Kyle R. Gluesenkamp

Senior Research and Development Scientist,
Joint Faculty Associate Professor
Building Equipment Research Group
Energy and Transportation Science Division
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EDUCATION

PhD, Mechanical Engineering August, 2007 – November, 2012
University of Maryland, College Park, MD
Dissertation: Development and analysis of micro-polygeneration systems and adsorption chillers
Advisor: Prof. Reinhard Radermacher

BS, Environmental Science September, 2000 – June, 2004
University of Oregon, Eugene, OR
Minor: Biology

RESEARCH EXPERTISE

- Fundamental limits of energy conversion technologies
- Sorption- and vapor compression-based dehumidification, cooling and heating
- Thermal storage materials and thermodynamic and transport properties of working fluids
- Gas and electric heat pump water heating, residential appliance energy efficiency
- Separate sensible and latent cooling
- Engines and power generation; combined cooling, heat and power; integrated systems
- Thermodynamic, psychrometric and heat/mass transfer modeling
- Thermal system prototype development; experimental design and instrumentation

RESEARCH OUTPUT METRICS

h-index	11
i10-index	9
Citations (Google)	339
Citations (Scopus)	174
Career publications (Google Scholar)	112
SciVal citations per publication	4.0
SciVal field weighted citation impact	1.62
Granted patents	4

RESEARCH EXPERIENCE

Senior Research & Development Scientist January, 2019 – present
Oak Ridge National Laboratory, Oak Ridge, TN

- Principal investigator for portfolio of 7-10 projects per year
- Partnerships and industry engagement
  - Manage and lead projects in cooperative research and development agreements (CRADAs) with major manufacturers, and DOE and lab-directed research
  - Lead ORNL's international collaboration with IEA HPT Annex 43, Fuel-Driven Sorption Heat Pumps and HPT Annex 54, Comfort Climate Box
  - Establish partnerships and subcontracts with academia and private industry (large-market share manufacturers and small businesses)
- Funding
  - Successfully secure funding from competitive solicitations for energy efficient building equipment R&D (>$10M awarded as lead PI)
  - Successfully contribute as team member to proposals (additional $10M to date)
- IP and publication
  - Published 90 publications and delivered 50 invited seminars nationally and internationally
  - 4 granted patents, and 42 invention disclosures filed
- Mentorship
  - Graduated 2 PhD students to date as dissertation committee co-advisor (Purdue and Texas A&M)
  - Bredesen Center Joint Faculty Associate Professor
  - Co-advisor of PhD students at UT-Knoxville, Purdue, Georgia Tech, Texas A&M-Kingsville, and Michigan Tech
  - Mentor of Post-Master's and Post-Doctoral researchers
  - Mentor of undergraduate and graduate student interns (through GEM, HERE, CCI, and SULI internship programs)

ORNL Subprogram Manager October, 2020 – present
HVAC, Water Heating, and Appliances Program

Joint Faculty Associate Professor August, 2020 – present
University of Tennessee Knoxville, Bredesen Center for Interdisciplinary Research and Graduate Education, Energy Science and Engineering (ESE) graduate program

- Advisor to two PhD students

Research & Development Scientist May, 2013 – 2018
Oak Ridge National Laboratory, Oak Ridge, TN

Postdoctoral Research Associate November, 2012 – May, 2013
Oak Ridge National Laboratory, Oak Ridge, TN

- Led fabrication and development of experimental absorption heat pump water heater

- Managed controls development and design of experiments for transcritical CO_2 heat pump water heater
- Conceived and drafted response to US DOE Funding Opportunity Announcement

Consultant September 2011 – November, 2012
Optimized Thermal Systems, College Park, MD
- Enable technology selection by developing and interpreting thermodynamic models for Fortune 100 client

Graduate Research Assistant July 2007 – November, 2012
University of Maryland, College Park, MD
- Conceived, designed, constructed and operated "simulated domestic residence" dynamic test facility to evaluate residential cogeneration and trigeneration systems
- Successfully managed progress and milestones for sponsored projects, directing junior graduate students
- Initiated three invention records with industry partner; coauthored two more

ADDITIONAL EXPERIENCE

Data and Research Assistant January 2007 –June, 2007
American Council On Renewable Energy (ACORE), Washington, DC

Congressional Legislative Intern September, 2006 – December 2006
First District of Oregon, Washington, DC

Volunteer April, 2006 – December 2006
Green Empowerment, Portland, OR

Field Manager March, 2005 – August 2006
Green Mountain Energy Company, Portland, OR

MENTORSHIP AND ADVISORSHIPS:

Current Dissertation Committee Co-Advisorships:

Masoud Ahmadi, *Michigan Technological University* 2019 – present
(co-advised with Asst. Prof. Sajjad Bigham)

Sara Sultan, *University of Tennessee, Knoxville, Bredesen Center* 2019 – present
(co-advised with Prof. Mark DeKay)

Damilola Akamo, *University of Tennessee, Knoxville, Bredesen Center* 2018 – present
(co-advised with Prof. David Keffer)

Jason Hirschey, *Georgia Institute of Technology*
(co-advised with Prof. Samuel Graham) — 2017 – present

Past Dissertation Committee Co-Advisorships:

Dr. Zhiyao Yang, *Purdue University*
(co-advised with Assoc. Prof. Ming Qu). Dissertation: *"An ammonia-based chemisorption heat pump for cold climate: experiments and modeling for performance analysis and design optimization"* — 2016 – 2020

Dr. Joseph Rendall, *Texas A&M at Kingsville*
(co-advised with Prof. William Worek). Dissertation: "*Thermal stratification in hot water tanks: a review, an empirical fit, a novel model and a prototype diffuser*" — 2018 – 2019

***Mentor* of 30 students** (current and past), including postdoctoral research associates, post-masters research associates, graduate and undergraduate interns through SULI, GEM, HERE, ASTRO, and CCI programs. — 2013 – present

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PUBLICATIONS

JOURNAL PUBLICATIONS:

2020

1. Rendall, Joseph; Kyle R. Gluesenkamp, William Worek, Ahmad Abu-Heiba, Kashif Nawaz, and Tony Gehl. "Empirical Characterization of Vertical-tube Inlets in Hot-water Storage Tanks" ***International Communications in Heat and Mass Transfer*** (in press).
2. Adrian S. Sabau, Adrian Bejan, David Brownell, **Kyle R. Gluesenkamp**, Bart Murphy, Fred List III, Keith Carver, Charles R. Schaich, and James W. Klett (2020). "Design, additive manufacturing, and performance of heat exchanger with a novel flow-path architecture," ***Applied Thermal Engineering***, v. 180, (2020): p. 115775. https://doi.org/10.1016/j.applthermaleng.2020.115775
3. Wang, Lingshi; Xiaobing Liu, Zhiyao Yang, **Kyle R. Gluesenkamp** (2020). "Experimental study on a novel three-phase absorption thermal battery with high energy density applied to buildings," ***Energy***, (October 2020), v. 208, 118311. https://doi.org/10.1016/j.energy.2020.118311
4. Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp** (2020). "Ammonia-Based Chemisorption Heat Pumps for Cold-Climate Heating Applications: A Comprehensive Review," ***Applied Thermal Engineering***, v. 179, 115674. https://doi.org/10.1016/j.applthermaleng.2020.115674

5. Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp** (2020). "Design Screening and Analysis of Gas-fired Ammonia-based Chemisorption Heat Pumps for Space Heating in Cold Climate," ***Energy***, v. 207, 118213. https://doi.org/10.1016/j.energy.2020.118213
6. Junfei Weng, Pu-Xian Gao, Zhiming Gao, Josh Pihl, Tim LaClair, Mingkan Zhang, **Kyle Gluesenkamp**, Ayyoub Momen (2020). "Nanoarray-Based Monolithic Adsorbers for SO_2 Removal," ***Emission Control Science and Technology*** v. 6, 315-323.
7. Philip Boudreaux, **Kyle R. Gluesenkamp**, Viral K. Patel, Bo Shen (2020). "Measurement and Analysis of Clothes Dryer Air Leakage," ***Drying Technology***. (April 2020), DOI: https://doi.org/10.1080/07373937.2020.1753765
8. **Gluesenkamp, Kyle R.**; Andrea Frazzica, Andreas Velte, Steven Metcalf, Zhiyao Yang, Mina Rouhani, Corey Blackman, Ming Qu, Eric Laurenz, Angeles Rivero-Pacho, Sam Hinmers, Robert Critoph, Majid Bahrami, Gerrit Füldner, and Ingemar Hallin (2020). "Experimentally Measured Thermal Masses of Adsorption Heat Exchangers," ***Energies***, 2020 v.13, 1150. https://www.mdpi.com/1996-1073/13/5/1150/pdf, doi:10.3390/en13051150
9. Li, Yuzhan; Yuehong Zhang, Monojoy Goswami, Dan Vincent, Liwei Wang, Tuan Liu, Kai Li, Jong K. Keum, Zhenhua Gao, Soydan Ozcan, **Kyle R. Gluesenkamp**, Orlando Rios, and Michael R. Kessler (2020). "Liquid crystalline networks based on photo-initiated thiol-ene click chemistry," ***Soft Matter***, 16, 1760.

