

JAMIL A. KHAN

Professor

Department of Mechanical Engineering, College of Engineering

University of South Carolina, Columbia, SC 29208

Tel: (803) 777-1578; Fax: (803) 777-0106

PROFESSIONAL PREPARATION

- Ph.D. Mechanical Engineering, Clemson University, 1988
- M.S. Mechanical Engineering, Clemson University, 1984
- B.Sc. Mechanical Engineering, Bangladesh Univ. of Engineering & Technology, 1977

APPOINTMENTS

- Director of College Faculty Affairs in the College of Engineering and Computing, Jan 2021-Present
- Chair of Mechanical Engineering, University of South Carolina, November 2007 - Dec. 2020
- Interim Chair of Mechanical Engineering, University of South Carolina, July 2005 - Nov. 2007
- Professor of Mechanical Engineering, University of South Carolina, August 2004 - Present
- Associate Prof. of Mechanical Engineering, University of South Carolina, August 1996 - July 2004
- Interim Assistant Dean for Minority and Women, College of Engineering, University of South Carolina, August 1997 - 1998
- Assistant Prof. of Mechanical Engineering, University of South Carolina, August 1990 - July 1996
- Assistant Professor, Valdosta State University, Valdosta, GA, September 1988 - June 1990

AFFILIATIONS

- Licensed Professional Engineer in South Carolina, No. 14590
- Fellow of the American Society of Mechanical Engineers
- Member American Nuclear Society

RESEARCH EXPERIENCE

- Professor Khan is involved in enhanced heat transfer research for heat dissipation from electronic devices using both passive and active micro-channel cooling.
- Professor Khan is studying transport phenomenon associated with the drying of spent nuclear fuel.

- Professor Khan has developed experimental and computational research to understand coupled phase change, heat, and mass transfer associated with the welding processes.
- Professor Khan has been involved with the Ship System Thermal Management (SSTM) initiative sponsored by ONR for the last four years. As part of this initiative he has developed and incorporated several thermal models for dynamic simulation in the Virtual Test Bed (funded by ONR).
- Professor Khan has performed research in thermal management issues related to high band gap devices fabricated with Gallium Nitride (funded by CMAT, SC).
- Professor Khan has developed dynamic thermo-chemical models of tubular Solid Oxide Fuel Cells for hybrid power generating systems (funded by ESRDC consortium, ONR).
- Professor Khan has studied fluid flow and pressure drop related to micro-channel flow for Accelerator Production of Tritium (funded by DOE SCUREF).

AWARDS AND HONORS

- Joseph M. Biedenbach Distinguished Service Award (College of Engineering and Computing) 2018
- Research Achievement Award (College of Engineering and Computing) 2017
- Mechanical Engineering Professor of the Year Award (2012-2013)
- Fellow of the American Society of Mechanical Engineers, 2007
- Finalist Mungo Graduate Teaching Award, 2002 and 2004
- Litman Teaching Award, College of Engineering, USC, 1999 (highest teaching award of the college, awarded to 1 faculty per year)
- Mungo Teaching Award (University of South Carolina Teaching Award), 1996
- Professor of the Year, Pi Tau Sigma (Mechanical Engineering Honors Society), 1996
- Teacher of the Year, National Society of Black Engineers, 1993
- Best Teacher of the Year, National Society of Black Engineers, 1994
- Lilly Teaching Fellow, University of South Carolina, 1992 - 93
- Outstanding Graduate Teaching Assistant, Clemson University, 1988

LEADERSHIP AND MANAGEMENT EXPERIENCE

- Director of College Faculty Affairs in the College of Engineering and Computing
- Chair of Mechanical Engineering, University of South Carolina, November 2007 - Dec. 2020
- Interim Chair of Mechanical Engineering, University of South Carolina, July 2005 - November 2007

- Interim Assistant Dean for Minority and Women, College of Engineering, USC, August 1997 - 1998
- Director of Undergraduate Studies, Department of Mechanical Engineering, USC August 2002 - June 2005
- Member Advisory Board USC TRIO Program 2010-present. The TRIO Programs (TRIO) are Federal outreach and student services programs designed to identify and provide services for individuals from disadvantaged backgrounds.
- Chair, USC Budget Committee (2004 - 2005), Member 2002-2004

FUNDED RESEARCH

RECENT FUNDED PROJECTS AS PRINCIPAL INVESTIGATOR (PI) – TOTAL \$ 4.994 MILLION:

1. “Characterization of SIC Composite Cladding Fuel Rod”, \$ 22,470, Westinghouse Electric Company LLC, 4/1/2018 – 12/31/2022
2. “Thermal-Hydraulic Test to Determine Flow Resistance and Heat Transfer Coefficients for Coated Fuel Cladding Design”, \$ 81,000, Westinghouse Electric Company LLC, 4/1/2018 – 12/31/2020.
3. “University of South Carolina Nuclear Engineering Faculty Excellence Program”, T. Knight (Co-PI), \$450,000, Nuclear Regulatory Commission, 8/4/2011-8/3/2015.
4. “Remote Ultrasonic Diagnostics of Material Damage under High Radiation and High Temperatures”, \$402,107, Westinghouse Electric Co. LLC, 6/24/2002-12/31/2020.
5. “Conducting Heat Transfer Measurements of Nanoparticle Enhanced Ionic Liquids (NEILS)”, \$100,203, SC Universities Research & Education Foundation (SCUREF)/Department of Energy, 5/19/2010-9/5/2012.
6. “Professional Development Training and Support Fellowship”, \$76,187, Sandia National Laboratories/Department of Energy, 10/18/2011 - 7/31/2012.
7. “Professional Development Opportunity Fellowship Program”, \$490,857, Sandia National Laboratories/Department of Energy, 4/7/2008 - 9/30/2011.
8. “NRC New Generation Nuclear Engineering Faculty Development Program”, \$375,000, Nuclear Regulatory Commission, 08/01/2008 - 07/31/2011.
9. “Center of Economic Excellence for Nuclear Science and Technology”, T. Knight (Co-PI), A. Bayoumi (Co-PI) \$3,000,000, SC General Assembly, 7/1/2010 - 6/30/2050.

RECENT FUNDED PROJECTS AS CO-PRINCIPAL INVESTIGATOR (CO-PI) Total \$26.46 million. J. Khan's Share (\$3,897,000).

10. "Talent and Technology for Navy and Energy Systems" Navatek LLC/Office of Naval Research/DOD, \$ 3,973,878, 07/2020 – 07/19/2023
11. Co-Principal Investigator, U. S. Nuclear Regulatory Commission (NRC), Experimental Testing and Evaluation of Boral Performance in Spent Fuel Storage and Transportation, 5/16/2018 to 5/15/2020, \$555,000
12. "Aluminum-Clad Spent Nuclear Fuel Management", T. Knight (PI), J. Khan (co-PI), T. Farouk (co-PI), Y. Wang (co-PI), Batell Energy Alliance, LLC/Idaho National Lab, \$ 400223, 8/16/2018 – 01/21/2021.
13. "Electric Ship Research and Development (ESRDC FY17-21)" R. Dougal (PI), H. Ginn (Co-PI), E. Santi (Co-PI), A. Benigni (Co-PI), C. Li (Co-PI), \$8,280,578, Office of Naval Research, 8/1/2016–to-7/31/2021.
14. "Experimental Determination and Modeling of Used Fuel Drying by Vacuum and Gas Circulation for Dry Cask Storage", T. Knight (PI), J. Khan, J. Tarbutton, T. Farouk and J. Ritter (co-PIs), \$4,000,000, DOE Integrated Research Project, 10/1/2014 to 9/30/2017.
15. "Center of Economic Excellence for Nuclear Science Strategies", T. Knight (PI), \$3,000,000, SC General Assembly, 7/1/2010 - 6/30/2015.
16. "DOE Nuclear Engineering Scholarship and Fellowship Program at USC", T. Knight (PI), \$170,000, US Department of Energy, 7/1/2009 - 6/30/2017.
17. "EPRI: On-demand Sweating-Boosted Air Cooled Heat-Pipe Condensers for Green Power Plants", C. Li (PI), T. Farouk (Co-PI), X. Huang (Co-PI), \$670,729, National Science Foundation (NSF), 5/1/2014 - 4/30/2017.
18. "ESRDC – Designing and Powering the Future Fleet", R. Dougal (PI), H. Ginn (Co-PI), E. Santi (Co-PI), C. Li (Co-PI), \$1,925,608, Office of Naval Research, 2/1/2014 - 1/31/2017.
19. "Explore a Unified, Ultra-efficient, and Gravity-insensitive Flow Boiling Regime for Space Missions", C. Li (PI), \$750,000, NASA EPSCoR, 7/9/2014 - 7/8/2017.
20. "Mechanisms of Enhanced Flow Boiling with High Frequency Self-modulated Microbubble-switched Oscillations", C. Li (PI), \$286,184, Office of Naval Research, 6/1/2012 - 6/30/2015.
21. "University of South Carolina Next Generation Nuclear Engineer Fellowship Program", T. Knight (PI), \$381,016, Nuclear Regulatory Commission, 5/1/2010-4/30/2015.
22. "MRI: Development of a Multifunctional Far-Field Nanoscopic System for Multidisciplinary Research", G. Wang (PI), K. Reifsnider (Co-PI), Q. Wang (Co-PI), \$599,268, National Science Foundation, 1/15/2011 - 6/30/2015.
23. "Advanced Nuclear Materials Laboratory Enhancements", T. Knight (PI), D. Kaoumi (Co-PI), \$200,500, Department of Energy, 9/1/2010 - 8/31/2011.

