

July 19, 2021

To: Chair of the Search Committee Director of Undergraduate Research Auburn University

Dear Chair of the Search Committee,

Thank you for the opportunity to review my profile. I am currently a professor in the Department of Mechanical Engineering at Auburn University. I would like to apply for the position of director of undergraduate research at Auburn University.

I have been engaging undergraduate students in research and scholarship while working at Purdue University, at Oklahoma State University, and here at Auburn. During my career as an instructor, mentor, and researcher at the University, my contributions to student engagement took place in many ways, which I would like to highlight below.

**I committed (and will continue to commit) to using a faculty position to be a force of enlightenment and change by opening up opportunities to students**

I opened up opportunities for students that belonged to minority groups, which several of my students belong to. I supported them by raising scholarships. Recently, I worked with two of my students through a nationwide fellowship program and provided support and mentorship. The students continued to graduate school after their BS. I consider these examples in which the *students may otherwise have never known of the intellectual and life options and would have certainly abandon the University if it was not for my support, encouragement, and accommodations.*

**I enriched (and will continue to enrich) the classroom environment by providing exposure to new perspectives on cultures, beliefs, and practices**

I volunteered to teach a course open to all years and to all students of the engineering disciplines and architecture that covers sustainability and modern technological innovations abroad, focusing on cultural exchange, manufacturing processes, and practices in the engineering systems of Italy. This course has a study abroad component, and I led groups of undergraduate students to Italy for visiting sites, industries, and local Universities that emphasized new perspectives on culture, beliefs, and practices in the engineering disciplines.

**I provided (and will continue to provide) exposure to research opportunities**

I engaged first-year students and exposed them to research opportunities through state-wide undergraduate research and scholarship programs. Nine of the undergraduate student mentees that I engaged in such programs belong to minority groups, and I successfully obtained scholarship funds for all nine students and exposed them to my lab research environment in mechanical engineering for thermal energy-conversion systems. Five of them continued to graduate school, and I consider this an excellent outcome for inspiring the young students belonging to underrepresented groups to pursue graduate education for a lifelong learning experience.

**I mentored (and will continue to mentor) undergraduate students for research and scholarly activities**

I have mentored 22 undergraduate students in my research work since 2006 and advised over 50 undergraduate students for academic careers and professional development. I have engaged freshman research scholars, honors students, special projects course students, and mentored students through State-wide undergraduate research and scholarship programs. I consider my experience in engaging these students in experimental research in my laboratory at the undergraduate level an excellent background for the position that I am applying to.

**I led (and will continue to lead) outreach to the local community for fostering a diverse environment**

I have been the faculty advisor of several student clubs, one of which had over 50 students belonging to minority groups, mainly Hispanics, African Americans, and Women. I led the organization at the university

level and served the local community, local towns around the campus. In particular, I led social events (dinners, salsa balls, participation in town parades) within the University and with the local communities to celebrate the heritages of Latin Americans and foster a diverse environment.

As a professor in the Department of Mechanical Engineering and as faculty member of the institute for scalable energy conversion science and technologies. I worked with faculties and researchers in multidisciplinary areas. Recent examples are my collaborations with the faculty members from the School of Nursing, School of Kinesiology, and School of Industrial and Graphic Design. In addition, **I have significant experience managing large-scale interdisciplinary, multi-institutional, and multi-investigator projects.** I consider this managerial experience quite relevant and instrumental for my future success as the new director of undergraduate research at Auburn University.

My applied and fundamental research enhances our national energy security, and I made (and will continue to make) significant and near-term impacts on building systems' energy usage. I feel very proud of the reputation I achieved as faculty and, while I have been overall happy as a researcher and scholar in the Department of Mechanical Engineering at Auburn, I am looking at the director position as a unique and timely opportunity for me to lead future researchers and educators at Auburn University. I envision a large growth in undergraduate research and looking forward to enhancing the quality of the experience for the students. Auburn is an ideal place to launch new initiatives that will attract the youngest and brightest. The diverse and outstanding students population is a unique advantage for enriching our undergraduate research. By leveraging AU research centers, Alabama-based companies, and not-for-profit organizations, I plan to establish novel platforms to perform the new multidisciplinary undergraduate research needed. My goal as new director is to bridge the gaps between undergraduate students and the faculties and bring undergraduate research at AU at the forefront edge of research, training, and education. My goal for Auburn is to achieve nationally recognized leadership and be an inspirational example in students' undergraduate research experience.

In summary, throughout my career as faculty in Mechanical Engineering, I had the opportunities to advise and mentor undergraduate students in higher education, including women and ethnic minorities. I provided opportunities in my research laboratory and created financial assistantships for these students. I believe that they would otherwise have never known of the intellectual and life options that abound at University without my encouragement and support. In alignment with AU's mission, I will continue to provide openings and programs to undergraduate students, especially in traditionally underrepresented groups. I plan to continue raising scholarships and gifts from foundations serving students. I would certainly continue to promote the participation of women and underrepresented minorities in academic science, technology, engineering, and mathematics (STEM) careers through the AU program. I also plan to work within the local schools to raise awareness of AU programs among 8 to 12<sup>th</sup>-grade students.

When looking at the outstanding faculty and students at Auburn, I am confident that I can be a good fit and that I will be able to engage and enhance the undergraduate research programs. I have attached my current resume and required application material. I look forward to hearing from you.

Sincerely,



Lorenzo Cremaschi, Ph.D

Professor

Department of Mechanical Engineering at Auburn University

Auburn, AL, USA, 36849

Cell: (334) 734 6058, Email: lzc0047@auburn.edu

**LORENZO CREMASCHI, Ph.D.**  
**Professor, Department of Mechanical Engineering**

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**SUMMARY**

**TEACHING (45%)**

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***Advised as major professor:***

- PhD students being advised: 13
- MS students being advised: 20
- BS students being advised: 22

***Advised as committee member:***

- PhD students being advised: 10
- MS students being advised: 26
- Students graduated: 7 PhD & 20 MS

***Courses taught:***

- Number of different courses: 9
- New courses developed: 3
- Courses significantly revised: 3
- Instructor evaluation (last 3 years): 5 out of 6

***Teaching awards***

- 2018, Birmingham chapter of ASHRAE's Educator of the Year Award;
- 2008 Teaching award from Pi Tau Sigma.

**SERVICE & OUTREACH (10%)**

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- Judge at Middle School Science and Engineering Fair

***Service to archival journals***

- Associate editor for STBE Journal
- Regular reviewer for 20 journals

***Professional organizations:***

- Conference Technical Program Chair for the 4<sup>th</sup> Thermal and Fluid Engineering International Conference, ASTFE
- Conference session chair for four sessions in ASHRAE conferences
- Conference track organizer for two ASME ICNMM conferences in 2018 and 2019
- Chairman of the International Institute of Refrigeration (IIR) / U.S. National Committee
- Research Liaison in the ASHRAE Research Administration Committee
- Co-Chair of the ASTFE Task Group in Energy and Sustainability (ASTFE TG, April 2017 – present)
- Chair of ASHRAE Technical Committee TC8.4
- Voting member of ASHRAE TCs 1.3, 8.4, 8.5, and 8.11
- Member of two ASHRAE Standards committees
- Member of the International Energy Agency Heat Pump Program/U.S. National Team

***Auburn University:***

- Member of the Graduate Council, Representative of the Samuel Ginn College of Engineering
- Member of the Auburn University delegation for developing international collaborations with German Universities and Industries
- Member of the ME faculty search committee
- Faculty advisor of the ASHRAE student branch chapter

***Funding Agencies Review Service:***

- Regular reviewer for DOE, DOD, NSF, California Energy Commission
- Member of ASHRAE Research Administration Committee

***Service-related Awards:***

- 2020 ASHRAE Exceptional Service Award

**RESEARCH (45%)**

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***Extramural Funding:***

- 20 Grants as PI: \$4.7 M
- 3 Grant as Co-PI: \$0.5M

***Research facility and lab development projects***

- 2 Grant as PI: \$1.2M

***Internal Funding Awarded***

- 1 Grant as PI: \$37K

**Publications**

h-index:15; i10-index: 32.

