

Day 0 - 3 September 2017

17:00 to 19:00 Welcome Reception and Registration - Hamilton Centre

Day 1 - 4 September 2017

08:00 Registration from 8am throughout the day in the 1st floor foyer of the Hamilton Centre

08:45 Welcome address - Professor Tassos Karayiannis (UK Heat Transfer Committee & Conference Chair)

08:55 Overview of current research developments in the UK against a changing environment - Professor Geoff Rodgers (Deputy Vice Chancellor (Research & Innovation))

09:20 Tribute to Prof D. Brian Spalding, FRS, FREng - Professor Brian E. Launder (University of Manchester)

NEWTON ROOM

CAVENDISH ROOM

Session 1A: Micro & Nano Scale I

Chair: **Professor Xi Jiang (Queen Mary University of London)**

- 09:45 117 Wetting phenomena observed in evaporating nanofluid and water drops on structured surfaces
Gail Duursma, Veronika Kubyskhina, Coinneach Mackenzie-Dover, Revekka Tekidou, Jonathan Terry, Khellil Sefiane
- 10:00 77 Experimental investigation of SiO₂-water nanofluids on backward-facing step flow through PIV
Jizu Lyu, Liangyu Li, Chengzhi Hu, Minli Bai, Shengnan Chang, Peng Wang
- 10:15 156 The effect of improved colloidal stability on the viscosity and thermal conductivity of surfactant-less Fe₃O₄ ethylene glycol - water nanofluid
Rong Fu, Zeyu Liu, Hang Kang, Yuying Yan, Yong shi
- 10:30 84 A two-dimensional analytical model for transport and entropy generation in microreactors
Graeme Hunt, Nader Karimi, Mohsen Torabi
- 10:45 121 Effect of meniscus curvature on forced convection in microchannels with ridged walls
Toby Kirk, Simon Game, Marc Hodes, Demetrios Papageorgiou
- 11:00 203 Fanno flows in micro-channels: an enhanced numerical model
Marco Cavazzuti, Mauro Corticelli

Session 1B: Heat Exchangers & Heat Pipes

Chair: **Professor David Reay (Newcastle University)**

- 37 A novel lumped parameter model for Loop Heat Pipes – validation and parametric analysis
M. Bernagozzi, A. Georgoulas, I. Malavasi, N. Michè, M. Marengo
- 90 Airside Heat Transfer and Friction Characteristics of a 0.8 mm Diameter Bare Tube Heat Exchanger
Zhiwei Huang, Jiazhen Ling, Dr. Yunho Hwang, Vikrant Aute, Reinhard Radermacher
- 162 High Temperature Polymer Hollow Fiber Heat Exchanger for Industrial Applications
Amir Amini, Jeremy Miller
- 199 Multi-objective optimization tool for shell-and-tube heat exchanger design
Nicolas Sweeney-ortiz, Sören Brockmann, Sung in Kim
- 196 Use of Fouling Models to Determine Appropriate Exchanger Design and Heat Recovery Network Structure
Peter Ellerby, Graham Polley, Elvis Tamakloe
- 224 Evaluation of heat exchanger network retrofit design using plant data
Emilio Diaz-Bejarano, Marta Yugo Santos, Manuel Garcia Dopico, Francesco Coletti

Coffee Break in Newton Room

Session 2A: Micro & Nano Scale II

Chair: **Professor Khellil Sefiane (University of Edinburgh)**

- 11:30 193 Flow Boiling in a Copper Micro-channel: Influence of Copper Ageing
J Prasanna, Sateesh Gedupudi, Sarit Kumar Das
- 11:45 10 A Study of Convective Boiling of FC-72 in Micro-pin-finned Channels
Liang-han Chien, Wun-rong Liao
- 12:00 210 Break-up Mechanisms and Conditions for Vapour Slugs Within Mini-Channels
Manolia Andreadaki, Anastasios Georgoulas, Nicolas Michè, Marco Marengo
- 12:15 134 Nusselt Numbers for Poiseuille Flow over Isoflux Parallel Ridges for Arbitrary Meniscus Curvature
Simon Game, Demetrios Papageorgiou, Toby Kirk, Marc Hodes
- 12:30 32 Numerical Modeling of Fluid Flow and Thermal Transport in Gravity-Dominated 3D Microchannels
Abimbola Ashaju, Olubunmi Ige, Isaac Odesola
- 12:45 177 Thermoelectric Generator in Micro scale with the Use of Cavitating Flows
Berk Ucak, Selim Kaan Demirbilek, Kerem Kilic, Morteza Ghorbani, Ali Kosar