24. "NRC Next Generation Engineer Scholarship Program", T. Knight (PI), \$59,825, Nuclear Regulatory Commission, 7/01/2009 - 6/30/2011.
25. "Copper Air Quality Program", C. Feigley (PI), \$1,154,064, Advanced Technology Institute/USAMRMC, 5/3/2007 - 06/30/2011.
26. "High Speed Turbo-Generator: Test Stand Simulator Including Turbine Engine Emulator", R. Dougal (PI), A. Monti (Co-PI), \$119,998, Office of Naval Research/Department of Defense, 11/7/2007 - 4/30/2010.

OTHER FUNDED PROJECTS (PIs are identified in the parenthesis) Total \$ 6.287 million, Total Khan's Share (\$ 3,492,000)

27. "JIDOKA Project Technical Proposal" Huhns, M. (PI), Vargas, J., Khan, J. A., \$640,043, US Army TACOM, 2003 - 2005.
28. "An Innovative High Thermal Conductivity Fuel Design" Khan, J. A (PI), and Tulenko, J., \$330,078, DOE, June 2004 - 07.
29. "Investigating Principles of Workroom Exposure using CFD and Experiments" Feigley, C.E. (PI) and, Khan, J.A., \$607,228, DHHS/NIOSH, 2001 - 2004.
30. "Departure from Nucleate Boiling and Pressure Drop Studies of Nuclear Rod Bundles" Khan, J.A. (PI), \$85,000, Westinghouse Co., 2003 - 2004.
31. "Computational Investigation of the Combustion Process for a Micro-Turbine" Khan, J.A. (PI), \$9,652, Doty Scientific Co., 2002 - 2003.
32. "Enhancement of an Existing Thermal Model for Friction Stir Welding To Make it User-friendly" Khan, J.A., and Reynolds, A. P. (PI), \$5,000, US Navy (Naval Surface Warfare Center, Carderock Division), 2003.
33. "Research Activities to Support Consolidated Systems, Inc." Khan, J.A. (PI), and Bayoumi, A.E., \$27,676, Consolidated Systems, Inc., 2003.
34. "Creating Detailed Graphical Drawing of a Scaffolding System" Khan, J. A. (PI) and Rhodes, C. A., \$35,000, Mid Mid-Atlantic Scaffold Inc., \$35,000.
35. "Computational and Experimental Analysis of the Effectiveness of Argon Reservoir" Khan, J. A. (PI), \$138,820, SCUREF/DoE, 2001-2002.
36. "Novel High Pressure Waterjet Technologies for Hazardous Waste Minimization" Khan, J.A. (PI), Deng, X., Bayoumi A.E., \$32,000, SC HWMF, 2000 - 2001.
37. "Experimental and Analytical Investigation of Temperature Effect During Gas-Spring Production" Khan, J.A. (PI), \$39,115, AVM/ARVIN Inc., 2000 - 2001.
38. "Dynamic Testing of Celotex" Khan, J.A. (PI), Rhodes, C. A., \$23,112, SCUREF, 2000 - 2001.

39. "Development of Coupled Thermal, Mechanical, and Material Transport Models of the Friction Stir Welding Process" Reynolds, A.P. (PI), Deng, X., and Khan, J.A., \$ 341,000, NSF, 1999 - 2002.
40. "Experimental Investigation of Cross-Flow between Two Parallel Microchannels for APT Project" Khan, J.A. (PI), Rhodes, C.A., \$78,444, DOE/Univ. Support for APT, 1997 - 1998.
41. "Contact Conductance of Lead and Aluminum" Khan, J.A. (PI), Rhodes, C.A., \$39,577, SCUREF/APT Project, 1997 - 1998.
42. "Evaluating Models for Airborne Workroom Contaminants" Feigley, C.E. (PI), Khan, J.A., \$46,906, DHHS Public Health Services, 1997 - 1998.
43. "Enhancement of Mechanics and Materials Research Cluster to Evaluate and Improve the Strength of Structural Joints in Transportation System" Chao, Y.C (PI), Khan, J.A., Sutton, M. A., Reynolds, T., Deng, X., \$2,800,000, NSF/EPSCoR, 1996 - 1999.
44. "Graduate Research Traineeship in Environmentally Conscious Manufacturing" Peters, W. H. (PI), Khan, J. A. Matthews, M. A., Ritter, J. A. Bolton, C. L., \$562,500, NSF, 1995 - 1999.
45. "Testing and Design of Air Handling System for PEM-DF2 Power Plant" Khan, J.A. (PI), \$50,000, Analytic Power Corp., 1995 - 96.
46. "Natural Convection within Flooded Cavity Space About a Single Ladder" Khan, J. A. (PI), Curtis Rhodes, \$9,638, SCREF APT-Project, 1997 June.
47. "SC 33/50 Pollution Prevention: Reduction of EPA Targeted 17 Priority Pollutants" Khan, J.A. (PI), Morse, J.S., \$50,000, SCHWMF, 1994 - 1995.
48. "Investigation of Destruction Removal Efficiency (DRE) and Nox Formation with a Flameless Thermal Oxidation Process" Khan, J. A. (PI), \$14,800, HWMF, 1995.
49. "Design and Fabrication of a Low Speed (Mach No. = 0.2) Wind Tunnel for Mechanical Engineering" Khan, J.A., Hawkins, L.E., Wally Peters, \$130,000, Thermal Engineering Corp., 1995 - 1996.
50. "An Interdisciplinary Course in Environmentally Conscious Manufacturing" Matthews, M.A. (PI), Bolton, C.L., Khan, J.A., \$2,670, USC Instruction-al Grant, 1995.
51. "Multimedia Teaching Modules for Materials Science and Engineering Courses" Lyons, J. (PI), Khan, J. A., \$30,000, Gateway NSF, 1995 - 1996.
52. "Multimedia Teaching Modules for Materials Science and Engineering Courses" Lyons, J. (PI), Khan, J. A., and Sutton, M.A., \$38,354, Gateway NSF, 1996 - 1997.
53. "Restructuring applied Thermodynamics" Morse, J.S. (PI), Khan, J.A., Miller, D.L., \$5,700, Gateway NSF, 1993 - 1994.
54. "SC 33/50 Technical Assistance Program" Smith, R.L (PI), Khan, J.A., Morse, J.S., \$50,000, SCUREF, 1993 - 1994.
55. "Hazardous Waste Reduction through Technology Transfer a Unit Operations Approach to Waste Minimization" Smith, R.L (PI), Khan, J.A., Morse, J.S., \$59,206, SCUREF, 1992 - 1993.
56. "Performance Evaluation of a Compact Heat Exchanger" Khan, J. A. (PI), \$5,000, Doty Scientific, 1990 - 1991.

