



Science and Technology of Heat Pipes

Historical Perspective to Contemporary Developments

Proceedings
of the



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Celebrating



of IHPC Series

PROCEEDINGS OF THE 17TH INTERNATIONAL HEAT PIPE CONFERENCE

EDITOR: SAMEER KHANDEKAR

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PROCEEDINGS OF THE 17TH INTERNATIONAL HEAT PIPE CONFERENCE

TABLE OF CONTENTS

KEYNOTE LECTURES		Page
KN1	Heat Pipe Science and Technology: A Historical Review <i>Manfred Groll</i>	1
KN2	India Indian Space Mission and Advanced Heat Pipe Technologies <i>N. Prahalad Rao</i> (on request from the author, not included in the proceedings)	-
KN3	Oscillating Menisci and Liquid Films at Evaporation/Condensation <i>Vadim Nikolayev and Senthilkumar Sundaraj</i>	59
KN4	Heat Pipes: Evolution of Endless Application Opportunities <i>Masataka Mochizuki and T. Nguyen</i>	69
SECTION 1: Heat Pipe Fundamentals and Transport Phenomena		
1	Motion of an Isolated Liquid Plug Inside a Dry Circular Capillary <i>Vyas Srinivasan and Sameer Khandekar</i>	79
2	Thermally Induced Two-Phase Oscillating Flow in a Capillary Tube: Experimental Investigations <i>Manoj Rao, Frédéric Lefèvre, Jocelyn Bonjour and Sameer Khandekar</i>	87
3	Investigation of Entrainment Through Folded Porous Metallic Mesh Screens <i>Karthik Remella Siva Rama, Frank Gerner and Ahmed Shuja</i>	95
4	Infrared Thermography of Pulsating Taylor Bubble Train Flow in a Mini-Channel <i>Balkrishna Mehta and Sameer Khandekar</i>	103
5	Enhancement of Two-Phase Boiling by Carbon Nanotube Forests <i>Jean Antoine Gruss, Rémi Bertossi, Nadia Caney, Jean Dijon, Adeline Fournier and Philippe Marty</i>	111
SECTION 2: Conventional Heat Pipes, Thermosyphons and Special Passive-Structures		
6	Contribution of Fourier Series Expansion to Conventional Heat Pipe Modeling: Towards a Universal Analytical Model <i>Stéphane Lips and Frederic Lefevre</i>	121
7	Development of Aluminum-Water Heat Pipes <i>Masahiro Kuroda, Je-Young Chang, Paul Gwin, Rajiv Mongia, Choong-Un Kim, Gerald Cabusao, Kazuhiko Goto and Masataka Mochizuki</i>	129
8	Experimental Study of a Two-Phase Closed Thermosyphon Charged with an Immiscible Mixture <i>Julia Fransozi Carneiro, Kênia W. Milanez, Fernando Henrique Milanese and Márcia B. H. Mantelli</i>	137
9	Polymer Flat Loop Thermosyphons <i>L. P. Grakovich, M. L. Rabetsky, L. L. Vasiliev, L. L. Vasiliev Jr., S. P. Bogdanovich and S. S. Pesetskii</i>	145
10	Design of High Temperature Heat Pipes and Thermosyphons for Compact High Temperature Reactor (CHTR) <i>Abhishek Basak, I.V. Dulera and P. K. Vijayan</i>	153
11	Visual Study of Fluid Dynamics in Wickless Transparent Heat Pipes <i>Kate Smith, Samuel Siedel, Anthony Robinson and Roger Kempers</i>	161
12	Experimental Analysis of the Instabilities Effect on the Thermal Performance of a Closed Loop Two-Phase Thermosyphon <i>Sauro Filippeschi and Alessandro Franco</i>	169
13	Development and Test of a "Two-Phase" Structure <i>C. Figus, M. Pauilhiac, S. Arnaud, C. Flemin, T. Bertheleon and A. Larue de Tournemine</i>	177
14	Experimental and Theoretical Analysis of Flow and Heat Transfer Within Grooved Flat Miniature Heat Pipes <i>Jed Mansouri, Samah Maalej and Mohamed Chaker Zaghdoudi</i>	185

