International Conference
IX Minsk International Seminar

Heat Pipes, Heat Pumps, Refrigerators, Power Sources

September 7–10, 2015

Minsk, Belarus

http://minskheatpipes.org/

PRELIMINARY PROGRAM

National Academy of Sciences of Belarus

A.V. Luikov Heat & Mass Transfer Institute

NIS Scientific Association "Heat Pipes"

Belarusian National Technical University

International Centre for Heat and Mass Transfer

LG Electronics

Belarusian Republican Foundation for Fundamental Research

TAIS Ltd.

THERCON-LHP Ltd

Organizers

National Academy of Sciences of Belarus
Luikov Heat & Mass Transfer Institute
NIS Scientific Association "Heat Pipes"
Belarusian National Technical University

Sponsors

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WORKING SCHEDULE

of the Conference "IX International Minsk Seminar "Heat Pipes, Heat Pumps, Refrigerators, Power Sources"

September 7, Monday	
From 8:00	Registration of participants
9:30 – 10:30	Opening Ceremony
10:30 – 13:00	Session 1
13:00 – 14:00	*Lunch-break*
14:00 – 18:00	Session 2
16:00 – 16:20	*Coffee-break*
16:20 – 18:20	Session 2 (continuation)
19:00	*Welcome Party*
September 8, Tuesday	
9:00 – 13:00	Session 3
11:20 – 11:40	*Coffee-break*
11:40 – 13:00	Session 3 (continuation)
13:00 – 14:00	*Lunch-break*
14:00 – 18:40	Session 4
19:00	*Banquet**
September 9, Wednesday	
9:00 – 11:20	Session 5
11:20 – 11:40	*Coffee-break*
11:40 – 13:00	Session 6
13:00 – 14:00	*Lunch-break*
14:00 – 15:00	Posters Session
19:00	*Cultural Program*
September 10, Thursday	
9:00 – 13:00	Session 7
11:20 – 11:40	*Coffee-break*
11:40 – 13:00	Session 7 (continuation)
13:00 – 14:00	*Lunch-break*
14:00 – 18:00	Session 8
16:00 – 16:20	*Coffee-break*
16:30 – 17:40	Session 8 (continuation)
18:00 – 19:00	Closing Ceremony

Time: keynote lecture – **40 minutes**, paper presentation – **20 minutes**, including a discussion.

Ladies program includes Minsk sightseeing excursion, visits to the National Art Museum, Central Botanical Garden and National Souvenirs Shop.

***The cost of the Conference banquet** *will be announced at registration*

PROGRAM OF THE INTERNATIONAL CONFERENCE
"IX Minsk International Seminar
Heat Pipes, Heat Pumps, Refrigerators, Power Sources"

September 7, Monday

REGISTRATION OF PARTICIPANTS:

A.V. Luikov Heat & Mass Transfer Institute

P. Brovka str., 15

From **8:00**

Opening Ceremony

9:30 – 10:30

Session 1.

10:30–13:00

O.G. Penyazkov *Keynote Lecture*
Belarus (Minsk)
Shock and adiabatic compression ignitions of inhomogenious gas and two-phase flows

S. Kakaç[1], A. Pramuanjaroenkij[2] *Keynote Lecture*
[1]Turkey (Ankara), [2]Thailand (Sakon Nakhon)
Single-phase and two-phase analysis of convective heat transfer with nanofluids

G.V. Kuznetsov, D.V. Feoktistov, **E.G. Orlova**
Russia (Tomsk)
Dynamics of evaporation in two-phase systems

A. Tongkratoke[1], **A. Pramuanjaroenkij**[1], A. Chaengbamrung[2], S. Kakaç[3]
[1, 2]Thailand ([1]Sakon Nakhon, [2]Bangkok), [3]Turkey (Ankara)
The development of mathematical modeling for nanofluid as a porous media in heat transfer technology

S.C. Kaushik, **S. Manikandan**, R. Hans
India (Delhi)
Thermodynamic modelling of thermoelectric generator systems

13:00–14:00 – LUNCH-BREAK

Session 2
14:00–18:20

R.M. Cotta, K.M. Lisboa, J.R.B. de Souza, A.B. Allahyarzadeh, J.B.R.Loureiro, C.P. Naveira-Cotta, Á.P. Silva Freire — *Keynote Lecture*
Brazil (Rio de Janeiro)
Experimental-theoretical analysis of conjugated heat transfer in aeronautical sensors and structures with anti-icing systems

A.G. Fedorov — *Keynote Lecture*
USA (Atlanta)
Exploiting nanoscale confinement for design of optimal evaporation/condensation Interface

