



INSTITUT INTERNATIONAL DU FROID
INTERNATIONAL INSTITUTE OF REFRIGERATION

CONFERENCE PROGRAM

13th IIR Conference on Phase Change Materials and Slurries for Refrigeration and Air Conditioning

PCM2021

Storing Energy can make the difference

University of Padova
Vicenza Campus – Italy
1-3 September 2021
www.gest.unipd.it/TTPR2021



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Programme at a glance

| Venue | 1st Sept, Wednesday | | | |
|---------------|----------------------|---------|--------|--------|
| Time (CEST) | MAIN ROOM | | | |
| 09:00 - 10:00 | WELCOME | | | |
| 10:00 - 11:00 | KEYNOTE LECTURE 1 | | | |
| 11:00-11:30 | Virtual Coffee Break | | | |
| | ROOM A | ROOM B | ROOM C | ROOM D |
| 11:30-13:00 | TPTPR 1 | TPTPR 2 | PCM 1 | PCM 2 |
| 13:00-14:00 | LUNCH | | | |
| | MAIN ROOM | | | |
| 14:00-15:00 | KEYNOTE LECTURE 2 | | | |
| 15:00-15:30 | Virtual Coffee Break | | | |
| 15:30-17:00 | TPTPR 3 | TPTPR 4 | PCM 3 | PCM 4 |

| Venue | 2nd Sept, Thursday | | | |
|-------------|-------------------------|----------|--------|--------|
| Time (CEST) | MAIN ROOM | | | |
| 09:00-10:00 | KEYNOTE LECTURE 3 | | | |
| | ROOM A | ROOM B | ROOM C | ROOM D |
| 10:00-11:30 | TPTPR 5 | TPTPR 6 | PCM 5 | PCM 6 |
| 11:30-12:00 | Virtual Coffe Break | | | |
| 12:00-13:30 | TPTPR 7 | TPTPR 8 | PCM 7 | PCM 8 |
| 13:30-14:30 | LUNCH | | | |
| | MAIN ROOM | | | |
| 14:30-15:30 | KEYNOTE LECTURE 4 | | | |
| 15:30-16:00 | Virtual Coffe Break | | | |
| | ROOM A | ROOM B | ROOM C | ROOM D |
| 16:00-17:30 | TPTPR 9 | TPTPR 10 | PCM 9 | PCM 10 |
| 17:30-19:00 | IIR commissions meeting | | | |

| Venue | 3rd Sept, Friday | | | |
|-------------|---------------------|----------|--------|--------|
| Time (CEST) | MAIN ROOM | | | |
| 09:00-10:00 | KEYNOTE LECTURE 5 | | | |
| | ROOM A | ROOM B | ROOM C | ROOM D |
| 10:00-11:30 | TPTPR 11 | TPTPR 12 | PCM 11 | PCM 12 |
| 11:30-12:00 | Virtual Coffe Break | | | |
| 12:00-13:30 | TPTPR 13 | | PCM 13 | |
| | MAIN ROOM | | | |
| 13:30-14:30 | CLOSING | | | |

Timing is referred to Italian summer time (CEST)

Opening session

Welcome

Time: Wednesday, 01/Sep/2021: 9:00am - 10:00am · *Location:* MAIN ROOM

Keynote 1 (Chair: G.A. Longo)

Time: Wednesday, 01/Sep/2021: 10:00am - 11:00am · *Location:* MAIN ROOM

Some important specificities of the boiling behavior of water used as (the most natural) refrigerant Jocelyn Bonjour

Department of Energy and Environmental Engineering, INSA Lyon

PCM1: Thermophysical and rheological properties of Phase-Change Materials (PCMs) and Slurries #1 (Chair: S. Barison)

Time: Wednesday, 01/Sep/2021: 11:30am - 1:00pm · *Location:* ROOM C

11:30am - 11:50am ID: 1916

POLYMORPHIC ESTERS AS BIO-BASED PCMS

Rebecca Ravotti^(a,b), Colin R. Pulham^(b), Jörg Worlitschek^(a), Anastasia Stamatou^(a)