No. of Citations: 1098

- Refereed Journal Publications – 41
- Conference Proceedings – 38
- Conference Papers – 12
- Presentations Only
  - Invited talks – 13
  - Presentation at professional societies - 38

***Research-related Awards:***

- 2014 Research Excellence Award (Oklahoma State University)
- 2013 Innovative Research Grant Award, ASHRAE.
- 2012 Halliburton Outstanding Young Faculty Award (Oklahoma State University)

***Publication-related Awards:***

- 2012 International Journal of Refrigeration Best Paper of the Year Award 2011/2012.

**INTEREST AREAS**

Energy Efficiency and Sustainability, Scalable Energy Systems, Heat and Mass Transfer Processes in AC Systems, Building and Transportation HVAC, Refrigerants Thermodynamics, Refrigeration and Cryogenics, Waste Heat Recovery.

**CURRENT RESEARCH ON**

Low GWP Refrigerants Thermodynamic and Heat Transfer, Lubricants and Nanolubricants Heat Transfer, Frosting, Icing and Defrost Phenomena, Mini- and Micro-Channels Heat Exchangers.

**EDUCATION**

**Postdoctoral training in Mechanical Engineering** Aug. 2006

Research topics investigated: micro-refrigeration systems, electro-hydrodynamic flows, electronic cooling, Purdue University, West Lafayette, IN, USA

Supervisors and Mentors: Dr. Eckhard Groll and Dr. Suresh Garimella

**Ph.D. in Mechanical Engineering** July 2004

Research topics investigated: heat transfer and two phase flow of lubricants and refrigerants mixtures, advanced heat pump systems, sensors for lubricant circulation in AC automobile systems

University of Maryland, College Park, MD, USA

Ph.D. Thesis title: "Experimental and theoretical investigation of oil retention in vapor compression systems"

Thesis Advisor: Dr. Reinhard Radermacher

**M.S. & B.S. Degree in Mechanical Engineering** Feb. 2001

Research topics investigated: Computational heat transfer and thermal management of electronics

University of Modena and Reggio Emilia, Modena, Italy

M.S. Thesis title: "Direct numerical simulation (DNS) of natural convection inside enclosure with round heat sources"

Thesis Advisor: Dr. Mauro Corticelli

**PROFESSIONAL EXPERIENCE****Present Position****Professor**

April 1, 2021 - present

Auburn University, Department of Mechanical Engineering, Auburn, AL, USA

Description of current job responsibilities:

- Teaching undergraduate and graduate courses; supervising graduate and undergraduates assistants, serving on graduate student committees, advising students on curricular and career choice, serving on departmental, college, and university committees.
- Pursuing research on energy systems, heat and mass transfer processes and thermodynamics, pursue research on energy conversion systems and mini-, micro-technologies as they relate to building and transportation thermal systems; acquiring of external funding and developing scholarly and creative activities via publication of research and presentation of technical materials, organizing seminars, technical conference, and outreach activities.
- Developing and maintaining an extramurally funded and nationally competitive research program, and working collaboratively with colleagues in the department as well as those in the college of engineering and in the University.

**Previous experience****Associate Professor**

Jan 1, 2016 – Mar 31, 2021

**Associate Professor**

July 2012 – Dec. 2015

Oklahoma State University, School of Mechanical and Aerospace Engineering, Stillwater, OK

**Assistant Professor**

Aug. 2006 – June 2012

Oklahoma State University, School of Mechanical and Aerospace Engineering, Stillwater, OK

**Post-Doctorate Research Associate**

Sept. 2004 – July 2006

Ray W. Herrick Laboratories, Mechanical Engineering Department, Purdue University, West Lafayette, IN

- Investigated the performance and feasibility of meso- and micro-scale refrigeration systems for electronics cooling. I also studied electron hydro dynamic pumps and micro- diaphragm compressors for electronics cooling applications.

**Graduate Research Assistant**

Jun. 2001- Aug. 2004

Center for Environmental Energy Engineering (CEEE), University of Maryland, College Park, MD

- Studied Carbon Dioxide (CO<sub>2</sub>) as refrigerant for air conditioning and refrigeration systems.
- Assembled and tested new sensor to measure oil circulation in line of a vapor compression system.
- Analyzed tri-generation systems for electric power production, heating, and cooling of buildings.

## AWARDS AND RECOGNITIONS

- 2020 ASHRAE Exceptional Service Award; “*this award recognizes ASHRAE members who have served the Society with exemplary effort, far in excess of that required for the Distinguished Service Award*”.
- 2019 ASHRAE Distinguish Service Award; “*this award recognizes ASHRAE members who have served the Society faithfully and with distinction on committees or have otherwise given freely of their time and talent on behalf of the Society*”.
- 2018, Birmingham Chapter of ASHRAE’s 2017 Educator of the Year Award; plaque reads “*for outstanding achievements in the application of heating, refrigerating, and air conditioning technology*”, Birmingham regional ASHRAE meeting, May 16 2018, Birmingham, AL, U.S.A.
- 2014 Research Excellence Award from the College of Engineering, Architecture and Technology of Oklahoma State University; this award is “*in recognition of excellent achievements in research and scholarly activities*”.
- 2013 Innovative Research Grant Award, ASHRAE; this award is for “*novel research which does not fit within the current TC research activities, but deemed to have the potential to significantly advance the state-of-the-art in heating, ventilating, air-conditioning and refrigeration engineering*”.
- 2012 Halliburton Outstanding Young Faculty Award from the College of Engineering, Architecture and Technology of Oklahoma State University; Plaque says “*in recognition of outstanding achievement and professionalism in education, research and service to students*”.
- 2012 International Journal of Refrigeration Best Paper of the Year Award 2011/2012.
- 2012 Best Paper (3<sup>rd</sup> place) Award at the Int. Conference of Refrigeration and Air Conditioning at Purdue.
- 2012 Best Poster Paper Presentation Award at the ASHRAE Annual and Semi-annual Conferences.
- 2008 Teaching Award from Pi Tau Sigma in the School of Mechanical and Aerospace Engineering, presented by Pi Tau Sigma ME Honorary society undergraduate students. This award is for “*best course of the year with the highest efforts required and the most useful material learnt by the students*”.

## PROFESSIONAL SERVICE TO ARCHIVAL JOURNALS

- Associate Editor for STBE Journal July 2017 - present  
*Science and Technology for the Built Environment Journal* (STBE, formerly the *ASHRAE HVAC&R Research Journal*),

## CERTIFICATIONS IN THE FIELD OF RESEARCH AND TEACHING

- EPA Certified Technician Universal Type, required by 40 CFR 82 Subpart for purchasing, handling, and disposing of refrigerants and for conducting inspection and service of HVAC&R systems and equipment. 2002 - present

## TEACHING ACTIVITIES

### GENERAL TEACHING PHILOSOPHY

Theoretical knowledge is fundamental for the engineering profession but theoretical knowledge alone would not be enough to respond to real word challenges in thermal energy systems. My *education philosophy* integrates *theoretical knowledge with authentic and real word projects*. The modus operandi is to consider actual phenomena and contemporary issues, logically allocate smaller and simplified questions by means of engineering judgment, and inspire students for critical and creative solutions of such question by using fundamental principles of mechanical engineering. Integration of research in engineering education is and will continue to be a strong thrust in my undergraduate and graduate courses. Effective communication among students with diverse background and technical skills is an important factor in my peer-to-peer teaching technique. Students should learn to be flexible, receptive to change, and have mutual respect to effectively work in vibrant environments that are culturally, socially, economically, and politically diverse.

