

34th UIT HEAT TRANSFER CONFERENCE

FERRARA, 4–6 JULY 2016
Università degli Studi di Ferrara
Polo scientifico tecnologico
via Saragat, 1

CONFERENCE PROGRAMME

Monday, July 4th

10:30 – 11:00 Registration

11:00 – 12:00 Opening Ceremony

12:00 – 13:00 **Poster presentation**
Chairman: Prof. Nicola BIANCO

13:00 – 14:00 *Lunch*

14:00 – 14:40 **Invited Lecture**
Prof. Paolo DI MARCO
Title

Session 1 Natural, forced and mixed convection

Chairman: Prof. Giovanni TANDA

14:40 – 15:00 (12) · *Experimental investigation on the convective heat transfer enhancement in tubes with cross-helix profile wall corrugation*
Luca CATTANI, Fabio BOZZOLI, Sara RAINIERI, Giorgio PAGLIARINI

- 15:00 – 15:20 (28) · *Numerical investigation on laminar round-jet impinging on a surface at uniform heat flux in a channel partially filled with a porous medium*
Bernardo BUONOMO, Alessandra DIANA, Oronzio MANCA, Sergio NARDINI
- 15:20 – 15:40 (32) · *Second principle approach to the performance analysis of heat transfer enhancement in ducts with corrugated walls*
Pamela VOCALE, Andrea MOCERINO, Sara RAINIERI, Giorgio PAGLIARINI
- 15:40 – 16:00 (42) · *New experimental results on local heat transfer inside a rectangular channel with rib-roughened surfaces*
Damiano FUSTINONI, Pasqualino GRAMAZIO, Luigi VITALI, Alfonso NIRO
- 16:00 – 16:20 *Coffee Break*

Session 2 Heat transfer and efficiency in energy system

Chairman: Prof. Giorgio PAGLIARINI

- 16:20 – 16:40 (6) · *Modelling of Shaded and Unshaded Shallow-Ground Heat Pump System for a Residential Building Block in a Mediterranean Climate*
Michele BOTTARELLI, Charles YOUSIF
- 16:40 – 17:00 (9) · *Hourly Simulation of a Ground-Coupled Heat Pump System*
Claudia NALDI, ENZO ZANCHINI
- 17:00 – 17:20 (26) · *The Effect of the Boundary Condition at the Ground Surface in Modelling Horizontal Ground Heat Exchangers*
Marco BORTOLONI, Michele BOTTARELLI, Yuehong SU
- 17:20 – 17:40 (40) · *Pulsating Thermal Response Test: Modeling and Description of Experiments in presence of Groundwater Circulation*
Marco FOSSA, Davide ROLANDO, Antonella PRIARONE, Francesco BERTI
- 17:40 – 18:00 (2) · *Application of close range aerial infrared thermography to detect landfill gas emissions: a case study*
Giovanni TANDA, Mauro MIGLIAZZI, Valter CHIARABINI, Paolo CINQUETTI

Tuesday, July 5th

9:00 – 9:40 **Invited Lecture**

Prof. Giovanni S. BAROZZI

Notes and Experiments on the Statics of Capillary Columns

Session 3 Computational Fluid Dynamics and heat transfer

Chairman: Prof. Enrico NOBILE

9:40 – 10:00 (5) · *Numerical Study of Metal Foam Heat Sinks under Uniform Impinging Flow*
Assunta ANDREOZZI, Nicola BIANCO, Marcello IASIELLO, Vincenzo NASO

10:00 – 10:20 (10) · *Unsteadiness and Transition to Turbulence in Woven Spacer Filled Channels for Membrane Distillation*
Michele CIOFALO, Francesco PONZIO, Alessandro TAMBURINI, Andrea CIPOLLINA, Giorgio MICALE

10:20 – 10:40 (37) · *Application of Recurrence Analysis to the period doubling cascade of a confined buoyant flow*
Diego ANGELI, Mauro A. CORTICELLI, A. FICHERA, A. PAGANO

10:40 – 11:00 (49) · *Coupled radiative and fluid flow modeling for a direct absorption solar receiver*
Matteo BORTOLATO, Simone DUGARIA, Erik MAGRO, Davide DEL COL

11:00 – 11:20 *Coffee Break*

Session 4 Multi-phase fluid dynamics, heat transfer and interface phenomena

Chairman: Prof.