2019

10. Cremaschi, Lorenzo; **Kyle R. Gluesenkamp** (2019). "Cutting Edge Research and New Technologies in Heat and Mass Transfer Processes of Refrigeration and Air Conditioning Systems" (editorial), ***Science and Technology for the Built Environment***, v. 25 (10) pp 1269-1270 (November 2019). https://doi.org/10.1080/23744731.2019.1698532
11. Yang, Zhiyao; Ming Qu, Omar Abdelaziz, **Kyle R. Gluesenkamp** (2019). "Development and case study of the liquid desiccant system module in sorption system simulation program (SorpSim)," ***Applied Thermal Engineering***, v.162, 114261 (November 2019). https://doi.org/10.1016/j.applthermaleng.2019.114261
12. Kumar, Navin; Jason Hirschey, Tim J. LaClair, **Kyle R. Gluesenkamp**, Samuel Graham (2019). "Review of Stability and Thermal Conductivity Enhancements for Salt Hydrates," ***Journal of Energy Storage***, v. 24, 100794 (August 2019). https://doi.org/10.1016/j.est.2019.100794
13. Chugh, Devesh; **Kyle R. Gluesenkamp**, Ahmad Abu-Heiba, Morteza Alipanah, Abdy Fazeli, Richard Rhode, Michael Schmid, Viral Patel, and Saeed Moghaddam (2019). "Experimental evaluation of a semi-open membrane-based absorption heat pump system utilizing ionic liquids," ***Applied Energy***, v. 239, 919-927 (April 2019). https://doi.org/10.1016/j.apenergy.2019.01.251
14. **Gluesenkamp, Kyle R.**; Philip Boudreaux, Viral Patel, Dakota Goodman, Bo Shen (2019). "An efficient correlation for heat and mass transfer effectiveness in tumble-type clothes dryer drums," ***Energy***, v. 172, 1225-1242 (April 2019). https://doi.org/10.1016/j.energy.2019.01.146
15. Blackman, Corey; **Kyle R. Gluesenkamp**, Mini Malhotra, Zhiyao Yang (2019). "Study of Optimal Sizing for Residential Sorption Heat Pump System," ***Applied Thermal Engineering***, v. 150, 421-432. (March 2019) https://doi.org/10.1016/j.applthermaleng.2018.12.151

16. Zhu, Chaoyi; **Kyle R. Gluesenkamp**, Zhiyao Yang, Corey Blackman (2019). "Unified Thermodynamic Model to Calculate COP of Diverse Sorption Heat Pump Cycles: Adsorption, Absorption, Resorption, and Multistep Crystalline Reactions," ***International Journal of Refrigeration***, v. 99, 382-392. https://doi.org/10.1016/j.ijrefrig.2018.12.021

2018

17. Patel, Viral; **Kyle R. Gluesenkamp**, Dakota Goodman, Anthony Gehl (2018). "Experimental evaluation and thermodynamic system modeling of thermoelectric heat pump clothes dryer," ***Applied Energy***, v. 217, 221-232. (May 2018) https://doi.org/10.1016/j.apenergy.2018.02.055
18. Dhumane, Rohit; Anne Mallow, Yiyuan Qiao, **Kyle R. Gluesenkamp**, Samuel Graham, Jiazhen Ling, Reinhard Radermacher (2018). "Enhancing the Thermosiphon-Driven Recharge of a Latent Heat Thermal Storage System used in a Personal Cooling Device", ***International Journal of Refrigeration***, v. 88, 599-613. (April 2018)

2017

19. Perez-Blanco, Horacio; **Kyle R. Gluesenkamp,** Moonis R. Ally (2017). "Simulation of an Ammonia–Water Heat Pump Water Heater with Combustion Products-Driven Evaporator", ***International Journal of Refrigeration***, v. 75, 228-238. (March 2017)
20. Chugh, Devesh; **Kyle R. Gluesenkamp,** Omar A. Abdelaziz, Saeed Moghaddam (2017). "Ionic liquid-based hybrid absorption cycle for water heating, dehumidification, and cooling", ***Applied Energy***, v. 202, 746-754. (September 2017)
21. **Gluesenkamp, Kyle R.**; Chugh, Devesh; Abdelaziz, Omar A.; Moghaddam, Saeed (2017). "Efficiency analysis of semi-open sorption heat pump systems", ***Renewable Energy***, v. 110, 95-104. (September 2017)

2016 and prior

22. Odukomaiya, Wale; Abu-Heiba, Ahmad; **Gluesenkamp, Kyle**; Abdelaziz, O.A.; Jackson, Roderick; Daniel, Claus; Graham, Samuel; Momen, Ayyoub (2016). "Thermal analysis of a near-isothermal compressed gas energy storage system", ***Applied Energy***, v. 179, 948-960. (October 2016)
23. Qian, S., **Gluesenkamp, K.**, Hwang, Y., Radermacher, R., Chun, H. (2013) 'Cyclic steady state performance of adsorption chiller with low regeneration temperature zeolite', ***Energy***, v. 60, 517-526. (October 2013)
24. **Gluesenkamp, K.**, Hwang, Y. and Radermacher, R. (2013). 'High efficiency micro trigeneration systems', ***Applied Thermal Engineering***, v. 50, 1480-1486. (February 2013)
25. Spencer J.D., Moton, J., Gibbons, W., **Gluesenkamp, K.**, Ahmed, I,. Taverner, A., McGahagan, D., Tesfaye, M., Gupta, C., Bourne, R., Monje, V., Jackson, G. (2013). 'Design of a combined heat, hydrogen, and power plant from university campus waste streams', ***International Journal of Hydrogen Energy***, v. 38, 4889-4900. (April 2013)

BOOK CHAPTERS:

Gluesenkamp, K., Hwang, Y., and Radermacher, R. (2013) 'Thermally driven heat pumps for use in combined cooling, heating and power', chapter in Kühn, A., ed. *Handbook of International Energy Agency Annex 34: Thermally Driven Heat Pumps for Heating and Cooling*.

Gluesenkamp, K. and Radermacher, R. (2011) 'Heat Activated Cooling Technologies for Small and Micro CHP Applications', chapter in Beith, R., ed. *Small and Micro CHP Systems*, Cambridge, UK: Woodhead Publishing Ltd.

REFEREED CONFERENCE ARTICLES:

1. Li, Yuzhan; Navin Kumar, Tim LaClair, **Kyle R. Gluesenkamp**, "Standard characterization techniques for inorganic phase change materials," Session E-7: Novel measurements, instrumentation and experimental techniques I, *2020 IEEE ITherm 2020 (virtual)*, July 21 – 23, 2020 (virtual conference).
2. Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp**, "Seasonal Performance Simulation of a Gas-fired Chemisorption Heat Pump for Residential Heating in Cold Climate," *2020 Building Performance Analysis Conference and SimBuild* co-organized by ASHRAE and IBPSA-USA, September 29 – October 1, 2020 (virtual conference).
3. Gao, Zhiming; Navin Kumar, Zhiyao Yang, **Kyle Gluesenkamp**, Ahmad Abu-Heiba, Van Baxter (2020). "Modeling and Simulation of a Membrane-Based Heat and Mass Exchanger (HMX) Recovering Latent Heat of Dehumidification" (Presentation 27089, VC-20-C059) *ASHRAE Virtual Conference*, Paper Session 1, June 2020.
4. Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp** (2020). "Dynamic Modelling and Performance Evaluation of a Chemisorption Heat Pump for Cold Climate," Conference Paper Session 20, *ASHRAE 2020 Winter Conference*, Feb 4, 2020, Orlando, FL.
5. Wang, Lingshi; Xiaobing Liu, Zhiyao Yang, **Kyle R. Gluesenkamp**. (2019). "Experimental Investigation of a Novel High Energy Density Mobile Sorption-based Thermal Battery." *Geothermal Resources Council (GRC) Annual Meeting and Expo*, September 15-18, 2019, Palm Springs, CA. Available in *GRC Transactions*, Vol. 43, 2019, pp 60-72.
6. Dong, Jin; Bo Shen, Jeff Munk, **Kyle R. Gluesenkamp**, Tim J. Laclair, Teja Kuruganti (2019). "Novel PCM Integration with Electrical Heat Pump for Demand Response," *IEEE Power and Energy Society General Meeting*, Atlanta, GA, August 4-8, 2019.
7. Yang, Zhiyao, **Kyle R. Gluesenkamp**, and Andrea Frazzica (2018). "Database of sorption material equilibrium properties," *Heat Powered Cycles*, Bayreuth Germany, 16-19 September 2018.
8. Zhang, Mingkan; Ahmad Abu-Heiba, **Kyle R. Gluesenkamp**, Ayyoub Momen (2018). "Fully solid state thermomagnetoelectric generator: cycle model and proof-of-concept results," *Thermag VIII: Eighth IIF-IIR International Conference on Magnetic Refrigeration at Room Temperature*, Darmstadt, Germany, 16-20 September 2018.
9. Patel, Viral K. Hsin Wang, **Kyle R. Gluesenkamp**, Anthony Gehl, Geoffrey Ormston, Emily Kirkman (2018). "Long-term effects of power quality and power cycling on thermoelectric module performance," *Proceedings of the ASME 2018 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK)*, San Francisco, CA, August 28-30, 2018.