## TEACHING RESPONSIBILITY

### General Instruction Area

The courses I teach are in the area of Thermodynamics, Heat Transfer, and Energy Conversion Systems. They are offered at the second and third year of mechanical engineering (Thermodynamics I and II), at the senior year (Design of Indoor Environmental Systems and Advanced Refrigeration Systems), and at the graduate level (Advanced Thermodynamics, Advanced Refrigeration Systems, and Cryogenics). I also volunteered to teach a lower division course to freshmen (Introduction to Engineering) that focuses on students’ retention in the engineering disciplines. I finally volunteer to teach a course open to all years and to all students of the engineering disciplines and architecture. This course covers sustainability and modern technological innovations abroad with focus on cultural exchange, manufacturing processes, and engineering systems of foreign countries (Study abroad course for Modern Technological Innovations of Italy).

**Nature of Courses Taught**

The undergraduate courses I teach include regular lectures and informal discussion sessions. Some lectures are integrated with computer lab sessions, which I teach during regular lecture hours to expose students to modern design and analysis tools in my field. I teach a senior course in buildings thermal systems. This course has a strong design component and the course revolves around real world projects for the design of heating, ventilating, and air conditioning systems. Graduate courses include regular lectures, discussion sessions, and student presentations. The graduate courses develop by adopting projects in Thermodynamics and Thermal Energy Conversion Systems. These projects are assigned to graduate students and final presentations and written technical reports are major ingredients for the didactic of my graduate courses.

**Course Taught at Auburn University (AU)****Undergraduate courses taught at AU (2)**

1. Thermodynamics I (a second year engineering level course), Auburn University (Sp16, Fa18, Sp19)
2. Thermodynamics II (a third year engineering level course), Auburn University (Sp. 2017, Fa19)

**Graduate courses taught at AU (4)**

1. Advanced Refrigeration Systems (Fa17, Fa18, Fa20)
2. Cryogenic systems and low temperature processes (Sp18, Sp21)
3. Advanced Thermodynamics (Fa19)
4. Renewable Energy Resources and Applications (Sp20)

**Course Taught at Oklahoma State University (OSU)****Undergraduate courses taught at OSU (4)**

1. Introduction to Engineering (a freshman level course), Oklahoma State University (F 2009, 2010, 2012)
2. Thermodynamics II (a third year engineering level course), Oklahoma State University (F 2006 – 2010, Sp 2011, Sp. 2012)
3. Design of Indoor Environmental Systems (a fourth year engineering level course), Oklahoma State University (F 2008-2014)
4. Modern Technological Innovations of Italy, (for all Engineering college students at all levels, site visit and study abroad are components of this course) (Spring 2013-2015)

**Graduate courses taught at OSU (2)**

1. Refrigeration, Oklahoma State University (Sp 2007, 2008, 2010, 2012, 2014)
2. Advanced Thermodynamics I, Oklahoma State University (Sp 2009, 2011, 2013, 2015)

**TEACHING LOAD**

The percent teaching time I am assigned for instructional activities during 9 academic months is 45 percent. Since 2006 I have conducted research and scholarly activities during the 3 summer months of every year, and my research and scholarly activities required me to get some release time and my external research funds provided financial support to buy out of my course requirements from time to time.

**STUDENTS TEACHING EVALUATIONS (at Oklahoma State University from 2006 to 2015)**

Semester	Courses Taught (Number and Name)			Number of Students in Class	Overall Student Evaluation	
			(G = Graduate course)		Instructor	Course
Students evaluations of my performance in the classrooms and of my courses are given below on a scale from 0 to 4, where 4 represent excellent overall performance of the instructor and very useful course. Evaluations above 3.0 indicate good performance.						
20 06	F	MAE 3223 Thermodynamics II		49	3.45	3.54
20 07	S	MAE 5653 Refrigeration (G)		6	3.80	4.00
20 07	F	MAE 3223 Thermodynamics II		39	3.56	3.26
20 08	S	MAE 5653 Refrigeration (G)		13	3.70	3.70
20 08	F	MAE 4703 Design of Indoor Environm. Systems		29	3.48	3.65
20 09	S	MAE 5803 Advanced Thermodynamics I (G)		10	3.11	3.50
20 09	F	MAE 3223 Thermodynamics II		45	3.18	3.19
20 09	F	MAE 4703 Design of Indoor Environm. Systems		29	2.94	3.12
20 09	F	ENGR 1111.314 Introduction to Engineering		24	3.10	3.11
20 10	S	MAE 5653 Refrigeration (G)		9	3.63	3.44
20 10	F	MAE 3223 Thermodynamics II		49	3.54	3.42
20 10	F	MAE 4703 Design of Indoor Environm. Systems		23	3.29	3.33
20 10	F	ENGR 1111.314 Introduction to Engineering		24	2.60	2.65
20 11	S	MAE 3223 Thermodynamics II		46	3.38	3.18
20 11	S	MAE 5803 Advanced Thermodynamics I (G)		8	3.88	3.63
20 11	F	MAE 4703 Design of Indoor Environm. Systems		21	3.72	3.50
20 12	S	MAE 3223 Thermodynamics II		53	3.66	3.46
20 12	S	MAE 5653 Refrigeration (G)		9	3.67	3.67
20 12	F	ENGR 1111.324 Introduction to Engineering		23	2.37	2.56
20 12	F	MAE 4703 Design of Indoor Environm. Systems (2 sections)		37	3.67 3.63	3.29 3.71
20 13	S	MAE 5803 Advanced Thermodynamics I (G)		14	3.18	3.18
20 13	S	ENGR4060 Technologies and Innovations of Italy		13	N/A	N/A
20 13	F	MAE 4703 Design of Indoor Environm. Systems (2 sections)		58	2.62* 2.05*	2.89* 2.31*
20 14	S	MAE 5653 Refrigeration (G)		9	3.38	3.57
20 14	S	ENGR4060 Technologies and Innovations of Italy		22	N/A	N/A
20 14	F	MAE 4703 Design of Indoor Environm. Systems (2 sections)		53	2.68 3.19	2.91 3.00
20 15	S	MAE 5803 Advanced Thermodynamics I (G)		9	3.11	2.88
20 15	F	MAE 4703 Design of Indoor Environm. Systems (2 sections)		55	— —	— —

**STUDENTS TEACHING EVALUATIONS (at Auburn University from 2016 to present)**

Students evaluations of my performance in the classrooms and of my courses are given below on a scale from 0 to 6, where 6 represent excellent overall performance of the instructor and very useful course. Evaluations above 5 typically indicate very good performance.

Semester			Courses Taught (Number and Name) (G = Graduate course, V = Outreach course)	Number of Students in Class	Overall Student Evaluation	
					Instructor	Course
20	16	S	ENGR 2010 Thermodynamic I	47	4.4	4.6
20	17	S	MECH 3020 Thermodynamic II	52	3.1	4.0
20	17	F	ME 5970/6970/6976 Advanced Refrigeration Systems (G, V)	11	5.0	4.5
				4 (G)	6.0	6.0
				1 (V)	5.0	6.0
20	18	S	ENGR 2010 Thermodynamic I	60	5.7	5.7
20	18	S	ME 7970 Cryogenic Systems and Low Temperature Processes (G)	3 (G)	5.7	6.0
20	18	F	ENGR 2010 Thermodynamic I	54	5.8	5.7
20	18	F	ME 5970/6070 Advanced Refrigeration Systems (G)	6	4.3	4.0
				3 (G)	4.0	5.0
20	19	S	ENGR 2010 Thermodynamic I	57	5.9	5.8
20	19	F	MECH 3020 Thermodynamic II	60	5.2	5.3
20	19	F	MECH 7010 Advanced Thermodynamics	5 (G)	4.6	5.4
			MECH 7016V01 Adv. Thermodynamics (DL)	3 (V)	5.5	5.5
20	20	S	MECH 5050/6050 Renewable Energy (G)	62	4.5	4.4
				9 (G)	6.0 (G)	5.5 (G)
20	20	F	MECH 5970/6070 Advanced Refrigeration Systems (G)	21	5.2	5.3
				7 (G)	5.8 (G)	5.8 (G)
20	21	S	MECH 7970 Cryogenic Systems and Low Temperature Processes (G)	7 (G)	6.0 (G)	6.0 (G)
20	21	F		—	—	—