^(a)Lucerne University of Applied Sciences and Arts, Switzerland, ^(b)University of Edinburgh, School of Chemistry, United Kingdom

11:50am - 12:10pm ID: 1918

CHARACTERIZATION OF MIXED CP + CO₂ HYDRATES FOR REFRIGERATION APPLICATIONS

Nada Cham^(a, b), Pascal Clain^(c, b), Véronique Osswald^(b), Anthony Delahaye^(b), Laurence Fournaison^(b), Didier Dalmazzone^(a)

^(a)ENSTA-Paris, France, ^(b)Université Paris-Saclay, France, ^(c)Léonard de Vinci Pôle Universitaire, Research Center Paris la Défense, France

12:10pm - 12:30pm ID: 2044

EMPLOYMENT OF DYNAMIC TEMPERATURE-TIME-TRANSFORMATION (DTTT) DIAGRAMS ON PHASE CHANGE MATERIALS (PCM)

Gabriel Rubio-Pérez^(a), Natalia Muñoz-Rujas^(a), Rebecca Ravotti^(b,c), Lukas Müller^(b), Jörg Worlitschek^(b), Fernando Aguilar^(a)

^(a)Escuela Politécnica Superior, Universidad de Burgos Spain, ^(b)CC Thermal Energy Storage, Lucerne School of Engineering and Architecture Horw, Switzerland, ^(c)University of Edinburgh, School of Chemistry, United Kingdom

12:30pm - 12:50pm ID: 1934

REVIEWING THE SOLID-LIQUID PHASE TRANSITION ENTHALPIES OF POPULAR SALT HYDRATE PCM

Henri Schmit^(a), Christoph Rathgeber^(a), Peter Hooock^(a), Stefan Hiebler^(a)

^(a)ZAE Bayern Garching, Germany

PCM2: Materials Science and innovation of PCMs and Slurries #1

(Chair: H. Suzuki)

Time: Wednesday, 01/Sep/2021: 11:30am - 1:00pm · *Location:* ROOM D

11:30am - 11:50am ID: 1910

FINDINGS ON THICKENING GLAUBER'S SALT

Lukas Müller^(a), Dario Guarda^(a, b), Janine Leiggenger^(a), Adrian Müller^(a), Simon Maranda^(a), Anastasia Stamatou^(a), Jörg Worlitschek^(a)

^(a)Lucerne University of Applied Sciences and Arts, Switzerland, ^(b) Department of Management and Engineering, University of Padova, Italy

11:50am - 12:10pm ID: 1914

SURFACTANT SELECTION IN PHASE CHANGE DISPERSIONS

Poppy O'Neill^(a, b), **Ludger Fischer**^(b), **Anastasia Stamatou**^(b), **Rémi Revellin**^(a), **Jocelyn Bonjour**^(a)

^(a)Univ Lyon, INSA Lyon, CNRS, CETHIL, France, ^(b)Lucerne University of Applied Sciences and Arts, Switzerland

12:10am - 12:30pm ID: 1973

THE INFLUENCE OF DROPLET SIZE AND HEXADECANE VOLUME FRACTION ON THE RHEOLOGICAL BEHAVIOR OF HEXADECANE-IN-WATER EMULSION STABILIZED BY CELLULOSE NANOCRYSTALS

Somia Haouache^(a, b), **Pascal Clain**^(a), **Isabelle Capron**^(b), **Anthony Delahaye**^(a), **Laurence Fournaison**^(a)

^(a)FRISE, INRAE, France ^(b)BIA, INRAE, France

Keynote 2 (Chair: **S. Mancin**)

Time: Wednesday, 01/Sep/2021: 2:30pm - 3:30pm · *Location:* MAIN ROOM

State of art of PCM for air conditioning and refrigeration

Luisa F. Cabeza

University of Lleida, Spain

PCM3: Novel and optimised PCMs and Slurries for refrigeration and air conditioning applications (Chair: **R. Radermacher**)

