



Kutateladze
Institute of
Thermophysics



HTI
Heat Transfer Institute



ENEA



Microgravity
Research
Centre
ULB



Università degli
Studi Napoli
Federico II



esa

Sixth International Conference on TWO-PHASE SYSTEMS FOR GROUND AND SPACE APPLICATIONS

Scientific Institute and Astronomic Observatory A. Genoino,
Cava de' Tirreni (Napoli), Italy, September 25-28, 2011

In memory of the 50th anniversary of the first space flight
of the Russian cosmonaut Yuriy Gagarin on 12th April, 1961

Conference Chairs

Oleg A. Kabov

Prof. and Co-Director of
Heat Transfer International
Research Institute of ULB
and IT SB RAS, Belgium

Jean Claude Legros

Prof. Microgravity
Research Center,
Université Libre de
Bruxelles, Belgium

Gian Piero Celata

Prof. Division of
Advanced Technologies
for Energy and Industry
of ENEA, Rome, Italy

Raffaele Savino

Prof. Università degli Studi
di Napoli "Federico II",
Dipartimento di Ingegneria
Aerospaziale, Italy

Conference organizers

Division of Advanced Technologies for Energy and Industry of ENEA, Rome, Italy
Università degli Studi di Napoli "Federico II", Dipartimento di Ingegneria Aerospaziale, Italy
Heat Transfer Institute of ULB and IT SB RAS, Brussels
Microgravity Research Center, Université Libre de Bruxelles, Brussels
Institute of Thermophysics, SB RAS, Novosibirsk

Conference Scientific Secretary

Dr. Yulia Kabova

Technische Universität Darmstadt, Center of Smart Interfaces, Darmstadt, Germany
Heat Transfer Institute of ULB and IT SB RAS, Russia

Conference objective

The conference is intended to provide a platform for researchers to exchange information and identify research needs in this important area encompassing several engineering, mechanical and physical disciplines.

Topics for the presentations include:

- Experiments in Microgravity
- Boiling, Evaporation and Condensation
- Films, Layers and Interfaces
- Physics of Contact Line and Wetting
- Microchannels and Minichannels
- Thermocapillary flows
- Spray, Jets and Two-Phase Flows
- Bubbles, Drops and Foams
- Electronics Cooling
- Properties of Vapour - Liquid - Solid interfaces

Scientific Committee

- Dr. Yoshiyuki Abe, AIST, Japan
- Prof. Sergey V. Alekseenko, IT, Russia
- Prof. Avram Bar-Cohen, UM, USA
- Prof. Alberto Cavallini, UP, Italy
- Prof. Gian Piero Celata, ENEA, Italy
- Prof. Catherine Colin, IMFT, France
- Prof. Michael Dreyer, ZARM, Germany
- Prof. Alexander M. Frank, ICM, Russia
- Prof. Qiu-Sheng Liu, IM, China
- Prof. Dmitriy Markovich, IT, Russia
- Dr. Olivier Minster, ESA, The Netherlands
- Prof. Haruhiko Ohta, KU, Japan
- Prof. Vladislav V. Pukhnachev, LIH, Russia
- Prof. Peter Stephan, TUD, Germany
- Prof. Lounes Tadrist, IUSTI, France
- Prof. John R. Thome, EPFL, Switzerland
- Prof. Charles A. Ward, UT, Canada
- Prof. Jian-Fu Zhao, IM, China

Website: <http://hti.ulb.ac.be/workshop-11/index.html>

Scientific Programme

25 September, Sunday:

18.00-19.00 Registration

19.00-22.00 Welcome Reception

26 September, Monday:

08.30-09.00 Registration

09.00-09.15 Welcome and Introduction:

Conference Opening Remarks: Oleg Kabov; Jean Claude Legros, Raffaele Savino, Gian Piero Celata

Session- 1: Opening session

Session chairs: Oleg Kabov and Raffaele Savino

09.15-09.35 OPENING LECTURE #1

<u>Sergey Alekseenko</u>	Russian exploration in cosmonautics
--------------------------	-------------------------------------

09.35-09.55 OPENING LECTURE #2

<u>Olivier Minster</u>	Introductory remarks from the European Space Agency
------------------------	---

09.55-10.30 KEYNOTE#1

<u>Haruhiko Ohta</u> , Hitoshi Asano, Osamu Kawanami, Koichi Suzuki, Haruo Kawasaki, Kiyosumi Fujii	Subjects to be Clarified in ISS Experiment of Boiling Two-phase Flow
---	--