Session 2B: Single Phase Heat Transfer

Chair: **Dr. Graham Polley (Cal Gavin Limited)**

- 174 Heat Transfer Correlations for the Generation-IV Molten Salt Reactor
Fangyu Dong, Niccolo Le Brun, Christos N. Markides
- 68 Modelling of In-Line Tube Banks inside AGR Boilers
James Blackall, Hector Lacovides, Juan Uribe
- 189 Numerical investigation on the unsteady flow field induced by the movements of a piezoelectric fan
Siming Zhang, Xi Jiang, Alastair Hales
- 74 Influence of Reaction-Induced Thermal Convection on the Electrical Currents Measured in Chronoamperometry and Cyclic Voltammetry
Yavor Navev, Shaltiel Eloul, Richard Compton
- 122 Unsteady Heat and Mass Transfer of a Blunt Leading Edge using Hybrid LES-RANS
Xiaosheng Chen, Christopher D. Ellis, Hao Xia
- 221 Insights into Conjugate Heat Transfer and Methane Dissolution in Underground Salt Covers
Dean Wilson, Hector Lacovides, Tim Craft, Ali Omranian

Lunch & Posters

14:00 **Keynote 1: Computational Approaches in Heat Transfer Optimisation - Professor Harvey M. Thompson (University of Leeds)**

Session 3A: Cooling of Electronics & Other High Heat Flux Devices

Chair: **Professor Yuying Yan (University of Nottingham)**

- 14:30 166 Effect of Spatial Confinement and Liquid Level on Nucleate Boiling
Roy Bartle, Kalyani Menon, Ed Walsh
- 14:45 108 Ultrasonic instrumentation for simultaneous flow and mixture measurements of binary gas blends and heat transfer coefficient in zeotropic C₂F₆/C₃F₈ blends
Cecilia Rossi, Michele Battistin, Stephane Berry, Pierre Bonneau, Olivier Crespo-lopez, Cecile Deterre, Martin Doubek, Gilles Favre, Gregory Hallewell, Sergey Katunin, Didier Lombard, Alexander Madsen, Koichi Nagai, Benjamin Pearson, David Robinson, Alexander Rozanov, Ewa Stanecka, Vaclav Vacek, Joel Young
- 15:00 180 FASTT technology and some observations relating to other Cooling Technologies
William Alexander
- 15:15 147 Thermal Performance Modelling of a Solar Concentrating Photovoltaic CPV Receiver
Ali Maka
- 15:30 184 An Investigation on the Fluid Flow and Heat Transfer in the Near Vicinity of an Oscillating Blade Tip
Alastair Hales, Xi Jiang, Siming Zhang
- 15:45 213 Effective heat transfer from microchips to the external environment
Mustafa Kadhim, Nikil Kapur, Jan Summers, Harvey Thompson

Session 3B: Heat Transfer in Combustion & Thermal Management in Vehicles

Chair: **Professor Brian Launder (University of Manchester)**

- 219 Thermal Performance of Parked Cars in the United Arab Emirates
Peter Kew, Danish Karmally
- 157 Analysis of heat transfer and thermal stresses for IGBT power module integrated with vapour chamber thermal management system
Yiyi Chen, Bo Li, Wei Gong, Yuying Yan
- 188 Numerical Simulation of Heat Transfer in Gas Turbine Combustor
Lellei Dong
- 39 Numerical Investigation of the Effects of the Design of a Ship Exhaust System on Engine Backpressure
Mehmet Turgay Pamuk, Atilla Savaş
- 181 Thermocell with Molten Carbonate Electrolyte to Recover Waste Heat
Sathiyaraj Kandhasamy
- 91 Stabilized finite element simulation of heat transfer inside industrial furnaces
Jaafar Albadr, Mohammed Seaid, Jon Trevelyan, Majdi El-amrani