**TEACHING SERVICES****Academic Advising – undergraduate students****Undergraduate students advised/currently advising for academic career or professional development (52)**

- (1) Jason Matthew Saghi (B.S. Mechanical Engineering), Oklahoma State University, Jan. 2007 - Dec 2008
- (2) Kent William Torbett (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2007 to May 2008
- (3) Kearn Che Tse (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2007 - Dec 2008
- (4) Kelli Michelle Gosney (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2006 - May 2008
- (5) Grant Ryan Heimbach (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2006 - May 2008
- (6) Omogbolahan Samusedeen Jabitta (B.S. Mechan. Eng.), Oklahoma State Univ., Aug. 2006 - May 2008
- (7) Alexander J Jech (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2006 - May 2008
- (8) James Daniel Lewis (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2006 to May 2008
- (9) Harrison Michael, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2008 – Dec 2009
- (10) Cary Sarah, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2008 – Aug 2010
- (11) Saenz Cesar, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2008 - Aug 2010
- (12) Shields Sarah, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2008 - Aug 2010
- (13) Woltemath Sean, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2008 - Aug 2010
- (14) Atharva Barve, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan 2009 – Aug 2010
- (15) Eric Pametichy, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2009 – May 2011



- (16) Aaron Dishman, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan 2010 – Dec 2011
- (17) Christopher Duncan, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2010 – May 2012
- (18) Jacob Gibbs, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2010 – May 2012
- (19) Curtis Donner (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2011 – May 2012
- (20) Causey Courtney, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2010 – May 2013
- (21) Jared Gipson, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2010 – May 2013
- (22) Saad Gondal (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2011 – May 2013
- (23) James Anderson (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2012 – Dec 2013
- (24) Luke Balke (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2012 – Dec 2013
- (25) Ronald Brosie (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2012 – Dec 2013
- (26) Matthew Castner (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2012 – Dec 2013
- (27) Travis Dollar (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2012 – Dec 2013
- (28) Craig Durkee (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2012 – Dec 2013
- (29) Michael Carter, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – Dec 2013
- (30) Robert Cheney (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2012 – Dec 2014
- (31) Kirsten Berg, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – May 2014
- (32) Aaron Cain, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – Dec 2014
- (33) Carl Crawford, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – Dec. 2014
- (34) Rafael Prado, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – Dec. 2014
- (35) Nathan Banker, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – May 2015
- (36) Jordan Morgan, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – May 2015
- (37) Jason Proffitt, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2013 – May 2015
- (38) Christopher Welsh, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2014 – May 2015
- (39) Christopher Heath, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2014 – Dec. 2015
- (40) Troy Jensen, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2014 – Dec. 2015
- (41) Clinton Reese, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2014 – Dec. 2015
- (42) Paul Rosencrans, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug 2014 – Dec. 2015
- (43) Marshall McDougal, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2015 – Dec. 2015
- (44) Raymond McVay, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2015 – Dec. 2015
- (45) Philip Spruiell, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2015 – Dec. 2015
- (46) Uyen Than, (B.S. Mechanical Engineering), Oklahoma State Univ., Jan. 2015 – Dec. 2015
- (47) Samuel Allison, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2015 – Dec. 2015
- (48) Peter Glockenmeier, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2015 – Dec. 2015
- (49) Craig Lovell, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2015 – Dec. 2015
- (50) Gregory Vrooman, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2015 – Dec. 2015
- (51) Matthew Williams, (B.S. Mechanical Engineering), Oklahoma State Univ., Aug. 2015 – Dec. 2015
- (52) Kayla Rowland, (B.S. Mechanical Engineering), Auburn University, Aug. 2019 – Dec. 2019

#### **Academic Advising – Graduate Students**

##### **Graduate students advised/currently advising (33)**

##### **Ph.D. students advised/currently advising (13)**

- (1) Sankaranarayanan K Padhmanabhan (Ph. D. Mech. Eng.), co-advisor, Oklahoma State University, Aug 2007 – March 2011 (*winner of the 2012 International Journal of Refrigeration Best Paper Award*)
- (2) Ehsan Moallem (Ph. D. Mech. Eng.), Oklahoma State University, Aug. 2008 – July 2012, (*winner of the 3<sup>rd</sup> Best Paper Award at the 14th International Refrigeration and Air Conditioning Conference at Purdue, West Lafayette, IN, USA, July 2012*)
- (3) Shanshan Cai (Ph.D. Mechanical Engineering), Oklahoma State University, Aug 2009 – Dec2013 (*winner of 2012 Poster presentation award at ASHRAE meetings*)
- (4) Ardiyansyah Yatim (Ph.D. Mechanical Engineering), Oklahoma State University, Aug 2011 – July 2015, *Recipient of the 2011-2014 Fulbright Graduate Student Fellowship*
- (5) Andrea Arnaldo Maria Bigi, (Ph.D. Mechanical Engineering), Oklahoma State University (Jan 2013 – December 2015), and Auburn University (Jan 2016 to May 2018), *Recipient of NSF IGERT Graduate Student Fellowship 2017-2018*
- (6) Pratik Deokar, (Ph.D. Mechanical Engineering), Oklahoma State University (Aug 2014 – Dec 2015) and Auburn University (Jan 2016 – Aug. 2019)
- (7) Ellyn Harges, (Ph.D. Mechanical Engineering), Auburn University (Jan 2017 to May 2021), *Recipient of the AU College of Engineering Graduate Student Fellowship 2017-2021, and of the 100+ Women Strong 2017-2018 Graduate Student Fellowship; Recipient of NSF Graduate Research Scholar Program Fellowship in 2018 & in 2019, Recipient of 2019 ASHRAE Grant-In-Aid Fellowship*

- (8) Josh Rothe, (Ph.D. Mechanical Engineering), Auburn University (Jun 2019 to Present), *Recipient of the AU Presidential Graduate Student Fellowship 2019-2023*
- (9) Fuqiang Ren, (Ph.D. Mechanical Engineering), Auburn University (Aug 2019 to Present)
- (10) Stefano Morcelli, (Ph.D. Mechanical Engineering), Auburn University (Jan 2020 to Present)
- (11) Jerin Robins, (Ph.D. Mechanical Engineering), Auburn University (May 2020 to Present)
- (12) Maliha Yel Mahi, (Ph.D. Mechanical Engineering), Auburn University (May 2020 to Present)
- (13) Gerard Muteba, (Ph.D. Mechanical Engineering), Auburn University (May 2020 to Present)

#### Occupation of Ph.D. students advised immediately after their graduation

	PhD Student	PhD Year	Job Title	University / Fed Lab / R&D in Industry
(1)	Sankaranarayanan K P	2011	System Simulation/Application	Danfoss (HVAC Manufacturer), Baltimore, MD, USA
(2)	Ehsan Moallem	2012	Adjunct Assistant Professor	School of Mechanical and Aerospace Engineering, <b>Oklahoma State University</b> , Stillwater, OK, USA
(3)	Shanshan Cai	2013	Lecturer	Department of Refrigeration and Cryogenic Engineering School of Energy and Power Engineering Huazhong <b>University of Science and Technology</b> (HUST), Wuhan, Hubei, China
(4)	Ardiyansyah Yatim	2015	Assistant Professor	Department of Mechanical Engineering, <b>University of Indonesia</b> , Depok, West Java, Indonesia
(5)	Andrea Arnaldo Maria Bigi	2018	Senior Research Engineering	United Technologies Corporation (UTC), Charlotte, NC, USA
(6)	Pratik Deokar	2019	Senior Research Engineering	Rheem Manufacturing, Montgomery, AL, USA
(7)	Ellyn Harges	2021	---	---
(8)	Fuqiang Ren	2022	---	---
(9)	Josh Rothe	2023	---	---
(10)	Stefano Morcelli	2023	---	---