V. Ayel[1], **R. Bertossi**[2], B. Mehta[1], N. Chauris[1], C. Romestant[1], Y. Bertin[1]
France ([1]Futuroscope, [1]Ivry-sur-Seine)
Evaporation of a thin liquid film in a heated capillary tube: experimental results and discussion on the related physical phenomena

Tsai Meng-Chang[1], Fong-Hao Wu[1], Wei-Chun Liao[1], Wei-Chi Su[1], Heng-Yi Li[1], Wen-FaTsai[1], **Shung-Wen Kang**[2]
Taiwan ([1]Taoyuan, [2]Taipei)
Operational characteristics of a reverse-loop thermosyphon with a large preheat accumulator

16:00–16:20 – COFFEE-BREAK

Session 2
(Continuation)

J. Bonjour, R. Rullière, M. Clausse, C. Toublanc, F. Giraud, S. Michaïe — *Keynote Lecture*
France (Lyon)
Studying pool boiling at subatmospheric pressure: a path toward more compact evaporators for sorption systems and a tool for an improved understanding of the bubble dynamics

S.T.R.Velásquez, G.G.V.Nuernberg, J.P.M. Florez, L.E.Vieira, **M.B.H. Mantelli**, A.N. Klein
Brazil (Florianópolis)
Development of multilayer porous media using colloidal processing

H.F. Smirnov, A.V. Zykov.
Ukraine (Odessa)
The new approach to the drying processes modeling with respect of some deceleration mechanisms actions

A.M. Ilyanok, T.N. Timoshchenko, **A.G. Smirnov**, A.A. Stepanov
Belarus (Minsk)
Electro freezing/heating foil

P. Cheppudira Thimmaiah, A. Sharafian, W. Huttema, M. Bahrami
Canada (Surrey)
Effects of fin spacing and fin height of capillary-assisted tubes on the performance of a low-operating pressure evaporator for an adsorption cooling system

19:00 – WELCOME PARTY

September 8, Tuesday

Session 3
9:00– 13:00

Yu.I. Aristov *Keynote Lecture*
Russia (Novosibirsk)
Current progress in adsorption technologies for low-energy buildings

B.B. Saha[1], I.I. El-Sharkawy[1, 2], T. Miyazaki[1], S. Koyama[1] *Keynote Lecture*
[1]*Japan (Fukuoka),* [2]*El-Mansoura (Egypt)*
Adsorption characteristics of ethanol on surface treated activated carbons and phenol resins for adsorptive cooling/refrigeration

D. Eysseric[1], C. Romestant[1], Y. Bertin[1], V. Ayel[1], A. Delmas[2]
France (Futuroscope, [2]*Cannes la Bocca)*
Multi-sources refrigerator for satellite active cooling

I.S. Girnik, Yu.I. Aristov
Russia (Novosibirsk)
Dynamics of water adsorption on loose grains of AQSOA™-FAM-Z02: a multi-layer configuration

M.Yu. Liakh, O.S. Rabinovich
Belarus (Minsk)
Adsorption refrigeration with phase transitions of working fluid in sorbent at minimal transport restrictions: 1D-model

11:20–11:40 – COFFEE-BREAK

Session 3
(Continuation)

S. Graf, D. Becker, J. Ackermann, F. Lanzerath, A. Bardow
Germany (Aachen)
Heat and mass transfer mechanisms in adsorption heat pumps: Experiment and dynamic modeling

L.L. Vasiliev[1], **L.E. Kanonchik**[1], A.P. Tsitovich[1], S.H. Alqahtani[2]
[1]*Belarus (Minsk),* [2]*Saudi Arabia (Riyadh)*
Safe storage of gaseous fuel in a coupled state:
I. Methane adsorption on microporous carbon fiber;
II. CFD modeling of the adsorber with heat pipe

B.I. Basok, M.P. Novitska, E.V. Riasnova
Ukraine (Kyiv)
Hydrodynamics and heat transfer of vertical ground pile helical heat exchanger

C. McCague, K. Fayazmanesh, C. Berlanga, M. Bahrami
Canada (Messina)
Evaluation of $CaCl_2$-silica gel sorbent for water sorption cooling systems

J.M. Costa Jr., **C.P. Naveira-Cotta**, C.P. Tostado, J.S. Nunes
Brazil (Rio de Janeiro)
Design, fabrication and characterization of micro-reactors for biodiesel synthesis