10.30-10.55 Coffee Break

Session- 2: Flow Boiling

Session chairs: Peter Stephan and Lounès Tadrist

10.55-11.30 KEYNOTE#2.1

<u>A. Bar-Cohen</u> , J. Sheehan, E. Rahim	Two-Phase Thermal Transport in Microgap Channels – Theory, Experimental Results, and Predictive Relations
--	---

11.30-12.05 KEYNOTE#2.2

<u>Richard Saurel</u>	Toward DNS-like of boiling flows
-----------------------	----------------------------------

12.05-12.25 Oral#1

<u>Laetitia Léal</u> , Marc Miscovic, Pascal Lavielle, François Pigache, Lounès Tadrist	Control of pool boiling incipience in confined space: effect of the dynamic morphing of the wall
---	---

12.25-12.45 Oral#2

Nils Schweizer, <u>Paolo Di Marco</u> , Peter Stephan	Investigation of wall temperature and heat flux distribution during nucleate boiling in the presence of an electric field
---	---

12.45 -13.45 Lunch**Session- 3: Contact line phenomenon**

Session chairs: Dieter Bothe

13.45-14.20 KEYNOTE#3

<u>Pierre Colinet</u> and Alexey Rednikov	A general theory of moving contact lines with phase change
---	--

14:20-14:40 Oral#1

<u>Peter Stephan</u> , Christian Kunkelmann, Khalid Ibrahim, Nils Schweizer, Tatiana Gambaryan-Roisman	The effect of three-phase contact line speed on local evaporative heat transfer: Experimental and numerical investigations
--	---

14:40 -15:30 Session – 4**Short oral presentation of posters ***

Session chairs: Paolo Di Marco, E. A. Chinnov, Valentina Shevtsova and Hitoshi Asano

1	<u>T.P. Lyubimova</u> , Ya. Parshakova	Rotational Vibration Effect On The Onset Of Morphological Instability In The Directional Solidification Of Binary Alloys
2	Stanislav Mingalev, Dmitriy Lyubimov, <u>Tatyana Lyubimova</u>	Dynamics Of Particle Confined Between Two Oscillating Walls
3	Dmitriy Lyubimov, Lyudmila Klimenko	Generation of average flow in a pulsating flow near the curved gas-liquid interface
4	<u>G. Tsyarkin</u> , A. Il'ichev	Gravitational Stability Of Water Over Vapor In Geothermal Reservoirs

5	<u>Hikaru Ishii</u> , Yutaka Abe, Akiko Kaneko, and Koji Hasegawa	Interaction Between Flow Structure And Mass Transport Of An Acoustically Levitated Droplet
6	<u>Ahmed Kaled</u> , Sébastien Dutour , Jean-Louis Joly and Vincent Platel	A Transient Model Of A Capillary Pumped Loop For Ground Applications
7	<u>Georges El Achkar</u> , Marc Miscevic, Pascal Lavieille	Isolated Bubbles Regime In Capillary-Cooling Systems' Condensers: About The Thermal Equilibrium Between Liquid And Vapor
8	<u>Dong-Ming Mo</u> , You-Rong Li, Wan-Yuan Shi and Lan Peng	Linear-Stability Analysis Of Thermocapillary Flow In An Annular Two-Layer System With Upper Rigid Wall
9	<u>Ruquan Liang</u> , Guangdong Duan, Fusheng Yan, Junhong Ji, Masahiro Kawaji	Flow Structure And Surface Deformation Of High Prandtl Number Fluid Under Reduced Gravity And Microgravity
10	<u>Ruquan Liang</u> , Guangdong Duan, Fusheng Yan, Junhong Ji, Masahiro Kawaji	Investigation Of Thermocapillary Convection Of High Prandtl Number Fluid Under Zero Gravity
11	<u>C. Iorio</u> , O. Goncharova, O. Kabov	Decoupling The Thermocapillary And Gravitational Effects In Evaporative Convection: A Numerical Study
12	<u>I. Simanovskii</u> , A. Viviani , F. Dubois , J-C. Legros	The Influence Of The Horizontal Component Of The Temperature Gradient On Nonlinear Oscillatory Convective Regimes In Multilayer System
13	Vasily Salomatov, <u>Vladimir Salomatov</u>	Evaporation Of The Liquid From The Moist Particle
14	<u>Alexey Fedyushkin</u> , Alexey Rozhkov	Investigation Of The Impact And Spreading Of Drops On Solid Surface For Ground And Space Conditions
15	<u>Chen Ma</u> , D. Bothe	Vof-Based Numerical Simulation Of Thermocapillary Flows Using A 2-Scalar Approach For Heat Transfer
16	Peter Canfield, <u>Michael Dreyer</u> , Aleksander Grah and Joerg Klante	Capillary Channel Flows In Microgravity
17	<u>Dmitry Zaitsev</u> , Andrey Semenov, Yuriy Luilin, Oleg Kabov, Yulia Kabova, Chen Ma and Dieter Bothe	Rupture of a liquid film on horizontal and inclined plates under local heating
18	D.Zaitsev, A.Semenov, I.Marchuk, S.Chikov, P.Queeckers, E.Bykovskaya, <u>L.Valdarno</u> , L.Araneo, O.Kabov	The Effect of Gravity on the Dynamics of Contact Line