10. Abu-Heiba, Ahmad, **Kyle R. Gluesenkamp**, Adewale Odukomaiya, Ayyoub Momen (2018). "Diverse energy storage technology," *ACEEE Summer Study on Energy Efficiency in Buildings*, Pacific Grove, CA, August 12-17, 2018.
11. Patel, Viral K.; **Kyle R. Gluesenkamp** (2018). "Thermoelectric Heat Pump Clothes Dryer using Secondary Loop Heat Exchangers: Experimental Evaluation," *5th International High Performance Buildings Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
12. **Gluesenkamp, K.R.;** Philip Boudreaux, Bo Shen, Dakota Goodman, Viral K. Patel (2018). "Experimental Measurements of Clothes Dryer Drum Heat and Mass Transfer Effectiveness," *5th International High Performance Buildings Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
13. Abu-Heiba, Ahmad; Mini Malhotra, **Kyle R. Gluesenkamp**, Viral K. Patel (2018). "Domestic Dishwasher Simulated Energy Efficiency Evaluation Using Thermoelectric Heat Pump for Water Heating and Dish Drying," *5th International High Performance Buildings Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
14. Shen, Bo; **Kyle R. Gluesenkamp**, Philip Boudreaux, Viral K. Patel (2018). "Model-Based Air Flow Path Optimization for Heat Pump Clothes Dryer," *17th International Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
15. Qiao, Yiyuan; Anne Mallow, Jan Muehlbauer, Yunho Hwang, Jiazhen Ling, Vikrant Aute, Reinhard Radermacher, **Kyle R. Gluesenkamp** (2018). "Experimental Study on Portable Air-Conditioning System with Enhanced PCM Condenser," *17th International Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
16. Nawaz, Kashif; **Kyle R. Gluesenkamp** (2018). "Separate sensible and latent cooling systems: A critical review of the state-of-the-art and future prospects," *17th International Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
17. Hirschey, Jason; **Kyle R. Gluesenkamp**, Anne Mallow, Samuel Graham (2018). "Review of Inorganic Salt Hydrates with Phase Change Temperature in Range of 5 to 60°C and Material Cost Comparison with Common Waxes," *5th International High Performance Buildings Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
18. Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp** (2018). "Performance Comparison of Chemisorption Heat Pump Cycles Using a Generalized Analytical Model," *17th International Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 9-12, 2018.
19. Patel, Viral K.; **Kyle R. Gluesenkamp** (2017). "Development of Packaging and Modular Control of Thermoelectric Clothes Dryer, With Performance Evaluation." *ASME InterPACK 2017*, Session 4-3-2, Aug 29 – Sept 1, 2017, San Francisco, CA.
20. Mallow, A.M., **Kyle R. Gluesenkamp**, Omar Abdelaziz, Samuel Graham (2017). "Optimization of graphite composite latent heat storage systems." *ASME InterPACK 2017*, IPACK2017-7577, Aug 29 – Sept 1, 2017, San Francisco, CA.
21. Blackman, Corey; **Kyle R. Gluesenkamp**, Mini Malhotra, Zhiyao Yang (2017). "Study of Optimal Sizing for Residential Sorption Heat Pump System." *International Sorption Heat Pump Conference*, August 7–10, 2017, Tokyo, Japan.

22. **Gluesenkamp, Kyle R.**, Jaume Fitó, Zhiyao Yang, Alberto Coronas (2017). "Operational Solubility Limits for Water-Based Absorption Working Pairs." *International Sorption Heat Pump Conference*, August 7–10, 2017, Tokyo, Japan.
23. Yang, Zhiyao, Ming Qu, **Kyle R. Gluesenkamp**, Omar Abdelaziz (2017). "Update of the Sorption System Simulation Program (SorpSim)." *International Sorption Heat Pump Conference*, August 7–10, 2017, Tokyo, Japan.
24. Yang, Zhiyao, **Kyle R. Gluesenkamp**, Andrea Frazzica (2017). "Database of Equilibrium Vapor Pressures for Sorption Materials." *International Sorption Heat Pump Conference*, August 7–10, 2017, Tokyo, Japan.
25. Chugh, Devesh; **Gluesenkamp, Kyle R.**; Abdelaziz, Omar; Moghaddam, Saeed (2017). "Hybrid Membrane-based Ionic Liquid Absorption Cycle for Water Heating, Dehumidification, and Cooling." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.
26. Goodman, Dakota K.; Patel, Viral K.; **Gluesenkamp, Kyle R.** (2017). "Thermoelectric heat pump clothes dryer design optimization." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.
27. Yang, Zhiyao; Qu, Ming; **Gluesenkamp, Kyle R.**; Abdelaziz, Omar. "Liquid Desiccant System Component Models in the Sorption System Simulation Program (SorpSim)." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.
28. **Gluesenkamp, Kyle R.**; Yang, Zhiyao; Abdelaziz, Omar. "Translating cycle performance to system-level efficiency for sorption heat pumps." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.
29. Yang, Zhiyao, Liu, Xiaobing, **Gluesenkamp, Kyle R.**, Mehdizadeh Momen, Ayyoub. "Transported Low-temperature Geothermal Energy for Thermal End Uses", *42nd Workshop on Geothermal Reservoir Engineering*, Stanford, California, February 13-15, 2017.
30. Mallow, A., Graham, S., **Gluesenkamp, K.R.**, Abdelaziz, O.A. (2016). "Design of compressed graphite/PCM thermal batteries", *Fourth International Conference on Computational Methods for Thermal Problems (ThermaComp2016)*, July 6-8, 2016, Georgia Tech, Atlanta, GA, USA.
31. **Gluesenkamp, K.**, Shope, M., Abdelaziz, O., and Wang, K. (2016). "Thermophysical Properties of Lithium Bromide + 1,2-Propanediol Aqueous Solutions – Vapor Pressure and Solubility", *IVth International Symposium on Innovative Materials for Processes in Energy Systems (IMPRES)*, October 23-26, 2016, Taormina, Italy.
32. Moghaddam, S., Abdelaziz, O., Chugh, D., **Gluesenkamp K.R.** (2016). "Compact membrane-based hybrid dehumidifier and water heater absorption system", *IVth International Symposium on Innovative Materials for Processes in Energy Systems (IMPRES)*, October 23-26, 2016, Taormina, Italy.
33. Mallow, A., Abdelaziz, O., **Gluesenkamp, K.**, Graham, S. (2016). "Optimized Design of a Compressed Graphite/PCM Thermal Battery", *IVth International Symposium on Innovative Materials for Processes in Energy Systems (IMPRES)*, October 23-26, 2016, Taormina, Italy.
34. **Gluesenkamp, K.** (2016). "Energy Factor Analysis for Gas Heat Pump Water Heaters", *ASHRAE Annual Meeting 2016*, Conference Paper Session 19, June 29, 2016, St. Louis, MO.

35. **Gluesenkamp, K.**, Bush, J. (2016). "Impact on Water Heater Performance of Heating Methods that Promote Tank Temperature Stratification", *ASHRAE Annual Meeting 2016*, Conference Paper Session 19, June 29, 2016, St. Louis, MO.

36. Ally, M., Sharma, V., **Gluesenkamp, K.** (2016). "Bounding limitations in the practical design of adsorption heat pump water heaters", *ASHRAE Annual Meeting 2016*, Conference Paper Session 19, June 29, 2016, St. Louis, MO.

37. Patel, V., Goodman, D., **Gluesenkamp, K.**, Gehl, T. (2016). "Experimental evaluation and thermodynamic system modeling of thermoelectric heat pump clothes dryer". *16th Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 11, 2016.

38. Shen, Bo, **Kyle R. Gluesenkamp,** Pradeep Bansal, David Beers. (2016). "Heat pump clothes dryer model development". *16th Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 11, 2016.

39. Yang, Z., Liu, X., **Gluesenkamp, K.**, Momen, A. (2016). "A Preliminary Study on Innovative Absorption Systems that Utilize Low-Temperature Geothermal Energy for Air-Conditioning Buildings". *16th Refrigeration and Air Conditioning Conference*, Purdue University, West Lafayette, IN, July 11, 2016.

40. Liu, Xiaobing, Yang, Zhiyao, **Gluesenkamp, Kyle R.**, Momen, Ayyoub M. (2016). "A technical and economic analysis of an innovative two-step absorption system for utilizing low-temperature geothermal resources to condition commercial buildings", *Proceedings of the 41st Workshop on Geothermal Reservoir Engineering*, Stanford University, Stanford, CA, February 22-24, 2016.

41. Mehdizadeh Momen, Ayyoub, Abdelaziz, Omar, **Gluesenkamp, Kyle R.**, Kokou, Edem K., Bansal, Pradeep (2015). "Preliminary Study on the Performance of the Novel Direct Contact Ultrasonic Clothes Dryer", IMECE2015, Houston, Texas, USA.

42. Chugh, Devesh; Isfahani, Rasool Nasr; **Gluesenkamp, Kyle R.**; Abdelaziz, Omar; Moghaddam, Saeed (2015). "A hybrid absorption cycle for water heating, dehumidification, and evaporative cooling", Proceedings of the ASME InterPACKICNMM2015, July 6-9, 2015 San Francisco, California, USA.

43. Mehdizadeh Momen, Ayyoub, Abdelaziz, Omar, **Gluesenkamp, Kyle R.**, Odukomaiya, Wale O. (2015). "Transient Thermofluids Analysis of a Ground-Level Integrated Diverse Energy Storage (GLIDES) System", IMECE2015, Huston, Texas, USA.

