Hamidreza Shabgard

Assistant Professor
School of Aerospace and Mechanical Engineering
University of Oklahoma
865 Asp Ave, Felgar Hall 206, Norman, OK
Phone: (405) 325-5753, *Email:* shabgard@ou.edu

Education

- **Ph.D.** Mechanical Engineering, University of Connecticut, USA, Aug. 2014
  - *Concentration:* Thermal-Fluid Sciences
- **M.S.** Mechanical Engineering, Amirkabir University of Technology, Iran, 2007
  - *Concentration:* Energy Conversion
- **B.S.** Mechanical Engineering, Azad University of Mashhad, Iran, 2003

Professional Positions

- Assistant Professor of Mechanical Engineering, University of Oklahoma, Fall 2016 - Present
- Visiting Professor of Mechanical Engineering, Gannon University, Spring 2016 - Summer 2016
- Postdoctoral Research Associate, Drexel University, Sep. 2014 - Jan. 2016
- Graduate Research Assistant, University of Connecticut, Spring 2009 - Spring 2014

Research Interests

- Multiphase flow and heat transfer
- Thermal energy storage
- Heat pipes
- CFD
- Particulate flow

Teaching

- University of Oklahoma, ongoing
  Thermodynamics, Heat transfer in multiphase systems, Thermal-fluids laboratory
- Gannon University, Spring and Summer 2016
  Convection heat transfer, Computational fluid dynamics, Thermal environmental engineering
- Drexel University, Fall 2015
  Conduction heat transfer

Honors and Awards

- Highly cited paper on the Web of Science network, 2019
- 2nd prize in the annual graduate research competition, University of Connecticut, USA, 2013
- Doctoral dissertation fellowship, University of Connecticut, USA, 2013
- Graduate school doctoral travel grant, University of Connecticut, USA, 2012
- Top 25 hottest articles in "International Journal of Heat and Mass Transfer", 2010-2011
- Ranked 1st among graduates of the academic year 2003
- 2nd prize in the national physics and mathematics contest for college students in Iran, 2000

Journal Publications

1. **H. Shabgard**, A. Faghri, Exergy analysis in energy systems: fundamentals and application, *Frontiers in Heat and Mass Transfer*, 12, 9, 2019.
2. **H. Shabgard**, L. Song, W. Zhu, Heat transfer and exergy analysis of a novel solar-powered integrated heating, cooling, and hot water system with latent heat thermal energy storage. *Energy Conversion and Management*, 175, 121-131, 2018.
3. B. Xu, J. Ordonez, Z. Rao, X. Xu, **H. Shabgard,** Innovative applications of advanced solar thermal technologies using phase change materials. *International Journal of Photoenergy*, 2018.
4. M. Temirel, H. Hu, **H. Shabgard**, P. Boettcher, M. McCarthy, Y. Sun, Solidification of additive-enhanced phase change materials in spherical enclosures with convective cooling. *Applied Thermal Engineering* 111, 134-142, 2017.
5. **H. Shabgard**, H. Hu, P.A. Boettcher, M. McCarthy, Y. Sun, Heat transfer analysis of PCM slurry flow between parallel plates. *International Journal of Heat and Mass Transfer* 99, 895-903, 2016.
6. M. Rahman, H. Hu, **H. Shabgard**, Y. Sun, M. McCarthy, Experimental characterization of inward freezing and melting of additive-enhanced PCM within millimeter-scale cylindrical enclosures. *Journal of Heat Transfer* 138(7), 072301, 2016.
7. **H. Shabgard**, M.J. Allen, N. Sharifi, S.P. Benn, A. Faghri, T.L. Bergman, Heat pipe-heat exchangers and heat sinks: opportunities, challenges, applications, analysis, and state of the art. *International Journal of Heat and Mass Transfer* 89, 138-158, 2015.
8. M.M. Rahman, H. Hu, **H. Shabgard**, P. Boettcher, Y. Sun, M. McCarthy, Dendrite growth during freezing of millimeter-scale eicosane droplets. *Journal of Heat Transfer* 137(8), 080905, 2015.
9. **H. Shabgard**, A. Faghri, T.L. Bergman, C.E. Andraka, Numerical simulation of heat pipe-assisted latent heat thermal energy storage unit for dish-Stirling systems. *ASME Journal of Solar Energy Engineering* 136(2), 021025, 2014.
10. **H. Shabgard**, B. Xiao, A. Faghri, R. Gupta, W. Weissman, Thermal characteristics of a closed thermosyphon under various filling conditions. *International Journal of Heat and Mass Transfer* 70, 91-102, 2014.
11. **H. Shabgard**, T.L. Bergman, A. Faghri, Exergy analysis of latent heat thermal energy storage for solar power generation accounting for constraints imposed by long-term operation and the solar day. *Energy* 60, 474-484, 2013.
12. **H. Shabgard**, C.W. Robak, T.L. Bergman, A. Faghri, Heat transfer and exergy analysis of cascaded latent heat storage with gravity-assisted heat pipes for concentrating solar power applications. *Solar Energy* 86, 816-830, 2012.
13. **H. Shabgard**, A. Faghri, Performance characteristics of cylindrical heat pipes with multiple heat sources. *Applied Thermal Engineering* 31(16), 3410-3419, 2011.
14. N. Khajeh-Hosseini D., **H. Shabgard**, M.J. Kermani, Water management in the cathode side of a PEM fuel cell. *Amirkabir Journal* 43, 47-54, 2011.
15. **H. Shabgard**, T.L. Bergman, N. Sharifi, A. Faghri, High temperature latent heat thermal energy storage using heat pipes. *International Journal of Heat and Mass Transfer* 53(15), 2979-2988, 2010.

