8th Heat Powered Cycles Conference
University of Bayreuth, Germany
16 to 19 September 2018

Conference at a Glance

			8TH HEAT POWERED CYCLES CONFERENCE					
			16-19 September 2018 - Bayreuth, Germany					
	16-Sep	17-Sep			18-Sep			19-Sep
8:00								
8:30		Registration			Registration			Registration
8:45			Welcome Address					
9:00								Keynote Presentation
9:30		Keynote Presentation			Keynote Presentation			
10:00								B-5 - Thermodynamic Cycles V / C-6 - Sorption Cycles VI
10:30		A-1 - Heat and Mass Transfer I	B-1 - Thermodynamic Cycles I	C-1 - Sorption Cycles I	B-2 - Thermodynamic Cycles II	F-1 - Advanced Heat Transfer Mechanisms	C-3 - Sortion Cycles III	
11:30								
12:00		LUNCH			LUNCH			LUNCH
13:15		Keynote Presentation			Keynote Presentation			
14:15			D-1 - Special Session - Power Generation		B-3 - Thermodynamic Cycles III		C-4 - Sorption Cycles IV	
16:15		Coffee Break			Coffee Break			
16:30		A-2 - Heat and Mass Transfer II	E-1 - Reactors and Working Fluids	C-2 - Sorption Cycles II	B-4 - Thermodynamic Cycles IV		C-5 - Sorption Cycles V	
17:00	Registration							
17:30								
18:00	Welcome Drinks and Snacks							
18:15								
19:30								
20:00					Gala Dinner			
			Sessions Color					
			Room	H31	H30	H31	S104	

Important Note: The Organizing Committee of the 8th Heat Powered Cycles Conference reserves the right to amend and/or modify this program at any time

8th Heat Powered Cycles Conference
Bayreuth University, Germany, 16 to 19 September 2018

SUNDAY 16 September 2018
17.00 to 20.00: **Registration - Hotel Rheingold, Austraße 2, 95445 Bayreuth**
18.00 to 20.00: Welcome reception, drinks and snacks

MONDAY 17 September 2018
8.00 to 9.30: **Registration - Bayreuth University, Room H31**
8.45 to 9.15: **Welcome Address - Room H31 - Prof. Dr. Stefan Leible**, President of the University of Bayreuth. **Prof. Dr.-Ing. Dieter Brüggemann** - Director of the Center of Energy Technology of the University of Bayreuth.
9.30 to 10.15: **Keynote Presentation - Room H31 - Dr.-Ing. Florian Heberle** - Bayreuth University, Germany - *From cycle efficiency to physical properties - Comprehensive analyses of ORC working fluids by theoretical and experimental methods*, page 26,.
Chair: Prof. Markus Preissinger

10.15 to 10.30: Coffee Break

10.30 to 11.50: A-1 - Heat and Mass Transfer I - Room S104
This session covers heat and mass transfer methods
Chair: Prof. Steven Garrett, University of Mass-Dartmouth and Le Mans Université

Paper ID	Authors	Title	Page
HPC-2018-201	H Bahrehmand, M Khajejpour, W Huttema, C McCague, M Bahrami	The effects of graphite flake on specific cooling power of sorption chillers: An experimental study	46
HPC-2018-204	W Kisha, D Hann, P H Riley,	The Influence of Heat Input Ratio on Electrical Power Output of a Dual-Core Travelling-Wave Thermoacoustic Engine	48
HPC-2018-205	D O Silva, R R Riehl	Experimental and Numerical Study of the Thermal Performance of Water-Stainless Steel Heat Pipes Operating in Mid- Level	50
HPC-2018-207	P Garbis, C Kern, A Jess	CO selective methanation for PEMFC applications	52

10.30 to 11.50: C-1 - Sorption Cycles I - Room H31
This session covers sorption cycles investigations
Chair: Prof. Mike Tierney, University of Bristol, UK

Paper ID	Authors	Title	Page
HPC-2018-102	M Preissinger	Bubble Columns in Humidification Dehumidification Technology From a Demonstration Unit to Fundamental Research in Optical Accessible Laboratory Bubble Columns	42
HPC-2018-103	E Elsayed, R Al-Dadah, S Mahmoud, P Anderson, A Hassan	Iron(III) trimesate (MIL-100(Fe)) in adsorption desalination	44
HPC-2018-300	P Cheppudira Thimmaiah, A Fradin, W Huttema, M Bahrami	Porous copper coated low pressure condenser/evaporator for sorption chillers	61
HPC-2018-303	A D Grekova, L G Gordeeva, Y I Aristov	"LiCl/vermiculite – methanol" as the new working pair for adsorption cycle "HeCol" for upgrading the ambient heat	63