BOOK CHAPTER:

Smith, R. L. and Khan, J. A., "Unit Operations Database for Transferring Waste Minimization Solutions," CHAPTER 11, pp. 133-148, in Waste Minimization Through Process Design, Ed. Alan Rossiter, McGraw Hill, NY, 1995

REFEREED ARTICLES IN PRINT

(As of February 9, 2021; his work has been cited more than 4452 times, with an i10-index of 95 and H-factor of 35; Google Scholar,

https://scholar.google.com/citations?hl=en&user=gslquaQAAAAJ&view_op=list_works&sortby=pubdate):

Journals:

- J-107 AS Salman, NM Abdulrazzaq, A Tikadar, SK Oudah, **JA Khan**, "Parametric study of heat transfer characteristics of enhanced surfaces in a spray cooling system: An experimental investigation", Applied Thermal Engineering, Volume 183, year 2021, pp. 115824
- J-106 **JA Khan**, TW Knight, SB Pakala, W Jiang, R Fang, JS Tulenko, "Enhanced thermal conductivity for LWR fuel", Nuclear Science and Engineering, year 2020.
- J-105 K Egab, M Alwazzan, B Peng, SK Oudah, Z Guo, X Dai, **J Khan**, C Li, "Enhancing filmwise and dropwise condensation using a hybrid wettability contrast mechanism: Circular patterns", International Journal of Heat and Mass Transfer, Volume 154, year 2020, pp. 119640.
- J-104 SK Oudah, R. Fang, A Tikadar, AS Salman, **J Khan**, "An experimental investigation of the effect of multiple inlet restrictors on the heat transfer and pressure drop in a flow boiling microchannel heat sink", International Journal of Heat and Mass Transfer, Volume 153, year 2020, pp. 119582
- J-103 S Saha, **J Khan**, T Farouk, "Numerical study of evaporation assisted hybrid cooling for thermal powerplant application", Applied Thermal Engineering, Volume 166 (2020), pp. 114677.
- J-102 A Tikadar, TC Paul, SK Oudah, NM Abdulrazzaq, AS Salman, **JA Khan**, "Enhancing thermal-hydraulic performance of counter flow mini-channel heat sinks utilizing secondary flow: Numerical study with experimental validation", International Communications in Heat and Mass Transfer, Volume 111 (2020), pp. 104447
- J-101 DA McCants, AM Hayes, TC Paul, **JA Khān**, AH Shaaban, "Experimental Investigation of Heat Transfer Enhancement of CuO–Water and ZnO–Water Nanofluids Flowing Over a Heated Plate", Journal of Thermal Science and Engineering Applications Volume 11 (4), Year 2019, pp. 041015.
- J-100 S Saha, A Tikadar, TW Knight, **JA Khan**, TI Farouk, "Can an Analytical Model be Employed for Simulating Used Fuel Vacuum Drying Process?", ANS Transactions , Volume 121 (1) (2019), pp. 175-178.
- J-99 A Tikadar, S Saha, TW Knight, TI Farouk, **JA Khan**, "CFD Framework for Used Fuel Vacuum Drying Application", ANS Transactions Volume 121 (1) (2019), pp. 179-182.
- J-98 A. Tikadar, SK Oudah, TC Paul, AS Salman, A Morshed, **JA Khan** "Parametric study on thermal

- and hydraulic characteristics of inter-connected parallel and counter flow mini-channel heat sink" *Applied Thermal Engineering* Volume 153 (2019), pp. 15-28.
- J-97 Jiaxuan Ma, Wenming Li, Congcong Ren, **Jamil A Khan**, Chen Li, "Realizing highly coordinated, rapid and sustainable nucleate boiling in microchannels on HFE-7100", *International Journal of Heat and Mass Transfer*, vol. 133, (2019), pp. 1219-1229.
- J-96 Azzam S Salman, Nabeel M Abdulrazzaq, Saad K Oudah, Amitav Tikadar, Noble Anumbe, Titan C Paul, **Jamil A Khan**, "Experimental investigation of the impact of geometrical surface modification on spray cooling heat transfer performance in the non-boiling regime", *International Journal of Heat and Mass Transfer*, vol. 133, (2019), pp. 330-340.
- J-95 Titan C Paul, Rajib Mahamud, **Jamil A Khan**, "Multiphase modeling approach for ionic liquids (ILs) based nanofluids: Improving the performance of heat transfer fluids (HTFs)," *Applied Thermal Engineering*, vol. 149, (2019), pp. 165-172.
- J-94 Amitav Tikadar, Umair Najeeb, Titan C Paul, Saad K Oudah, Azzam S Salman, Ahmed M Abir, Leo A Carrilho, **Jamil A Khan**, "Numerical investigation of heat transfer and pressure drop in nuclear fuel rod with three-dimensional surface roughness", *International Journal of Heat and Mass Transfer*, vol. 126, (2018), pp. 493-507.
- J-93 Tamanna Alam, Wenming Li, Wei Chang, Fanghao Yang, **Jamil Khan**, Chen Li, "A comparative study of flow boiling HFE-7100 in silicon nanowire and plainwall microchannels", *Int. J. of Heat and Mass Transfer*, vol. 124, (2018). Pp 829-840.
- J-92 Wenming Li, Jiaxuan Ma, Tamanna Alam, Fanghao Yang, **Jamil Khan**, Chen Li, "Flow Boiling of HFE-7100 in Silicon Microchannels Integrated with Multiple Micro-nozzles and Reentry Micro-cavities", (2018) *Int. J. of Heat and Mass Transfer*, vol. 123, (2018). Pp 354-366.
- J-91 W Li, F Yang, T Alam, X Qu, B Peng, **J Khan**, C Li, "Enhanced flow boiling in microchannels using auxiliary channels and multiple micronozzles (I): Enhanced CHF and reduced pressure drop, ", (2018) *Int. J. of Heat and Mass Transfer*, vol. 116, (2017). Pp 208-217.
- J-90 W Li, T Alam, F Yang, X Qu, B Peng, **J Khan**, C Li, "Enhanced flow boiling in microchannels using auxiliary channels and multiple micronozzles (II): Enhanced CHF and reduced pressure drop, ", (2017) *Int. J. of Heat and Mass Transfer*, vol. 115, (2017). Pp 264-272.
- J-89 M Alwazzan, K Egab, B Peng, **J Khan**, C Li, "Condensation on hybrid-patterned copper tubes (II): Visualization study of droplet dynamics", (2017) *Int. J. of Heat and Mass Transfer*, vol. 112, (2017). Pp 950-958.
- J-88 M Alwazzan, K Egab, B Peng, **J Khan**, C Li, "Condensation on hybrid-patterned copper tubes (I): Characterization of condensation heat transfer", (2017) *Int. J. of Heat and Mass Transfer*, vol. 112, (2017). Pp 991-1004.
- J-87 Titan C. Paul, A.K.M.M. Morshed, Elise B. Fox, **Jamil A. Khan**, "Enhanced Thermophysical Properties of NEILs as Heat Transfer Fluids for Solar Thermal Applications" *Applied Thermal Engineering*, vol. 110 (2017), pp 1-9.
- J-86 W.M. Li, X.P. Qu, T. Alam, Wei Chang, **J. Khan**, and Chen Li, "Enhanced Flow Boiling in Microchannels through Integrating Multiple Micro-nozzles and Reentry Microcavities," *Applied Physics Letters*. 110 (2017), 014104
- J-85 P.T. Wang, R. Dawas, M. Alwazzan, W. Chang, **J. Khan**, and Chen Li, "Sweating-boosted air cooling on nanoscale CuO wick structures," (2017) *Int. J. of Heat and Mass Transfer*, vol. 111 (2017). Pp 817-826.