#### M.S. students advised/currently advising (20)

- (1) Samuel R. Hobson (M.S. Mechanical Engineering), Oklahoma State University, Jan 2007 - May 2008
- (2) Spencer Lifferth (M.S. Mechanical Engineering), Oklahoma State University, Aug 2007 - May 2009
- (3) Emre Ozdemir (M.S. Mechanical Engineering), Oklahoma State University, Jan 2008 - May 2009
- (4) Shanshan Cai (M.S. Mechanical Engineering), Oklahoma State University, Aug 2007 – Dec 2009
- (5) Annamalai, Ramesh (M.S. Mechanical Engineering), Oklahoma State University, Jan 2008 - May 2010
- (6) Ellisa Lim (M.S. Mechanical Engineering), co-advisor, Oklahoma State University, April - May 2010
- (7) Ozgur Aslan (M.S. Mechanical Engineering), Oklahoma State University, Jan 2008 – Dec 2010
- (8) Kasey Worthington (M.S. Mechanical Engineering), Oklahoma State University, Jun 2009 – July 2011
- (9) Tommy Hong (M.S. Mechanical Engineering), Oklahoma State University, Jun 2009 – Dec 2011
- (10) Atharva Barve (M.S. Mechanical Engineering), Oklahoma State University, Aug 2010 – Dec 2012
- (11) Auvi Biswas (M.S. Mechanical Engineering), Oklahoma State University, Aug 2010 – Dec 2012
- (12) Pratik Deokar, (M.S. Mechanical Engineering), co-advisor, Oklahoma State University, Aug 2012 – May 2013
- (13) Xiaoxiao Wu (M.S. Mechanical Engineering), Oklahoma State University, Aug 2010 – Dec 2013
- (14) Weiwei Zhu, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2012 – Dec 2014
- (15) Jeremy Smith, (M.S. Mechanical Engineering), Oklahoma State University, Jan 2013 – July 2015
- (16) Pedro Pablo Perez (M.S. Mechanical Engineering), Oklahoma State University, Aug 2013 – Dec 2015
- (17) Thiam Wong, (M.S. Mechanical Engineering), Oklahoma State University, Jan 2014 – Dec 2015
- (18) Sarath Kumar Mulgurthi, (M.S. Mechanical Engineering), Oklahoma State University, Jan 2014 – Dec 2015
- (19) Ellyn Jespersen, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2014 – Dec 2016
- (20) Burak Adanur, (M.S. Mechanical Engineering), Auburn University, Jan. 2017 – Dec 2019

#### Graduate students supervised during research and scholarly activities (6)

- (1) Suwat Tratassanawin (Ph.D. Mechanical Engineering), Purdue University, Sept 2004 - May 2006

- (2) Abhijit A. Sathe (Ph.D. Mechanical Engineering), Purdue University, Sept 2004 - Jul. 2006
- (3) Stefan Bertsch (Ph.D. Mechanical Engineering), Purdue University, Mar - Jul, 2006
- (4) Edwin Lee (M.S. Mechanical Engineering), Oklahoma State University, Jun. 2006 - May 2007
- (5) Austin Forrest (M.S. Mechanical Engineering), Oklahoma State University, Jul 2008 - Jan 2009
- (6) Garret Hansen (M.S. Mechanical Engineering), Oklahoma State University, Aug 2009 – Jan 2010

**Other advising services to students****Mentoring undergraduate students for research and scholarly activities (22)**

Dr. Cremaschi has mentored 21 undergraduate students in his research work since 2006. Dr. Cremaschi has engaged freshman research scholars; honors students; special projects course students and mentored two (2) Wentz research scholars (an undergraduate research and scholarship program at Oklahoma State University), one (1) Reuben-Trane scholar (a Nation-wide undergraduate research and scholarship program from the American Society of Heating Refrigerating and Air Conditioning Engineers – ASHRAE), two (2) OK-LSAMP Scholars (a State-wide undergraduate research and scholarship program for students that belong to Minority Groups), and (3) ME undergraduate research scholars at Auburn University.

At Auburn University, Dr. Cremaschi mentored (6) ME undergraduate students.

(3) were awarded the ME undergraduate research scholarships, (2) ME undergraduate students, who were awarded the 2017 ASHRAE Birmingham (AL) Chapter undergraduate research scholarship, and (1) ME undergraduate student, who was awarded the 2017/18 Samuel Gin College of Engineering undergraduate research scholarship.

To date, the Dr. Cremaschi mentored and paid 21 undergraduate research students. Nine (9) of Dr. Cremaschi undergraduate student mentees belong to minority groups and thirteen (13) of Dr. Cremaschi undergraduate student mentees continued to graduate education (with 3 most recent mentees in ME at Auburn University expressed interests in graduate school but they have not formalized their plans, yet). The table next highlights Dr. Cremaschi previous and current experience mentoring undergraduate students in Dr. Cremaschi research work. Projects have included fundamental as well as applied industrial research and several students have worked on development and assembly of experimental research facilities. Dr. Cremaschi has experience in engaging students in experimental research at the undergraduate level.

	Undergraduate Student	Major	University	Period of mentoring and supervising	Did Student continue to Graduate School? Y/N
1	Shayan Sinha	B.S. ME	Purdue Univ.	Sept - Dec., 2005	Y
2	Paul Francis Egan <sup>(a)</sup>	B.S. AE	Oklahoma State Univ.	Aug. - Dec, 2006	Y
3	Steven Brett Walker <sup>(a)</sup>	B.S. AE	Oklahoma State Univ.	Aug - Dec, 2006	Y
4	Seth Hayes	B.S. ME	Oklahoma State Univ.	Jul. 2007 - Aug 2008	N
5	Chris Carrol	B.S. ME	Oklahoma State Univ.	Jul. 2008 - May 2009	N
6	Adam Parker	Technology B.S. ME	Oklahoma State Univ.	Jun. 2008 - May 2009	N
7	Johnathan Peterson	Technology B.S. ME	Oklahoma State Univ.	Jun. 2008 - June 2009	N
8	Amelia Jeannette Wilson <sup>(a,b, M)</sup>	Technology B.S. AE	Oklahoma State Univ.	Aug 2008 – May 2011	Y
9	Jeremy Smith	B.S. ME	Oklahoma State Univ.	Aug 2012 – Dec 2012	Y
10	Jimmy Kim	B.S. ME	Oklahoma State Univ.	Aug 2012 – Dec 2012	Y
11	Chad Rich	B.S. Ag. and Bio Eng.	Oklahoma State Univ.	Aug 2009 – Dec 2011	-
12	Kody Jones <sup>(c,d,M)</sup>	B.S. ME	Oklahoma State Univ.	Aug 2011 – Dec 2013	N
13	Erin Westbrook <sup>(a,,M)</sup>	B.S. ME	Oklahoma State Univ.	Jan 2012 – May 2013	Y
14	Jaron Redmond <sup>(c,M)</sup>	B.S. ME	Oklahoma State Univ.	Jan 2012 – May 2013	-
15	Amy Wong <sup>(M)</sup>	B.S. ME	Oklahoma State Univ.	Jan 2014 – May 2014	Y
16	Arkasama Bandyopadhyay <sup>(b,,M)</sup>	B.S. ME	Oklahoma State Univ.	Aug 2014 – Dec 2014	Y
17	Alyssa Fink <sup>(f,,M)</sup>	B.S. ME	Auburn Univ.	Sept 2016 – May 2017	N
18	Ford Gibbs <sup>(e,f,g)</sup>	B.S. ME	Auburn Univ.	Sept 2016 – Present	N
19	Morgan Price <sup>(e,M)</sup>	B.S. ME	Auburn Univ.	Sept 2016 – May 2017	Y
20	Amy Strong <sup>(e,M)</sup>	B.S. ME	Auburn Univ.	Sept 2017 – May 2018	Y
21	Josh Rothe	B.S. ME	Auburn Univ.	Jan. 2019 – May 2019t	Y
22	Mikah Abbott	B.S. ME	Auburn Univ.	May 2020 – Dec 2020	N

a : Honor Research Scholar

b : Wentz Scholar (an undergraduate research and scholarship program at Oklahoma State Univ. from the Wentz foundation)

c : OK-LSAMP Scholar (a State-wide undergraduate research and scholarship program for students that belong to Minority Groups)

d : Reuben Trane Scholar (a Nation-wide undergraduate research and scholarship program from the American Society of Heating Refrigerating and Air Conditioning Engineers – ASHRAE)

e : ASHRAE Regional Chapter Scholar (a Region-wide undergraduate research and scholarship program from the American Society of Heating Refrigerating and Air Conditioning Engineers – ASHRAE)

f : Auburn University ME research scholar (ME wide scholarship program for undergraduate students involved with research activities with an ME faculty)

g : Auburn University Samuel Ginn College of Engineering research scholar (College of Engineering wide scholarship program for undergraduate students involved with an engineering faculty)

M : Student belongs to a Minority Group

#### International Visiting Exchange students supervised during research and scholarly activities (8)

(1) Gianpietro Piroddi, Post-B.S. Student, NTB, Buchs, Switzerland, Oct. 2004 - May 2005 (at Purdue Univ.)