15	Conditions of Working Ability of Pulsating Pump of Heat Action <i>Natalia Savchenkova and Vladimir Sasin</i>	193
16	Experimental and Theoretical Investigation of a Loop Heat Pipe/Thermosyphon Behavior in a Heat Recovery System Application <i>Yaser Mollaei Barzi and Mohsen Assadi</i>	199
17	Experimental Analysis of Thermophysical and Mechanical Characteristics of AlSiCp Metal Matrix Composite <i>Purna Chandra Mishra, Manoj Ukamanal, Manasee Mishra and Susant Sahu</i>	207
18	Thermal Network Model for Device in Flat Heat Pipe Assisted Heat Sink <i>S. Kesav Kumar and S. N. Sridhara</i>	213
19	Investigation of Thermogravity/Thermocapillary Effects in Rotating Heat Pipes: Prediction of Instabilities at the Liquid Film <i>Adel Benselama, Cyril Romestant, Yves Bertin and Vincent Aye</i>	221
20	Investigation of Thermosyphon Performance with Changing Adiabatic Section Geometry <i>Kate Smith, Samuel Siedel, Anthony Robinson and Roger Kempers</i>	231
21	Thermal Performance of Re-Entrant Groove Heat Pipe: Dependence on Orientation and Temperature <i>Yasuko Shibano and Hiroyuki Ogawa</i>	237
22	Electrical Force Effect on a Capillary Loop Two-Phase Thermosyphon <i>P. Di Marco and S. Filippeschi</i>	245
23	Precise Differential Mechanism, Sodium Charging Equipment and Heat Pipe Performance <i>Wei Qu, Ai Bangcheng and Yu Jijun</i>	253
SECTION 3: Loop Heat Pipes and Capillary Pumped Loops		
24	Transient Modeling of CPL for Terrestrial Application, Part A: Network Concept and Influence of Gravity on the CPL Behavior <i>Nicolas Blet, Vincent Aye, Yves Bertin, Cyril Romestant and Vincent Platel</i>	263
25	Transient Modeling of CPL for Terrestrial Application, Part B: Reservoir Modeling Improvement <i>Nicolas Blet, Vincent Aye, Yves Bertin, Cyril Romestant and Vincent Platel</i>	271
26	Steady-State Analytical Model of a Loop Heat Pipe <i>Benjamin Siedel, Valérie Sartre and Frédéric Lefèvre</i>	279
27	Experimental Comparison of Loop Heat Pipe Performance with Various Evaporator Designs <i>S. Ouenzerfi, T. Barreateau, C. Petit, V. Sartre, J. Bonjour, R. Hodot and C. Sarno</i>	287
28	Evaporator Heat-Transfer Analysis of a Loop Heat Pipe with Low Thermal Conductivity Wicks <i>Masahito Nishikawara, Hosei Nagano and M. Prat</i>	295
29	Experimental Investigations of a CPL Pressurized with NCG Inside a Centrifuge up to 10 G <i>Vincent Dupont, Jean-Claude Legros, Stéphane Van Oost and Laurent Barremaecker</i>	303
30	Railways Qualification Tests of a Capillary Pumped Loop on a Train <i>Vincent Dupont, Stéphane Van Oost, Laurent Barremaecker and Sébastien Nicolau</i>	311
31	Development and Investigation of an Improved LHP-PHP Heat-Transfer System <i>V. G. Pastukhov and Yu. F. Maydanik</i>	319
32	Research on Operating Parameters of Copper-Water Loop Heat Pipes with Flat Evaporator <i>M. A. Chernysheva, S. I. Yushakova and Yu. F. Maydanik</i>	327
33	3D Modeling and Optimization of a Loop Heat Pipe Evaporator <i>Romain Hodot, Valérie Sartre, Frédéric Lefèvre and Claude Sarno</i>	335
34	Dynamic Model of Phase Change in the CPL Evaporator <i>Riadh Boubaker, Vincent Platel and Sebastien Nicolau</i>	343
35	Measurement of Thermal Conductivity, Pore-Size, Permeability and Coefficient of Thermal Expansion of Porous Nickel Wick for LHPS <i>Arpana Prasad, A. R. Anand, Raghavendra Kumar, V. Ramakrishnan, Amrit Ambirajan, Dinesh Kumar and Pradip Dutta</i>	351