Time: Wednesday, 01/Sep/2021: 3:30pm - 5:00pm · *Location:* ROOM C

03:30pm - 03:50pm ID: 1884

COMBINED STUDY OF A D-MANNITOL BASED ENERGY STORAGE

Loïc Vialettes^(a), **Hazhir Fatahi**^(a), **Sébastien Poncet**^(a)

^(a)Mechanical Engineering Department, Université de Sherbrooke, Canada

03:50pm - 04:10pm ID: 2027

HYBRID NANOFLUID FLOW IN A WATER HEATER WITH INTERMEDIATE FINS AND PCM

Amirhossein Amirsoleymani^(a), **Paul Henshaw**^(a), **Hamid Kazemi Moghadam**^(b), **Seyed Soheil Mousavi Ajarostaghi**^(c), **Sébastien Poncet**^(d)

^(a)University of Windsor, Canada, ^(b)DITEN, University of Genoa, Italy, ^(c)Babol Noshirvani University of Iran, ^(d)Université de Sherbrooke, Canada

04:10pm - 04:30pm ID: 2031

A PHASE CHANGE MATERIAL NANO-EMULSION FOR COOLING APPLICATIONS

Filippo Agresti^(a), **Silvan von Arx**^(b), **Poppy O'Neill**^(b), **Stefano Rossi**^(c), **Simona Barison**^(a)

^(a)Institute of Condensed Matter Chemistry and Technologies for Energy (ICMATE), National Research Council of Italy (CNR), Italy, ^(b)Competence Center Thermal Energy Storage (CCTES), Lucerne University of Applied Sciences and Arts, Switzerland, ^(c)Institute of Construction Technologies (ITC), National Research Council of Italy (CNR), Italy

PCM4: Industrial (food, transport...) and building applications of PCMs and Slurries #1 (Chair: **A. Stamatou**)

Time: Wednesday, 01/Sep/2021: 3:30pm - 5:00pm · *Location:* ROOM D

03:30pm - 03:50pm ID: 1900

ORGANIC PCM THERMAL STORAGE

Domenico Feo^(a), **Claudio Zilio**^(b), **Simone Mancin**^(b)

^(a)Thermalink srl, Italy, ^(b)Dept. of Management and Engineering, University of Padova, Italy

03:50pm - 04:10pm ID: 1930

EXPERIMENTAL EVALUATION OF A HEAT PUMP-LATENT STORAGE SYSTEM FOR INCREASING RENEWABLE SHARE OF THE RESIDENTIAL STOCK

V. Palomba^(a), S. Varvagiannis^(b), E. Monokrousou^(b), B. Nitsch^(c), N. Barmparitsas^(d), A. Bonanno^(a), G.E. Dino^(a), A. Leontaritis^(b), A. Strehlow^(c), S. Karellas^(b), A. Frazzica^(a), L.F. Cabeza^(e)

^(a)Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano", CNR ITAE, Italy, ^(b)Lab. of Steam Boilers and Thermal Plants, National Technical University of Athens, Greece, ^(c)AKG Verwaltungsgesellschaft mbH, Germany, ^(d)Daikin Air conditioning Greece, Greece, ^(e)REIA Research Group, INSPIRES Research Centre, Universitat de Lleida, Spain

04:10pm - 04:30pm ID: 1960

PERFORMANCE INVESTIGATION OF A WATER-BASED PCM THERMAL ENERGY STORAGE UNIT COUPLED WITH AN AIR CONDITIONING SYSTEM IN A SOLAR DECATHLON HOUSE

Wenye Lin^(a,b), Yeganeh Baghi^(b), Zhenjun Ma^(b), Stefan Geschwander^(a), Duane Robinson^(b), Clayton Mcdowell^(b)

^(a)Fraunhofer Institute for Solar Energy Systems ISE, ^(b)Sustainable Buildings Research Centre (SBRC), University of Wollongong (UOW), Australia

04:30pm - 04:50pm ID: 1981

HEAT PUMP WITH INTEGRATED LATENT HEAT STORAGE FOR FLEXIBLE HEAT SUPPLY TO BUILDINGS

Michael Barton^(a), Christian Schweigler^(a)