44. Ayyoub M. Momen, Omar Abdelaziz, **Kyle Gluesenkamp**, Edward Vineyard, Michael Benedict (2014) 'Thermofluid analysis of magnetocaloric refrigeration', in *Proceedings of the ASME International Mechanical Engineering Congress and Exposition*, Montreal, QC, Canada, November 14-20, 2014.

45. Jiazhen Ling, Yunho Hwang, Vikrant Aute, Reinhard Radermacher, **Kyle Gluesenkamp** (2014) 'Development of a control strategy to maximize system performance of heat pump systems', in *11th IEA Heat Pump Conference*, Montreal, QC, Canada, May 12-16, 2014.

46. Devesh Chugh, **Kyle Gluesenkamp**, Omar Abdelaziz, Saeed Moghaddam (2014) 'A novel absorption cycle for combined water heating, dehumidification, and evaporative cooling', in *International Sorption Heat Pump Conference 2014*, College Park, MD, USA, March 31-April 3, 2014.

47. Katie Maerzke, George Mozurkewich, Omar Abdelaziz, **Kyle Gluesenkamp**, William Schneider, Doug Morrison, and Edward Maginn (2014) 'Ionic liquid development for

absorption heat pump applications', in *International Sorption Heat Pump Conference 2014*, College Park, MD, USA, March 31-April 3, 2014.

48. Zhiyao Yang, Xin Tang, Ming Qu, Omar Abdelaziz, **Kyle R. Gluesenkamp** (2014) 'Development of an updated ABsorption SIMulation software (ABSIM), in *International Sorption Heat Pump Conference 2014*, College Park, MD, USA, March 31-April 3, 2014.
49. Suxin Qian, John Hartsog, **Kyle Gluesenkamp**, Yunho Hwang, Reinhard Radermacher (2014) 'Performance of trigeneration systems with adsorption heat pump under various climates', in *International Sorption Heat Pump Conference 2014*, College Park, MD, USA, March 31-April 3, 2014.
50. Jiazhen Ling, **Kyle Gluesenkamp**, Suxin Qian, Yunho Hwang, Reinhard Radermacher (2013). "Design of a Combined Cooling, Heating and Power Unit driven by IC Engine." *Annual Meeting of the Deutscher Kaelte und Klimatechnischer (DKV) 2013*, Hannover, Germany, November 20-22, 2013.
51. Qian, S., **Gluesenkamp, K.**, Hwang, Y., Radermacher, R. (2013) 'Experimental study on performance of a residential combined cooling, heating and power system under varying building load', in *Proceedings of ASME 2013 7th International Conference on Energy Sustainability and 11th Fuel Cell Science, Engineering and Technology Conference*, Minneapolis, MN, USA, July 14-19, 2013.
52. **Gluesenkamp, K.**, Radermacher, R. and Hwang, Y. (2011) 'Trends in absorption machines', in *International Sorption Heat Pump Conference*, Padua, Italy, April 5-7, 2011.
53. **Gluesenkamp, K.**, Radermacher, R. and Hwang, Y. (2011) 'High efficiency trigeneration systems for buildings', in *European Conference on Polygeneration*, Tarragona, Spain, March 30-April 1, 2011.
54. **Gluesenkamp, K.**, Horvath, C., Radermacher, R. and Hwang, Y. (2011) 'Air-cooled, single-effect, waste heat-driven water/LiBr absorption system for high ambient temperatures', in *International Sorption Heat Pump Conference*, Padua, Italy, April 5-7, 2011.
55. **Gluesenkamp, K.**, Radermacher, R. and Hwang, Y. (2011) 'Crystallization inhibitors for water/LiBr absorption chillers', in *International Sorption Heat Pump Conference*, Padua, Italy, April 5-7, 2011.
56. **Gluesenkamp, K.**, Radermacher, R. and Hwang, Y. (2011) 'Preliminary design of a low regeneration temperature residential adsorption chiller', in *International Sorption Heat Pump Conference*, Padua, Italy, April 5-7, 2011.
57. Berry, B., Bowen-Davies, G., **Gluesenkamp, K.**, Kaler, Z., Schmaus, J., Staruk, W., Weiner, E., Woods, B. (2012) 'Design optimization of *Gamera II*: a human powered helicopter', in *68th American Helicopter Society International Forum*, Ft. Worth, TX, USA, May 1-3, 2012.

MAGAZINE ARTICLES:

Nawaz, Kashif, **Kyle R. Gluesenkamp,** Viral K. Patel (2020). 'Heat Pump R&D for Appliance Applications', in *Heat Pumping Technologies Magazine*, an IEA Heat Pump Center product, Vol. 38 No. 1/2020: p. 4. ISSN 2002-018X. (April 2020)

Mallow, Anne M., **Gluesenkamp, K.** (2017). 'Personal cooling and the Roving Comforter', in *Heat Pumping Technologies Magazine*, an IEA Heat Pump Center product, Vol. 35 No. 2/2017: 49-52.

POSTERS:

Yang, Zhiyao; Xiaobing Liu, Lingshi Wang, **Kyle R. Gluesenkamp** (2019). "Mobile sorption thermal battery (MSTB) for low-grade thermal energy storage, transportation, and utilization," presented to the *Fifth International Symposium on Innovative Materials and Processes in Energy Systems (IMPRES) 2019*, October 20-23, 2019, Kanazawa, Japan. **Zhiyao won Best Student Poster Award**.

Yang, Zhiyao; Ming Qu, **Kyle R. Gluesenkamp** (2019). "Model-based study of gas-fired chemisorption heat pump for cold climate heating applications," presented to the *Fifth International Symposium on Innovative Materials and Processes in Energy Systems (IMPRES) 2019*, October 20-23, 2019, Kanazawa, Japan.

Dong, Jin; Bo Shen, Jeffrey Munk, **Kyle R. Gluesenkamp**, Tim LaClair, Teja Kuruganti (2019). "Novel PCM integration with electrical heat pump for demand response." *2019 IEEE Power and Energy Society General Meeting*, Atlanta, GA, August 5–8, 2019.

Gluesenkamp, Kyle R.; Yang, Zhiyao; Abdelaziz, Omar. "Translating cycle performance to system-level efficiency for sorption heat pumps." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.

Goodman, Dakota K.; Patel, Viral K.; **Gluesenkamp, Kyle R.** (2017). "Thermoelectric heat pump clothes dryer design optimization." *12th IEA Heat Pump Conference 2017*, Rotterdam, Netherlands, May 15–18, 2017.

Yang, Z., Liu, X., **Gluesenkamp, K.**, Momen, A. (2016). "Transporting geothermal heat to condition buildings" (2016). *Power Plays: Geothermal Energy in Oil and Gas Fields Conference and Workshop*, Southern Methodist University, Dallas, TX, April 25-26, 2016.

TECHNICAL REPORTS:

1. Axel Albers, Marcello Aprile, Corey Blackman, Robert Critoph, Johan Emhofer, Andrea Frazzica, Gerrit Füldner, Michael Garrabrant, **Kyle Gluesenkamp**, Stefan Henninger, Ivan Malenkovic, Patricia Melograno, Steven Metcalf, Mario Motta, Björn Niedburg, Valeria Palomba, Ángeles Rivero-Pacho, Peter Schossig, Lindsay Sugden, Luigi Tischer, Tommaso Toppi, Andreas Velte, Ursula Wittstadt, Zhiyao Yang. "Final Report Annex 43: Fuel Driven Sorption Heat Pumps." September, 2020. IEA report number HPT-AN43-1. https://heatpumpingtechnologies.org/publications/final-report-annes-43-fuel-driven-sorptionheat-pumps/
2. Wang, Lingshi, Xiaobing Liu, Zhiyao Yang, **Kyle R. Gluesenkamp** (August 2020). "Mobile Sorption-based Thermal Battery for Harvesting Low-Temperature Geothermal Energy." ORNL Report ORNL/TM-2019/1183. https://doi.org/10.2172/1651404
3. Sabau, Adrian, **Kyle R. Gluesenkamp**, Phil Lafond, David Brownell (February 2020). "Certification and User Manual for A 5kW Heat Exchanger Test Loop at Low Temperatures and High-Pressures" ORNL Report ORNL/TM-2019/1403. https://doi.org/10.2172/1606805
4. **Gluesenkamp, K.**, Abdelaziz, O., Patel, V., Mandel, B., deAlmeida, V. (May 2017). "High Efficiency Water Heating Technology Development – Final Report, Part II: CO2 and Absorption-Based Residential Heat Pump Water Heater Development" ORNL

publication TM-2016/291. Available at http://info.ornl.gov/sites/publications/Files/Pub68329.pdf

5. Yang, Z., Liu, X., **Gluesenkamp, K.**, Smith, C., Li, J., Momen, A. (October 2016). "Transported Low Temperature Geothermal Energy for Thermal End Uses – Final Report." ORNL publication TM-2016/658. Available at http://info.ornl.gov/sites/publications/Files/Pub71276.pdf.
6. Liu, X., Yang, Z., **Gluesenkamp, K.**, Momen, A. (Dec 2015). "A Technical and Economic Analysis of an Innovative Two-Step Absorption System for Utilizing Low-Temperature Geothermal Resources to Condition Commercial Buildings", ORNL publication TM-2015/655. Available at http://info.ornl.gov/sites/publications/Files/Pub59856.pdf
7. Liu, X., **Gluesenkamp, K.**, Momen, A. (2015). "Overview of Resources for Geothermal Absorption Cooling for Buildings", ORNL publication 2015/131. Available at http://info.ornl.gov/sites/publications/Files/Pub54942.pdf
8. Sharma, Vishaldeep, **Gluesenkamp, Kyle R.**, Ally, Moonis Raza, Mandel, Bracha T., Geoghegan, Patrick J., 2014, "Commercial Absorption Heat Pump Water Heater: Q4 Milestone Report: Complete first generation prototype design", ORNL report, ORNL/TM-2015/292
9. **Gluesenkamp, K.** (2014). *Residential clothes dryer performance under timed and automatic termination test procedures*. ORNL publication 2014/431. Available at http://web.ornl.gov/sci/buildings/docs/2014-10-09-ORNL-DryerFinalReport-TM-2014-431.pdf
10. Horvath, C., **Gluesenkamp, K.**, Hwang, Y., Radermacher, R. (2011). 'Final project report: Comparison of waste heat driven water/LiBr absorption systems and conventional electrically run vapor compression systems for an off-grid, high ambient temperature setting.' Prepared under Sub-award 400036855 under CERDEC Army Power Division Contract No. W909MY-10-C-0003, July 2011.
11. **Gluesenkamp, K.**, Radermacher, R. and Hwang, Y. (2009). 'Integration of a residential micro CHP system.' September, 2009.