Coffee Break & Posters in Mead Room

Session 4A: Boiling & Evaporation I

Chair: **Professor Simone Mancin (University of Padova)**

- 16:30 140 Anomalous Long Lifetimes of Evaporating Sessile Droplets
Stephen Wilson, Feargus Schofield, David Pritchard, Khellil Sefiane
- 16:45 167 Flow Boiling Heat Transfer Using Temperature Sensitive Paints
Caleb Hammer, Michel Lebon, Jungho Kim
- 17:00 28 Pressure influence on microbubble boiling of subcooled water
Arslan Zabirov, Victor Yagov
- 17:15 159 Flow Boiling Heat Transfer of R245fa in Vertical Small-Micro Diameter Tubes
Asseel Al-Gaheeshi, Mohamed Mahmoud, Tassos Karayiannis
- 17:30 123 Photothermally induced phase change behaviors of saline solution in the microchannel
Xuefeng He, Rong Chen, Xun Zhu, Qiang Liao, DingDing Ye, Long Jiao
- 17:45 141 Experimental Investigation of Temperature Profiles Along a Heated Tube at Depressurization from Supercritical Pressures at Medium Heat and Mass Fluxes
Andreas Kohlhepp, Gerrit Schatte, Tobias Gschnaidtner, Christoph Wieland, Hartmut Spliethoff
- 18:00 198 The Engineering of Compact Exchangers to Required Dimensions
Tom Higley, Graham Polley, Peter Drögemüller, Martin Gough

Session 4B: Computational Heat Transfer & Fluid Dynamics I

Chair: **Dr. Sung In Kim (Queen's University Belfast)**

- 151 A Frequency-based Lattice Boltzmann Algorithm for Linear Oscillatory Flow
Hang Kang, Yong Shi, Yuying Yan
- 133 Effect of Non-Flat Contacts on Thermal Contact Resistance
Michael Mayer, Marc Hodes, Toby Kirk, Darren Crowdy
- 215 A numerical investigation of thermal-conductivity mixing models for crude oil fouling deposits
Emilio Diaz-bejarano, Francesco Coletti, Sandra Macchietto
- 209 Enhancement of the overall gas turbine performance by optimizing the blade internal cooling system
Seyed Morteza Mousavi, Farshad Kowsary
- 194 A Novel Method for Preventing the Dew Condensation on the Casing of Air Condition Indoor Unit
Guangri Jin, Kwan-Soo Lee
- 115 Prediction of Temperature Fluctuations in Conjugate Heat Transfer Based on RANS models
Gaoqiang Yang
- 223 Thermal Analysis of Cladded Pipe at a Joint Connection
Bin Wang, Luiz Wrobel, Mahmoud Chizari, Bridget Kogo