CENERGIE-Center for Energy-Efficient Buildings and Districts, Munich University of Applied Sciences, Germany

Keynote 3 (Chair: **S. Bobbo**)

Time: Thursday, 02/Sep/2021: 9:00am - 10:00am · *Location:* MAIN ROOM

Thermodynamic property measurements for next-generation refrigerants

Yukihiro Higashi

Research Center for Next Generation Refrigerant Properties (NEXT-RP)

International Institute for Carbon-Neutral Energy Research (I 2 CNER), Kyushu University, Japan

PCM5: Thermophysical and rheological properties of Phase-Change Materials (PCMs) and Slurries #2 (Chair: **J. Worlitschek**)

Time: Thursday, 02/Sep/2021: 10:00am - 11:30am · *Location:* ROOM C

10:00am - 10:20am ID: 2032

HEAT STORAGE AND RELEASE CHARACTERISTICS OF SODIUM ACETATE TRIHYDRATE-BASED PHASE CHANGE MATERIALS

Kohei Nakamura^(a), Naoki Nishikawa^(a), Daiki Hayashi^(a)

^(a)Technical Research Institute, Toho Gas Co., Japan

10:20am - 10:40am ID: 1945

ACTIVE CONTROL OF SUPERCOOLING DEGREE BY AMPHOTERIC SURFACTANTS SHOWING CATIONICITY UNDER VOLTAGE APPLICATION

Takeuchi Daiki^(a), Moritsuka Kento^(a), Kuroiwa Yuta^(a), Maruko Yuji^(a), Matsumoto Koji^(a)

^(a) Chuo University 1-13-27 Kasuga, Bunkyo-ku, Tokyo 112-8551, Japan

11:00am - 11:20am ID: 1933

HOW TO MEASURE THE MELTING ENTHALPY OF SEMICONGRUENTLY MELTING SALT HYDRATE PCM

Henri Schmit^(a), Dovile Rudaleviciene^(a), Christoph Rathgeber^(a), Stefan Hiebler^(a)

^(a)ZAE Bayern Garching, Germany

PCM6: Numerical and experimental methods dedicated to PCMs and Slurries #1 (Chair: G.L. Morini)

Time: Thursday, 02/Sep/2021: 10:00am - 11:40am · *Location:* ROOM D

10:00am - 10:20am ID: 1870

OPTIMIZING THERMAL STORAGE TANKS CONTAINING PCMS

Kamel Hooman^(a)

^(a)The University of Queensland, Australia

10:20am - 10:40am ID: 1942

STUDY ON HEAT TRANSFER CHARACTERISTICS OF PCM SLURRY OF SUPER-HYDROPHOBIC GEL PARTICLES ADSORBING PARAFFIN

Takumu Otsubo^(a), **Naoki Miyata**^(a), **Masao Iwaya**^(b), **Masaru Endo**^(b), **Naotaka Nishio**^(b), **Ruri Hidema**^(a), **Hiroshi Suzuki**^(a)

^(a)Department of Chemical Science and Engineering, Kobe University, Japan, ^(b)R&D Headquarters, DAICEL CORPORATION, Japan

10:40am - 11:00am ID: 1921

NUMERICAL MODEL CALIBRATION FOR COMPOSITE-PCM LTES

Claudia Naldi^(a), **Matteo Dongellini**^(a), **Federica Salvi**^(b), **Michele Silvestrini**^(b), **Morena Falcone**^(c), **Gian Luca Morini**^(a)

^(a)Department of Industrial Engineering (DIN), University of Bologna, Italy, ^(b)Interdepartmental Center of Industrial Research –Building and Construction, University of Bologna, Italy, ^(c) Interdepartmental Center of Industrial Research – Advanced Mechanics and Materials, University of Bologna, Italy

11:00am - 11:20am ID: 1935

NUMERICAL STUDIES OF THE BEHAVIOUR OF ISOTHERMAL AND NON-ISOTHERMAL ICE SLURRY INSIDE THE SPECIAL PLATE HEAT EXCHANGER

Shaimaa Hefny^(a), **Christiane Thomas**^(a), **Ullrich Hesse**^(a)