LECTURES, PRESENTATIONS AND WEBINARS

1. Lingshi Wang, Xiaobing Liu, Zhiyao Yang, **Kyle R. Gluesenkamp**, "A Novel High Energy Density Mobile Sorption-based Thermal Battery for Low-grade Thermal Energy Storage," presented to MIT A+B Applied Energy Symposium, August 12-14, 2020, www.applied-energy.org/mitab2020.
2. **Gluesenkamp, Kyle R.**, Navin Kumar (2020). "Salt Hydrate Phase Change Materials," presented during *Novel Materials in Thermal Energy Storage Buildings for Buildings* (part of *BTO Thermal Energy Storage Webinar Series* (webinar), August 5, 2020. https://www.energy.gov/eere/buildings/thermal-energy-storage-webinar-series-novel-materials-thermal-energy-storage
3. **Gluesenkamp, Kyle R.**, Navin Kumar, Sara Sultan, Jason Hirschey, Tim LaClair (2020). "Economic value of HVAC-mediated thermal storage under TOU tariffs," IEA HPT Annex 55 Experts Meeting (web meeting), June 25, 2020.

4. **Gluesenkamp, Kyle R.**, Jason Hirschey (2019). "Technology status of heat pumps integrated with thermal energy storage in the US," IEA HPT Annex 55 Experts Meeting February 6, 2020, Rome, Italy.
5. **Gluesenkamp, Kyle R.**, Navin Kumar (2019). "Challenges with Current Characterization Techniques for Thermal Energy Storage Materials." Presented to *Workshop on Fundamental Needs for Dynamic and Interactive Thermal Storage Solutions for Buildings*, Lawrence Berkeley National Laboratory, November 19-20, 2019.
6. **Gluesenkamp, Kyle R.**, Zhiyao Yang, Corey Blackman, Chaoyi Zhu (2019). "A method for the treatment of inactive thermal mass in thermally driven heat pump systems," ***keynote*** presentation in the *Fifth International Symposium on Innovative Materials and Processes in Energy Systems (IMPRES) 2019*, October 20-23, 2019, Kanazawa, Japan.
7. Zhiyao Yang, **Gluesenkamp, Kyle R.**, Andrea Frazzica (2019). "Vapor Equilibrium database for sorption materials," presented to the *Fifth International Symposium on Innovative Materials and Processes in Energy Systems (IMPRES) 2019*, October 20-23, 2019, Kanazawa, Japan.
8. Guolian Wu, **Kyle R. Gluesenkamp,** "Thermoelectric Heat Recovery System for Household Dishwasher" invited talk for the session: "Fitted for the Future: A Discussion on Emerging Technologies," *ENERGY STAR Products Partner Meeting*, Charlotte, NC. September 10-12, 2019.
9. **Gluesenkamp, Kyle R.** (2019). "Funding Opportunities in Energy Systems." ***Plenary*** lecture at *ASME Summer Heat Transfer Conference*, July 15-17, 2019, Bellevue, WA.
10. **Gluesenkamp, Kyle R.**, Ahmad Abu-Heiba (2019). "Optimization Framework to Maximize Absorption Water Heater Energy Efficiency" *ASHRAE Annual Conference*, Seminar 53, Kansas City, MO, June 25, 2019.
11. **Gluesenkamp, Kyle R.** (2019). "Natural Gas Technology: ORNL Research Update." Presented to American Gas Association Sustainable Growth Committee Meeting, May 8, 2019, Portland, OR.
12. **Gluesenkamp, Kyle R.** (2019). "Low-Cost Composite Phase Change Material." DOE Building Technologies Office 7th Annual Peer Review, April 15–10, 2019, Crystal City, Virginia. available at https://www.energy.gov/sites/prod/files/2019/05/f62/bto-peer%E2%80%932019-ornl-low-cost-composite-phase-change.pdf
13. **Gluesenkamp, Kyle R.** (2019). "Drop-in, Retrofit Furnace with Maximum Efficiency – Self Powered System." DOE Building Technologies Office 7th Annual Peer Review, April 15–10, 2019, Crystal City, Virginia. available at https://www.energy.gov/sites/prod/files/2019/05/f62/bto-peer%E2%80%932019-ornl-drop-in-retrofit-furnace-max-eff.pdf
14. **Gluesenkamp**, **Kyle R.** (2019). "Residential Gas-Fired Cost-Effective Triple-State Sorption Heat Pump." DOE Building Technologies Office 7th Annual Peer Review, April 15–10, 2019, Crystal City, Virginia. available at https://www.energy.gov/sites/prod/files/2019/05/f62/bto-peer-2019-ornl-res-gas-fired-heatpump.pdf
15. **Gluesenkamp, Kyle R.**, Kashif Nawaz (2019). "CO_2 vs. Fluorocarbons: Thermodynamic Comparison of Subcritical and Transcritical Heat Pump Water Heater (HPWH) Efficiency." *ACEEE Hot Water Forum*, Session 4A, March 12-13, 2019, Nashville, TN.

16. **Gluesenkamp, Kyle R.** (2019). "Semi-open sorption water heater: experimental results and theory of operation." *ACEEE Hot Water Forum*, Session 7B, March 12-13, 2019, Nashville, TN.
17. Abu-Heiba, Ahmad; **Kyle R Gluesenkamp**, Bo Shen (2019). "Optimization of water heater control strategy to maximize UEF and FHR." *ACEEE Hot Water Forum*, March 12-13, 2019, Nashville, TN.
18. Rendall, Joseph (2019). "Characterizing the impact of modern dip tubes on hot water tank stratification with classical dimensionless groupings." Session 7B, *ACEEE Hot Water Forum*, March 12-13, 2019, Nashville, TN.
19. **Kyle R. Gluesenkamp**, "The Role of ORNL in Private Sector Innovation: Current Collaborations and Opportunities". Presented to *Rheem 2018 Global R&D Summit*, November 6, 2018, Montgomery, AL.
20. **Kyle R. Gluesenkamp**, Yang, Zhiyao, Andrea Frazzica. "Database of Vapor Equilibria for Sorption Materials". Presented to 8th *Expert Meeting of the IEA HPP Annex 43*, May 16, 2018, Stockholm, Sweden.
21. **Kyle R. Gluesenkamp**, (2018). "Thermoelectric clothes dryer". DOE Building Technologies Office 6th Annual Peer Review, April 30–May 3, 2018, Arlington, Virginia. available at https://www.energy.gov/sites/prod/files/2018/06/f52/32226o_Gluesenkamp_050218-1100.pdf
22. **Kyle R. Gluesenkamp**, (2018). "Residential gas-fired cost-effective triple-state sorption heat pump". DOE Building Technologies Office 6th Annual Peer Review, April 30–May 3, 2018, Arlington, Virginia. available at https://www.energy.gov/sites/prod/files/2018/06/f52/32292_Gluesenkamp_050118-1630.pdf
23. **Gluesenkamp, Kyle R.**, Ahmad Abu-Heiba, Devesh Chugh, Saeed Moghaddam (2018). "Experimental results: gas-fired membrane-based semi-open sorption water heater." *ACEEE Hot Water Forum*, Session 4A: Developments in gas heat pump water heaters, March 21-23, 2018, Portland, OR.
24. Yang, Zhiyao, **Kyle R. Gluesenkamp**, Andrea Frazzica. "Database of Equilibrium Vapor Pressure for Sorption Materials". Presented to 7th *Expert Meeting of the IEA HPP Annex 43*, Dec 5, 2017, Brussels, Belgium.
25. **Gluesenkamp, Kyle R.**; Mini Malhotra (2017). "Mass Markets in the US for Sorption Heating Appliances." *ASHRAE Annual Conference*, Seminar 11 (sponsored by TC 8.3), June 25, 2017, Long Beach, CA.
26. **Gluesenkamp, K.** (2017). "Heat pump clothes dryer". DOE Building Technologies Office 5th Annual Peer Review, March 13-16, 2017, Arlington, Virginia. available at https://energy.gov/sites/prod/files/2017/04/f34/6_32226b_Gluesenkamp_031317-1630.pdf
27. **Gluesenkamp, K.** (2017). "SaltX residential heat pump". DOE Building Technologies Office 5th Annual Peer Review, March 13-16, 2017, Arlington, Virginia. available at https://www.energy.gov/sites/prod/files/2017/04/f34/5_32292_Gluesenkamp_031317-1600.pdf
28. **Gluesenkamp, K.** "Update on US Country Report". Presented to 6th *Expert Meeting of the IEA HPP Annex 43*, June 15, 2016, Milan, Italy.
29. **Gluesenkamp, K.** (2016). "Novel energy-efficient ventless thermoelectric clothes dryer". DOE Building Technologies Office 4th Annual Peer Review, April 4-7, 2016, Falls