- J-84 Tamanna Alam, Ahmed Shehab Khan, Wenming Li, Fanghao Yang, Yan Tong, **Jamil Khan**, Chen Li, "Transient force analysis and bubble dynamics during flow boiling in silicon nanowire microchannels" *International Journal of Heat and Mass Transfer* 101 (2016) 937–947.
- J-83 Tamanna Alam, Wenming Li, Fanghao Yang, Wei Chang, Jing Li, Zuankai Wang, **Jamil Khan**, Chen Li, "Force analysis and bubble dynamics during flow boiling in silicon nanowire microchannels" *International Journal of Heat and Mass Transfer* 101 (2016) 915–926.
- J-82 Wei Zhao, Fang Yang, **Jamil Khan**, Ken Reif Snider, Guiren Wang, "Measurement of velocity fluctuations in microfluidics with simultaneously ultrahigh spatial and temporal resolution" *Experiments in Fluids*, Vol. 57, pp. 11, 2016.
- J-81 Wenming Li, Fanghao Yang, Tamanna Alam, **Jamil Khan**, Chen Li, "Experimental and theoretical studies of critical heat flux of flow boiling in microchannels with microbubble-excited high-frequency two-phase oscillations", *International Journal of Heat and Mass Transfer* Vol. 88, pp. 368-378, 2015.
- J-80 Titan C. Paul, A.K.M.M. Morshed, Elise B. Fox, **Jamil A. Khan**, "Thermal performance of Al₂O₃ Nanoparticle Enhanced Ionic Liquids (NEILs) for Concentrated Solar Power (CSP) applications" *International Journal of Heat and Mass Transfer* Vol. 85, pp. 585-594, 2015.
- J-79 Titan C. Paul, A.K.M.M. Morshed, Elise B. Fox, **Jamil A. Khan**, "Experimental investigation of natural convection heat transfer of Al₂O₃ Nanoparticle Enhanced Ionic Liquids (NEILs)" *International Journal of Heat and Mass Transfer* Vol. 83, pp. 753-761, 2015.
- J-78 Wei Zhao, Fang Yang, **Jamil Khan**, Ken Reifsnider, and Guiren Wang, "Corrections on LIFPA velocity measurements in microchannel with moderate velocity fluctuations" *Experiments in Fluids*, Vol. 56, pp. 39, 2015.
- J-77 Titan C. Paul, A.K.M. M. Morshed, **Jamil A. Khan**, "Effect of nanoparticle dispersion on thermophysical properties of ionic liquids for its potential application in solar collector" *Procedia Engineering* Vol. 90, pp. 643-648, 2014.
- J-76. Titan C Paul, AKMM Morshed, Elise B Fox, Ann E Visser, Nicholas J Bridges, **Jamil A Khan**, "Thermal Performance of Ionic Liquids for Solar Thermal Applications" *Experimental Thermal and Fluid Science*, Vol. 59, pp. 88-95, 2014.
- J-75. Titan C Paul, AKMM Morshed, Elise B Fox, Ann E Visser, Nicholas J Bridges, **Jamil A Khan**, "Buoyancy driven heat transfer behavior of [C₄mim][NTf₂] ionic liquid: An experimental study" *Applied Thermal Engineering*, Vol.66, Issue 1-2, pp. 534-560, 2014.
- J-74. Fanghao Yang, Xianming Dai, Yoav Peles, Ping Cheng, **Jamil Khan**, and Chen Li, "Flow boiling phenomena in a single annular flow regime in microchannels (I): Reduced pressure drop and enhanced critical heat flux," *Int. J. of Heat and Mass Transfer*, Vol. 68, pp. 703-716, 2014.
- J-73. Fanghao Yang, Xianming Dai, Yoav Peles, Ping Cheng, **Jamil Khan**, and Chen Li, "Flow boiling phenomena in a single annular flow regime in microchannels (II): Reduced pressure drop and enhanced critical heat flux," *Int. J. of Heat and Mass Transfer*, Vol. 68, pp. 716-724, 2014.
- J-72. Ruixian Fang and **Jamil Khan**, "Suppression of Two-Phase Flow Instabilities in Parallel Microchannels by using Synthetic Jets", *Journal of Heat Transfer*, Vol. 135, Issue 11, 2013.

- J-71. Fanghao Yang, Xianming Dai, Chih-Jung Kuo, Yoav Peles, **Jamil Khan**, and Chen Li, "Enhanced Flow Boiling in Microchannels by Self-sustained High Frequency Two-phase Oscillations," Int. J. of Heat and Mass Transfer, Vol. 58, pp. 402-412, 2013.
- J-70. Xianming Dai, Fanghao Yang, Ruixian Fang, Tsegaye Yemame, **Jamil A. Khan** and Chen Li, "Enhanced Single and Two-phase Transport Phenomena using Flow Separation in the Microgap with Copper Woven Mesh Coatings," Applied Thermal Engineering, 54, pp. 281-288, 2013.
- J-69 Titan C. Paul, A.K.M. M. Morshed, and **Jamil A. Khan**, "Nanoparticle Enhanced Ionic Liquids (NEILs) as Working Fluid for the Next Generation Solar Collector", Procedia Engineering, Vol. 56, pp. 631-636, 2013.
- J-68. AKM M. Morshed, Titan C. Paul, **Jamil A. Khan**, 2013, "Atomistic simulation of temperature dependent thermal transport across nanoconfined liquid", Physica E-Low Dimensional Systems and Nanostructures, vol. 47, pages 246-251.
- J-67. AKM M. Morshed, Titan C. Paul, **Jamil A. Khan**, 2013, "Effect of Al₂O₃ nanoparticle deposition on flow boiling Performance of water in a Microchannel", Experimental Thermal and Fluid Science, vol. 47, pages 6-13.
- J-66. Michael G. Schmidt, Hubert H. Attaway, Silva Terzieva, Anna, Marshall, Lisa L. Steed, Deborah Saltzberg, Hameed A. Hamoody, **Jamil A. Khan**, Charles E. Feigley, and Harold T. Michels, 2012, "Characterization and Control of the Microbial Community Affiliation with Copper or Aluminum Heat Exchangers of HVAC Systems, Current Microbiology, volume 65, number 2, 2012, pp. 141-149, DOI: 10.1007/s00284-012-0137-0 Open Access.
- J-65. Feigley, C, **Khan, J.**, Salzberg, D., Hussey, J., Attaway, H., Steed, L., Schmidt, M., and Michels, H., 2013, "Experimental tests of copper components in ventilation systems for microbial control", Journal of HVAC&R, vol. 19, pages 53-62.
- J-64. Ruixian Fang and **Jamil Khan**, 2013, "Active Heat Transfer Enhancement in Single-Phase Microchannels by using Synthetic Jets", Journal of Thermal Science and Engineering Applications, vol. 5, 011006 Pages 1-9.
- J-63. AKM M. Morshed, Titan C. Paul, **Jamil A. Khan**, 2013, "Effect of Cu-Al₂O₃ Nanocomposite Coating on Flow Boiling Performance of a Microchannel", Applied Thermal Engineering , vol. 51, pages 1135-1143.
- J-62. AKM M. Morshed, Fanghao Yong, Yakut Ali, **Jamil Khan**, Chen Li, "Enhanced flow boiling in a micro channel with integration of nanowires", Applied Thermal Engineering, volume 32, January 2012, Pages 68-75.
- J-61. AKM M. Morshed, T C Paul, **Jamil A. Khan**, 2012, "Effect of Nanostructures on Evaporation and Explosive Boiling of Thin Liquid Films: A Molecular Dynamics Study" Applied Physics A: Materials Science & Processing, vol. 105, pages 445-451 DOI: 10.1007/s00339-022-6577-8.
- J-60. Ruixian Fang, Wei Jiang, **Jamil Khan**, "The Effects of a Cross-Flow Synthetic Jet on Single-Phase Microchannel Heat Transfer", Journal of Enhanced Heat Transfer , vol. 19(4), pp.