^(a)Technical University in Dresden, Faculty of Mechanical Science and Engineering, Institute of Power Engineering, Bitzer-Chair of Refrigeration, Cryogenics and Compressor Technology, Germany

11:20am - 11:40am ID: 1968

EFFECTS OF PARTICLE EVOLUTION IN ICE SLURRY BASED COOLING NETWORKS

Christoph Steffan^(a), **Mathias Safarik**^(a), **Ullrich Hesse**^(b)

^(a)Institute of Air Handling and Refrigeration, Department for Applied Energy Engineering Dresden, Germany,

^(b)Dresden University of Technology, Bitzer-Stiftungsprofessur für Kälte-, Kryo- & Kompressorentchnik, Germany

PCM7: Materials Science and innovation of PCMs and Slurries #2

(Chair: S. Bobbo)

Time: Thursday, 02/Sep/2021: 12:00pm - 01:30pm · *Location:* ROOM C

12:00pm - 12:20pm ID: 1955

THERMOPHYSICAL PROPERTIES AND THERMAL STABILITY OF DIFFERENT SUGAR ALCOHOLS AS PHASE CHANGE MATERIALS: A COMPREHENSIVE REVIEW

Giovanni Di Nicola^(a), **Alessia Aquilanti**^(a,b), **Sebastiano Tomassetti**^(a), **Pio Francesco Muciaccia**^(a)

^(a)Marche Polytechnic University, Department of Industrial Engineering and Mathematical Sciences, Italy; ^(b)Technical University of Darmstadt, Institute of Construction and Building Materials, Germany

12:20pm - 12:40pm ID: 1953

SYSTEMATIC MELTING POINT ADJUSTMENT FOR CERTAIN SALT HYDRATES

Adrian Müller^(a), **Stefan Beeler**^(a), **Rebecca Ravotti**^(a,b), **Lukas Müller**^(a), **Anastasia Stamatidou**^(a), **Simon Maranda**^(a), **Janine Leiggenger**^(a), **Jörg Worlitschek**^(a)

^(a)Lucerne University of Applied Sciences and Arts, Switzerland; ^(b)EaStCHEM, School of Chemistry, University of Edinburgh, United Kingdom

12:40pm - 01:00pm ID: 2051

**COMPATIBILITY OF PLASTICS AND METALS WITH LATENT HEAT STORAGE MEDIA:
METHODOLOGIES FOR EVALUATION**

Milan Ostrý^(a), Sylva Bantová^(a), Karel Struhala^(a)

^(a)Brno University of Technology, Faculty of Civil Engineering, Czech Republic

**PCM8: Numerical and experimental methods dedicated to PCMs and
Slurries #2** (Chair: K. Hooman)

Time: Thursday, 02/Sep/2021: 12:00pm - 01:40pm · *Location:* ROOM D

12:00pm - 12:20pm ID: 1938

EXPERIMENTAL STUDY OF HEAT TRANSFER OF ICE SLURRY BASED ON MPG IN LAMINAR FLOWS

Souheila Mellari^(a)

^(a)Department Genie Climatique, University Mentouri Constantine, Algeria

12:20pm - 12:40pm ID: 2030

**EXPERIMENTAL AND NUMERICAL INVESTIGATION OF TWO VERTICAL FINS GEOMETRY FOR A
PARAFFIN-BASED PHASE CHANGE MATERIAL**

Maxime Thonon^(a), Yassine Cherif^(b), Nicolas Cellier^(a), Laurent Zalewski^(b), Gilles Fraise^(a)

^(a) Univ. Savoie Mont Blanc, CNRS, France, ^(b) Laboratoire de Génie Civil et géo-Environnement, Université d'Artois, France

12:40pm - 01:00pm ID: 2081

**NUMERICAL SIMULATION OF LATENT AND SENSIBLE CONCRETE THERMAL ENERGY STORAGE
SYSTEM**

Francesca Martelletto^(a), Luca Doretti^(a), Simone Mancin^(b)