10.30 to 11.50: B-1 - Thermodynamic Cycles I - Room H30
This session covers thermodynamic cycles investigations
Chair: Dr. Ing. Florian Heberle, University of Bayreuth, Germany

Paper ID	Authors	Title	Page
HPC-2018-400	S Van Erdeweghe, J Van Bael, B Laenen, W D'haeseleer	Optimal design and control of a low-temperature geothermally-fed parallel CHP plant	120
HPC-2018-401	X Qin, X L Wei, D W Zhang, X Meng	A Study on Optimum Discharge Pressure of Transcritical CO2 Heat Pump System under Different Ambient Temperatures and Compressor Frequencies	122
HPC-2018-403	W Kisha, P H Riley, D Hann	Development of a low-cost, electricity-generating Rankine cycle, hydroxide and calcium oxide in a packed bed reactor	126
HPC-2018-405	A P Weiss, T Popp, G Zinn, M Preissinger, D Brüggemann	A Micro-Turbine-Generator-Construction-Kit (MTG-c-kit) for Small-Scale Waste Heat Recovery ORC-Plants	128

12.00 to 13.00 Lunch

13.15 to 14.00: **Keynote Presentation - Room H31 - Prof. Steven L Garrett**, University of Mass-Dartmouth and Le Mans Université - *A Fission-Powered Thermoacoustic In-Core Sensor*, page 12.
Chair: Prof. Roger R. Riehl

14.00 to 14.15: Coffee Break

14.15 to 16.15: D-1 - Special Session - Power Generation - Room H31
This session presents invited works related to current needs for power generation
Chair: Prof. Roger R Riehl, National Institute for Space Research - INPE/Brazil

Paper ID	Authors	Title	Page
HPC-2018-434	K. Wang, A. M. Pantaleo, M. Herrando, C. N. Markides	Thermodynamic and Thermoeconomic Assessment of a PVT-ORC Combined Heating and Power System for Swimming Pools	172
HPC-2018-435	S. Georgiou, M. Aunedi, G. Strbac, C. N. Markides	Application of Liquid-Air and Pumped-Thermal Electricity Storage Systems in Low-Carbon Electricity Systems	174
HPC-2018-436	B. Atakan, D. Roskosch	Pumped Heat Electricity Storage at Intermediate Temperatures: Basics and Limits	176
HPC-2018-437	A A-Márquez, J C Bruno, A Coronas	Performance analysis of a novel polygeneration plant for LNG cold recovery	179
HPC-2018-334	A. Vandersickel, W. G. Wedel, H. Spliethoff	High temperature heat and water recovery in steam injected gas turbines using an open absorption heat pump	116
HPC-2018-438	A. Vandersickel, A. Aboueldahabb, H. Spliethoff	Small-scale Pumped Heat Electricity Storage for decentralised combined Heat and Power Generation	181

16.15 to 16.30: Coffee Break

16.30 to 18.10: C-2 - Sorption Cycles II - Room H31
This session covers sorption cycles investigations
Chair: Dr.-Ing. Franz Lanzerath, RWTH Aaschen University, Germany

Paper ID	Authors	Title	Page
HPC-2018-306	M Khajehpour, S Shokoya, M Bahrami,	Effect of Conductive Additives on Performance of CaCl2-Silica Gel Sorbent Materials	69
HPC-2018-307	S Wu, T X Li, T Yan, R Z Wang	An innovative solid-gas chemisorption heat transformer system for high-efficiency energy upgrade with a large temperature lift	72
HPC-2018-308	M S Treier, A Desai, F P Schmidt	Comparison of Storage Density and Efficiency for Cascading Adsorption Heat Storage and Sorption assisted Water Storage	74
HPC-2018-309	A Gibelhaus, T Tangkrachang, U Bau, F Lanzerath, A Bardow	Design and control of adsorption cooling systems based on dynamic optimization	76
HPC-2018-310	M J Tierney, J Yon	Early Design of a Magnetic Mover for Adsorbents	78