Conference Dinner in the Newton Room

19:00

Day 2 - 5 Sept. 2017

09:00	Keynote 2: Influence of wetting and dewetting phenomena on evaporative heat transfer - Professor Peter Stephan (Technische Universität Darmstadt)	
	<p>Session 5A: Boiling & Evaporation II Chair: Professor Y. Takata (Kyushu University)</p> <p>09:30 54 Do Marangoni flows exist in pure water drops? Alexandros Askounis, Yutaku Kita, Yasuyuki Takata, Masamichi Kohno, Jungho Kim, Vasileios Koutsos, Khellil Sefiane</p> <p>09:45 195 On the Evaluation of Correlations Predicting the Heat Transfer Coefficient at Supercritical Pressure Conditions Tobias Gschneidner, Gerrit Schatte, Andreas Kohlhepp, Christoph Wieland, Hartmut Spliethoff</p> <p>10:00 176 Superhydrophobic coatings for spray cooling applications Zhuyang Chen, Tanmoy Maitra, Zong Han Lee, Ioannis Papakonstantinou, Ramanarayanan Balachandran, William Suen, Manish K. Tiwari</p> <p>10:15 42 Cassie to Wenzel: The photothermal effect induced droplet evaporation on the superhydrophobic surface Long Jiao, Rong Chen, Xun Zhu, Qiang Liao, DingDing Ye, Xuefeng He</p> <p>10:30 227 Evaporation of Binary Mixtures: Pools and Droplets Adam WILLIAMS, Pedro J. Sáenz, George Karapetsas, Khellil Sefiane, Omar K. Matar, Prashant Valluri</p> <p>10:45 197 Design of Evaporators That Employ a Combination of External Jacket and Internal Coil to Vaporize Hazardous Liquids at Sub-Atmospheric Pressures Tom Higley, Graham Polley</p>	<p>Session 5B: Heat Transfer Fundamentals I Chair: Professor Jungho Kim (University of Maryland)</p> <p>40 Phase transformation and the heat and mass transfer in the ice, water and brine system Xiao Yun, Sam Brooks, Giuseppe Quarini</p> <p>128 Experimental Investigation into the behaviour of PCM in a Serpentine Thermal store rig Stan Shire, Bashir Jimoh</p> <p>50 Characterization of the radiative heating stage in the end-forming process of PVC pipes Michael Lucchi, Marco Lorenzini</p> <p>70 Heat transfer performance of slush nitrogen in a horizontal circular pipe Yijian Li, Tao Jin, Shuqin Wu, Jun Xia, Tassos Karayiannis</p> <p>160 Heat transfer and flow measurements in falling films by application of laser-induced fluorescence, particle tracking velocimetry and infrared thermography Alexandros Charogiannis, Christos N. Markides</p> <p>64 Liquid Crystals and Infrared Thermography in Heat Transfer and Biomedical Research Jan Stasiek, Marcin Jewartowski</p>
11:00	Coffee Break & Posters	
	<p>Session 6A: Condensation Chair: Professor John Rose (Queen Mary University of London)</p> <p>11:30 12 Condensation Heat Transfer in Microchannels Ali Al-Zaidi, Tassos Karayiannis, Mohamed Mahmoud</p> <p>11:45 75 R1234yf and R134a condensation inside a 2.4 mm ID microfin tube Andrea Diani, Alberto Cavallini, Luisa Rossetto</p> <p>12:00 204 Measurements for Condensation of Steam in Microchannels Lei Chai, Nan Hua, Rong Ji Xu, Guang Xu Yu, Ji Wang, Jie Sun, John Rose, Andrew Diakiv, Mario Ciaffarafa, Andrew Roberts, Hua Sheng Wang</p> <p>12:15 99 Simultaneous Dropwise and Filmwise Condensation on Hydrophilic Microstructured Surfaces Daniel Orejon, Orest Shardt, Naga Siva Kumar Gunda, Tatsuya Ikuta, Koji Takahashi, Sushanta K. Mitra, Yasuyuki Takata</p> <p>12:30 17 Contribution of solid-liquid interfacial thermal resistance to dropwise condensation heat transfer Dong Niu, Lin Guo, Guihua Tang</p> <p>12:45 124 An appraisal of existing models for the estimation of in-tube two-phase flow pressure drop of HFO and HC refrigerants Giulia Righetti, Simone Mancin, Claudia Zillo, Giovanni A. Longo</p>	<p>Session 6B: Heat Transfer for Sustainable Energy Chair: Dr Peter Kew (Heriot-Watt University)</p> <p>22 Intensified Carbon Capture using Adsorption: Heat Transfer Challenges and Potential Solutions David Reay, Richard Law, Jonathan McDonough, Vladimir Zivkovic</p> <p>130 Effect of variable rheology index on convective heat transfer of microalgae slurries in fully developed laminar flow Qian Fu, Hao Chen, Qiang Liao, Yun Huang, Ao Xia, Xun Zhu, Chao Xiao</p> <p>120 Technoeconomic assessment of novel hybrid PVT panels for residential applications Maria Herrando, Alba Ramos, Christos N. Markides</p> <p>67 Performance of evacuated flat solar thermal collectors Roger Moss, Stan Shire, Paul Henshall, Farid Arya, Phil Eames, Trevor Hyde</p> <p>62 Numerical investigation of radiation propagation in volumetric receivers Qibin Zhu, Yimin XUAN</p> <p>61 Axisymmetric Lattice Boltzmann method for packed bed thermochemical heat storage reactors Zhihao Pan, Changying Zhao</p>