343-358.

- J-59. Muhmmad Yakut Ali, Fanghao Yang, Ruixian Fang, Chen Li, **Jamil Khan**, "Thermohydraulic Characteristics Of A Single-Phase Microchannel Heat Sink Coated With Copper Nanowires" *Frontier of Heat and Mass Transfer (FHMT)*, Volume 2, No. 3, 033003, 2011.
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- C-22. Smith, A.C., Vormelker, P.R., Miller, K. W., **Khan, J.A**, Khandkar, MZH, Chapman, G., Creech, G., "Effect of Orientation and Strain Rate on Crush Strength of Cellulose Fiberboard Assemblies", in Transportation, Storage, and Disposal of Radioactive Materials, ASME PVP-Vol. 425, Ed. R.S. Hafner, pp. 13-19., 2001.
- C-21. Miller, K. W., **Khan, J.A**, Khandkar, MZH, Smith, A. C. "Evaluation of Celotex[®] for Shock Protection of Pressure Vessels", in Transportation, Storage, and Disposal of Radioactive Materials, ASME PVP-Vol. 425, Ed. R.S. Hafner, pp. 21 -30., 2001.
- C-20. Wiseman, B., **Khan, J. A.**, "Enhancement Of Absorption Properties Of Building Materials By Adding Scattering Particles" ASME paper # NHTC2001-20222, 2001.
- C-19. Wiseman, B., **Khan, J. A.**, Rhodes, C. A., "Experimental Determination Of Absorption Properties Of Building Materials" Proceedings of the Third International Symposium On Radiative Transfer, pp. 641-651, June 17-22, 2001, Antalya, TURKEY.
- C-18. *Ma, X., **Khan, J. A.**, Rhodes, C.A., Smith, A., Hamm, L.L., "Experimental Investigation of Contact Resistance Across Pressed Lead and Aluminum Contact in Vacuum", Fundamentals of*

Calibration and Experimental Methods in Heat Transfer, ASME HTD-Vol. 366-2, Ed. J. H. , Kim, Nov. 2000.

- C-17. Young, E. F. and **Khan, J. A.**, "Thermodynamic Properties with Mathcad", accepted for presentation at the 2000 ASEE Annual Conference, St.Louis, MO, June 18-21, 2000.
- C-16. Fleming, W.H., **Khan, J. A.**, Rhodes, C.A., "Heat Transfer In A Metal Hydride Based Hydrogen Separation Process", ASME paper # NHTC2000-12165, 2000.
- C-15. **Khan, J. A.**, Pohan, A. N., Ma, X., Rhodes, C.A. "Experimental Investigation of Cross-flow Between Two Parallel Micro-Channels", PAPER# 7805, Proceedings of the 8th International Conference on Nuclear Engineering, Baltimore, 2000.
- C-14. Xu, L., **Khan, J. A.**, Chao, Y., and Broach, K., "Numerical Study of Thermal Modeling of Resistance Spot Welding Utilizing Coupled Thermal-Electrical-Mechanical Analysis" , ASME HTD-Vol. 364-3, Volume 3 (ISBN No. 0-7918-1656-7),1999, pp 395-402.
- C-13. Rhodes, C. A., **Khan, J. A.**, Wechsler, H., Mansson, M., "A Computational Model to Predict Pressure Drop and Droplet Removal Efficiency of Chevron Mist Eliminator", ASME HTD-Vol. 2 64-2, Volume 2 (ISBN No. 0-7918-1656-7), pp 33-42.
- C-12. Kabir, A.A.A.S., **Khan, J. A.**, and Broach, K., "Three Dimensional Thermal Model of Resistance Spot Welding in Aluminum", ASME HTD-Vol. 364-3, Volume 3 (ISBN No. 0-7918-1656-7), pp 371-380, 1999.
- C-11. Lijun Xu and **Khan, J. A.** " The Finite Element Modeling of Axisymmetric Nugget Development during Resistance Spot Welding" in Trends in Welding Research Proceedings of the 5th International Conference, Ed. J.M. Vitek, S.A. David, J. A. Johnson, H.B. Smartt, T. Debroy, American Welding Society, pp. 616-621,1998.
- C-10. Dutta, S., Dutta, P., **Khan, J.**, and Jones, R. (1997), "Experimental Study of Heat Transfer Coefficient Enhancement with Inclined Solid and Perforated Baffles," presented at the 1997 International Mechanical Engineering Conference and Exhibition, Dallas, Texas, November 16-21, 1997 ASME Paper # 97-WA/HT-4.
- C-9. Dutta, S., Zhang, X., **Khan, J.**, and Bell, D. (1997), "Heat Transfer Analysis in a Two-Sided Heated Smooth Square Vertical Channel With Adverse and Favorable Mixed Convection," in the 1997 National Heat Transfer Conference, Baltimore, Maryland, August 10-12, HTD-Vol. 346, Vol. 8, pp. 119-125.
- C-8. Dutta, S., Morehouse, J.H., and **Khan, J.A.**, "Numerical Analysis of Laminar Flow and Heat Transfer in a High Temperature Electrolyzer," 1996 ASME HTD Vol. 323, No. 6, pp. 71-77.
- C-7. Tong, X., **Khan, J. A.**, and Dutta, S., "Unidirectional Infiltration and Solidification / Remelting of a Binary Alloy in Porous Preform," ASME HTD Vol. 323, No. 1, pp. 39-48.

- C-6. Showalter, M. S., Nemchinsky, V. A., and **Khan, J. A.**, "Fundamental Study of Oxygen Scarfing Process," *1996 ASME HTD* Vol. 323, No. 1, pp. 233-238.
- C-5. Hawkins, L. E. and **Khan, J. A.**, "A Study of the Effect of Radiation on Mixed Mode Convection in a Vertical Channel," in *Heat Transfer with Combined Modes*, Ed. D.E. Beasley and K.D. Cole, HTD-Vol. 299, pp. 93-102, 1994.
- C-4. Yao, G-F. and **Khan, J. A.**, "A Modeling of Indoor Air Flow and Heat Transfer Through Doors and Windows," in *Air Pollution*, Editors, P. Zannetti, C.A. Brebbia, J.E. Garcia Gardea and G. Ayala Milian, Computational Mechanics Publication, Southampton Boston, pp. 195-208, 1993.
- C-3. Bono, J. E., Morse, J. S., Rocheleau, D. N., and **Khan, J. A.**, "A Study of Variable-Stroke Constant-Volume Combustion Spark Ignition Engine," in *Alternate Fuels, Engine Performance and Emissions*, Ed. Madan R. Goyal, ICE-Vol. 20, pp. 119-124, 1993.
- C-2. **Khan, J. A.** and Yao, G-F., "The Effect of Prandtl Number on Free Convection in Partitioned Enclosures," in *Fundamentals of Natural Convections*, Ed. R.D. Boyd and P.G. Kroeger, HTD-Vol. 264, pp. 1-8, 1993.
- C-1. Morehouse, J. H., **Khan, J. A.**, Connor, L. N., and Pal, D. "Peak Demand Reduction with Dual-Source Heat Pumps Using Municipal Water" *proceedings of The Eighth Symposium on Improving Building Systems in Hot and Humid Climate*, pp. 1-6, College Station, Texas, May, 1992.

TEACHING

Professor Khan has taught 18 different classes during the last 25 years at USC. His commitment to teaching is exemplified by the fact that in spite of serving as the Chair of the largest department in college, he taught 3 courses per year on average. During the last two semesters he taught junior level Fluid Mechanics class with more than 100 students each semester. He receives excellent evaluations from his peers and the students have consistently rated him as one of the best teachers in the College of Engineering and Computing (the mean student rating during the last 10 years for him is 4.76 out of 5.0). Some of the recent sample student comments have been: “well organized, challenging, good teaching strategy, wanted the students to learn and do well”, “Best teacher I’ve had had @ USC. Made complicated material seem simple and understand”, “Teacher put a lot of effort into the course”, “I actually learned some stuff”, “Dr. Khan does an awesome job of teaching the class”.