13:00–14:00 – LUNCH-BREAK

Session 4
14:00–18:40

M. Groll *Keynote Lecture*
Germany (Stuttgart)
Heat pipe science and technology: a historical review

V.V. Yagov *Keynote Lecture*
Russia (Moscow)
Possible mechanisms of high-intensity heat transfer in cooling of high temperature surfaces

B. Agostini, M. Habert
Switzerland (Daettwil)
Experimental characterization of a double back to back pulsating heat pipe for power electronics

V.A. Alexeev[1], R.H. Arifullin [1], L.V. Karaban [1], A.E. Karabin [1], O.A. Eliseev [1], Y.A. Bryk [1], A.V. Sergeev [1], V.V. Maziuk [2], A.V. Voronkevich [1]
*Russia ([1]Moscow, [3]Istra – Moscow R*egion*), [2]Belarus (Minsk)*
Experimental studies of thermal conditions for powerful electronic devices with miniature heat pipes and unpackaged heat accumulators integrated therein

16:00–16:20 – COFFEE-BREAK

Session 4
(Continuation)

Yu. Kuzma-Kichta[1], M. Shustov[1], **A. Lavrikov**[2], A. Ustinov[2], I. Prokopenko[3], Yu. Shtefanov[3]
Russia ([1]Moscow, [2]Skolkovo, [3]Protvino – Moscow Region)
Investigation of heat transfer in a heat pipe with nanoparticles coating

M. Mochizuki, Thang Nguyen, K. Mashiko, Y. Saito, S. Ahamed, R. Singh, Tien Nguyen, V. Wuttijumnong
Japan (Tokyo)
Latest trends in heat pipe application

S. Mori, N. Maruoka, K. Okuyama
Japan (Yokohama)
Critical heat flux enhancement of pool boiling using honeycomb porous plate with two-layer structure

J. M. Moreira Júnior, L.H.R. Cisterna, **M.B.H. Mantelli**, F.H. Milanese
Brazil (Florianópolis)
Development of numerical tools for shell-and-shell thermosyphon heat exchanger design

J.-A. Gruss, A. Frere, A. Maisse, O. Soriano
France (Grenoble)
Development of pulsating heat pipe with a central heating zone

Wei-Keng Lin
Taiwan (Hsinchu)
Development of the heat pipe performance simulation program – HPPS by capillary wick theory

A. Titlov, E. Osadchuk
Ukraine (Odessa)
The search of the water-ammonia absorption refrigeration machines' energy efficient modes

19:00 – BANQUET

September 9, Wednesday

Session 5
9:00–11:20

Yu. Maydanik, V. Pastukhov *Keynote Lecture*
Russia (Ekaterinburg)
Copper-water loop heat pipes: issues and achievements

V.V. Kuznetsov *Keynote Lecture*
Russia (Novosibirsk),
Fluid flow and heat transfer with phase change in minichannels and microchannels

V.N. Buz
Ukraine (Odessa)
Modeling characteristics of fuel cells which use the ambient air oxygen

Yu.M. Matsevity, N.B. Chirkin, M.A. Kuznetzov, E.V. Sherstov
Ukraine (Kharkov)
Using the exergoeconomic method in design of heat pump systems for heating and cooling of housing and communal facilities

K. Fayazmanesh, C. McCague, M. Bahrami
Canada (Surrey)
Graphite-doped composite adsorbent coatings for heat-driven water sorption cooling systems

11:20–11:40 – COFFEE-BREAK

Session 6
11:40 – 13:00

A.A. Mohamad[1], H.Z. Hassan[2] *Keynote Lecture*
[1]Canada (Calgary), [2]Saudi Arabia (Riyadh)
Mathematical modeling of the adsorption cooling reactor

G.G. Ilis[1], G. Arslan[2], **M. Mobedi**[3]
[1, 2]Turkey ([1]Manisa, [2]Izmir), [3]Japan (Hamamatsu)
Optimum design of an adsorbent bed of adsorption refrigeration system for highest specific cooling power

A. Sharafian, P.C. Dan, W. Huttema, M. Bahrami
Canada (Surrey)
Novel expansion and control valves design for two-bed adsorption cooling system

13:00–14:00 – LUNCH-BREAK

Posters Session
14:00 – 15:00

V.N. Buz [1], K.A. Goncharov[2]
[1]Ukraine (Odessa), [2]Russia (Khimki – Moscow Region)
Vapor generating in the loop heat pipe evaporators. Modeling and analyses

D. Mishkinis[1], A. Kulakov[1], J. Meléndez[1], E. Turrión[1], A. Torres[1], M. Czupalla[2], B. Daly[2], C. Scharl[2]
[1]Spain (Madrid), Germany (Munich)
Active thermal control system with two parallel LHPS and pressure regulating valves