11:20 – 11:40 (11) · *Critical heat flux in a multi-minichannel heat sink. Effect of the heated length-on-diameter ratio*
Rita MASTRULLO, Alfonso William MAURO, Luca VISCITO

11:40 – 12:00 (13) · *Numerical Simulation of Thin Film Breakup on Nonwetttable Surfaces*
Nicola SUZZI, Giulio CROCE, Paola D'AGARO

12:00 – 12:20 (15) · *Experimental Characterization of a Droplet Generator Based on a Micro T-junction with Newtonian and Non-Newtonian Liquids*
Behnam ROSTAMI, Beatrice PULVIRENTI, Giacomo PUCCHETTI, Gian Luca MORINI

12:20 – 12:40 (19) · *R1234yf condensation inside a 3.4 mm ID microfin tube: experimental results and modelling*
Andrea DIANI, Alberto CAVALLINI, Luisa ROSSETTO

12:40 – 13:00 (20) · *Gas holdup in large-scale bubble columns: influence of internals, sparger design, liquid velocity and liquid phase properties*
Giorgio BESAGNI, Fabio INZOLI

13:00 – 14:00 *Lunch*

14:00 – 14:40 **Invited Lecture**
Prof. Nicola BIANCO
Heat transfer in Fire Engineering

Session 5 Computational Fluid Dynamics and heat transfer

Chairman: Prof.

14:40 – 15:00 (21) · *Comparative CFD simulations of an hydrogen fire scenario*
Matteo NOBILI, Gianfranco CARUSO

15:00 – 15:20 (57) · *Adjoint optimal control problems for the RANS system*
Andrea ATTAVINO, Daniele CERRONI, Roberto DA VIÀ, Sandro MANSERVISI, Filippo MENGHINI

15:20 – 15:40 (30) · *Numerical investigation on thermal and fluid dynamics behaviors of forced convection in rectangular microchannels with nanofluids*
Bernardo BUONOMO, Luca CIRILLO, Oronzio MANCA, Sergio NARDINI, Salvatore TAMBURRINO

15:40 – 16:00 (46) · *Optimization of a single-stage double-suction centrifugal pump*
Aljaž ŠKERLAVAJ, Mitja MORGUT, Dragica JOŠT, Enrico NOBILE

16:00 – 16:20 *Coffee Break*

16:00 – 17:00 Poster Session

(1) · *An experimental and numerical study of endwall heat transfer in a turbine blade cascade including tangential heat conduction analysis*
L. RATTO, F. SATTA, G. TANDA

- (8) · *Electrocaloric refrigeration: an innovative, emerging, eco-friendly refrigeration technique*
C. APREA, A. GRECO, A. MAIORINO, C. MASSELLI
- (14) · *CO₂ transcritical refrigeration cycles: potential for exploiting waste heat recovery with variable operating conditions*
M. PIEVE, G. BOCCARDI, L. SARACENO, R. TRINCHIERI, G. ZUMMO
- (16) · *Sensitivity Coefficients for Thermal Property Measurements Using a Boundary Condition of the 4th Kind*
G. D'ALESSANDRO, F. DE MONTE
- (17) · *Experimental validation of CFD model of thermal fluxes through a multilayer wall*
N. BIANCO, M. MUSTO, G. ROTONDO
- (18) · *Motive flow calculation trough ejectors for transcritical CO₂ heat pumps. Comparison between new experimental data and predictive methods*
G. BOCCARDI, G. LILLO, R. MASTRULLO, A. W. MAURO, M. PIEVE, R. TRINCHIERI
- (22) · *Combining in situ and laboratory measurements to evaluate the impact of defects on the transmittance of new insulation materials*
D. AMBROSINI, S. SFARRA, T. DE RUBEIS, I. NARDI, S. PERILLI
- (23) · *Numerical study of laminar magneto-convection in a differentially heated square duct*
A. TASSONE, F. GIANNETTI, G. CARUSO
- (24) · *Transient heat conduction in a wall exposed to a fire: an analytic approach*
G. CASANO, S. PIVA
- (33) · *Experimental measurements of the thermal conductivity of concrete matrix embedding Radioactive Materials*
R. LO FRANO, A. MAGGINI, D. AQUARO
- (36) · *Methods for the estimation of the energy stored in geothermal reservoirs*
A. FRANCO, F. DONATINI
- (39) · *Preliminary numerical studies of an experimental facility for heat removal in natural circulation*
C. BERTANI, M. DE SALVE, M. CARAMELLO, N. FALCONE, A. BERSANO, B. PANELLA

(43) · *Inverse filtering of spectral BRDF measurements for high-directional features reconstruction*

L. VITALI, D. FUSTINONI, P. GRAMAZIO, A. NIRO

(45) · *Numerical analysis of heat conduction problems on irregular domains by means of a collocation meshless method*