15.30-16:30 Coffee Break and Poster session

*** One presentation will be recommended by session chairs for the award ceremony**

Participants with posters should be next to their posters during the allocated time indicated on the programme.

Session- 5: Two-phase Systems

Session chairs: Haruhiko Ohta and Pierre Colinet

16.30-17.05 KEYNOTE#5

<u>Eduard Son</u>	Two phase liquid-gas flow with high gas content as the new type of plasma reactor for ground and space applications
-------------------	---

17.05-17.25 Oral#1

A. Nepomnyashchy, <u>I. Simanovskii</u>	The Influence Of The Gravity Force On Longwave Marangoni Patterns In Two-Layer Films
--	--

17:25-17:45 Oral#2

<u>Maria Rosaria Vetrano</u> , Alessia Simonini, Johan Steelant and Patrick Rambaud	Temperature and concentration measurements in a flashing ethanol jet: Application to space propulsion
--	--

17.45-18.05 Oral#3

<u>V. Shevtsova</u> , A.Mialdun, D.Melnikov, Yu.Gaponenko, J-C. Legros	Experimental evidence of heat transfer enhancement by vibrations. Microgravity experiments.
---	--

18:05 – 18:30 Discussion

Day debrief and discussions stimulated by chairs of sessions, **Best Poster Award**

Prof. Qiusheng Liu : conference – 2012 in Beijing, China

18.40 Scientific committee meeting

27 September, Tuesday:

Session- 6: Liquid films

Session chairs: Qiusheng Liu and Sergey Alekseenko

09.00-09.35 KEYNOTE#6

<u>Ya-Pu Zhao</u>	Precursor film in electrowetting and precursor chain in wetting of an interior corner for nano droplets
-------------------	---

9:35 -09:55 Oral#1

<u>W. Rohlf</u> s, G. F. Dietze, H. D. Haustein, V. V. Lel and R. Kneer	Experimental investigation of 3-dimensional wavy liquid films under the influence of electrostatic forces
---	---

09:55-10:15 Oral#2

<u>V. Ajaev</u> , E. Gatapova, O. Kabov	Stability of thin liquid films on structured substrates
---	---

10:15-10:35 Oral#3

Hao Hou, Qincheng Bi	Measurement of falling film thickness around a horizontal tube by a conductance probe technique
----------------------	---

10.35-11.00 Coffee Break

Session- 7: Two-phase flows

Session chairs: Avram Bar-Cohen and Tatyana Lyubimova

11.00-11:20 Oral#1

<u>S. Alekseenko</u> , A.Cherdantsev and D.Markovich	On three-dimensional structure and interaction of primary and secondary waves in annular gas-liquid flow at low liquid flow rates
--	---

11.20-11:40 Oral#2

E. Da Riva and <u>D. Del Col</u>	Effect of gravity during condensation of R134a in a circular minichannel
----------------------------------	--

11:40 -12:00 Oral#3

<u>Viktoriya Bekezhanova</u> and Oleg Kabov	Instability Of The Joint Flow Of Liquid Film And Co-Current Gas Flow: Theory And Experiment
---	---

12:00-12:20 Oral#4

<u>Osamu Kawanami</u> , Tatsuya Hamada, Kenji Saruwatari, Soumei Baba, Yuto Wada, Hitoshi Asano, Yuuki Kanai, Yasuhisa Shinmoto and Haruhiko Ohta	Parabolic Flight Experiment of Flow Boiling in Transparent Heated Tube
---	--