^(a)Dept. of Civil, Environmental and Architectural Engineering, University of Padova, Italy, ^(b)Dept. of Management and Engineering, University of Padova, Italy

01:00pm - 01:20pm ID: 2116

NUMERICAL STUDY OF PCM BASED TMS FOR LI-ION CELLS

Dario Guarda^(a,b), Michele Calati^(a), William Delgado^(b), Stefano Landini^(c), Remo Waser^(b), Anastasia Stamatiou^(b), Tadhg O'Donovan^(c), Simone Mancin^(a)

^(a)Department of Management and Engineering, University of Padova, Italy, ^(b)Competence Center Thermal Energy Storage (CCTES), Lucerne University of Applied Sciences and Arts, Switzerland, ^(c)Department of Mechanical Engineering, School of Engineering and Physical Sciences, Heriot-Watt University, United Kingdom

01:20pm - 01:40pm ID: 2204

**EXPERIMENTAL STUDY ON THE ROLE OF METAL FOAMS IN A VERTICAL PCM-BASED THERMAL
ENERGY STORAGE TUBE**

Giulia Righetti^(a), Simone Mancin^(a), Claudio Zilio^(a), Giovanni Antonio Longo^(a)

^(a)Dept. of Management and Engineering, University of Padova, Italy

Keynote 4 (Chair: C. Zilio)

Time: Thursday, 02/Sep/2021: 2:30pm - 3:30pm · *Location:* MAIN ROOM

**Some issues in heat transfer needed to be clarified for a better design of heat exchangers in
refrigeration (a/c and heat pump) systems**

Pedrag S. Hrnjak

University of Illinois at Urbana Champaign, USA

**PCM9: Thermophysical and rheological properties of Phase-Change
Materials (PCMs) and Slurries #3** (Chair: H. Schmit

Time: Thursday, 02/Sep/2021: 04:00pm - 05:30pm · *Location:* ROOM C

04:00pm - 04:20pm ID: 1915

HEAT TRANSFER AND RHEOLOGY OF A PCD

Poppy O'Neill^(a,b), **Ludger Fischer**^(b), **Rémi Revellin**^(a), **Jocelyn Bonjour**^(a)

^(a) Univ Lyon, INSA Lyon, CNRS, CETHIL, UMR5008, 69621 Villeurbanne, France

^(b) Lucerne University of Applied Sciences and Arts, 6048, Horw, Switzerland

04:20pm - 04:40pm ID: 2014

CHARACTERIZATION OF THE UREA-SODIUM NITRATE EUTECTIC MIXTURE AS A PCM: PHASE SEGREGATION

Laura Quant^(a), **Gonzalo Diarce**^(a), **Lourdes Bouzas**^(a), **Ana García-Romero**^(a)

^(a)ENEDI research group, School of Engineering of Bilbao, University of the Basque Country, Spain

04:40pm - 05:00pm ID: 1961

KINETIC STUDY OF CO₂HYDRATE FORMATION BASED ON HEAT TRANSFER MEASUREMENT
Véronique Osswald^(a), **Pascal Clain**^(a,b), **Didier Dalmazzone**^(c), **Anthony Delahaye**^(a), **Laurence Fournaison**^(a)

^(a)Université Paris-Saclay, INRAE, France, ^(b)Léonard de Vinci Pôle Universitaire, Research Center Paris la Défense, France

05:00pm – 05:20pm ID: 1950

THERMAL STORAGE PROPERTIES OF ORGANIC PCMS WITH OPERATING TEMPERATURE OF 150 °C BY DSC

Hazhir Fatahi^(a), **Sébastien Poncet**^(a), **Jérôme Claverie**^(b)

^(a)Mechanical Engineering Department, Université de Sherbrooke, Canada; ^(b)Chemistry Department, Université de Sherbrooke, Canada

PCM10: Numerical and experimental methods dedicated to PCMs and Slurries #3 (Chair: D. Groulx)