16.30 to 18.10: E-1 - Reactors and Working Fluids - Room H30
This session covers reactors and working fluids applications
Chair: Prof. Dr. Burak Atakan, University of Duisburg-Essen, Germany

Paper ID	Authors	Title	Page
HPC-2018-431	A. Frazzica, V. Palomba, V. Brancato, L. Calabrese, A.G. Fernández, M. Fullana, A. Solé, L. F. Cabeza	Salt hydrate-silicone foam composite for heat storage application	166
HPC-2018-324	A. Freni, L. Calabrese, A. Malara, P. Frontera, L. Bonaccorsi	Silica Gel microfibres by electrospinning for adsorption heat pumps	100
HPC-2018-412	J Stengler, E Fischer, J Weiss, M Linder	Experimental Results of a 1 kW Heat Transformation Demonstrator based on a Gas-Solid Reaction	138
HPC-2018-402	S Funayama, Y Kato	Numerical analysis for dehydration and hydration of calcium hydroxide and calcium oxide in a packed bed reactor	124
HPC-2018-427	P. Bombarda, G. Di Marcoberardino, C. Invernizzi, P. Iora, G. Manzolini	Water Mixtures as Working Fluids in Organic Rankine Cycles	160

16.30 to 18.10: A-2 - Heat and Mass Transfer II - Room S104
This session covers heat and mass transfer methods
Chair: Prof. Y I Aristov, Novosibirsk State University, Russia

Paper ID	Authors	Title	Page
HPC-2018-433	J. I. Hernandez, R. Best, R. Dorantes, R. Roman, J. Galindo, P. Aragón	The Obtention of an Ejector Cooing System's Performance Map Through Different Graphical Representations	170
HPC-2018-211	M. Worall, A. Dicken, M. Shatat, S. Gledhill, S. Riffat	A novel hybrid dew point cooling system for mobile applications	59
HPC-2018-304	J Seiler, F Lanzerath, C Jansen, A Bardow	Get your tubes wet: capillary-assisted thin-film evaporation of water for adsorption chillers	65
HPC-2018-305	K Geilfuss, B Dawoud,	Analytical Investigation of Zeolite-NaY-Water for Sorption Heat and Cold Storage Utilizing High Temperature Heat	67
HPC-2018-429	M. Falsafioon, Z. Aidoun	An Investigation of Nozzle Shape on the Performance of an Ejector	164

End of 17 September 2018

TUESDAY 18 September 2018
8.00 to 9.30: **Registration - Bayreuth University, Room H31**
9.30 to 10.15: **Keynote Presentation - Room H31 - Dr.-Ing. Franz Lanzerath** - RWTH Aaschen University, Germany - *Honey, I shrunk the sorption lab: Model-based scale-up of adsorption systems*, page 20.
Chair: Prof. Mike Tierney

10.15 to 10.30: Coffee Break

10.30 to 11.50: F-1 - Advanced Heat Transfer Mechanisms - Room S104
This session covers heat transfer methods
Chair: Prof. Srinivas Garimella, Gerogia Institute of Technology, USA

Paper ID	Authors	Title	Page
HPC-2018-500	S Wu, C R Ortiz	Experimental Investigation of the Effect of Magnetic Field on Vapour Absorption Rate of LiBr+H2O Nanofluid	183
HPC-2018-501	R R Riehl	Thermal Performance of Nanofluids Applied to the Temperature Control of Electronic Components	185
HPC-2018-602	N. Mohammadaliha, W. Huttema, M. Bahrami	Natural graphite: Potential material for heat exchangers of waste heat recovery systems	191
HPC-2018-600	R R Riehl	Two-Phase Pressure Drop Correlation During the Convective Condensation in Microchannel Flows	187

10.30 to 11.50: B-2 - Thermodynamic Cycles II - Room H30
This session covers thermodynamic cycles investigations
Chair: Dr. Kai Wang, Imperial College, UK