Graduate Courses:

- Advanced Heat Transfer (EMCH 751)
- Advanced Thermodynamics (EMCH 794)
- Selected Topics in Advanced Energy Conversion (EMCH 791)
- Mechanical Engineering Project (EMCH 764)
- Viscous and Turbulent Flows (EMCH 741)
- Thermal Hydraulics (EMCH 754)

Graduate/undergraduate Courses:

- Intermediate Heat Transfer (EMCH 554)
- Intermediate Fluid Mechanics (EMCH 560)
- Thermal Environmental Engineering (EMCH 597)
- Environmentally Conscious Manufacturing (ENGR 540)
- Introduction to Combustion (EMCH 592)

Undergraduate Courses:

- Numerical Analysis (EMCH 301)
- Mechanical Engineering Laboratory (EMCH 467)
- Heat Transfer (EMCH 354)
- Thermodynamic System Design (EMCH 394)
- Fluid Mechanics (ENGR 360)
- Thermodynamic Fundamentals (EMCH 290)
- Special Problems (EMCH 460)

CURRENT GRADUATE STUDENTS

List of Current Graduate Students (full time on-campus):

1. Nabeel M. Abdulrazzak (**PhD**), “Spray cooling with modified surfaces with refrigerant as the cooling fluid ” expected graduation 2021.
2. Saad Oudah “(**PhD**), Two-phase heat transfer through micro-channel and nucleate boiling correlation” expected graduation 2021.
3. Sanjay Chopra (**PhD**), “Comprehensive modeling of gas turbine engine”, expected graduation 2021
4. Donald Floyd (**PhD**), “real-time reduced order modeling of gas turbine clearance”, expected graduation 2022.
5. Ross Gorman (**PhD**), “ Experimental and Analytical Study of Fluidized Bed for mixing of coal-ash”, expected graduation 2021.
6. Sowmya Raghu (**PhD**), “Experimental and Analytical Investigation of Enhancement of Heat Transfer: Micro Channel”, expected graduation 2024.
7. Shaheer Anjum (**MS**), “Heat Transfer in 3-D printed Micro-Channels”, Expected graduation 2020

FORMER GRADUATE STUDENTS

Post-Doctoral Researchers Supervised:

1. Dr. A. Kassem
2. Dr. Andrew Hays
3. Dr. Dale McCants
4. Dr. Wei Jiang
5. Dr. Ruixian Fang
6. Dr. Titan Paul

PhD Students Supervised:

18. Abdulwahab Alhashem (**PhD**), “Proposed model for Condensation Heat Transfer in Hydrophobic-hydrophilic surfaces”, **2019**. Current: Assistant Professor, The Public Authority

for Applied Education and Training, Kuwait

17. Azzam Salman (**PhD**), "Spray cooling heat transfer on nano-coated surfaces", **2019**, **Current:** Engineer, SC Department of Transportation.
16. Nobel Anumbe (**PhD**), "Two-phase flow regime mapping related to oil drilling", **2018**, **Current:** Research Associate, University of SC Office of Economic Development.
15. Karim K. Egab (**PhD**), "A Comprehensive Evaluation of Hybrid Wetting Configurations on Dropwise Condensation" (Co-advised with Prof. Chen LI), **2017**. **Current:** Lecturer, Southern Technical University, Samawa, Iraq.
14. Cedric Fitzgerald Green (**PhD**), "Evaluating the Sustainability of an Energy Supply System Using Renewable Energy Sources: An Energy Demand Assessment of South Carolina", **2015**. **Current:** Vice President for Gas Transmission and Storage, Dominion Energy, Richmond, VA.
13. Titan Chandra Paul (**PhD**), "Investigation of Thermal Performance of Nanoparticle Enhanced Ionic Liquids (NEILs) for Solar Collector Applications", **2014**. **Current:** Assistant Professor of Engineering, U of SC at Aiken, SC.
12. A K M Monjur Morshed (**PhD**), "Heat Transfer across Nanoengineered Interfaces", **2012** **Current:** Professor of Engineering, Bangladesh University of Engineering and Technology.
11. Leo Alves Carrilho (**PhD**), "Ribbed Surface Design for Enhanced Heat Transfer in PWR Fuel Rod Bundles", **2012** **Current:** Lead Engineer, Westinghouse Electric Company, Columbia, SC.
10. Ruixian Fang (**PhD**), "Experimental and Numerical Analysis of Enhanced Micro-Channel Cooling Using Micro-Synthetic Jets", **2011**. **Current:** Research Specialist, Nuclear Engineering, University of South Carolina.
9. John R Neuville (**PhD**), "Modeling and Simulation of Large Scale Stirred Tank", **2010**. **Current:** Savannah River Remediation, Savannah River Site, Aiken, South Carolina, 29808.
8. Avinash K. Gholap (**PhD**), "Design Tool for Multi-Objective Optimization of Heat Exchanger in Domestic Refrigerators with a Single and Dual Evaporator", **2009**. **Current:** Director, Refrigeration Technology at Johnson Controls – Hitachi Air Conditioning.
7. Dale Allen McCants (**PhD**), "Experimental and Numerical Analysis of Convective Heat Transfer Enhancement with Nanofluids Flowing Over a Heated Flat Plate", **2009**., **Current:** CEO Cool Dragon.
6. Wei Jiang (**PhD**), "Models Development and System Simulation of Solid Oxide Fuel Cell/Gas Turbine Hybrid Cycle", **2006**, **Current:** Entrepreneur, CEO of his own company in Durham NC

5. Andrew Mettler Hayes (**PhD**), "The Thermal Modeling of a Matrix Heat Exchanger Using Porous Media and the Thermal Non-Equilibrium", **2006**, **Current**: Thermal Engineer, Lockheed Martin, Littleton, CO.
4. Michael James Luneau (**PhD**), "Investigation of Methods for 3-D FEA Simulation of Truck Tire Retread Molding", **2006**. **Current**: Senior Engineer, wind turbine, Div. GE, Greenville, SC.
3. Mir Zahidul Huq Khandkar (**PhD**), "Thermo-Mechanical Modeling of Friction Stir Welding", **2005**. **Current**: Staff Engineer, Corporate Computer-Aided Engineering, BD Technologies, RTP, NC.
2. Irl Douglas Greenwell (**PhD**), "The Development of a Smart Tire-Curing Process", **2004**. **Current**: Technical Careel Manager, Michelin NA.
1. Bonnie K. Wiseman (**PhD**), "Theoretical and Experimental Evaluation of the Radiative Properties of a Dispersed Particulate Medium", **2001**. **Current**: Business Development Manager, Smithers, Akron, OH.

MS (thesis) Students Supervised:

33. Amitav Tikadar (**MS**), "Enhancing Thermal-Hydraulic Performance of Parallel and Counter Flow Mini-Channel Heat Sinks Utilizing Secondary Flow: A Numerical and Experimental Study".
32. Ahmed Musafi Abir (**MS**), "Pressure drop measurement on rough silicon carbide rod for Nuclear application" Fall **2017**.
31. Kang Liu (**MS**), "Heat Transfer Enhancement by using Nanofluid as Coolant in Nuclear Fuel Rod Bundles", Fall **2013**.
30. Eshwarprasad Thirunavukarasu (**MS**), "Gas Turbine Modeling for System Level simulation", Spring **2013**
29. Stewart Williams (**MS**), "Improvement and Control of Glass Melt Temperature of High Strength, Continuous Glass Fiber", **2011**.
28. Umair Najeeb (**MS**), "Heat Transfer Enhancement by Three-Dimensional Surface Roughness Technique in Nuclear Fuel Rod Bundles", **2012**.
27. Muhammad Yakut Ali (**MS**), "Experimental Investigation of the Effect of Copper Nanowires on Heat Transfer and Pressure for a Single Phase Microchannel Heat Sink", **2010**.
26. Sean D. Lawler (**MS**), "Computational Study of Particle Deposition within a HVAC Heat