A.P. Lukisha[1], D.A. Mishkinis[2]
[1]Ukraine (Dnepropetrovsk), [2]Spain (Madrid)
Effectiveness study of combined subcooler-capillary blocker device in LHP for space applications

V.V. Maziuk, A.A. Antuh
Belarus (Minsk)
Effectiveness study of combined subcooler-capillary blocker device in LHP for space applications

A.S. Ionov, Y.V. Kiliba, **I.V. Romanov**, A.V. Petrov
Russia (Veliky Novgorod)
The cooling system on specialized capillary heat pipes

A.V. Voronkevich
*Russia ([3]Istra – Moscow R*egion*)*
Numerical simulation of unsteady heat transfer in thermocontrol system based on gas-regulated heat pipe

R.R. Riehl
Brazil (São José)
Passive thermal management of surveillance systems using pulsating heat pipes

Fu-long Liu, Chun-lin Li
China (Beijing)
Design of low temperature system to infrared space telescope

O.N. Kaban'kov, L.A. Sukomel, V.V. Yagov, N.O. Zubov
Russia (Moscow)
Heat transfer and hydrodynamics in thermosyphon loop with heated channels of different cross-section configuration

Tao Ding, Zhiguang He, Zhen Li
China (Beijing)
Data center cooling using separated heat pipe system

F.S. Khosroshahi[1], T. Salem [1], M. Arik [1], M.O. Hamdan[2]
[1]*Turkey (Istanbul),* [2]*UAE(Abu Dhabi*)
Numerical and experimental analysis of a heat pipe embedded printed circuit board for solid state lighting applications

A.V. Seryakov, V.I. Ananiev, A.V. Orlov
Russia (Veliky Novgorod)
Condensation research in the short low-temperature range heat pipes

A.V. Seryakov, A.V. Konkin
Russia (Veliky Novgorod)
Numerical simulation of pulsations in vapour channel of low-temperature range heat pipes

V.V. Sorokin
Belarus (Minsk)
Modeling of the super atomization of hot water mini jet

V.I. Lutsenko, V.I. Yeliseyev
Ukraine (Dnepropetrovsk)
Experimental study of the vibration effect on the wetting hysteresis and capillary fluid motions

O.G. Burdo, S.G. Terziev, B.N. Bandura, N.V. Ruzhitskaya
Ukraine (Odessa)
Heat-and-mass transfer in micro- and nanoscale structures in targeted energy delivery conditions

Yu.M. Matsevity, **V.A. Tarasova**, D.Kh. Kharlampidi, P.G. Gakal
Ukraine (Kharkov)
Numerical and experimental study heat-mass transfer with phase transition in capillary-porous structure of heat pipes

Yu.M. Matsevity, **V.A. Tarasova**, D.Kh. Kharlampidi
Ukraine (Kharkov)
Numerical and experimental testing of the thermodynamic efficiency of heat pumps

A. Alimgazin[1], S.G. Alimgazina[1], Y.M. Petin[2]
[1]*Kazakhstan (Astana),* [2]*Russia (Novosibirsk)*
Application of new generation heat pump technologies using alternative energy sources to generate additional heat energy at the heat power plants-2 (Astana-City)

N. Koneva, L. Domorod, A. Smargun
Belarus (Minsk)
Development of heat pump system with effective thermal storage

L.G. Gordeeva, M.V. Solovyeva, **Yu.I. Aristov**
Russia (Novosibirsk)
NH_2–MIL–125 as a promising material for adsorptive heat transformation and storage

S.M. Nemati Mehr, A. Sharafian, W. Huttema, M. Bahrami
Canada (Surrey)
In-situ water uptake rate measurement of AQSOA FAM-Z02 packed in finned tube adsorber beds of an adsorption cooling system

M. Rouhani, M. Bahrami
Canada (Surrey)
Improved lumping parameter model for phase change in latent thermal energy storage systems

R. Kaczmarek, **A.A. Stachel**
Poland (Szczecin)
Effectiveness of operation of ORC installation applied in the LNG re-gasification plant

E.V. Romanova, A.N. Koliukh, N.Z. Gatapova
Russia (Tambov)
Applying heat pump for drying in chemical and related technologies

B. Baghapour, **M. Rouhani**, M. Bahrami
Canada (Surrey)
Experimental design and performance analysis of a desiccant dehumidification column under cyclic operating condition

S. Vasta, V. Palomba, G. Gullì, A. Sapienza, O. Barbera, L. Bonaccorsi, A. Freni
Italy (Messina)
Performance assessment of a novel graphite adsorber for heat pumps and chillers