12:20-12:40 Oral#5

Z.Zhang, X.-H.Sun, G.-N. Tong, Z.-C.Huang, Z.-H.He, A. Pauw, J. van Es, E. Laudy, R.Battiston, and B. Verlaat	Performance of Active-pumped Two-phase CO2 Loops for the AMS-02 Tracker Thermal Control in Thermal Vacuum Tests
---	---

*12.40 Joint conference photo***12.50 -13.50 Lunch****Session- 8: Experiments in Microgravity**

Session chairs: Koichi Suzuki and Gian Piero Celata

13:50-14.25 KEYNOTE#8.1

<u>Haruo Kawasaki</u>	Experimented Two-Phase loop system for thermal control system in JAXA
-----------------------	---

14:25 - 15:00 KEYNOTE#8.2

<u>Vijay Dhir</u>	Nucleate Pool Boiling Experiments (NPBX) on the International Space Station
-------------------	---

15:00 -15:20 Oral#1

Valentin Solotych, Eric Kommer, Channing Tsai, Tae Hoon Kim, Serguei Dessiatoun, and <u>Jungho Kim</u>	IR Based Flow Boiling Heat Transfer Measurements in Earth Gravity and Low-G
--	---

15:20-16:00 Session – 9**Short oral presentation of posters***

Session chairs: Eduard Son, Ilia Simanovskii, Olga Goncharova and Davide Del Col

1	<u>Hai-Trieu Phan</u> , Sébastien Dutour, Vincent Platel and Amaury LarueDeTournemine	Analytical Model For Liquid-Vapour Distribution In A Loop-Heat-Pipe Evaporator
---	---	--

2	<u>S. Filippeschi</u> , A. Franco	Thermal Performances Of Flexible Low Bond Number Loop Two Phase Thermosyphons
3	<u>Yu. Gaponenko</u> , V. Shevtsova	Numerical Simulation Of Heat Transfer Across Fluidic Interfaces In Liquid Bridge
4	Eduardo Aktinol, <u>Vijay Dhir</u>	Numerical Simulation Of Nucleate Boiling Coupled With The Thermal Response Of The Solid
5	Yanfeng Fan, <u>Ibrahim Hassan</u>	The effect of orifice on flow boiling instability in a single horizontal microtube
6	Haruo Kawasaki, Kiyosumi Fujii, Kenichiro Sawada, Takashi Sakai, Soumei Baba, Yasuhisa Shinmoto, Hitoshi Asano, Osamu Kawanami, Koichi Suzuki, Haruhiko Ohta	Equilibrium Estimation Of The Ground Test Loop System For Interfacial Behaviors And Heat Transfer Characteristics In Boiling Two-Phase Flow (Tpf)
7	<u>C. Albert</u> , D. Bothe	Influence Of Surface Tension Models On The Hydrodynamics Of Falling Films In Volume Of Fluid-Simulations
8	<u>D. Mikaelian</u> , P. Colinet	Contribution To The Rigorous 3D Thermo-Hydraulic Modeling Of Grooved Micro Heat Pipes
9	<u>Olaf Schoele-Schulz</u> , Nils Schweizer, Gerold Picker, Hans Ranebo, Jan Dettmann, Olivier Minster, Balázs Tóth, Josef Winter, Christer Fuglesang	Latest Developments Of The Reference Multiscale Boiling Investigation Experiment For The International Space Station
10	<u>A.S. Ovcharova</u>	Features Of The Rupture Of Liquid Film Due The Action Of Thermal Load Under Microgravity Conditions. The Role Of The Prandtl Number
11	<u>Victor K. Andreev</u>	The Motion Of Two Viscous Heat Conducting Liquids In A Cylindrical Pipe
12	<u>Olga Lavrenteva</u> , Irina Smagin and Avinoam Nir	Slow Sedimentation Of Viscoplastic Double Emulsion Drops In A Newtonian Fluid
13	<u>E. A. Chinnov</u> , E. N. Shatskii and O. A. Kabov	Interaction Of Thermocapillary And Wave Instabilities In Heated Falling Liquid Film
14	<u>Balázs Tóth</u> et al	Future ESA Experiments In Heat And Mass Transfer Research Onboard The International Space Station

16.00-16:45 Coffee Break and Poster session

*** One presentation will be recommended by session chairs for the award ceremony**
Participants with posters should be next to their posters during the allocated time indicated on the programme.