13:00	Lunch & Posters	
14:00	Keynote 3: Improving the Operational Performance of Existing Heat Exchangers used in the Hydrocarbon Processing Industries - Mr Martin Gough (Cal Gavin Limited)	
	<p>Session 7A: Energy Recovery & Heat Integration Chair: Dr. Christos Markides (Imperial College London)</p> <p>14:30 148 Study of Integrated LNG Regasification and Combined Cycle Gas Turbine Power Plant with Trans-Critical CO2 Rankine Cycle as Bottoming Cycle Mohammad Ers Harry Yunash Tanto, Simon Perry, Boris Ertl</p> <p>14:45 129 Assessment of reciprocating-piston and screw expanders for waste heat recovery applications Michael Simpson, Paul Sapin, Christoph Kirmse, Giuseppe Rotolo, Pietro De Palma, Christos N. Markides</p> <p>15:00 169 A study on optimally select working fluid and operating conditions of ORC Shuang Ye</p> <p>15:15 139 Improvement of a Geothermal Power Plant with Multiple Organic Rankine Cycles (ORC) Oguz Altunkas, Barkin Durmuş, Barbaros Çetin, Ozan Akgöz</p> <p>15:30 87 Disintegration and heat transfer characteristics in centrifugal granulation process for molten blast furnace slag Yu Tan, Xun Zhu, Hong Wang, Xianyan He, Bin Ding, Qiang Liao</p> <p>15:45 111 Optimization of a Low-Cost Single Regenerator Traveling-wave Looped-Tube Thermoacoustic Engine Wigdan Kisha, David Hann, Paul Riley</p>	<p>Session 7B: Heat Transfer Enhancement Chair: Professor Joe Quarini (University of Bristol)</p> <p>178 CFD Simulation of Two Compact Fin-Tube Heat Exchanger Cores Karl Lindqvist, Erling Næss</p> <p>45 Experimental Investigation on Heat Transfer Performance of the Serrated Spiral Finned Tube Bundles Xiu Liu, Shiyao Ni, Huixiong Li, Hu Juanjuan, Lun Ai, Chao Yao</p> <p>94 Heat transfer enhancement in a finned horizontal concentric annulus: Isothermal blocks position effect Sara Touzani, Abdelkhalik Cheddadi, Mohammed Ouazzani</p> <p>153 A Study of the Local Heat Transfer Characteristics in a Helically Coiled Tube with Different Heating Methods Wei Gong, Xuesong Li, Yuying Yan</p> <p>96 Enhanced condensation in presence of inserts by using hiTRAN® wire matrix inserts Konrad Hüfner, Yan Lu, Peter Drögemüller, Stephan Scholl</p> <p>175 Nanotextured surfaces for thermally aware anti-icing Michael Grizen, Tanmoy Maitra, George Kokkinos, Manish K. Tiwari</p>
16:00	Coffee Break	
	<p>Session 8A: Computational Heat Transfer & Fluid Dynamics II Chair: Professor Chieh-Li Chen (National Cheng Kung University)</p> <p>16:15 118 Finite Element Analysis of Heat Transfer in Thin Multilayered Plates Theodosios Papathanasiou, Payam Khazaeinejad, Hamid Bahai</p> <p>16:30 57 Fluid Dynamic and Thermal Characterisation of Fast Response Heaters for Experimental Assessment of Exhaust Gas Components Peter Heidrich</p> <p>16:45 186 Estimation of Bacterial Growth Parameters in a Vegetable Food with Markov Chain Monte Carlo Method Gnanasekaran Nagarajan, Helcio R B Orlande, M Valeria De Bonis, Gianpaolo Ruocco</p> <p>17:00 152 A Study of the Unphysical Mass Transfer of SCMP LB models Wei Gong, Bo Li, Yiyi Chen, Yuying Yan</p> <p>17:15 14 Wall Effects on the Thermocapillary Migration of Single Gas Bubbles in Liquid A 3D Study Yousuf Alhendal, Ali Turan</p> <p>17:30 53 On Numerical Investigation of Empirical Relations representing the Non-Uniformity concerned with the Nusselt Profile Siddique Umair, Gulhane Nitin Parashram</p>	<p>Session 8B: Heat Transfer Fundamentals II & Porous Media Chair: Dr. Prashant Valluri (University of Edinburgh)</p> <p>80 Water Pool Boiling in High Porosity Aluminum Foams Luca Doretti, Hosein Sadafi, Simone Mancin, Kamel Hooman, Giovanni Longo</p> <p>143 Modelling ice generation in a cooled pipe containing a flowing brine stream Giuseppe Quarini, Sam Brooks, Xiao Yun, Edward Lucas</p> <p>214 Natural Convective Heat Transfer of a Radial Heat Sink Surrounded by a Chimney-shaped Structure According to the Installation Angle Seung-Jae Park, Kwan-Soo Lee</p> <p>71 Non-similar solutions for free convection in a doubly stratified fluid saturated non-Darcy porous medium with Soret-Dufour effects Surender Ontela, Srinivasacharya Darbhashayanam</p> <p>82 On the effects of microstructure upon the thermal and second law performance of microreactors Graeme Hunt, Nader Karimi, Mohsen Torabi</p> <p>127 A Fully-coupled model of heat and fluid flow in discretely fractured geothermal reservoir Musa D Aliyu, Hua-Peng Chen, Colin D Hills, Ouahid Harireche</p>
17:45	Conference Closure and Farewell	