- Exchanger”, **2008**.
25. Jordan Hogeboom **(MS)**, “Effect of Monolith Channel Distribution of Catalytic Converter Performance”, **2005**.
 24. Sujan Pakala **(MS)**, “Enhanced Thermal Conductivity for Light Water Reactor Fuel the Composite Oxide Fuel Approach”, **2005**.
 23. Md. Faruq Hasan **(MS)**, “**Design** and Optimization of a PCM Heat Sink for Transient Thermal Management of Portable Electronic Devices”, **2005**.
 22. Praveen Yadav **(MS)**, “Thermal Design and Optimization of AlGaN Based Deep UV Light Emitting Diodes”, **2005**.
 21. Asif Salahuddin **(MS)**, “Computational Thermal Hydraulics Investigation on 5 x 5 Freon Loop”, **2005**.
 20. Dale Allen McCants **(MS)**, “Experimental and Numerical Analysis of Pressure Loss Coefficients Across Coolant Distribution Nozzles for a Pressurized Water Reactor”, **2004**.
 19. Sanjida Tamanna **(MS)**, “A Simplified Approach to Estimating Work Room Contaminant Concentration Distribution”, **2004**.
 18. Mallik R. Ahmed **(MS)**, “Computational and Experimental Analysis of the Effectiveness of Argon Reservoir”, **2003**.
 17. Mirza Arif Baig **(MS)**, “**A** Study of Temperature Field in a GaN Heterostructure Field-Effect Transistor”, **2002**.
 16. Harold Jason Hamilton **(MS)**, “Heat Transfer Enhancement with Inclined Baffles and Ribs “, **2001**.
 15. Xiao Ma **(MS)**, “Experimental Investigation of Contact Resistance Across Pressed Lead and Aluminum Contact in Vacuum Environment”, **2000**.
 14. Dahvid Nathaniel Brown **(MS)**, “Numerical and Experimental Simulation of an Active Lift Enhanced Airfoil Utilizing the Magnus Effect”, **2000**.
 13. Afroza Akhter **(MS)**, “Coupled Thermal and Mechanical Model of Laser Welding with Melting and Vaporization”, **2000**.
 12. William H. Fleming, Jr. **(MS)**, “Analysis of Heat Transfer in a Metal Hydride Based Hydrogen Separation Process”, **1999**.

11. Ashar N. Pohan **(MS)**, “Experimental Investigation of Cross Flow Between two Parallel Micro-Channels”, **1999**.
10. Kirkland D. Broach **(MS)**, “Thermal Model of Resistance Spot Welding in Binary Aluminum Alloys”, **1999**.
9. A.A. S. Arefin Kabir **(MS)**, “Three-Dimensional Thermal Model of Resistance Spot Welding in Aluminum”, **1998**.
8. Bonnie K. Wiseman **(MS)**, “Experimental Determination of Absorption Properties of Building Materials”, **1998**.
7. Andrew Mettler Hayes **(MS)**, “A Study of Denitrification in a Sand Column”, **1997**.
6. Zheng Fang **(MS)**, “Numerical Modeling of Micro Particle Deposition in Laminar Pipe Contractions”, **1997**.
5. Michael S. Showalter **(MS)**, “Experimental and Numerical Analysis of Oxygen Scarfing Process”, **1996**.
4. Xinglin Tong **(MS)**, “Infiltration, Solidification and Remelting of a Pure Metal in a Two-Dimensional Porous Preform”, **1995**.
3. James Edward Bono **(MS)**, “A Thermodynamic Analysis of a Constant-Volume-Combustion, Fuel-Expansion, Spark-Ignited, 4-Stroke Internal Combustion Engine”, **1993**.
2. Guang-Fa Yao **(MS)**, “A Numerical Study of Natural Convection in Partitioned Enclosures”, **1993**.
1. Debabrata Pal **(MS)**, “3-D Numerical Modeling of a Full Scale Industrial Incinerator”, **1992**.

SERVICE

University and College Service:

- Chair of the Search Committee for Chemical Engineering Chair Search 2020
- Chair of the Review Committee for Breakthrough Faculty Scholars at USC 2020
- Member of the Search Committee to search for USC Assistant Director for Energy Management 2018
- Member of the UofSC Committee to Review IDQ Contracts

- Member of the Advisory Board of USC TRIO program (20011-present)
- Frequent Volunteer for the Big Friday, USC Scholars Social, and Honor College Social for recruiting students to CEC (2006 – present)
- Volunteer Engineer’s Day Open House (2011-present)
- Carolina Top Scholars Selection Committee member 2009 – Present
- Member of Search Committee to search the Director TRIO programs at USC, 2017
- Chair of the Search Committee for Chemical Engineering Chair Search 2011
- Member of Review Committee for Breakthrough Faculty Scholars at USC 2017 and 2018.
- Chair, Undergraduate Studies Committee and Director of Undergraduate Studies, Department of Mechanical Engineering (2003- 2006)
- Senator, University of South Carolina Faculty Senate
- Faculty Advisor ASME, student chapter at the University of South Carolina
- Chair, College of Engineering & Information Technology Grievance Committee (1996-1997).
- Member, University of South Carolina Instructional Development Committee
- Chair, Mungo Teaching Award Selection Committee
- Member of the University of South Carolina Diversity Task Force (2009-2011), Chair of the Research, Scholarship and Creative Activities Sub-Task Force.
- Faculty Advisor National Society of Black Engineers, USC Chapter (1991-2000)
- Made Presentation at the Industrial Advisory Board Meeting in April 2000, 2006-present.
- Member of the Departmental Graduate Studies Committee (1999-2006)
- Member Departmental Faculty Search Committee, select qualified candidates for the NSF/EPSCoR project (Fall 1996)
- Chair, Department of Mechanical Engineering Facilities and Equipment Committee (1999 - 2001)
- Member, College of Engineering & Information Technology Research Advisory Committee
- Liaison between local high schools. Organized Science Olympiad, Engineering experience for Benjamin E. Mays Academy. Helped with recruiting and retention of Minority and Women student- College of Engineering Interim Dean for Minorities and Women (01/1997 – 12/31/97)
- ABET Committee, Department of Mechanical Engineering (1997 - 1998)
- Departmental Faculty Search Committee, Department of Mechanical Engineering (Fall 1995, 1997 - 1998)
- EIT Committee, College of Engineering (1996 - 1997)
- Grievance Committee, College of Engineering (1996 - 1997)

- Undergraduate Curriculum Committee, Department of Mechanical Engineering (1996 - 1997)
- Strategic Planning Committee, Department of Mechanical Engineering (1994 - 1997)
- Chair Seminar Committee, Department of Mechanical Engineering (1993 - 1998)
- EIT Review Course (Fluid Mechanics), College of Engineering (1991 - 1994)
- College of Engineering Petitions Committee (substituted Dr. J. Morehouse), Evaluation of Petitions made by students (Spring 1994)
- Action Committee on Graduate Course offerings, Department of Mechanical Engineering (1992 - 1993)
- Seminar Committee, Department of Mechanical Engineering (1990 - 1992)
- Publicity Committee, College of Engineering (1991 - 1992)
- Secretary Dept. Faculty, Department of Mechanical Engineering (1990 - 1991)
- Research Advisor to 6 Students (Minority Students are given Research Experience to Encourage them to Pursue Graduate Education), USC McNair Program (Summer 1994)
- Accompanied 12 Students to the RSC, ASME, Charlotte, NC, ASME, USC Chapter (April 7 - 9, 1994)

Other Service:

- Judge SECME Mouse Trap Car Competition (Spring 2000)
- Judge, SCAMP research presentations (summers 2000 and 2001)
- Member, ASME Heat Transfer Division K-15 and K-20 Committees (1997 - Present)
- Member, ASME Heat Transfer Division (K-15) Committee on Applied Heat Transfer (1997 - Present)
- Secretary, Midlands Section ASME (1994 - 2002)
- Judge, High School Science Bowl Organized by DOE & Cray Computer (1992 and 1993)