Paper ID	Authors	Title	Page
HPC-2018-407	L Urbanucci, D Testi, J C Bruno	Real-time operational optimization of a complex DHC plant	130
HPC-2018-408	Y Zheng, J Xu, L Lei	Thermodynamic analysis of S-CO_2 cycle for coal-fired plant	132
HPC-2018-409	W D Steinmann, H Jockenhöfer, D Bauer	Pumped Thermal Energy Storage (PTES) as Smart Sector-Coupling Technology for Heat and Electricity	134
HPC-2018-410	D Roskosch, V Venzik, B Atakan	A theoretical approach to identify optimal replacement fluids for existing vapour compression refrigeration systems and heat pumps	136

10.30 to 11.50: C-3 - Sorption Cycles III - Room H31
This session covers sorption cycles investigations
Chair: Prof. Raya Al-Dadah, Birmingham University, UK

Paper ID	Authors	Title	Page
HPC-2018-311	M Erdogan, C McCague, S Graf, M Bahrami, A Bardow	Squaring the circle in drying high-humidity air by a novel composite sorbent with high uptake and low pressure-drop	80
HPC-2018-312	C McCague, W Huttema, A Fradin, M Bahrami	Lab-scale sorption chiller comparison of FAM-Z02 coating and pellets	82
HPC-2018-313	J Cranston, A Askalany, G Santori	A new generation of hybrid adsorption washer dryers	84
HPC-2018-314	H. Dong, A Askalany, G Santori	Formulation influence on the preparation of silica nanoparticle-based ionogels	86

12.00 to 13.00 Lunch

13.15 to 14.00: **Keynote Presentation - Room H31 - Prof. Srinivas Garimella**, Georgia Institute of Technology, USA - *Mining and Upgrading Low-Grade Heat: From Infinite Potential to Practical Reality*, page 23.
Chair: Prof. Roger R. Riehl

14.00 to 14.15: Coffee Break

14.15 to 16.15: B-3 - Thermodynamic Cycles III - Room H30
This session covers thermodynamic cycles investigations
Chair: Prof. Roger R Riehl, National Institute for Space Research - INPE/Brazil

Paper ID	Authors	Title	Page
HPC-2018-701	M. Steiner, S Beer, D Hummel	Ultra-clean Biomass Gasification/Combustion Unit for Micro-CHP based on a Stirling Engine	193
HPC-2018-413	R He, X Ma, X Wei	A study on optimizing of pure working fluids in Organic Rankine Cycle (ORC) for different low grade heat recovery	140
HPC-2018-416	M R J Al-Tameeni, Z Yu	Numerical analysis of a heat pump based on combined thermodynamic cycles using ASPEN plus software	142
HPC-2018-417	T Korth, F Loistl, A Storch, R Schex, A Krönauer, C Schweigler	Latent heat storage for direct integration in the refrigerant cycle of an air conditioning system	144
HPC-2018-418	A Köning Haagen, D Brüggemann	Detailed exergetic analysis of a packed bed thermal storage unit in combination with an Organic Rankine Cycle	146
HPC-2018-419	M J Tierney, M Pavier	Novel High Temperature Steam Transfer Pipes	148

14.15 to 16.15: C-4 - Sorption Cycles IV - Room H31
This session covers sorption cycles investigations
Chair: Prof. Mike Tierney, Bristol University, UK

Paper ID	Authors	Title	Page
HPC-2018-315	V Palomba, A Sapienza, Y Aristov	Heat rejection stage of an adsorption heat storage cycle: The useful heat and sorption dynamics	88
HPC-2018-317	Y I Aristov	Adsorptive transformation/storage of heat: temperature-driven vs. pressure-driven cycles	90
HPC-2018-319	Z Yang, K R Gluesenkamp, A Frazzica	Database of Sorption Materials Equilibrium Properties	92
HPC-2018-320	L Calabrese, L Bonaccorsi, A Freni, P Bruzzaniti, E Proverbio	Overview and step forward on SAPO-34 based zeolite coatings for adsorption heat pumps	94
HPC-2018-321	M Rouhani, W Huttema, C McCague, M Khajehpour, M Bahrami	Effects of storage period on the performance of salt composite sorption thermal energy storage	96
HPC-2018-325	E. Cerrah, C. McCague, M. Bahrami	Air-channel composite desiccant for northern climate humidity recovery ventilation system	102

16.15 to 16.30: Coffee Break

16.30 to 18.10: B-4 - Thermodynamic Cycles IV - Room H30
This session covers thermodynamic cycles investigations
Chair: Prof. Markus Preissinger, FH Vorarlberg, Austria