Poster Presentations - Mead Room

9	An experimental Study of Frost Formation on a Horizontal Cryogenic Cold Surface under Natural Convection Conditions Zhongliang Liu, Liyan Li, Yuwan Dong, Yanxia Li	131	Thermal/flow visualisation of flows in water drops induced by a microheater Yutaku Kita, Alexandros Askounis, Yasuyuki Takata, John Christy, Khellil Sefiane, Jungho Kim
16	Bubble Population Balance Modelling for Stationary and Rotating cylinder Yousuf Alhendal, Ali Turan	138	Pool boiling of water on a single tube at sub-atmospheric pressure Salem Salem
24	Analysis of Inverter IGBT Electric-thermal Model and Design of Cooling System Xiaohong Hao, Zhi Yao, Yixiong Wang	154	A comprehensive study of downhole continuous helical baffles electric heater for oil shale in-situ retorting Wei Guo, Youhong Sun, Yuying Yan
48	Effect of coil orientation on ice fraction produced by cooling brine flow in a helical coiled heat exchanger Sam Brooks, Xiao Yun, Giuseppe Quarini, Edward Lucas	155	The generation of free non-stationary fire whirls by axisymmetric burning of solid fuel pellets Pavel Dermer
49	Effect of flow direction on ice fraction produced by cooling brine flow in helical coiled heat exchanger Sam Brooks, Giuseppe Quarini, Xiao Yun, Edward Lucas	183	Near field effects and temperature dynamics of laser irradiated gold nanoparticles Ana Maria Mihaela Gherman, Nicoleta Tosa, Paul Serban Agachi
55	Retrofitting a Desuperheater to a Refrigeration System at an Ice Cream Processing Site in Scotland: a 7-months COP Review Maizura Mokhtar, Tariq Muneer, Stephen Burns	187	Moisture Diffusion through Clothing and Thermal Comfort Krittiya Ongwuttawat, Sudaporn Sudprasert, Yuying Yan
66	Lattice Boltzmann Simulation of Enhanced Heat Transfer and Mixing Efficiency by Two Active Stirring Impellers Shing-Cheng Chang, Chieh-Li Chen, Hong-yi Yu	190	The cooling process modelling of a bar with variable properties in relation to temperature Laurentiu Lipan, Sorin Dimitriu
69	Optimization of integrated PEM Fuel Cell system for Combined Heat and Power generation Gerard Jansen, Zahir Dehouche, Harry Corrigan, Richard Bonser	211	Effects of fouling build-up on shell-side clearances and its impact on thermo-hydraulic performance of refinery heat exchangers Emilio Diaz-bejarano, Francesco Coletti
106	Combined Effects of Thermophoresis and Electrophoresis on Particle Deposition in Mixed Convection Flow onto a Vertical Wavy Plate Po-Yu Ho, Kuan-Hao Huang, Cha'o-Kuang Chen	217	Combustion Characteristics of Drifted Foamed Polystyrene powder in High Temperature Oxidizing Atmosphere of Tubular Flames Hideo Kawahara
125	A modular rack for shared thermo-fluid dynamics experiments in reduced gravity environment Marco Marengo, Luca Pietrasanta, Nicolas Michè, Davide Fioriti, Lucio Araneo, Mauro Mameli	226	Horizontal air-water two-phase flow in a domestic heat pump water heating system Jianbo Qin, Xianghua Jiang, Yinzhi Hu, Yunting Ge