TECHNICAL REVIEWER OF:

ASME Journal of Heat Transfer

International Journal of Heat and Mass Transfer

Journal of Numerical Heat Transfer

Journal of Supercritical Fluids

AIAA Journal of Thermophysics and Heat Transfer

Journal of Science and Technology of Welding and Joining

Journal of Mechanical Engineering Research and Development

Metallurgical and Materials Transactions

Heat and Mass Transfer

ASME Journal of Solar Energy Engineering

TECHNICAL SESSIONS ORGANIZED (includes obtaining referees for papers):

- KCR (K Committee Representative for HTD K-15) for the ASME Heat Transfer Conference, Las Vegas, NV., 2003.
- Organized and Chaired the 3 sessions on “Transport Phenomena during Manufacturing and Material Processing” at the 2003 ASME Heat Transfer Conference, Las Vegas, NV 2003.
- Organized and Chaired a session on “Computational Heat Transfer in Porous/Composite Media and Heat Exchangers” at IMECE 2003, Washington, DC
- Organized and Chaired a session on “Transport Phenomena in Multi Scale Processes” at IMECE 2003, Washington, DC
- Organized and Co-Chaired the session on “Multiphase Flow and Heat Transfer in Manufacturing and Materials Processing” at the ASME IMECE 2002, New Orleans, LA
- Organized and Chaired the session on “Numerical Methods for Porous Media” at the 1999 ASME National Heat Transfer Conference, Albuquerque, NM.
- Organized and Chaired the session on “Transport Phenomena in Material Processing and Manufacturing” at the 2000 ASME National Heat Transfer Conference; Pittsburgh, PA.
- Organized and Chaired the session on “Computational Methods In Materials Processing” at the ASME IMECE 2000, Orlando FL
- Organized and Co-Chaired the session on “Multiphase Flow and Heat Transfer in Manufacturing and Materials Processing” at the ASME IMECE 2000, Orlando FL
- Chaired a session on “Computational Heat Transfer in Materials Processing with High Energy Density” (Khan, Amin, Andrews) at the 2001 ASME National Heat Transfer Conference.
- Organize and chaired a session on “ Computational Development of Multiphase Transport in Porous Media” at the 2001 ASME IMECE (Amin/Khan)
- KCR for the ASME Heat Transfer Conference, 2003 in Las Vegas, NV
- K-committee Representative (ASME HTD K-20) for National Heat Transfer Conference 2000.
- Session Chair of National ASME Conferences (NHTC 2000, IMECE 2000)

LEADERSHIP ACCOMPLISHMENTS

Professor Khan has been the Chair of the Department of Mechanical Engineering at the University of South Carolina (USC) since 2007; prior to that he served as interim chair for two years. The department has seen unprecedented growth and stature under his leadership, and is now number one in undergraduate enrollment, research expenditures, faculty size, and journal publications in the College (Appendix, Figures 1 - 4). The following are highlights of growth during his Chairmanship:

- Undergraduate student enrollment almost tripled from 300 to 866; and graduate student enrollment increased from 74 in 2006 to 161 in 2017.
- Annual research expenditures increased from \$4.2 million (\$200k / tenure track faculty) in 2006 - 2007 to \$10.5 million (\$275 k / tenure track faculty) in 2016 - 2017.
- Scholarly journal publications increased from 60 (2.86/tt-faculty) in 2007 to 168 (~5/tt-faculty) in 2014.
- Prof. Khan's initiative resulted in a new MS/ME degree program in Aerospace Engineering - the only Aerospace degree program in South Carolina. A proposal for undergraduate Aerospace program is now submitted to SC Commission on Higher Education (CHE)
- Mechanical Engineering was ranked 31st among PhD granting universities by the National Research Council (NRC).
- Tenure track faculty members have increased from 21 to 34.
- Two junior faculty members have earned tenure and early promotion to full professor, while four other assistant professors have recently earned tenure and promotion, one of them won the NSF Career Award.
- The department hired 4 SmartState Chairs (one SOFC, two Nuclear Engineering and one Multi-Functional Materials and Structures). Professor Khan was the PI/Co-PI of the two successful Nuclear Engineering SmartState Chair proposals.
- The Nuclear Engineering program has grown from two to five full time faculty members.
- An active Industrial Advisory Board representing major employers such as SCE&G, DuPont, GE, Duke Energy, Westinghouse Electric Company, Michelin, Savannah River Lab, and Gulf Stream (for complete list please visit <http://www.me.sc.edu/about/iab.html>) has been established.
- The department was successfully reviewed by the Accreditation Board of Engineering and Technology (ABET) in 2006, 2012 and most recently 2018.

CONTRIBUTION TO MULTIDISCIPLINARY RESEARCH ACTIVITIES

Professor Khan been successful in growing research, the department as a whole has seen unprecedented growth in funding and scholarly publications. I have served as PI or co-PI on grants totaling \$24.4 million. Of the recent grants, he serves as PI for a \$4.8 million grant and as co-PI on

grants totaling \$13.3 million. His research projects have been interdisciplinary, and he has successfully collaborated with faculty from all five departments in the College. He has also collaborated with colleagues from other colleges, most notably with faculty from the Colleges of Public Health and Arts and Sciences. Additionally, he worked on collaborative projects with faculty from Georgia Tech, the University of Florida, Clemson University, the University of Maryland, and Oregon State and Montana State Universities.

Under Professor Khan's leadership the department boasts a healthy mix of single investigator, multi-investigator, and multidisciplinary research. From a perpetual third place ranking in the college in research expenditure we have now achieved the number one ranking for the last five years. This began with a multi-university (lead institution: USC with partner institutions GaTech, U Penn, U Connecticut, and UC Santa Barbara) \$12 million Energy Frontiers Research Center (the largest grant in USC history at the time). The department has actively collaborated with the USC school of medicine to develop large NIH grants. The department now has several large multi-disciplinary grants, including a \$3.2 million ARPA-E grant led by Kevin Huang (DME) and a \$4.0 million Integrated Research Project (IIRB) funded by DOE with Travis Knight (DME) as PI with collaborators including the University of Florida, SC State University, and Areva Corporation. The Conditioned Based Maintenance (CBM) program led by Abdel Bayoumi is an example of sustained success. This program has been generating more than \$1.0 million per year for the last eight years. A multi-year, multi-million dollar research initiative was funded last year by Skolkovo Tech with Michel van Tooren (DME) PI and involving six other faculty from our department in addition to a grant from Fokker Aircraft. Victor Giurgiutiu (DME) has several active grants (ONR, AFOSR) totaling more than \$2 million in the area of Structural Health Monitoring. Lucy Yu and Travis Knight are PIs of DOE-NEUP grants, each at \$800,000 and have collaborations with Savannah River National Laboratory (SRNL). Chris Xu and Chen Li both have active grants of more than \$1.0 million each, and Djamel Kaoumi is part of a successful DOE IRP in collaboration with Penn State, UC Berkeley, and Argonne National Laboratory. Two different multi-university/industry ARPA-E white papers were recently approved, with Frank Chen and Tanvir Farouk leading these efforts.

SYNERGISTIC ACTIVITIES

Professor Khan served as the **Director of Undergraduate Studies** in the Department of Mechanical Engineering. He was instrumental in making positive changes in the ME curriculum to ensure continuous improvement in accordance with ABET requirements. He was **the faculty advisor of the National Society of Black Engineer's (NSBE)** at USC, for about 9 years. Under his mentorship, the NSBE members have taken on several projects to enhance retention and success of minority students in engineering. Professor Khan is an active participant in the Ronald McNair Summer Research Program (a program to prepare underrepresented and 1st generation college student for doctoral program), and leads the research faculty in coordinating the summer research program. He was a member of the University of South Carolina Diversity Task Force (2009-2011), and served as leader of the Research, Scholarship and Creative Activities Sub-Task Force. He serves as a member of the USC TRIO Advisory Board. He is active with the SCAMP program and has served as the Acting **Assistant Dean of Minorities and Women at USC**.