Time: Thursday, 02/Sep/2021: 04:00pm - 05:30pm · *Location:* ROOM D

04:00pm - 04:20pm ID: 1909

NANO-PCM STORAGE WITH FINNED ELLIPTICAL CROSS-SECTION CHANNEL

Hamid Kazemi Moghadam^(a), **Seyed Soheil Mousavi Ajarostaghi**^(b), **Sébastien Poncet**^(c)

^(a)DITEN, University of Genoa, Italy, ^(b)Mechanical Engineering Department, Babol Noshirvani University of Technology, Iran, ^(c)Mechanical Engineering Department, Université de Sherbrooke, Canada

04:20pm - 04:40pm ID: 1956

MELTING OF PCM: CORRELATIONS FOR NATURAL CONVECTION ONSET

Mohammad Azad^(a), **Dominic Groulx**^(a), **Adam Donaldson**^(b)

^(a)Department of Mechanical Engineering, Dalhousie University, Canada, ^(b)Department of Process Engineering and Applied Science, Dalhousie University, Canada

04:40pm - 05:00pm ID: 2034

EXPERIMENTAL INVESTIGATION OF MELTING AND SOLIDIFICATION PROCESSES OF PHASE CHANGE MATERIAL HEAT EXCHANGER

Jangho Yang^(a), **Jan Muehlbauer**^(a), **Daniel Bacellar**^(a), **Jiazhen Ling**^(a), **Vikrant Aute**^(a), **Yunho Hwang**^(a)

^(a)Center for Environmental Energy Engineering (CEEE), University of Maryland College Park, USA

05:00pm - 05:20pm ID: 2203

NUMERICAL MODELLING OF A PCM EMBEDDED IN PERIODIC STRUCTURES

Michele Calati^(a), **Dario Guarda**^(a), **Giulia Righetti**^(a), **Claudio Zilio**^(a), **Giovanni Antonio Longo**^(a), **Simone Mancin**^(a)

^(a)Department of Management and Engineering, University of Padova, Italy

Keynote 5 (Chair: L. Doretta)

Time: Friday, 03/Sept/2021: 9:00am - 10:00am · *Location:* MAIN ROOM

Heating and Cooling Decarbonisation using Phase Change Materials (PCMs) based Technologies
Yulong Ding

University of Birmingham, UK

PCM11: Materials Science and innovation of PCMs and Slurries #3

(Chair: F. Agresti)

Time: Friday, 03/Sep/2021: 10:00am – 11:30am · Location: ROOM C

10:00am - 10:20am ID: 1948

PHASE CHANGE DISPERSIONS FOR ISOTHERMAL COOLING APPLICATIONS

Ludger J. Fischer^(a), Silvan Von Arx^(a), Poppy O'Neill^(a), Simon Maranda^(a), Anastasia Stamatidou^(a), Jörg Worlitschek^(a)

^(a)Competence Center Thermal Energy Storage (CCTES), Lucerne University of Applied Sciences and Arts, Switzerland

10:20am - 10:40am ID: 2042

REDUCTION OF ROTATION PHASE SUPERCOOLING IN N-Docosanol NANO PHASE CHANGE SLURRIES

Moritz Kick^(a), Stefan Gschwander^(a)

^(a)Fraunhofer Institute for Solar Energy Systems ISE, Germany

10:40am - 11:00am ID: 1984

Expanded graphite addition to enhance the thermal conductivity of PCMs for heat storage applications

Paolo Bison^(a), Giovanni Ferrarini^(a), Sergio Bobbo^(a), Laura Fedele^(a), Stefano Rossi^(a), Christ Glorieux^(b)

^(a)Construction Technologies Institute, National Research Council, Italy; ^(b)Soft Matter and Biophysics, Department of Physics and Astronomy, Belgium

11:00am - 11:20am ID: 1951

Investigation On Ice Adhesion Force Made From Catechin-Surfactant Mixture

Fukazawa Kenta^(a), Sato Takumi^(a), Tsukagoshi Kentaro^(a), Matsumoto Koji^(a)

^(a)Chuo University 1-13-27 Kasuga, Bunkyo-ku, Tokyo 112-8551, Japan ,

PCM12: Industrial (food, transport...) and building applications of PCMs and Slurries #2 (Chair: G. Cortella)