Session- 10: Pool Boiling

Session chairs: Jungho Kim and Yutaka Abe

16:45-17:05 Oral#1

Mohamed Zamoum, <u>Lounès Tadriss</u> , Ouamar Rahli, Mohand Kessal, Hervé Combeau	Experimental study of the heat transfers in nucleate boiling: influence of the gravity level
---	---

17:05 -17:25 Oral#2

<u>Yan-Fang Xue</u> , Jian-Fu Zhao , Jin-Jia Wei, Jing Li and Dong Guo	Experimental Study of Pool Boiling of FC-72 Over Smooth Surface Under Microgravity
--	---

17.25-17.45 Oral#3

<u>Kiyosumi Fujii</u> , Haruo Kawasaki and Haruhiko Ohta	Recent Progress in JAXA Official Project of Boiling Two-Phase Flow Experiment onboard ISS
--	--

17.45-18.05 Oral#4

<u>Koichi Suzuki</u> , Kazuhisa Yuki and Haruhiko Ohta	Heat Transfer Enhancement in Subcooled Boiling with Wetting Surface
---	---

18:05 – 18:35 Discussion

Day debrief and discussions stimulated by chairs of sessions, [Best Poster Award](#)

19:00 Conference Dinner

28 September, Wednesday:

Session- 11: Bubbles, Drops, Foams

Session chairs: Catherine Colin and Marc Miscevic

09.00-09.35 KEYNOTE#11

<u>Ueno I.</u> , Nishino K., Kawamura H., Ohnishi M. , Matsumoto S.	Non-linear thermocapillary convection in half-zone liquid bridge - on-orbit experiments on Kibo aboard the ISS
---	--

09.35-9.55 Oral#1

<u>Pau Bitlloch</u> , Xavier Ruiz, Laureano Ramírez-Piscina and Jaume Casademunt	Interaction between bubbles and turbulence in monodisperse suspensions. Drop tower experiments
---	---

9:55 -10:15 Oral#2

<u>Michael Conrath</u> and Michael Dreyer	The Dynamic Bubble Point
--	--------------------------

10:15-10:35 Oral#3

<u>T.P. Lyubimova</u> , D.V. Lyubimov, B.S. Maryshev	The Effect Of Particle Sticking To Solid Matrix On A Stability Of A Diffusion Front In Porous Medium
--	--

10.35-11.00 Coffee Break

Session- 12: Heat Transfer Enhancement

Session chairs: Vladimir Ajaev and Ya-Pu Zhao

11.00-11.35 KEYNOTE#12

<u>J. J. Wei</u> J. F. Zhao, Y. F. Xue and J. Li	Enhanced Boiling Heat Transfer in Microgravity by Using Micro-Pin-Finned Surfaces
--	---

11.35-11.55 Oral#1

<u>Vadim Nikolayev</u> , Fabien Bonnet, Philippe Gully	New approach to the studies of the Pulsating Heat Pipes
---	---

11:55 -12:15 Oral#2

<u>A. Chatterjee</u> , P.C. Wayner, Jr., <u>J.L. Plawsky</u> , David F. Chao , Ronald J. Sicker, Tibor Lorik, Louis Chestney, John Eustace, Raymond Margie, John Zoldak	The CVB Experiment – Constrained Bubble Nucleation in Microgravity
---	--

12:15 -12:35 Oral#3

<u>Kobayashi Hiroyuki</u> , Yuka Asada, Shouhei Kanazawa, Yasuhisa Shinmoto, Haruhiko Ohta, Masato Fukagaya, Yoshiyuki Abe, Mayumi Ouchi, Masahide Sato and Ken-ichi Iimura	Development of High Efficient Heat Transport System for Electronics Devices by Using Flow Boiling
--	--

12.35 -13.45 Lunch**13:45 -14:45 Session – 13****Short oral presentation of posters***