Conference Publications

1. **H. Shabgard**, L. Song, W. Zhu, Demand responsive solar-powered integrated cooling, heating and hot-water system.", 3*rd Thermal And Fluids Engineering Conference*, 631-641, 2018.
2. **H. Shabgard**, Ben Xu, R.N. Parthasarathy, Solar thermal-driven multiple-effect thermosyphon distillation system for waste water treatment, *International Mechanical Engineering Congress and Exposition IMECE*2017, Nov. 3-9, 2017.

3. **H. Shabgard**, M. McCarthy, Y. Sun, Heat transfer analysis of solid particles during melting and sedimentation in a liquid pool, *Proceedings of the 1st Thermal and Fluid Engineering Summer Conference, TFESC*, New York City, Aug. 9-12, 2015.
4. **H. Shabgard**, A. Faghri, T.L. Bergman, C.E. Andraka, Numerical simulation of heat pipe-assisted latent heat thermal energy storage unit for dish-Stirling systems, *Proceedings of the 2013 ASME International Mechanical Engineering Congress*, San Diego, CA, Nov. 15-21, 2013.
5. **H. Shabgard**, M.J. Kermani, An enhanced numerical method for solving multi-component flow in the cathode electrode of PEM fuel cells, *15th Annual Conference of the CFD Society of Canada*, Toronto, Canada, May 27-31, 2007.
6. **H. Shabgard**, M.M. Nazari and M.J. Kermani, Evaluating of the effect of water overflow phenomena on overpotentials in PEM fuel cells, *13th Annual Conference of the CFD Society of Canada*, St. Johns, Canada, Jul. 31-Aug. 3, 2005.

Patents

1. **H. Shabgard**, A. Faghri, K. Goodson, M. Asheghi, Passively cooled high power electric cables, ID Number: 62/793,228, Provisional Application, 2019.
2. **H. Shabgard**, R.N. Parthasarathy, Multiple-effect vapor chamber distillation system for produced water treatment Non-provisional Application, 2018.
3. Faghri, T.L. Bergman, N. Sharifi, M.J. Allen, **H. Shabgard**, J.S. Breit, Energy storage and thermal management using phase change materials in conjunction with heat pipes and foils, foams or other porous media, Patent Application US20140284020 A1.

Engineering Experience

- **Bahman Motors Co.,** Iran, 2000 – 2001
  Jig and fixture design and fabrication for automotive assembly line

Computer Skills

- **Programming Languages:** FORTRAN, MATLAB, C
- **Software Packages:** ANSYS Fluent, SolidWorks, AutoCAD, Microsoft Office, Tecplot, LabVIEW

Reviewer

ASME Journal of Heat Transfer
International Journal of Heat and Mass Transfer
ARC AIAA Journal of Thermophysics and Heat Transfer
International Journal of Thermal Sciences
Journal of Energy Storage
Journal of Renewable and Sustainable Energy
Entropy
Energies
Frontiers in Heat and Mass Transfer
Applied Sciences

Links

Google Scholar Webpage