Paper ID	Authors	Title	Page
HPC-2018-421	D Toselli, F Heberle, D Brüggemann	Technical and thermodynamic evaluation of hybrid binary cycles with geothermal energy and biomass	150
HPC-2018-422	P. Collings, A. McKeown, Z. Yu	Experimental Analysis of a Regenerative Organic Rankine Cycle using Zeotropic Working Fluid Blends	152
HPC-2018-423	J. Mahmoudian, A. Milazzo, I. Murmanskii, A. Rocchetti	Experimental Results from R245fa Ejector Chiller	154
HPC-2018-424	A. I. Shkatulov, T. Yu. Kardash, Y. I. Aristov	Adapting the MgO-CO_2 working pair for thermochemical energy storage by doping with salts	156
HPC-2018-425	G. Tozer, R. Al-Dadah, S. Mahmoud	Effect of the apex gap size on the performance of a small scale Wankel expander	158

16.30 to 18.10: C-5 - Sorption Cycles V - Room H31
This session covers sorption cycles investigations
Chair: Prof. Raya Al-Dadah, Birmingham University, UK

Paper ID	Authors	Title	Page
HPC-2018-326	M. Jäger, K. Hurtig, R. Kühn, J. Römer	Influence of the fluid dynamics on an air-cooled fixed-bed adsorber with connected water evaporator	104
HPC-2018-328	S. Hunt, S. Petersen, F. Ziegler, C. Hennrich	Experimental Proof of concept for a water/LiBr single stage absorption heat conversion system as a house connection station	106
HPC-2018-329	I. Girnik, Yu. Aristov	Temperature- vs. Pressure-Initiated Cycles for Upgrading Low Temperature Heat: Dynamic Comparison	108
HPC-2018-335	S. Hinmers, R E Critoph	Methanol and its Sorption Heat Pump and Refrigeration Potential	118

20.00 - Gala Dinner
End of 18 September 2018

WEDNESDAY 19 September 2018
8.00 to 9.00: **Registration - Bayreuth University, Room H31**
9.00 to 9.45: **Keynote Presentation - Room H31- Prof. Raya Al-Dadah**, Birmingham University, UK - *Metal Organic Framework Materials for Adsorption Heat Pumps*, page 29.
Chair: Prof. Markus Preissinger.

9.45 to 10.00: Coffee Break

10.00 to 11.20: B-5 - Thermodynamic Cycles V - Room H30
This session covers sorption cycles investigations
Chair: Dr. A. Vandersickel, Technical University Munich, Germany

Paper ID	Authors	Title	Page
HPC-2018-428	K. Couvreur, J. Timmerman, W. Beyne, S. Gusev, M. De Paepe, W.D. Steinmann, B. Vanslambrouck	Constant power production with an organic Rankine cycle from a fluctuating waste heat source by using thermal storage	162
HPC-2018-209	F Arias, S de las Heras	On the Thermal Cyclic Precipitation of Aqueous Solutions for Heat, Powered Cycles	54
HPC-2018-432	E. Laurenz, G. Füldner, J. Doell, C. Blackman, L. Schnabel	Model based assessment of working pairs for gas driven thermochemical heat pumps	168
HPC-2018-210	F Arias, S de las Heras	Deliberate Salinization of Domestic Wastewater in Housing Estates for Energy	57

10.00 to 11.20: C-6 - Sorption Cycles VI - Room H31

This session covers sorption cycles investigations

Chair: Prof. Mike Tierney, Bristol University, UK

Paper ID	Authors	Title	Page
HPC-2018-601	M M Saleh, R Al-Dadah, S Mahmoud	Numerical Investigation of MOFs Adsorption Cooling System Using Microchannel Heat Exchangers	189
HPC-2018-330	A.D. Grekova, L.G. Gordeeva, Yu.I Aristov	Adsorption heat transformation: applicability for various climatic regions of the Russian Federation	110
HPC-2018-331	A. M. Rivero Pacho, S. J. Metcalf, R. E. Critoph, H. Ahmed	Design of a Gas-Fired Carbon-Ammonia Adsorption Heat Pump	112
HPC-2018-323	P. Chatzitakis, B. Dawoud, J. Safarov, F. Opferkuch	Experimental investigation of a novel absorption heat pump with organic working pairs	98

12.00 to 13.00 Lunch

End of 19 September 2018