R. ZAMOLO, E. NOBILE

(47) · *Energy demand hourly simulations and energy saving strategies in greenhouses for the Mediterranean climate*

A. PRIARONE, M. FOSSA, E. PAIETTA, D. ROLANDO

(55) · *Experimental validation of a model for the numerical simulation of hot water storage systems including phase change materials (PCMs)*

L. MONGIBELLO, M. ATRIGNA, N. BIANCO, M. DI SOMMA, G. GRADITI, N. RISI

(58) · *CFD analysis of turbulent heat transfer and thermal striping phenomena in T-junctions with liquid sodium*

P. FERRARA, P. DI MARCO

(59) · *Asymmetry during an horizontal annular flow in a micro-channel: optical measurements and effect of dimensionless numbers*

C. CAPO, T. LAYSSAC, S. LIPS, A. W. MAURO, R. REVELLIN

(60) · *The role of a recovery tank in a HPLCs heat transfer process: a transient analysis*

M. LORENZINI, P. VALDISERRI, M. PAGNONI

17:00 – 18:00 **UIT Assembly**

Wednesday, July 6th

Session 6 Heat transfer and efficiency in energy system

Chairman: Prof. Giovanni S. BAROZZI

- 9:00 – 9:20 (7) · *A two-dimensional investigation about magnetocaloric regenerator design: parallel plates or packed bed?*
Ciro APREA, Adriana GRECO, Angelo MAIORINO, Claudia MASSELLI
- 9:20 – 9:40 (25) · *Summer Performance of Ventilated Roofs With Tiled Coverings*
Marco BORTOLONI, Michele BOTTARELLI, Stefano PIVA
- 9:40 – 10:00 (41) · *Temperature field for radiative tomato peeling*
Gennaro CUCCURULLO, Laura GIORDANO
- 10:00 – 10:20 (48) · *Cool roofs with high solar reflectance for the welfare of dairy farming animals*
Giulia SANTUNIONE, Antonio LIBBRA, Alberto MUSCIO
- 10:20 – 10:40 (61) · *Energy performance of a ventilation system for a block of apartments with a ground source heat pump as generation system*
Michael LUCCHI, Marco LORENZINI, Paolo VALDISERRI
- 10:40 – 11:00 (56) · *CFD and Neutron codes coupling on a computational platform*
Daniele CERRONI, Roberto DA VIA', Sandro MANSERVISI, Filippo MENGHINI, Ruben SCARDOVELLI
- 11:00 – 11:20 *Coffee Break*

Session 7 Multi-phase fluid dynamics, heat transfer and interface phenomena

Chairman: Prof. Alfonso NIRO

- 11:20 – 11:40 (51) · *Foam evolution in a processed liquid solution*
Elisabetta SALERNO, Paolo LEVONI, Giovanni S. BAROZZI
- 11:40 – 12:00 (54) · *U-PHOS Project: Development of a Large Diameter Pulsating Heat Pipe Experiment on Board Rexus 22*
P. NANNIPIERI, S. PIACQUADIO, G. BECATTI, A. S. VIGLIONE, P. DI GIORGIO, E. FERRATO, A. CATARSI, G. MEONI, P. GUARDATI, F. NESTI, L. QUADRELLI, M. ANICHINI, F. ZANABONI, E. MANCINI, L. BUONO, F. CELI, L. BARSOCCHI, P. FAT-TIBENE, E. PRATELLI, S. FILIPPESCHI, M. MAMELI, P. DI MARCO, L. FANUCCI, F. BARONTI, S. MARCUCCIO, C. BARTOLI, M. MARENGO, N. BIANCO

- 12:00 – 12:20 (29) · *Numerical investigation on thermal behaviors of two-dimensional latent thermal energy storage with PCM and aluminum foam*
Bernardo BUONOMO, Davide ERCOLE, Oronzio MANCA, Sergio NARDINI
- 12:20 – 12:40 (50) · *A Further Contribution to the Parametric Analysis of a PCM Energy Storage System*
Giovanni CASANO, Stefano PIVA
- 12:40 – 13:00 (52) · *Embedded Paraffin/Metal foam Composite for Thermal Storage in Micro-gravity Conditions*
Paolo DI GIORGIO, Marcello IASIELLO, Alessandro VIGLIONE, Mauro MAMELI, Sauro FILIPPESCHI, Paolo DI MARCO, Assunta ANDREOZZI, Nicola BIANCO
- 13:00 – 14:00 *Lunch*