Church, Virginia. Available at http://energy.gov/eere/buildings/downloads/novel-energy-efficient-thermoelectric-clothes-dryer

30. **Gluesenkamp, K.** (2016). "CO2 heat pump water heater". DOE Building Technologies Office 4th Annual Peer Review, April 4-7, 2016, Falls Church, Virginia. Available at https://www.energy.gov/sites/prod/files/2016/04/f30/32218a_Gluesenkamp_040616-1205.pdf
31. **Gluesenkamp, K.**, Devesh Chugh, Saeed Moghaddam, Omar Abdelaziz (2017). "Theory of Semi-Open Sorption Gas-Fired Heat Pump Systems and Early Experimental Results". Presented to Session 5B, *2017 ACEEE Hot Water Forum*, February 28, 2017, Portland, OR.
32. **Gluesenkamp, K.**, de Almeida, V., Abdelaziz, O. (2016). "Affordable ENERGY STAR® Residential CO_2 HPWH for the US Market". Presented to Session 1B, *2016 ACEEE Hot Water Forum*, February 22, 2016, Portland, OR. Available at https://aceee.org/sites/default/files/files/pdf/conferences/hwf/2016/Gluesenkamp_Session1B_HWF16_2.22.16.pdf
33. **Gluesenkamp, K.**, Vineyard, E.A. "Semi-open sorption systems as heat pumps and coolers." Presented to *Sorption Friends*, September 22, 2015, Milazzo, Italy.
34. **Gluesenkamp, K.** "Fuel-fired heat pump water heaters: a generalized design study." Presented to *Sorption Friends*, September 22, 2015, Milazzo, Italy.
35. **Gluesenkamp, K.** "US activities, test standards and field tests in gas-fired heat pump water heaters". Presented to 4th *Expert Meeting of the IEA HPP Annex 43*, June 9, 2015, Vienna, Austria.
36. **Gluesenkamp, K.** "Development of Low-cost ENERGY STAR®-Qualified Residential CO_2 HPWH Prototype". Presented to *ACEEE Hot Water Forum*, February 23, 2015, Nashville, TN.
37. **Gluesenkamp, K.** "US activities in gas-fired heat pump water heaters". Presented to *3rd Expert Meeting of the IEA HPP Annex 43*, November 6, 2014, Freiburg, Germany.
38. **Gluesenkamp, K.** "Gas-fired heat pump water heaters" (Seminar 48, TC8.3). Presented to *ASHRAE Annual Meeting 2014*, July 2, 2014, Seattle, WA.
39. **Gluesenkamp, K.** (2014). "CO_2 Heat Pump Water Heater". DOE Building Technologies Office 2nd Annual Peer Review, April 22-24, 2014, Vienna, Virginia. Available at https://www.energy.gov/sites/prod/files/2014/10/f18/emt49_glusenkamp_042414.pdf
40. **Gluesenkamp, K.** (2014). "Absorption Heat Pump Water Heater". DOE Building Technologies Office 2nd Annual Peer Review, April 22-24, 2014, Vienna, Virginia. Available at https://www.energy.gov/eere/buildings/downloads/absorption-heat-pump-water-heater-0
41. **Gluesenkamp, K.**, Garrabrant, M., Chapman, G. "Gas heat pumps: an update" Webinar presented to Gas Committee of the Consortium for Energy Efficiency, March 20, 2014.
42. **Gluesenkamp, K.,** Yunho Hwang, and Reinhard Radermacher. "Separate sensible and latent cooling for trigeneration" (*Special Session 6, Workshop: Cutting Edge Absorption and Adsorption Cooling Technologies in Cogeneration and Trigeneration*), presented to *ASHRAE Annual Meeting 2013*, June 22-26, Denver, CO.
43. **Gluesenkamp, K.** "Development of a control strategy with multiple continuous outputs" (Seminar 55, TG1 Optimization). Presented to *ASHRAE Winter Meeting 2014*, January 22, 2014, New York, NY.

44. **Gluesenkamp, K.**, Abdelaziz, O., Vineyard, E. "Gas-fired absorption heat pump water heater development at Oak Ridge National Laboratory." Presented to *2013 ACEEE Hot Water Forum*, November 4, 2013, Atlanta, GA.
45. **Gluesenkamp, K.** (2013). "Absorption Heat Pump Water Heater". DOE Building Technologies Office 1st Annual Peer Review, April 2-4, 2013, Washington, DC. Available at https://www.energy.gov/sites/prod/files/2013/12/f5/emrgtech10_gluesenkamp_040313.pdf
46. **Gluesenkamp, K.**, Radermacher, R., Ling, J., Hwang, Y. "Hydrocarbon refrigerants for air conditioning: thermophysical properties and comparisons." Presented by K. Gluesenkamp to *2012 China Household Electrical Appliances Association (CHEAA) Technical Conference*, October 30, 2012, Nanjing, China.
47. Moton, J., Spencer, D., Bourne, R., **Gluesenkamp, K.**, Gibbons, W. "Combined heat, hydrogen and power plant design for the University of Maryland." Webinar hosted by US Department of Energy, September 4, 2012, Washington, DC, USA.
48. Moton, J., Spencer, D., Bourne, R., **Gluesenkamp, K.** "Combined heat, hydrogen and power plant design for the University of Maryland." Presented to *2012 World Hydrogen Energy Conference*, June 3, 2012, Toronto, Canada.
49. **Gluesenkamp, K.**, Radermacher, R. "Research on thermally-driven cooling at the CEEE." Presented by K. Gluesenkamp to *IEA Annex 34 9th Expert Meeting*, November 22, 2011, Warwick, UK.
50. Radermacher, R., **Gluesenkamp, K.** "Trends in absorption machines." Keynote session presented by K. Gluesenkamp to *2011 International Sorption Heat Pump Conference*, April 7, 2011, Padua, Italy.
51. **Gluesenkamp, K.**, Radermacher, R. "Update on CEEE research relevant to IEA Annex 34." Presented by K. Gluesenkamp to *IEA Annex 34 8th Expert Meeting*, April 5, 2011, Padua, Italy.

INTELLECTUAL PROPERTY

PATENTS GRANTED:

Momen, Ayyoub; **Kyle R. Gluesenkamp**, Ed Vineyard, Roger Kisner. *Dryer using high frequency vibration*. US Patent 10,520,252 B2, granted December 31, 2019

Momen, Ayyoub; **Kyle R. Gluesenkamp,** Omar A. Abdelaziz, Edward A Vineyard, Ahmad Abu-Heiba, Adewale O. Odukomaiya. *Near isothermal combined compressed gas/pumped-hydro electricity storage with waste heat recovery capabilities*, US Patent 10,519,923 B2, granted December 31, 2019.

Beers, David G., David Scott Dunn, **Kyle R. Gluesenkamp**, Philip R. Boudreaux, Bo Shen. *Dryer appliances including an air circulation duct*, US Patent 10,494,756 B2, granted December 3, 2019.

Gluesenkamp, K.R. *Configuration of dishwasher to improve energy efficiency of water heating*, US Patent 9,949,611, granted April 24, 2018.

PCT APPLICATIONS:

Momen, Ayyoub; **Kyle R. Gluesenkamp**, Ed Vineyard, Roger Kisner (2016). *Dryer using high frequency vibration*. PCT/US2016/030885.

PATENT APPLICATIONS:

Gluesenkamp, K.R., Tim LaClair, Jeffrey Munk, Jin Dong, Bo Shen, Navin Kumar (2019). *Thermal storage system for residential space conditioning*. Provisional patent applications filed 5/20/2019, serial number 62/850,000, based on ORNL Invention Disclosure 201804095, DOE S-138,762.

Wu, Guolian, **Kyle Gluesenkamp**, Viral Patel, Ravee Vaidhyanathan (2018). *Apparatus and Method for a Thermoelectric Heat Pump Appliance with Secondary Fluid Loops*. Third party filing, application number 62/654,239, filed April 6, 2018.

Momen, A., **Gluesenkamp, K.R.**, Vineyard, E.A., Kisner, R. *Dryer using high frequency vibration*. US Patent App. 15/798,057; PCT Patent Application PCT/US16/30885, filed May 5, 2016 (UT-Battelle ID-201403266). https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016182832

Momen, A. M., **Gluesenkamp, K. R.**, Abdelaziz, O. A., Vineyard, E. A., Abu-Heiba, A., Odukomaiya, A. O. *Near isothermal combined compressed gas/pumped-hydro electricity storage with waste heat recovery capabilities*, US Patent Application 15/254,137, filed September 1, 2016 (UT-Battelle ID-201603635).