SECTION 4: Pulsating/Oscillating Heat Pipes		
36	Infrared Thermography of a Closed Loop Pulsating Heat Pipe <i>V. K. Karthikeyan, Sameer Khandekar and B. C. Pillai</i>	361
37	Evaluation of the Vapor Thermodynamic State in PHP <i>Philippe Gully, Fabien Bonnet, Vadim Nikolayev, Nicolas Luchier and Trung Quan Tran</i>	369
38	Visualization of Flow Patterns in Flat Plate Pulsating Heat Pipe: Influence of Hydraulic Behaviour on Thermal Performances <i>Vincent Ayel, Cyril Romestant, Yves Bertin, Vincenzo Manno and Sauro Filippeschi</i>	377
39	On the Relevance of Local IR Visualization on Tube Walls of Pulsating Heat Pipes: A Modeling Investigation <i>Nicolas Chauris, Jean-François Bonnenfant, Vincent Ayel, Yves Bertin and Cyril Romestant</i>	385
40	Experimental Investigation of Closed Loop Pulsating Heat Pipe Using Ammonia Fluid: Effect of Inclination <i>Zhihu Xue, Minghui Xie, Wei Qu, Jijun Yu and Wei Li</i>	393
41	An Experimental Investigation on the Performance of Closed Loop Pulsating Heat Pipe <i>Nandan Saha, P. K. Sharma and P. K. Das</i>	401
42	Multi-Parametric Investigation on the Thermal Instability of a Closed Loop Pulsating Heat Pipe <i>Mauro Marneli, Marco Marengo, Sauro Filippeschi and Vincenzo Manno</i>	409
43	Heat Transfer Performance of Oscillating Heat Pipe by Difference of Surface Characteristics <i>Hiroki Nagai, Takamu Kanayama and Takuro Daimaru</i>	417
44	Visualization of Oscillating Heat Pipe under Microgravity <i>Naoko Iwata, Hiroyuki Ogawa, Yoshiro Miyazaki and Seisuke Fukuda</i>	425
45	Numerical Analysis of Performance of Closed-Loop Pulsating Heat Pipe <i>Ashutosh Singh, Ashok Satapathy and Pooja Jhunjhunwala</i>	433
46	Thermal Performance of Closed Loop Pulsating Heat Pipe: An Experimental Study with Visualization <i>Pramod Pachghare and Ashish Mahalle</i>	441
47	Heat Transfer Studies in a Closed Loop Pulsating Heat Pipe <i>Bhawna Verma, V. L. Yadav and K. K. Srivastava</i>	449
48	New Approach to Two-Phase Loop Cooling Applications for High Density Power Computing Hardware <i>Jeehoon Choi, Byungho Sung, Yunkeun Lee, Minwhan Seo, Xuan Hung Nguyen and Chulju Kim</i>	457
49	Ethane Two-Phase Thermal Control Hardware (HP, LHP) for Cryogenics Applications <i>E. Turrión, J. Meléndez, D. Mishkinis and A. Torres</i>	465
50	Performance Characteristics of Flat Plate Pulsating Heat Pipes with Mini- and Micro-channels <i>Dong Soo Jang, Eun-Ji Lee and Yongchan Kim</i>	473
SECTION 5: Space and Aerospace Applications (MHP/LHP/CPL)		
51	Experimental Study on Start-Up Behavior of Miniature Loop Heat Pipe Considering Effect of Gravity <i>Hiroki Nagai, Hiromichi Tamamura, Hosei Nagano and Hiroyuki Ogawa</i>	483
52	Effect of Working Fluid on 3-Port CPL Performance: An Experimental Investigation <i>Abhijit A. Adoni, Amrit Ambirajan, Jasvanth V. S., Dinesh Kumar and Pradip Dutta</i>	491
53	Performance Analysis and Bubble Visualization within the Evaporator of a Loop Heat Pipe <i>Saleem M Basha, Lalit K Bansal, Saptarshi Basu and Amrit Ambirajan</i>	499
54	Grooved and Self-Venting Arterial Heat Pipes for Space Fission Power Systems <i>Kara Walker, Calin Tarau and William Anderson</i>	507
55	The Application of High Temperature Heat Pipe Technique on Hypersonic Vehicle Thermal Protection <i>Siyuan Chen, Bangcheng Ai, Jijun Yu and Wei Qu</i>	515
56	Mini Heat Pipes Experiments Under Microgravity Conditions. What Have We Learned? <i>Kleber Paiva, Marcia Mantelli, Juan Pablo Florez and Gustavo Nuernberg</i>	521
57	Application of Flat Plate Heat Pipe for Cooling Spacecraft Electronics <i>D. R. Veerasha, Ch. Simhachal Rao, M. K. Shailandran, S. G. Barve, Dinesh Kumar and Anand Kumar Sharma</i>	531

