

Dr. Gerrit Füldner

Head of Team Sorption Technology, Division Thermal Systems and Building Technologies

Research focus

- Sorption technology for heating and cooling applications in buildings and industry, transport, refrigeration and thermal energy storages;
dynamics of adsorption processes, heat and mass transfer
- Experimental characterization of adsorption dynamics on lab scale samples up to full scale adsorption modules;
system integration of adsorption modules
- Dynamic modelling of adsorption processes, simulation with COMSOL Multiphysics

Curriculum vitae

Since 2017	Head of Team Sorption Technology
2015	PhD at Fraunhofer ISE: Mass transfer and adsorption kinetics in porous adsorbent composites for heat transformation applications; supervised at Albert-Ludwigs-University Freiburg by Prof. emerit. Joachim Luther
Since 2012	Project Manager (EU FP7 projects, nationally funded projects, industry collaborations)
2010	3 months research stage at CNR-ITAE, Messina, Sicily
2000 – 2006	Humboldt University, Berlin; Diploma of Physics (2006 Diploma thesis at Fraunhofer ISE on modelling of adsorption equilibria)

Awards & outstanding achievements

2018	Chair of Working Group Thermally Driven Heat Pumps EHPA (European Heat Pump Association)
2016	Participant of Fraunhofer Step Forward Career Mentoring program
Dec 2015	Award for the best joint poster presentation of a German-Greek research team at the Greek-German Days on Research, Innovation and Young Scientists (Project WasserMod)
2007 – 2010	PhD scholarship from Deutsche Bundesstiftung Umwelt (DBU)

Major projects

AdoSan-LXB (BMW, industry)	Development of a gas driven adsorption heat pump; project leader
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Fraunhofer HARVEST	Development of material and component IP for highly efficient adsorption modules; project leader
IEA-HPP Annex 43 	Fuel-driven Sorption Heat Pumps, assistance of operating agent
iNSPiRe (EU FP7) 	Design and evaluation of kits for deep energy renovation of existing buildings, project leader for work on integrated sorption collectors for solar cooling
KollSorp (BMU, industry)	Development and evaluation of components for adsorptive cooling and heating; (co-) project leader
MERITS (EU FP7) 	Development of a compact thermal energy storage system based on salt hydrates, project manager at Fraunhofer ISE
Fraunhofer WISA-Thoka	Development of components for high power density thermally driven adsorption chillers, evaluation of heat and mass transfer in aluminum fibre based adsorbent composites

Publications

YEAR	TITLE/AUTHOR	DOCUMENT TYPE
2021	Frequency Response Analysis for the Determination of Thermal Conductivity and Water Transport in MOF Adsorbent Coatings for Heat Transformation  Laurenz, E.; Füldner, G.; Velte, A.; Schnabel, L.; Schmitz, G.	Journal Article FULL TEXT
2020	Experimentally measured thermal masses of adsorption heat exchangers  Gluesenkamp, K.R.; Frazzica, A.; Velte, A.; Metcalf, S.; Yang, Z.; Rouhani, M.; Blackman, C.; Qu, M.; Laurenz, E.; Rivero-Pacho, A.; Hinners, S.; Critoph, R.; Bahrami, M.; Füldner, G.; Hallin, I.	Journal Article FULL TEXT
2020	A Novel Approach for the Determination of Sorption Equilibria and Sorption Enthalpy Used for MOF Aluminium Fumarate with Water  Laurenz, E.; Füldner, G.; Schnabel, L.; Schmitz, G.	Journal Article FULL TEXT
2020	Sorptionsbehälter, Sorptionsspeicher, Wärmepumpe und Wärmetransformator  Füldner, Gerrit; Laurenz, Eric; Schnabel, Lena	Patent FULL TEXT
2019	Adsorption dynamics of MOF coatings for waste heat driven cooling  Laurenz, E.; Velte, A.; Kummer, H.; Füldner, G.; Schnabel, L.	Conference Paper FULL TEXT
2019	Air-Con Metal-Organic Frameworks in Binder Composites for Water Adsorption Heat Transformation Systems  Gökpinar, S.; Ernst, S.-J.; Hastürk, E.; Möllers, M.; El Aita, E.; Wiedey, R.; Tannert, N.; Nießing, S.; Abdpour, S.; Schmitz, A.; Quodbach, J.; Füldner, G.; Henninger, S.; Janiak, C.	Journal Article