INVENTION DISCLOSURES:

1. Xiaobing Liu, Lingshi Wang, **Kyle R. Gluesenkamp**. Van D. Baxter, and Brian Bischoff. *Nanoporous Membrane-based Natural Gas Furnace*, ORNL Invention Disclosure 202004615, Record ID 81920255, DOE S- 162,029. Submitted Apr 1, 2020. Title elected 2020-05-21.
2. Yuzhan Li, Navin Kumar, Tim J. LaClair, Monojoy Goswami, Orlando Rios, and **Kyle R. Gluesenkamp**. *Stable Salt Hydrate-based Thermal Energy Storage Materials*, ORNL Invention Disclosure 202004580, Record ID 81918987. Submitted Feb 11, 2020.
3. **Gluesenkamp, Kyle R.**, Bo Shen. *Thermoelectric subcooler for cold climate heat pump*, ORNL Record ID 201904531. Submitted December 9, 2019.
4. LaClair, Tim, **Kyle R. Gluesenkamp**. *Pourable Enhanced Thermal Conductivity Phase Change Materials (PCMs)*, ORNL Invention Disclosure 201904515, Record ID 81917122. Submitted Nov 25, 2019.
5. Biswas, Kaushik, **Kyle R. Gluesenkamp**, James Klett, Tim LaClair. *Activated carbon for sorption energy storage*, ORNL Record ID 81913307. Submitted May 8, 2019.
6. Shen, Bo, Moonis Ally, **Kyle R. Gluesenkamp**. *Liquid Desiccant Storage Driven by a Thermal Electric Module Enhanced Desuperheater*. ORNL Invention Disclosure ID-201904374, Record ID 81913262. Submitted May 2, 2019.
7. Rios, Orlando, William G Carter, **Kyle R. Gluesenkamp**, Yuzhan Li, Michael R. Kessler. *3D printable liquid crystalline networks for solid state refrigeration applications*. Oak

Ridge National Laboratory Invention Disclosure 201904370, Record ID 81913106. Submitted April 23, 2019.

8. Rios, Orlando, Patrick J. Geoghegan, **Kyle R. Gluesenkamp**, Hunter B. Henderson, Michael S. Kesler, Ayyoub M. Momen, Kashif Nawaz, Bo Shen. *Al-Ce cast heat exchangers*. Oak Ridge National Laboratory Invention Disclosure 201904361, Record ID 81912595. Submitted March 28, 2019.
9. Jason R. Hirschey, Yuzhan Li, Tim Laclair, Anne Mallow, **Kyle R. Gluesenkamp**, Orlando Rios, Monojoy Goswami, and Samuel Graham (2019). *Composite Thermal Batteries: Robust Low-Cost Composite Phase Change Energy Storage with high transient power*. Oak Ridge National Laboratory Invention Disclosure 201804349, DOE S-TBD. Submitted March 6, 2019.
10. Rendall, Joseph, **Kyle R. Gluesenkamp** (2018). *Dip tube to maximize water tank stratification*. Oak Ridge National Laboratory Invention Disclosure 201804207, DOE S-138,878. Submitted August 10, 2018.
11. Gao, Zhiming, **Kyle R. Gluesenkamp**, Tim J. LaClair, Xiaobing Liu, Ayyoub Mehdizadeh Momen, James E. Parks II, Josh A. Pihl, Bo Shen (2018). *Advanced adsorption technology for new high-efficiency natural-gas furnace at low cost*. Oak Ridge National Laboratory Invention Disclosure 201804153, DOE S-138,820. Submitted May 30, 2018.
12. **Gluesenkamp, Kyle R.**, Kashif Nawaz (2018). *Leak-less Rotating Seal*. Oak Ridge National Laboratory Invention Disclosure 201804124, DOE S-138,791. Submitted April 17, 2018.
13. Momen, A.M., **Kyle R. Gluesenkamp**, Kashif Nawaz, James Klausner, and Xiaobing Liu, (2018). *Ultra-low cost ultrasonic mist-based thermal desalination*. Oak Ridge National Laboratory Invention Disclosure 201804104, DOE S-138,771.
14. **Gluesenkamp, K.R.**, Tim LaClair, Jeffrey Munk, Jin Dong (2018). *Thermal storage system for residential space conditioning.* ORNL Invention Disclosure 201804095, DOE S-138,762.
15. Mallow, A.M; **Gluesenkamp, K.R.** (2017). *Production method for stable salt hydrate/graphite composites.* ORNL Invention Disclosure 201703950, DOE S-138,611.
16. **Gluesenkamp, K.R.;** Beers, David; Shen, Bo; Boudreaux, Philip. (2017). *Design of heat pump clothes dryer for enhanced performance*. ORNL Invention Disclosure 201703909, DOE S-138,567. ***Title elected August 11, 2017, third party filing.***
17. **Gluesenkamp, K.R.** (2017). *Configuration of Dishwasher to Improve Energy Efficiency of Water Heating*. ORNL Invention Disclosure 201603839, DOE S-138,492.
18. **Gluesenkamp, K.R.**, Momen, A.M., Zhang, M. (2016). *Thermally-driven magnetocaloric heat pump for heating and cooling*. Oak Ridge National Laboratory Invention Disclosure 201603821, DOE S-138,472.
19. **Gluesenkamp, K.R.** (2016). *Configuration of reversible heat pump and phase change material for heating and cooling*. Oak Ridge National Laboratory Invention Disclosure 201603810, DOE S-138,461.
20. **Gluesenkamp, K.R.**, Patel, V.K., Goodman, D. (2016). *Controls and Configurations for a Thermoelectric Clothes Dryer*. Oak Ridge National Laboratory Invention Disclosure 201603793, DOE S-138,442.
21. Mallow, A.M., **Gluesenkamp, K.R.**, Muehlbauer, J. (2016). *Fabrication method for composite phase change material*. Oak Ridge National Laboratory Invention Disclosure

201603759, DOE S-138,406. ***Title elected June 20, 2017 to file coversheet provisional, in-house*.**

22. **Gluesenkamp, K.R.**, Momen, A.M. (2016). *Mechanical removal of moisture from a gas*. Oak Ridge National Laboratory Invention Disclosure 201603710, DOE S-138,352.
23. Momen, A.M., **Gluesenkamp, K.R.**, Abdelaziz, O.A., Birdwell, Kevin R. (2016). *Inflatable tunnel for coolings (ITCools)*. Oak Ridge National Laboratory Invention Disclosure 201603706, DOE S-138,348.
24. Abdelaziz, O.A., **Gluesenkamp, K.R.**, Ally, M.A., Momen, A.M. (2016). *Separate sensible and latent cooling with combined closed and open absorption cycles.* Oak Ridge National Laboratory Invention Disclosure 201603631, DOE S-138,270.
25. **Gluesenkamp, K.R.**, Munk, J. (2016). *Thermoelectric-boosted furnace.* Docket Number 201603627 / DOE S-Number S-138,266.
26. Abdelaziz, O.A., **Gluesenkamp, K.R.**, Ally, M. (2016). *Separate sensible and latent cooling with combined closed and open absorption cycles.* Docket Number 201603631 / DOE S-Number S-138,270.
27. Bansal, P.K., **Gluesenkamp, K.R.**, Bischoff, B.L., Hu, M.Z. (2015). *Membrane assisted heat pump clothes drying*. Oak Ridge National Laboratory Invention Disclosure 2015, DOE S-138,076.
28. **Gluesenkamp, K.R.**, Abdelaziz, O.A., Momen, A.M. (2015). *Separate sensible and latent cooling using single rotating device with multiple fluids.* Docket Number 201503480 / DOE S-Number S-138,111.
29. **Gluesenkamp, K.R.**, Bansal, P.B., Radermacher, R., Lee, H., Hwang, Y. (2014). *Multi-mode integrated heat exchanger for separate sensible and latent air conditioning*. Oak Ridge National Laboratory Invention Disclosure 201403447, DOE S-138,076.
30. Bischoff, B.L., Hu, M.Z., **Gluesenkamp, K.R.**, Bansal, P.K. (2014). *Membrane system for the reduction of water use in Rankine cycle*. Oak Ridge National Laboratory Invention Disclosure 201403406, DOE S-138,033.
31. Bansal, P.K., **Gluesenkamp, K.R.**, Vineyard, E.A. (2014). *Separate sensible and latent cooling system*. Oak Ridge National Laboratory Invention Disclosure 201403373, DOE S-124,997.
32. **Gluesenkamp, K.R.**, Momen, A.M., Vineyard, E.A. (2014). *Heat pump clothes dryer with thermoelectric drum*. Oak Ridge National Laboratory Invention Disclosure 201403292, DOE S-124,906.
33. Momen, A.M., **Gluesenkamp, K.R.**, Vineyard, E.A. (2014). *Clothes dryer using ultrasound phenomena*. Oak Ridge National Laboratory Invention Disclosure 201403266, DOE S-124,877.
34. Momen, A.M. and Vineyard, E.A., Abdelaziz, O.A., **Gluesenkamp, K.R.**, (2014). *Thermal storage in primary battery with waste heat recovery for climate control load reduction in BEVs*. Oak Ridge National Laboratory Invention Disclosure 201403272, DOE S-124-883.
35. **Gluesenkamp, K.R.**, Abdelaziz, O.A. (2013). *Back-to-back rotating heat exchangers for high performance air-to-air heat transfer*. Oak Ridge National Laboratory Invention Disclosure 201303190, DOE S-124,781.
36. Momen, A.M., Vineyard, E.A. **Gluesenkamp, K.**, Abdelaziz, O. (2013). *High-efficiency ground-level pumped-hydro electricity storage*. Oak Ridge National Laboratory Invention Disclosure 201303175.