(2) Stefan Schwendener, Post-B.S. Student, NTB, Buchs, Switzerland, May – Oct., 2006 (at Purdue Univ.)

(3) Andrea Arnaldo Maria Bigi (M.S. Mechanical Engineering), Milan Polytechnic Institute, Mar 2012 – Oct 2012 (at OSU)

(4) Stefano Marelli (M.S. Mechanical Engineering), Milan Polytechnic Institute, Oct 2012 – April 2013 (at OSU)

(5) Gabriele Corti (M.S. Mechanical Engineering), Milan Polytechnic Institute, Oct 2012 – April 2013 (at OSU)

(6) Stefano Dell'Orto (M.S. Mechanical Engineering), Milan Polytechnic Institute, Mar 2014 – Nov 2014 (at OSU)

(7) Carlo Andres (M.S. Mechanical Engineering), Milan Polytechnic Institute, April 2015 – Oct 2015 (at OSU)

(8) Gennaro Criscuolo (M.S. Mechanical Engineering), Milan Polytechnic Institute, Aug 2015 – April 2016 (at OSU)

**PROFESSIONAL SERVICE TO TEACHING****Assistance to Other Researchers and Courses (Guest Lectures, etc.)****Invited speaker/ guest lecturer (1)**

Refrigeration systems for electronics cooling, Purdue University, West Lafayette, IN (Apr. 19, 2007)

**Committee Memberships Related to Teaching (36)****Ph.D Graduate Faculty Committees (10)**

- (1) Xiaowei Xu (Ph.D. Mechanical Engineering), Oklahoma State University, Nov. 2007
- (2) Bereket Nigusse (Ph.D. Mechanical Engineering), Oklahoma State University, Nov. 2007
- (3) Edwin Lee (Ph.D. Mechanical Engineering), Oklahoma State University, Jan 2011 – Dec 2012
- (4) Swanand Bhagwat, (Ph.D. Mechanical Engineering), Oklahoma State University, Jan 2012 – July 2015
- (5) John Gall, (Ph.D. Mechanical Engineering), Oklahoma State University, Dec 2013 – Dec 2015
- (6) Maryam Fahar, (Ph.D. Mechanical Engineering), The University of Tulsa, Nov 2014 – Dec 2016
- (7) Ahmad Abbas, (Ph.D. Mechanical Engineering), Natural Fluids Refrigeration Center at the Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, Pakistan, April – May 2017
- (8) Mohammad Masoomi, (Ph.D. Mechanical Engineering), Auburn University, Jan 2018 – July 2018
- (9) Kyle C. Johnson (Ph.D. Aerospace Engineering – I was the student's University Reader), Auburn University, Oct. 2019 – Dec. 2019
- (10) Farrukh Najmi, (Ph.D. Materials Engineering), Auburn University, Jan 2018 – Dec 2020

**Master (M.S.) Graduate Faculty Committees (26)**

- (1) Barry Wilson, (M.S. Mechanical Engineering), Oklahoma State University, Apr. 2007
- (2) Michael Largent, (M.S. Mechanical Engineering), Oklahoma State University, Jun. 2007
- (3) Brad Richard Bailey (M.S. Mechanical Engineering), Oklahoma State University, Jul 2007
- (4) Saikiran Panchakar (M.S. Mechanical Engineering), Oklahoma State University, Nov. 2008
- (5) Yang, Jianpeng, (M.S. Mechanical Engineering), Oklahoma State University, Nov. 2008
- (6) Chris Wang, (M.S. Mechanical Engineering), Oklahoma State University, Dec. 2008
- (7) Amit Bhansali, (M.S. Mechanical Engineering), Oklahoma State University, Aug. 2009
- (8) Chandan Sharma, (M.S. Mechanical Engineering), Oklahoma State University, Aug. 2009
- (9) Pranav Godbole, (M.S. Mechanical Engineering), Oklahoma State University, Aug. 2009
- (10) Varun Kulkarni, (M.S. Mechanical Engineering), Oklahoma State University, April 2010
- (11) Lu Xing, (M.S. Mechanical Engineering), Oklahoma State University, Dec 2010
- (12) Samuel Anand Raj Ariekela, (M.S. Mechanical Engineering), Oklahoma State University, April 2011
- (13) Kaustubh Phalak (M.S. Mechanical Engineering), Oklahoma State University, August 2011
- (14) Garrett Hansen (M.S. Mechanical Engineering), Oklahoma State University, October 2011
- (15) Roshan Revankar (M.S. Mechanical Engineering), Oklahoma State University, May 2012
- (16) Ramprasad Chandrasekharan (M.S. Mechanical Engineering), Oklahoma State University, Jan 2011 – Dec 12
- (17) Xiang He (M.S. Mechanical Engineering), Oklahoma State University, Jan 2011 – Dec 2012
- (18) Zeyu Xiong (M.S. Mechanical Engineering), Oklahoma State University, Jan 2011 – May 2014
- (19) Matt Mitchell, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2011 – Dec 2013
- (20) Benjamin Rhoda, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2011 – Dec 2013
- (21) Sing Ramandeep, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2012 – May 2013
- (22) Sudha Sikha, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2012 – Dec 2013
- (23) Spitler Rachel, (M.S. Mechanical Engineering), Oklahoma State University, Aug 2012 – July 2013
- (24) John Holman, (M.S. Mechanical Engineering), Oklahoma State University, Dec 2013 – July 2015
- (25) Benjamin Kendall, (M.S. Mechanical Engineering), Auburn University, Jan 2018 – Sept 2019
- (26) Ryan Landry, (M.S. Non-thesis, Mechanical Engineering), Auburn University, Jan 2020 – May 2020

**External Reviews****Service and Participation in Organizations as Textbook Proposal Referee**

- John Wiley & Sons, Inc for evaluation of new book development for a course in Thermodynamics

**Recruiting Activities**

I re-established a student exchange program with the Polytechnic Institute of Milan, Italy, in order to expand the cultural exchange of the study abroad programs in the Engineering disciplines. I advertised the exchange program and recruited graduate and undergraduate students from Oklahoma State University and from the Polytechnic Institute of Milan, Italy.

**Professional Development - Self-Improvement Activities related to Teaching**

- College Teaching Workshops: “Basic of Teaching”, Spring 2005, Center for Instructional Excellence, Purdue University
- Read book by Phillip C. Wankat, on “The Effective, Efficient Professor: Teaching Scholarship and Service”, Spring 2013, Self-improvement teaching activity, Tulsa, Oklahoma
- University Wide Workshop: “Mentoring Undergraduate Research”, Auburn University Biggio Center for the Enhancement of Teaching, Auburn University, Auburn, AL, October 11, 2016

**Student organizations advised (club name and years advised)****At Auburn University**

1. Faculty Advisor of AU ASHRAE Student Branch Chapter, Nov 2016 – Present

**At Oklahoma State University****Within MAE Department**

2. Faculty Advisor of the PI TAU SIGMA ME Honorary Society at OSU, Aug 2009 – Dec. 2015
3. Faculty Advisor of OSU ASHRAE Student Branch Chapter, Dec 1, 2007 – Dec. 2015

**Campus wide**

4. Faculty Advisor of Latin Dance Cultural Club OSU, Jan 1, 2007 – Dec. 2015

**RESEARCH ACTIVITIES****RESEARCH RESPONSIBILITY AND LOAD**

My research responsibilities are to initiate and to maintain research and/or extension projects, and the acquisition of external funding. They include writing proposal, secure external research funds, train research assistant, develop laboratories and tools necessary to conduct the work, and develop scholarly activities via publication, preferably in referred journals, and presentation of technical materials at national and international conferences and meetings.