2019	<p>Experimentelle Arbeiten und Entwicklung von numerischen Modellen zur Analyse und Optimierung von erweiterten Adsorptionskreisläufen für die Wärmeversorgung von Gebäuden </p> <p>Velte, Andreas; Füldner, Gerrit (Betreuer); Schnabel, Lena (Betreuerin); Henning, Hans-Martin (Referent); Bart, Hans-Jörg (Referent)</p>	Dissertation
2018	<p>Adsorptionskälte aus Abwärme flüssiggekühlter CPUs in HPC Rechenzentren - Material- und Komponentenentwicklung: Vortrag gehalten beim Chillventa CONGRESS, Nürnberg, Germany, 15.10.2018 </p> <p>Füldner, G.</p>	Presentation
2018	<p>Innovative Adsorbent Heat Exchangers: Design and Evaluation </p> <p>Schnabel, L.; Füldner, G.; Velte, A.; Laurenz, E.; Bendix, P.; Kummer, H.; Wittstadt, U.</p>	Book Article
2018	<p>Klimamaschine </p> <p>Füldner, Gerrit; Schnabel, Lena; Volmer, Rahel; Warlo, Alexander; Weise, Jörg</p>	Patent FULL TEXT
2018	<p>Model Based Assessment of Working Pairs for Gas Driven Thermochemical Heat Pumps </p> <p>Laurenz, E.; Füldner, G.; Döll, J.; Blackman, C.; Schnabel, L.</p>	Abstract FULL TEXT
2018	<p>Wärmetauscherstruktur und Verfahren zu deren Herstellung und Verwendung </p> <p>Fugmann, Hannes; Füldner, Gerrit; Lauro, P. di; Munz, Gunther; Schnabel, Lena</p>	Patent FULL TEXT
2017	<p>Advanced Measurement and Simulation Procedure for the Identification of Heat and Mass Transfer Parameters in Dynamic Adsorption Experiments </p> <p>Velte, A.; Füldner, G.; Laurenz, E.; Schnabel, L.</p>	Journal Article FULL TEXT
2017	<p>Evaporator development for adsorption heat transformation devices - influencing factors on non-stationary evaporation with tube-fin heat exchangers at sub-atmospheric pressure </p> <p>Volmer, R.; Eckert, J.; Füldner, G.; Schnabel, L.</p>	Journal Article FULL TEXT
2017	<p>A functional full-scale heat exchanger coated with aluminum fumarate metal-organic framework for adsorption heat transformation </p> <p>Kummer, H.; Jeremias, F.; Warlo, A.; Füldner, G.; Fröhlich, D.; Janiak, C.; Gläser, R.; Henninger, S.K.</p>	Journal Article
2017	<p>Molecular dynamics phenomena of water in the metalorganic framework MIL-100(Al), as revealed by pulsed field gradient NMR and atomistic simulation </p> <p>Splith, T.; Pantatosaki, E.; Kolokathis, P.D.; Fröhlich, D.; Zhang, K.; Füldner, G.; Chmelik, C.; Jiang, J.; Henninger, S.K.; Stallmach, F.; Papadopoulos, G.K.</p>	Journal Article
2017	<p>A novel adsorption module with fiber heat exchangers: Performance analysis based on driving temperature differences </p> <p>Wittstadt, U.; Füldner, G.; Laurenz, E.; Warlo, A.; Große, A.; Herrmann, R.; Schnabel, L.; Mittelbach, W.</p>	Journal Article