A.N. Kudrashov, **S.G. Kotov**, A.E. Sazonko, V.A. Saetchnikov, D.S. Kotau
Belarus (Minsk)
Forecasting of emissions during accidents on ammoniac refrigeration units

19:00 –CULTURAL PROGRAM

September 10, Thursday

Session 7
9:00 – 13:00

K.A. Goncharov, V.N. Buz *Keynote Lecture*
Russia (Khimki – Moscow Region)
25 Years of loop heat pipes application on board Russian space crafts

L.L. Vasiliev[1], L.P. Grakovich[1], M.I. Rabetsky[1], *Keynote Lecture*
L.L. Vasiliev Jr.[1], A.S. Zhuravlyov[1], A.V. Shapovalov[2],
A.V. Rodin[2]
Belarus ([1]Minsk, [2]Gomel)
Long thermosyphons for different applications

M. Habert, B. Agostini
Switzerland (Daettwil)
Pulsating air to air heat exchanger for enclosure cooling

Y. Beliavski
Israel (Tiberias)
Heat transfer in gases by pressure gradient elastic waves

A.N. Sokolov, N.N. Tarnovsky, M.Z. Schedrinsky, K.V. Rybas, M.G. Vorobiev, K.N. Sukharev, T.N. Sobolevskaya, A.I. Leonteva, A.D. Pavlova
Russia (*Saint-Petersburg)*
Experimental researches of startup and blocking of loop heat pipes of the spacecraft thermoregulation system

11:20–11:40 – COFFEE-BREAK

Session 7
(Continuation)

X. Zhang, M.A. Arie, D.C. Deisenroth, A.H. Shooshtari, *Keynote Lecture*
S.V. Desiatoun, **M.M. Ohadi**
USA (Maryland),
Impact of additive manufacturing on performance enhancement of heat exchangers: a case study on an air-to-air heat exchanger for high temperature applications

R. Koresawa, **Y. Utaka**
Japan (Kanagawa)
Improvement of performance of polymer electrolyte fuel cell using new gas channel with micro-grooves

A.V. Petrov[1], V.A. Karachinov[2], **V.V. Kiliba**[1], S.V. Ilin[2], A.S. Ionov[1], I.V. Romanov[1]
Russia ([1]Veliky Novgorod, [2]St. Petersburg)
The study of manufacturing defects of capillary heat pipes

13:00–14:00 – LUNCH-BREAK

Session 8
14:00 – 17:40

M. Mochizuki, Thang Nguyen, Y. Saito, Tien Nguyen, M.S. Ahamed *Keynote Lecture*
Japan (Tokyo)
A simple mathematical model to predict heat pipe maximum heat transfer, equivalent thermal conductivity and thermal resistance

Shilei Zhao, Tao Yang
China (Beijing)
The experimental research of controllable loop heat pipe with non-condensable gases

R. Singh[1], M. Mochizuki[2], Yu. Saito[2], T. Yamada[2], Th. Nguyen[2], T. Nguyen[2]
[1](Köln), [2]Japan (Tokyo)
Heat pipes applications in automotive electronics cooling

V.N. Buz [1], K.A. Goncharov [2], H.F. Smirnov[1]
[1]Ukraine (Odessa), [2]Russia (Khimki – Moscow Region)
The surface tension forces influence on the film-wise condensation intensity

S.M. Khairnasov, Yu.E. Nikolaenko, B.M. Rassamakin, M.A. Lozovoi
Ukraine (Kyiv)
Investigation of characteristics of heat pipes for LED lighting device

16:00–16:20 – COFFEE-BREAK

Session 8
(Continuation)

V.V. Karnaukh[1], V.A. Mazur[2]
Ukraine ([1]Donetsk, [2]Odessa)
Thermodynamic and hydrodynamic behavior of nanofluids in cooling systems

E. Bartuli, M. Guzej, J. Kominek, Ja. Horsky
Czech Republic (Brno)
Experimental investigation of a heat transfer coefficient for aluminum alloys

V.V. Klimakov[1], M.V. Chirkin[1], A.I. Ulitenko[1], A.V. Molchanov[2]
Russia ([1]Ryazan, [2]Moscow)
Intensification of heat transfer between readout electronics and SINS outer frame using heat pipes

S. Khairnasov, B. Rassamakin, D. Kozak, A. Anisimova
Ukraine (Kyiv)
Experimental investigations of aluminum thermosyphons for photovoltaic-thermal module

18:00–19:00 – **Closing Ceremony**