**General Research Statement**

Concern about energy security, the threat of climate change and the need to meet growing energy demand all pose major challenges to energy decision makers. Buildings are forecast to account for 40 percent (38 Quads) of primary energy consumption in the USA, followed by the industry (33 percent) and transportation (27 percent). Building energy consumption represents a cost of approximately \$416 billion. HVAC is the largest energy end-user for U.S. buildings and increasing energy efficiency has the highest priority for achieving sustainable energy future and for reducing CO<sub>2</sub> emissions in the short term. For example a potential improvement of the efficiency of new and existing air-conditioning and refrigeration equipment by only 2 percent would lead to a primary energy savings of approximately 0.3 Quads per year, which is equivalent to the energy the U.S. consumes in oil for three days or to the energy consumed by 10 million average size homes in the U.S. for ten months.

My research contributes to the solutions of complex societal challenges especially in the *energy security and sustainable energy conversion systems*. Research on advanced energy conversion systems and multi-component two-phase thermal transport processes with interactions at micro- and nano-scale levels is my passion. My scholarship activities are, and will continue to be, *a balanced mix of fundamental and applied research*. Funds from state and federal agencies as well as from industrial and private organizations provide me the unique opportunity to pioneer on sustainability from a variety of perspectives; from energy efficiency of air conditioning systems to fresh water conservation, from heat and mass transfer phenomena during frost and de-icing processes, to development of diagnostics method and sensors for thermo-fluid systems. Scientific discovery and intellectual contributions are key steps for my scholarship and creative activities. My research is mainly experimental in nature and new state-of-the-art facilities, which I designed and constructed, are often used in my projects.

**Research activities**

~\$5.2M in externally funded research (~\$4.7M as PI and ~\$0.5M as co-PI)  
and ~\$1.2M in research facilities and laboratory development projects

**Current Creative Sponsored Research - \$2M of current funding (4 current projects as PI)**As Principal Investigator (4 current projects):

- April 1, 2020, DE-EE0009161, Separating Sensible and Latent Cooling with Electrically Charged Rotating Vortexes and Vapor Capturing Air Handler Technology, Sponsor: DOE (\$1,829,949).
- April 1, 2020, RP-1683, Collaborative Research: Experimental Evaluation of Two-Phase Pressure Drop and Flow Pattern in U-Bends with Ammonia, Sponsor ASHRAE (\$157,367 total award, split on \$63,922 at Auburn University (41%) and \$93,445 at GIK Institute of Engineering Sciences and Technology (59%, Pakistan))
- April 1, 2019, Good to Great Grant: Electrospray Dehumidification for High Energy Efficiency of Buildings, Sponsor: Auburn University (\$37,031)
- Oct 1, 2018, RP-1800, Spray Evaporation on Enhanced Tube Bundles with Low GWP pure Refrigerants and Refrigerant/Miscible Oil Mixture, Sponsor: ASHRAE (150,742)

As Co-Principal Investigator:

None.

**Past Creative Sponsored Research - \$2.7MM of external research funding for 15 completed projects as PI plus \$0.5MM and 3 completed projects as co-PI**As Principal Investigator

1. Sept 1, 2016 to Dec 31 2020, Collaborative Research: Understanding, Mitigating, and Controlling Frost Formation Through the Use of Biphilic and Hybrid Surfaces under Static and Dynamic Conditions, National Science Foundation, (\$449,795 total award, split on \$238,552 at Auburn University (53%) and \$211,243 at Kansas State University (47%))
2. Jan 1 2016 to Dec.31 2019, Smart nanolubricants for HVAC Systems, Sponsor: ASHRAE Innovative Research Grant (IRG) (\$119,000)

3. Jan 1 2016 to Aug. 2018, Alabama Innovation Fund-Developing A High Performance Integrated Building Energy Systems & Technologies Research Program at Auburn University, Sponsor: State of Alabama (\$397,012)
4. Feb 1 2016 to Sept 30 2016, Critical Literature Review of Polystyrene Rigid Foam Insulation Water Absorption, Sponsor: EPS Industry Alliance (\$53,142)
5. Jan 2014 to July 2016, Development of a Load-Based Method of Test for Light Commercial Unitary HVAC, Sponsor: ASHRAE RP 1608 (\$128,302)
6. October 2011 to Dec 2015, Measurement of Oil Retention in the Microchannel Heat Exchangers, Sponsor: ASHRAE 1564-RP (\$199,975)
7. Jun 2012 to July 2015, Measurements of thermal conductivity of pipe insulation at below ambient temperatures and in wet condensing conditions with moisture ingress, Sponsor: ASHRAE 1646-URP (\$104,935)
8. August 2011 to June 2015, Comparison of the energy performance and capacity of an Air Conditioning system that uses low GWP refrigerants, Sponsor: E. I. du Pont de Nemours and Company (\$213,864)
9. Jan 1 2013 to July 2013, Measurements of thermal performance of pipe insulation systems at below-ambient temperatures in wet ambient conditions with moisture ingress, Sponsor: North American Insulation Manufacturer Association (NAIMA) (\$59,979)
10. Sept. 2009 to Feb 28 2012, Effects of Fin Design on Frost and Defrost Thermal Performances of Microchannel Heat Exchangers, Sponsor: ASHRAE URP-1589 (\$137,065)
11. May 2008 to October 2011, Waterside Fouling Performance of Braze-Plate Type Condensers in Cooling Tower Applications, Sponsor: ASHRAE RP-1345 (\$130,202)
12. Aug. 2008 to July 2011, Methodology to measure thermal performance of pipe insulation at below-ambient temperatures, Sponsor: ASHRAE RP-1356 (\$154,003)
13. Jun. 2007 to Feb 2011, Microchannel coils in compact heat pump systems, Sponsor: Oklahoma Center for the Advancement of Science & Technology (OCAST) and Johnson Control Inc. Building Efficiency (formerly York Int.) (\$299,830 direct costs)
14. Jun. 2007 to Feb 2011, Fee for Microchannel coils in compact heat pump systems, Sponsor: Johnson Control Inc. Building Efficiency (formerly York Int.) (\$60,399)
15. May 2007 to Jan 2011, Design and construction of a new psychrometric research test facility at Oklahoma State University, Sponsor: AAON Inc. (\$250,000 in kind)

As Co-Principal Investigator:

1. Feb 1 2012 to April 2015, Optimally Controlled Air-Conditioning Equipment for Sustainable Building Systems, Sponsor: OCAST (\$295,415)
2. Jan 1 2012 to Nov 2013, Phase II DOE SBIR Program - Vortical-flow, Direct-Contact Heat Exchanger for Geothermal Cooling, Sponsor: Advanced Cooling Technology – DOE SBIR (\$199,993)
3. Mar 1 2016 to Dec 31 2016, The Industrial Technology R&D Program International Cooperative Research at Auburn University, Sponsor: KITECH (Korea Institute of Industrial Technology) (\$22,025)

**Research Expenditures Summary to date:**

~\$3.9M total (\$2.7M externally funded research + \$1.2M lab/facility development)  
 ~\$330k/year average