2017	Optimization of power density and metal-to-adsorbent weight ratio in coated adsorbers for adsorptive heat transformation applications  Bendix, P.; Füldner, G.; Möllers, M.; Kummer, H.; Schnabel, L.; Henninger, S.; Henning, H.-M.	Journal Article
2017	"Water - Silica Siegel" working pair for adsorption chillers: Adsorption equilibrium and dynamics  Sapienza, A.; Velte, A.; Girnik, I.; Frazzica, A.; Füldner, G.; Schnabel, L.; Aristov, Y.	Journal Article
2016	Assessment of thermodynamic equilibrium properties of salt hydrates for heat transformation applications at different temperature levels  Laurenz, E.; Füldner, G.; Schnabel, L.	Abstract FULL TEXT
2016	Experimental characterization of aluminum fibre/SAPO-34 composites for adsorption heat pump applications  Velte, A.; Herrmann, R.; Andersen, O.; Wittstadt, U.; Füldner, G.; Schnabel, L.	Abstract FULL TEXT
2016	Wasseradsorption und -diffusion in SAPO-34 für die adsorptive Wärmetransformation  Stallmach, F.; Splith, T.; Chmelik, C.; Füldner, G.; Henninger, S.K.; Kolokathis, P.T.; Pantatosaki, E.; Papadopoulos, G.K.	Journal Article
2015	Integration of sorption modules in Sydney type vacuum tube collector with air as heat transfer fluid  Hallstrom, O.; Füldner, G.	Journal Article FULL TEXT
2015	A new adsorbent composite material based on metal fiber technology and its application in adsorption heat exchangers  Wittstadt, U.; Füldner, G.; Andersen, O.; Herrmann, R.; Schmidt, F.	Journal Article FULL TEXT
2015	Stofftransport und Adsorptionskinetik in porösen Adsorbenskompositen für Wärmetransformationsanwendungen  Füldner, G.	Dissertation FULL TEXT
2015	Versatile siloxane based adsorbent coatings for fast water adsorption processes in thermally driven chillers and heat pumps  Kummer, H.; Füldner, G.; Henninger, S.K.	Journal Article
2014	Development of collector integrated sorption modules for solar heating and cooling: Performance simulation  Füldner, G.; Hallström, O.; Spahn, H.-J.; Schnabel, L.; Salg, F.	Conference Paper
2014	Effect of zeolite A coating thickness on adsorption kinetics for heat pump applications  Tatlier, M.; Munz, G.; Füldner, G.; Henninger, S.K.	Journal Article
2014	Experimental and Theoretical Analysis of the Kinetic Performance of an Adsorbent Coating Composition for Use in Adsorption Chillers and Heat Pumps  Frazzica, A.; Füldner, G.; Sapienza, A.; Freni, A.; Schnabel, L.	Journal Article

2014	Heat Transfer in Adsorption Heat Exchangers between Fins and Monolayer Pellet Beds  Laurenz, E.; Földner, G.; Schnabel, L.	Conference Paper
2013	Adsorption kinetics and isotherms of zeolite coatings directly crystallized on fibrous plates for heat pump applications  Atakan, A.; Földner, G.; Munz, G.; Henninger, S.; Tatlier, M.	Journal Article
2013	KollSorp - Entwicklung eines kollektorintegrierten Sorptionssystems zur solaren Kühlung und Heizung  Földner, G.; Schnabel, L.; Horn, P.; Spahn, H.-J.; Schmidt, C.; Thoma, C.; Salg, F.	Conference Paper
2011	General considerations on thermal energy storage with closed adsorption systems  Földner, G.; Henning, H.-M.; Schossig, P.; Schmidt, F.P.	Presentation FULL TEXT
2011	Numerical Layer Optimization of Alumin Fibre/ Sapo-34 Composites for the Application in Adsorptive Heat Exchangers  Földner, G.; Schnabel, L.; Wittstadt, U.; Henning, H.-M.; Schmidt, F.	Conference Paper FULL TEXT
2011	Numerical layer optimization of aluminum fibre/sapo-34 composites for the application in adsorptive heat exchangers  Földner, G.; Schnabel, L.; Wittstadt, U.; Henning, Hans-Martin; Schmidt, F.P.	Conference Paper
2009	Boost in power density of adsorbers by zeolite coated metal fibres  Földner, G.; Wittstadt, U.; Joshi, C.; Schmidt, F.	Conference Paper
2007	Novel cycle concept for adsorption chiller with advanced heat recovery utilising a stratified storage  Schmidt, F.P.; Schnabel, L.; Földner, G.; Henning, H.-M.	Conference Paper
2006	Monte-Carlo-Simulation eines Gittergas-Modells der Gasadsorption in mikroporösen Feststoffen  Földner, G.	Thesis

This publication list has been generated from the publication database [Fraunhofer-Publica](#) .

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