Session chairs: Vijay Dhir, Vadim Nikolayev, Yoshiyuki Abe and Michael Dreyer

1	<u>E. De Malmazet</u> , C. Colin	Flow Boiling In Straight Tubes In Microgravity
2	<u>Fabio Peluso</u> , Francesco Pezzuti, Salvatore Sorrentino	Non-Wetting Drops As Friction-Less Suspensions For Space Application
3	<u>Hitoshi Asano</u> , Yuuki Kanai, Soumei Baba, Yuto Wada, Yasuhisa Shinmoto, Haruhiko Ohta, Tatsuya Hamada, Kenji Saruwatari, Osamu Kawanami, Kiyosumi Fujii	Effect Of Gravity On One-Component Two-Phase Flow Characteristics During Parabolic Trajectory Flight
4	<u>Aleksey Doludenko</u> and Eduard Son	Rayleigh-Taylor Instability Of Newtonian And Viscoplastic Fluids In Microgravity
5	<u>Alexandr Nazarov</u> , Anatoly Serov and Victor Terekhov	Features Of Heat Transfer In The Pulse Spray
6	<u>Soumei Baba</u> , Yuto Wada, Osamu Kawanami, Tatsuya Hamada, Kenji Saruwatari, Hitoshi Asano, Yuuki Kanai, Yasuhisa Shinmoto and Haruhiko Ohta	Experiments Of Flow Boiling Heat Transfer In Microgravity By Using Parabolic Flight
7	<u>Olga N. Goncharova</u> , Carlo S. Iorio, Oleg A. Kabov	Mathematical Modeling Of The Convective Flows With Interfaces
8	<u>John McQuillen</u> and Brian Motil	NASA's Fluid Physics Program: Studies In The Early Stages Of Development

9	<u>Yu. Kabova, V.V.</u> Kuznetsov, O.A. Kabov, T. Gambaryan-Roisman, P. Stephan	Evaporation of A Thin Liquid Film in a Microchannel
10	Wang-Fang Du, Jian-Fu Zhao	Evaporating-Freezing Phenomena Of Water Droplets During Quick Depressurization
11	Bo Lan, You-Rong Li, Dong-Ming Mo and <u>Deng-Fang Ruan</u>	Numerical Simulation Of Thermocapillary Flow Induced By Non-Uniform Evaporating On The Meniscus In Capillary Tubes
12	Mebrouk Ait Saada, Salah Chikh, Lounès Tadrist	Evaporation Of A Water Drop On An Extended Or Narrowed Heating Surface
13	A.A. Dekterev, <u>A.A.</u> <u>Dekterev</u> , A.A. Gavrilov	Modeling Of Vortex Precession In Water-Air Flow
14	Andrey Gavrilov, <u>Alexander Dekterev</u>	Detached Eddy Simulation Of Cloud Cavitation On A NACA0015 Hydrofoil
15	<u>Andrey V. Minakov</u> , Valery Ya. Rudyak, Andrey A. Gavrilov, Alexander A. Dekterev	Turbulent Flow In The T - Shaped Microchannel
16	Qiaoling Zhang, Qincheng Bi, Jiangbo Wu	Experimental Investigation On Rapid Evaporation Of R-113 Liquid During Depressurization
17	Mehrrad Saadatmand, Masahiro Kawaji, and Howard H. Hu	Vibration-Induced Attraction Of A Particle Towards A Wall In Microgravity – The Mechanism Of Attraction Force
18	Lixi Zhang, Fangchao Han and Shiyuan Gao	Visual Experiment Researches For Bubbling Process In Water
19	Lixi Zhang, Wenbin Chen and Hefei Zhang	Analysis The Change Of Parameters In Bubbling Humidifier

14.45-15:45 Coffee Break and Poster session

*** One presentation will be recommended by session chairs for the award ceremony**

Participants with posters should be next to their posters during the allocated time indicated on the programme.

Session- 14: Capillary Flows

Session chairs: Jean-Claude Legros and John Thome

15.45-16.20 KEYNOTE#14

<u>Michael Dreyer</u> , Aleksander Grah, Joerg Klatte and Peter Canfield	<p style="text-align: center;">Capillary Channel Flow The CCF experiment on the International Space Station</p>
--	---

16:20-16:40 Oral#1

<p><u>Daniele Mirabile Gattia,</u> Raffaele Savino, Roberto Di Paola, Renzo Marazzi, Marco Vittori Antisari</p>	<p>Nanofluids with self-wetting behaviour for space and terrestrial heat pipes</p>
---	--

16:40 -17:00 Oral#2

<p>Rong Liu, Qiu-Sheng Liu</p>	<p>Analysis of ‘Surface Thermal Capacity’ Effects on Marangoni Instability of Evaporating Thin Liquid Layers</p>
--------------------------------	--

17.00-18.00 Final Discussion, Closing ceremony, Organizers Award and Best Poster Award
Moderators: Oleg Kabov; Jean Claude Legros, Raffaele Savino, Gian Piero Celata