetocaloric cooling (144) Urban Tomc, University of Ljubljana

August 22, Thursday

Session C1: Magnetocaloric Materials (1)	
Chair: Dr. Tino Gottschall, Helmholtz-Zentrum Dresden-Rossendorf, Prof. Adler Gamzatov, Amirkhanov Institute of Physics of Dagestan Federal Research Centre of RAS	
10:20-10:40	Magnetocaloric high-entropy alloys: prospects and challenges (keynote) Dr. Jia Yan Law, University of Seville
10:40-11:00	Magnetocaloric materials for cryogenic application (159) (keynote) Xin Tang, National Institute for Materials Science
11:00-11:15	Magnetic, structural, and magnetocaloric properties of Ni-Co-Mn-Ti Heusler alloys: Insights from ab initio and Monte Carlo approaches (111) Prof. Vladimir Sokolovskiy, Chelyabinsk State University
11:15-11:30	Smart thermoresponsive PNIPAM/FeRh composite activated by magnetocaloric effect for doxorubicin release (161) Dr. Abdulkarim Amirov, Amirkhanov Institute of Physics of Dagestan Federal Research Center, Russian Academy of Sciences
11:30-11:45	Theoretical insight on the magnetic and magnetocaloric properties of Mn₂YSn (Y = Sc, Ti, V) Heusler alloys under pressure (114) Prof. Vasily Buchelnikov, Chelyabinsk State University
11:45-12:00	Thermomagnetic effect in (Mn,Fe)₂(P,Si,B): model, indirect measurements and direct tests (128) Dr. Francois GUILLOU, Inner Mongolia Normal University
12:00-12:15	Inverse Design of Magnetocaloric Materials: From high-throughput to machine learning(16) Wei Liu, TU Darmstadt

August 22, Thursday

Session C2: Magnetocaloric Materials (2)

Chair: Prof. Victorino Franco, University of Seville, Prof. Bing Li, Shenyang National Laboratory for Materials Science (SYNL)

14:50-15:10	Structural, magnetic, and cryogenic magnetocaloric properties in the GdCoC compound (83) (keynote) Prof. Lingwei Li, Hangzhou Dianzi University
15:10-15:30	Dynamics of the irreversible inverse magnetocaloric effect in the Ni₄₇Mn₄₀Sn₁₂Cu₁ Heusler alloy in cyclic magnetic fields up to 8 T (95) (keynote) Prof. Adler Gamzatov, Amirkhanov Institute of Physics of Dagestan Federal Research Centre of RAS
15:30-15:45	High-entropy concept shifts the crossover critical point in magnetocaloric materials (93) Dr. Jia Yan Law, University of Seville
15:45-16:00	Study on Material Arrangement of Multi-Layered Active Magnetic Regenerator with Lanthanum Compound Materials (94) Mr. Yusuke Hanaoka, Meiji University
16:00-16:15	Magnetocaloric properties of polycrystalline sublimed dysprosium (91) Dr.Sc. Natalia Kolchugina, Russian Academy of Sciences
16:15-16:30	Formation of ferromagnetic clusters affecting the first-order phase transition in off-stoichiometric Fe-Rh (35) Alex Aubert, Functional Materials, TU Darmstadt
16:30-16:45	Study of the Effect of Microstructure and Configurational Entropy on Magnetocaloric Properties of High-entropy Amorphous Alloys (79) Prof. Lin Xue, Hohai University

August 23, Friday

Session C3: Magnetocaloric Materials (3)

Chair: Dr. Jia Yan Law, University of Seville, Prof. Lingwei Li, Hangzhou Dianzi University

09:50-10:10	Martensitic transition and caloric effect in powder and powder-based-processed Ni-Mn-Sn multicaloric Heusler alloys (40) (keynote) Prof. Dr. Oliver Gutfleisch, Technical University of Darmstadt
10:10-10:25	Impact of fast-solidification on all-d-metal NiCoMnTi based giant magnetocaloric Heusler compounds (71) Dr. Fengqi Zhang, City University of Hong Kong
10:25-10:40	Production of LaFeSi alloys for high-end magnetic cooling applications (60) Dr. Hugo Vieyra, Vacuumschmelze GmbH & Co. KG
10:40-10:55	Effect of Si doping on the microstructure and magnetocaloric properties of Gd-based metallic microfibers (42) Shiyang Yu, Inner Mongolia University of Technology
10:55-11:10	Structural and magnetic disorder in Heusler alloys: Peculiarities of the electronic, magnetic, and vibrational properties of Ni(Co)-Mn-Ti vs. Ni-Mn-(In,Sn) (36) Olga Miroshkina, University of Duisburg-Essen
11:10-11:25	Rapid phase formation and large magnetocaloric effect in off-stoichiometric La-Fe-Si based alloys for near room temperature applications (109) Huang Xuan, South China University of Technology
11:25-11:40	La(Fe,Si,Mn)₁₃HZ microparticles stability in different fluids for magnetic refrigeration systems(21) Wei Liu, TU Darmstadt

August 23, Friday

Session C4: Magnetocaloric Materials (4)

Chair: Prof. Akhmed Aliev, Amirkhanov Institute of Physics of Dagestan Federal Research Centre, Russian Academy of Sciences, prof. Hu Zhang, University of Science and Technology Beijing

14:20-14:40	Dissecting complexity of phase transitions in first-order multi-caloric materials(15) (keynote) Dr. Konstantin Skokov, Technische Universität Darmstadt, FB Materialwissenschaft
14:40-14:55	Cryogenic Temperature Induced Atomic Structure Evolution of a Medium-Entropy Alloy Amorphous Microwires(31) Ying Bao, Henan University of Engineering
14:55-15:10	New versatile instruments to measure element-specific and macroscopic hysteresis at ID12 of the ESRF(22) Alex Aubert, postdoctoral researcher, Functional Materials, TU Darmstadt
15:10-15:25	Controlling microstructure of Gd-based amorphous alloys and its influence on magnetocaloric properties(30) Hangboce Yin, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences
15:25-15:40	The role of Debye temperature in achieving large adiabatic temperature changes at cryogenic temperatures: a case study on Pr₂In(28) Wei Liu, TU Darmstadt
15:40-15:55	Influence of high-pressure heat treatment on magnetic and magnetocaloric effects in La_{0.75}Sr_{0.25}Mn_{0.9}Co_{0.1}O₃(177) Prof. Xiang Jin, Inner Mongolia Normal University, Baotou Teachers' College
15:55-16:10	The effect of thermal cycling on magnetocaloric properties of Fe₄₈Rh₅₂ alloy(112) Alexander Kamantsev, Kotelnikov Institute of Radioengineering and Electronics of RAS, Amirkhanov Institute of Physics of Dagestan Federal Research Centre of RAS