58	10 Years Experience of Operation of Loop Heat Pipes Mounted on Board "YAMAL-200" Satellite <i>K. Goncharov, A. Golikov, A. Basov, A. Elchin, Yu. Prochorov and B. Ovchinnikov</i>	539
59	Initial Evaluation of On-Orbit Experiment of Flat-Plate Heat Pipe <i>Atsushi Okamoto, Makiko Ando and Hiroyuki Sugita</i>	547
60	Application of Heat Pipes in Satellites <i>Kamlesh Kumar Baraya</i>	555
61	Optimization of Heat Pipe Panel for Communication Spacecraft <i>D. R. Veerasha, M. K. Shailandran, Ch. Rama Kishore, S. G. Barve, Dinesh Kumar and Anand Kumar Sharma</i>	563
62	Experience of Space Application of Axial Groove Heat Pipes with Ω -Shape Grooves <i>K. Goncharov, V. Antonov and Y. Vinokurov</i>	571
SECTION 6: Terrestrial Applications of Heat Pipes		
63	Transient Heat Transfer Characteristics of Inclined Loop- Thermosyphon-Type Heat Pipe for Solar Collector with Changing Input Solar Heat Flux <i>Shigeki Hirasawa, Shota Sato, Tsuyoshi Kawanami and Katsuaki Shirai</i>	581
64	Air-to-Air Thermosyphon Heat Exchanger for Cabinet Cooling <i>Mathieu Habert and Bruno Agostini</i>	589
65	Ultra-Thin High Performance Heat Pipe for Thin and Light Portable Computing Devices <i>Masataka Mochizuki, Thang Nguyen, Koichi Mashiko, Yuji Saito, Shahed Ahamed, Randeep Singh and Thanh Long Phan</i>	597
66	Experimental Study of a Loop Heat Pipe System for Automotive Exhaust Gas Heat Recovery <i>Benjamin Reul, Tobias Döpmeier and Peter Stephan</i>	603
67	Loop Heat Pipe Applications in Automotive Thermal Control <i>Randeep Singh, Masataka Mochizuki, Yuji Saito, Tadao Yamada, Thang Nguyen, Tien Nguyen and Aliakbar Akbarzadeh</i>	611
68	U-Shaped Heat Pipe Heat Exchanger for Air-Conditioning Application <i>Amit Sharma, Sanjeev Jain and Subhash C. Kaushik</i>	619
69	Evaporator Using Heat Pipe Heat Exchanger for a Heat Recovery System <i>Luis Alonso Betancur Arboleda and Farid Chejne Janna</i>	627
70	Cooling of a Concentrated Photovoltaic Cell Using Heat Pipes <i>Joon Hong Boo, Jae Hyuk Shin, Seung Shin Yi and Sang Min Kim</i>	639
71	Feasibility Study on the Thermal Management of Inductive Distance Sensors by a Heat Pipe Cooling System <i>Rudi Kulenovic, Rainer Mertz and Steven Hartmann</i>	647
72	Development of a Heat Flux Sensor Based on Heat Pipe as Thermal Sink <i>A. Brusly Solomon, H. Gavisiddayya, K. Ramachandran, Pavan K. Sharma and B. C. Pillai</i>	655
73	Performance Enhancement of Two Phase Thermosyphon Solar Water Heater Using Surfactant <i>Sandesh Chougule, Santosh Kumar Sahu and Ashok Pise</i>	663
74	Development of Conveyor Belt Baking Ovens Assisted by Two-Phase Thermosyphon Technology <i>Kénia Warmling Milanez, Fernando H. Milanez and Marcia B. H. Mantelli</i>	673
75	An Experimental Investigation of Phase Change Material (PCM) for Heat Management of Instruments <i>Pankaj Srivastava, J. K. Bajpai, A. K. Sahani and Sameer Khandekar</i>	681
76	Thermal Performance of a High-Temperature Solar Absorber Embedded with Liquid Metal Heat Pipes <i>Seung Shin Yi, Sang Min Kim, Yong Heak Kang and Joon Hong Boo</i>	689
	Appendix A1 – A7	697
	Author Index	709
	Subject Index	719
	Sponsor Poster: Industrial Manufacturing of Porous Media and Loop Heat Pipe (Sponsor Poster) <i>Thomas Albertin, Jerome Coulloux and Maxime Louchart</i>	722