37. Momen, A.M., **Gluesenkamp, K.**, Vineyard, E.A. (2013). *Heat storage using phase change material employing magnetic chains of ferrous particles*. Oak Ridge National Laboratory Invention Disclosure 201303162.
38. Radermacher, R., **Gluesenkamp, K.**, Hwang, Y., Bush, J. (2012). *Utility cube*. US Patent Application US2012/71478; University of Maryland Invention Disclosure PS-2012-066.
39. **Gluesenkamp, K.**, Leighton, D., Radermacher, R., Muehlbauer, J., Hwang, Y. (2012). *Differential pressure-based apparatus for high accuracy measurements of small temperature differences*. University of Maryland Invention Disclosure PS-2012-039.
40. Horvath, C., Leighton, D., **Gluesenkamp, K.**, Al-Abdulkarem, A., Hwang, Y., Radermacher, R. (2012). *Air-cooled absorber design*. University of Maryland Invention Disclosure PS-2012-013.
41. **Gluesenkamp, K.**, Radermacher, R., Hwang, Y. (2010). *Cascade vapor compression and absorption cycles to achieve building air conditioning at high ambient temperature with air-cooled water/LiBr absorption heat pump*. University of Maryland Invention Disclosure PS-2010-100.
42. **Gluesenkamp, K.**, Radermacher, R., Hwang, Y. (2010). *Separate sensible and latent cooling for water/LiBr absorption heat pumps with small vapor compression system*. University of Maryland Invention Disclosure PS-2010-099.

LEADERSHIP, PROFESSIONAL ACTIVITIES AND AWARDS

AWARDS:

UT Battelle Technology Commercialization Award	December, 2018
Ritter von Rittinger Award, Building Equipment Research Group for contributions to heat pump market development, technology advancement or application, awarded by the Executive Committee for the OECD IEA Technical Collaboration Program on Heat Pumping Technologies (HPT-TCP)	May, 2017
ORNL Awards Night – Mentor of Student Researchers, awarded by ORNL Leadership Team	October, 2016
Lab-Corps Cohort #4. Led one of 14 teams selected nationally for an entrepreneurial bootcamp on commercializing national laboratory technologies.	Fall, 2016
ORNL Significant Event Award, awarded by ORNL Leadership Team for "significant contribution to ORNL"	October, 2014
Fellowship Recipient, US Department of Energy, Office of Fossil Energy Fellowship	2010
Scholarship Recipient, GDF Suez North America Scholarship	2008; 2011

AWARDS TO ADVISED STUDENTS:

Damilola Akamo, ***2020 UT-Knoxville Chancellor's Extraordinary Professional Promise Award***	April, 2020
Zhiyao Yang, ***Best poster award****, IMPRES Conference, Kanazawa, Japan*	October, 2019
Nelson James, ***Best presentation****, GEM Conference, Puerto Rico*	2014

PROFESSIONAL SERVICE:

Service to ASHRAE:

ASHRAE TC 8.3 Absorption and Heat Operated Machines	***Corr. Member***	July 2018 – present
	Chair	July 2016 – June 2018
	Vice Chair	July 2015 – June 2016
ASHRAE TC 1.13 Optimization	***Vice Chair***	July 2019 – present
	Secretary	July 2018 – June 2019
ASHRAE SPC 182 Method of Testing Absorption Water-Chilling and Water Heating Packages	***Vice Chair***	Nov. 2020 – present
	Voting Member	October 2015 – present
ASHRAE SPC 118.2 Method of Testing for Rating Residential Water Heaters and Residential-Duty Commercial Water Heaters	***Voting Member***	July 2018 – present
ASHRAE SPC 118.1 Method of Testing for Rating Commercial Gas, Electric and Oil Service Water Heating Equipment	***Corr. Member***	Sept 2018 – present
ASHRAE SPC 40 Methods of Testing for Rating Heat Operated Unitary Air-Conditioning and Heat-Pump Equipment	***Corr. Member***	July 2019 – present
Corresponding or Provisional Corresponding Member, ASHRAE TC1.1, TC1.2, TC6.9, TC6.10, TC7.5		2014 – present (various dates)
Seminar 18, "Thermally Driven Devices Are Heating Up: Emerging International Field Studies and Standards for Residential Fuel-Fired Sorption Heat Pumps" *ASHRAE Winter Conference,* Las Vegas, NV	***Chair***	January 29, 2017

Seminar 17, "Building Integrated Renewable Fueled Natural Refrigeration Systems" *ASHRAE Winter Conference*, Atlanta, GA	***Chair***	January 13, 2019
Seminar 69, "Current Products and Development in Absorption and Heat Operated Machines" *ASHRAE Annual Conference*, Orlando, FL	***Chair***	February 5, 2020

Service to ASME, ACEEE, IEEE, and IEA Heat Pump Technologies Annexes:

Member, *AMSE K6 Heat Transfer in Energy Systems Committee*	2019 – present
Participating Expert, US Representative, IEA HPT Annex 55/ECES Annex 34: Storage with Heat Pumps in Smart Grids	2019 – present
Participating Expert, US Representative, IEA HPT Annex 43: Fuel Driven Sorption Heat Pumps	2013 – 2020
Leadership Team, ASME InterPACK, as Co-Chair of Track Track 6: Industry, National Lab, Academia Posters	2018 – present
Session co-chair, ASME IMECE	2020 – present
Steering Committee, ACEEE Hot Water Forum	2015 – present
Session chair, *Session E-10: Emerging materials and fabrication techniques, IEEE ITherm 2020*	July, 2020
Convened 7th International Expert Meeting of IEA HPP Annex 43, Fuel-driven Sorption Heat Pumps, Las Vegas, NV	June, 2017
Participating Expert, US Representative, IEA Annex 34: Thermally Driven Heat Pumps for Heating and Cooling	2011 – 2012

Additional Service:

Co-developer, *SorpSim* and *SorpPropLib* open source sorption simulation and properties software, with Purdue University https://www.github.com/oabdelaziz/sorpsim https://github.com/zhiyaoyang/sorpproplib https://github.com/zhiyaoYang/sorpproplib_JSON	2015 – present
International Scientific Committee, *International Sorption Heat Pump Conference (ISHPC) 2020 Berlin*	2019 – 2020

Guest Editor, *Science and Technology for the Built Environment*, v. 25 (10), topical issue on the Purdue 2018 Conference, "Cutting Edge Research and New Technologies in Heat and Mass Transfer Processes of Refrigeration and Air Conditioning Systems", published July-December 2019.	2018 – 2019
Journal Article Reviewer	2011 – present
Applied Energy (Elsevier)	
Renewable and Sustainable Energy Reviews (Elsevier)	
International Journal of Refrigeration (Elsevier)	
Applied Thermal Engineering (Elsevier)	
Energy (Elsevier)	
Sustainable Energy and the Built Environment (ASHRAE/Taylor and Francis)	
International Journal of Energy Research (Wiley)	
Drying Technology (Taylor and Francis)	
International Journal of Thermal Sciences (Elsevier)	
Journal of Food Processing and Preservation (Wiley)	
Heat and Mass Transfer (Springer)	
Textile Research Journal (Sage Publications)	
Member, American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)	May, 2010 – present
Member, American Society of Mechanical Engineers (ASME)	2017 – present
Member, Society of Automotive Engineers (SAE)	February, 2011 – present
Advisory Board Member, *Active Energy Systems, Inc.*	2018 – present
Member, Association of Energy Engineers (AEE)	June, 2009 – 2012
EPA Certified Technician Type Universal, as required by 40 CFR 82 Subpart F for recycling and emissions reduction of refrigerants	2008 – present
Scientific Committee, IMPRES Conference	2015 – 2016
Conference Session Chair, International Sorption Heat Pump Conferences, ACEEE Hot Water Forums, ASHRAE Conferences, ASME InterPACK Conference, ASME IMECE Conference	2014 – present
Chapter President, Association of Energy Engineers (AEE), University of Maryland Student Chapter	August, 2009 – August, 2012

Cofounder and Group Coordinator, University of Maryland team, winners of 2012 US DOE-sponsored Combined Heat, Hydrogen and Power Student Design Contest — November, 2011 – April, 2012

EXTRACURRICULAR ACHIEVEMENTS:

World record, pilot-motor of 49.9 second duration FAI-certified human-powered helicopter flight (Class IE, General), in University of Maryland Gamera Human Powered Helicopter Team — June 21, 2012

Competition Driver and Heat Transfer Engineer, drove to 4th place (of 80 teams) in Skidpad event, University of Maryland Formula SAE Team — July 2010 – June 2011

SELECTED COURSEWORK

Fundamentals of Mechanical Engineering: Molecular Thermodynamics, Advanced Fluid Dynamics, Advanced Convection Heat Transfer, Advanced Conduction and Radiation Heat Transfer, Transport Phenomena, Combustion and Reacting Flows

Energy Conversion Systems: Energy Systems Analysis, Advanced Energy Audits, Sustainable Energy Production and Utilization, Measurement Instrumentation and Data Analysis for Thermo-Fluid Processes

Applied Engineering: Engineering Optimization, Engineering Decision Making, Project Performance Measurement

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