Time: Friday, 03/Sep/2021: 10:00am – 11:30am · Location: ROOM D

10:00am - 10:20am ID: 1947

THERMAL ENERGY STORAGE WITH PCM FOR REFRIGERATED SEA WATER SYSTEM OF FISHING VESSELS

Muhammad Zahid Saeed^(a), Kristina N. Widell^(b), Armin Hafner^(a), Eirik Starheim Svendsen^(b), Tom Ståle Nordtvedt^(b)

^(a)Norwegian University of Science and Technology, Norway, ^(b)SINTEF Ocean Trondheim, Norway

10:20am - 10:40am ID: 1937

NEW METHOD OF PROCESSING ICE SLURRY FOR IMPROVED CHILLING OF FRESH FOODS

Thorsteinn I. Viglundsson^(a), Orn I. Agustsson^(a), Hlynur Sigurdsson^(a), Benedikt Kristjansson^(a), Birgir Josafatsson^(a), Haukur Hilmarsson^(a), Ester O. Palsdottir^(a), Jakob K. Kristjansson^(a)

^(a)Thor Ice Chilling Solutions, Iceland

10:40am - 11:00am ID: 2017

EXPERIMENTAL PERFORMANCE INVESTIGATION OF CO2 REFRIGERATION SYSTEM AND ITS INTEGRATION WITH PCM STORAGE

Derek Chapman^(a), Ashwaq Mohammed^(a), Konstantinos M. Tsamos^(a)

^(a)Hubbard Products, UK

11:00am - 11:20am ID: 2201

A NUMERICAL ANALYSIS OF LATENT THERMAL ENERGY STORAGE FOR REFRIGERATED TRUCKS

Michele Calati^(a), **Claudio Zilio**^(a), **Giulia Righetti**^(a), **Giovanni Antonio Longo**^(a), **Kamel Hooman**^(b),
Simone Mancin^(a)

^(a)University of Padova, Department of Management and Engineering, Italy; ^(b)Queensland Geothermal Energy Centre of Excellence School of Mechanical and Mining Engineering University of Queensland, Australia

PCM13: Industrial (food, transport...) and building applications of PCMs and Slurries #3 (Chair: F. Polonara)

Time: Friday, 03/Sep/2021: 12:00pm – 01:30pm · *Location:* ROOM C

12:00pm - 12:20pm ID: 2024

AIR CONDITIONING SYSTEM WITH INTEGRATED COLD STORAGE FOR DOMESTIC USE

Anna I. Egorova^(a), **Andrey S. Kolesnikov**^(a), **Alexander S. Krotov**^(a)

^(a)Bauman Moscow State Technical University, Russia

12:20pm – 12:40pm ID: 1939

COLD STORAGE USING PHASE CHANGE MATERIAL IN REFRIGERATED DISPLAY CABINETS: EXPERIMENTAL INVESTIGATION

Michael Jokiel^(a), **Alexis Sevault**^(a), **Krzysztof Banasiak**^(a), **Erling Næss**^(b)

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12:40pm - 1:00pm ID: 2074

WOOD IMPREGNATED WITH A MULTICOMPONENT BIO-PHASE CHANGE MATERIAL FOR ENERGY STORAGE IN BUILDINGS

Meysam Nazari^(a), **Mohamed Jebrane**^(a), **Nasko Terziev**^(a)

^(a)Department of Forest Biomaterials and Technology, Swedish University of Agricultural Sciences, Sweden

1:00pm – 1:20pm ID: 1924

EFFECT OF PHASE CHANGE MATERIAL (PCM) ON THE TEMPERATURE RISE OF A REFRIGERATOR: EXPERIMENT AND BASIC MODEL

Salman Mustafa Husain^(a), **Gökmen Peker**^(a), **Mutlu İpek**^(a), **Hüseyin Cura**^(a), **Akın Çağlayan**^(a)

^(a)Arçelik A.Ş İstanbul, 34940, Turkey

Closing session

Time: Friday, 03/Sep/2021: 1:30pm - 2:30pm · *Location:* MAIN ROOM