Foreword

International Heat Pipe Conferences (IHPC) series started in the year 1973, at Stuttgart, Germany, with specific focus on topics related to science, technology and applications of heat pipes, thermosyphons and related passive phase-change heat transfer devices/systems. The historical timeline of the conference is summarized below:

#	Location	Year
1st IHPC	Stuttgart, Germany	1973
2nd IHPC	Bologna, Italy	1976
3rd IHPC	Palo Alto, USA	1978
4th IHPC	London, UK	1981
5th IHPC	Tsukuba, Japan	1984
6th IHPC	Grenoble, France	1987
7th IHPC	Minsk, Belarus	1990
8th IHPC	Beijing, China	1992
9th IHPC	Albuquerque, USA	1995
10th IHPC	Stuttgart, Germany	1997
11th IHPC	Tokyo, Japan	1999
12th IHPC	Moscow, Russia	2002
13th IHPC	Shanghai, China	2004
14th IHPC	Florianopolis, Brazil	2007
15th IHPC	Clemson, USA	2010
16th IHPC	Lyon, France	2012
17th IHPC at Kanpur, India in 2013 Celebrating the Jubilee: 40 years of the IHPC series		

The last forty years have seen phenomenal technological growth and market penetration of heat pipe systems. The past 16 uninterrupted IHPC editions have diligently reflected this extraordinary progress. Today IHP conferences are the established primary knowledge repository of this art.

Commemorating forty years of successful organization of the International Heat Pipe Conference series, the 17th jubilee edition was held in the campus of Indian Institute of Technology Kanpur, Kanpur (UP), India, during October 13 to 17, 2013 (www.iitk.ac.in/ihpc17). The conference was organized by the Department of Mechanical Engineering, Indian Institute of Technology Kanpur, under the coordination of the Committee on International Heat Pipe Conferences and the local/national organization and advisory committees. The aim of the conference was to bring together experts, students, practicing engineers and industry representatives from across the world

on a common platform to share state-of-the-art information, experiences and latest developments on the science and technology of all kinds of heat pipes and passive phase-change devices and thermal systems. The main topics covered in the conference were:

- Fundamental studies on thermal and fluid-dynamic phenomena associated with passive heat pipes and closed two-phase thermosyphons, CPLs, LHPs, oscillating heat pipes, mini/micro- heat pipes, etc.
- Theoretical and experimental studies on thermosyphons and heat pipes including CPL, LHP, oscillating heat pipes, mini/micro-heat pipes, etc.
- Heat pipe and thermosyphon application in various industries, including passive heat removal, heat pipe heat exchangers, heat regenerators, vapor generators, renewable and new energy systems, etc.
- Microelectronics and power electronics thermal control applications.
- Aerospace applications of heat pipes, including spacecraft thermal control, space power systems, space experiments and high speed aircraft applications.
- Applications in manufacturing process and material processing, including new developments of wicks, fluids, materials, modeling of corrosion and life tests.
- State-of-art of heat pipe development in different countries and different fields and new ideas of heat pipe development.

It was our pleasure to welcome 130 participants from 21 countries to the campus of Indian Institute of Technology Kanpur, Kanpur, India, to participate in the jubilee conference. Now, with this publication, the deliberations of the conference will be preserved for posterity. We hope that the readers will find this publication highly useful, not only to understand and appreciate the contemporary developments through the presented papers, but also to note the seminal contributions of ‘heat pipers’ in thermal management of critical engineering systems and components, throughout the rich history of its development and applications.

We heartily thank the entire local as well as the international organization committee, all the sponsors, Keynote lecturers, several anonymous reviewers, participants, well-wishers and student volunteers from IIT Kanpur, without whose support organization of this event was not possible. Special thanks are also due to the entire administration of IIT Kanpur, for providing us an exemplary and memorable experience throughout our stay at the campus.



Yuri Maydanik
President
Committee on International Heat Pipe Conferences



Sameer Khandekar
Convener
17th IHPC