**Self-Improvement Activities related to Research**

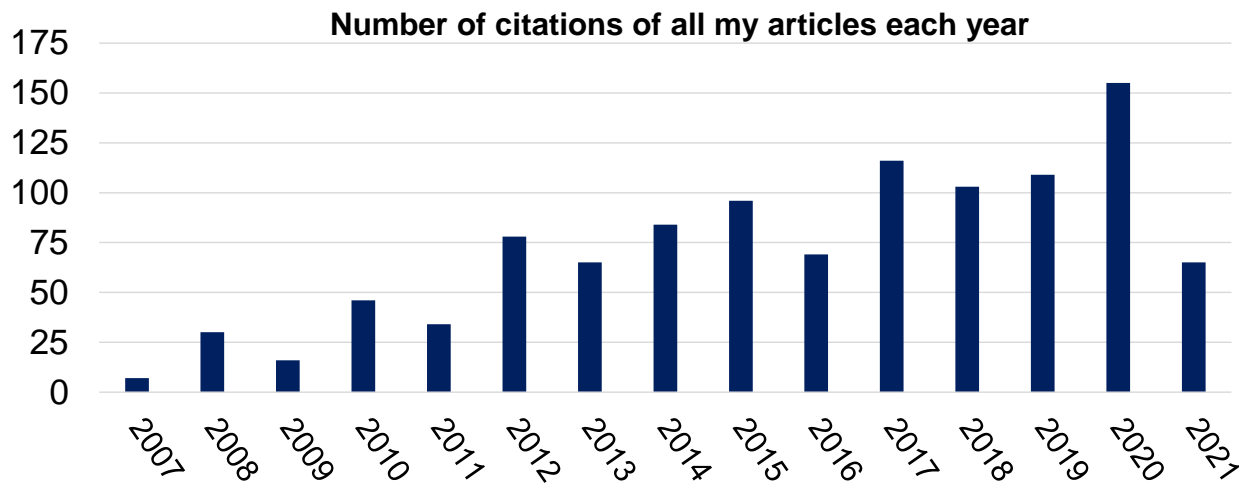
I attended the following workshops:

- NSF Grants workshop by Oklahoma Epscor, May 21, 2009, Stillwater, OK.
- OSU STEM Review, promotion, and tenure application preparation workshops, Nov 15 2011, Stillwater, OK.
- NSF-EPRI Workshop on Advanced Power Plant Cooling: Reducing Water Consumption, Nov 13, 2012, Houston, TX.
- Auburn University, Proposal Development Workshop: “Finding Funding, The Basic of Grantsmanship, Components of a Proposal, Compliance Overview, and Writing to Succeed”, April 22, 2016, Auburn, AL.



**PROFESSIONAL COMMUNICATIONS****Citation Indices (updated as of July 2021 – from Google Scholar)**

	All	Since 2016
Citations	1098	618
h-index	15	13
i10-index	32	20

**Top 5 Most Cited Papers that I authored/co-authored.**

Title	Year Published	No. of Citations
Trutassanawin, S., Groll, E., A., Garimella, S., V., and Cremaschi, L., 2006, "Experimental Investigation of a Miniature-Scale Refrigeration System", <i>IEEE Transactions on Components and Packaging Technologies</i> , 29 (3), p 678-687	2006	165
Cremaschi, L., Hwang, Y., and Radermacher R., 2005, "Experimental Investigation of Oil Retention in Air Conditioning Systems", <i>International Journal of Refrigeration</i> , 28 (7), p 1018-1028.	2005	78
Moallem, E., Cremaschi, L., Fisher, D., E., and Padhmanabhan, S., 2012, Experimental measurements of the surface coating and water retention effects on frosting performance of microchannel heat exchangers for heat pump systems, <i>Experimental Thermal and Fluid Science Journal</i> , 39, p176-188, doi: 10.1016/j.expthermflusci.2012.01.022.	2012	69
Cai, S., Zhang, B., and Cremaschi, L., 2017, Review of moisture behavior and thermal performance of polystyrene insulation in building applications, <i>Building and Environment</i> , Vol. 123, pp. 50-65, <a href="https://doi.org/10.1016/j.buildenv.2017.06.034">https://doi.org/10.1016/j.buildenv.2017.06.034</a> (online)	2017	55
Moallem, E., Hong, T., Cremaschi, L., Fisher, D., E., 2013, Experimental Investigation of Adverse Effect of Frost Formation on Microchannel Evaporators, Part 1: Effect of Fin Geometry and Environmental Effects, <i>International Journal of Refrigeration</i> , 36 (6), pp. 1762 – 1775.	2012	48

**Scholarly Publications****Journal Editorials (4)**

1. Cremaschi, L., and Gluesenkamp, K., R., 2019, Cutting Edge Research and New Technologies in Heat and Mass Transfer Processes of Refrigeration and Air Conditioning Systems, Special Issue of the *Science and Technology for the Built Environment Journal* from the 17<sup>th</sup> International Refrigeration and Air Conditioning Conference at Purdue University, Vol. 25 (10), pp. 1269–1270, ISSN: 2374-4731 print / 2374-474X online, DOI: 10.1080/23744731.2019.1698532.
2. Cremaschi, L., 2018, Modeling, Case Studies, and Optimization Methods for Building Energy Systems, *Science and Technology for the Built Environment* (formerly the *HVAC&R Research Journal*), Vol. 24 (4), pp. 325-326, ISSN: 2374-4731 (Print) 2374-474X (Online), DOI: 10.1080/23744731.2018.1444304.

3. Cremaschi, L., and Moghaddam S., 2017, Recent Advances on Heat and Mass Transfer in Refrigeration and Air Conditioning Systems, Special Issue of the *Science and Technology for the Built Environment* (formerly the *HVAC&R Research Journal*) focusing on the Purdue University Refrigeration Conference, Heat and Mass Transfer Topic, Vol 23 (6), pp. 871-874, ISSN: 2374-4731 print / 2374-474X online, DOI: 10.1080/23744731.2017.1334502.  
Available online at: <http://www.tandfonline.com/doi/full/10.1080/23744731.2017.1334502>
4. Bansal, P., and Cremaschi, L., 2015, Advances in refrigeration and heat transfer engineering, Special Issue of the *Science and Technology for the Built Environment* (formerly the *HVAC&R Research Journal*), Vol 21, 481-482, ISSN: 2374-4731 print / 2374-474X, DOI:10.1080/23744731.2015.1048623.

### Referred Journal Papers (42)

(I highlighted my students that I directly advised/supervised in the authors list)

#### 2021

1. Harges, E., and Cremaschi, L., 2020, A new semi-empirical model for droplet growth and freezing on surfaces with different wettabilities under forced convective flow. *Applied Thermal Engineering*. (in review, April 2021)

#### 2020

2. Najmi, F., Shen, W., Cremaschi, L., and Cheng Z., 2020, Electrocaloric Devices Part I: Analytical Solution of One-dimensional Transient Heat Conduction in a Multilayer Electrocaloric System, *Journal of Advanced Dielectrics*, Vol. 10 (6), DOE: <https://doi.org/10.1142/S2010135X20500289>
3. Najmi, F., He, J., Cremaschi, L., and Cheng Z., 2020, Electrocaloric Devices Part II: All-Solid Heat Pump without Moving Parts, *Journal of Advanced Dielectrics*, Vol. 10 (6), DOE: <https://doi.org/10.1142/S2010135X20500290>
4. Harges, E., Cremaschi, L., and Adanur, B., 2020, Distribution, Coalescence, and Freezing Characteristics of Water Droplets on Surfaces with Different Wettabilities under Subfreezing Convective Flow, *Applied Thermal Engineering*, Vol. 182., pp 1-13, DOI: <https://doi.org/10.1016/j.applthermaleng.2020.116052>
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#### 2021

1. Morelli, S., and Cremaschi, L., 2021, Analysis of Electro-static Assisted Air Dehumidification, (*accepted for the Proceedings of the 18th International Refrigeration and Air Conditioning Conference at Purdue University, West Lafayette, IN (USA), May 23-27,2021, Pages 1-10.*
2. Cremaschi, L., Ren, F., and Harges, E., 2021 Effect of Surface Wettability on Frost Density during Initial Droplets Icing and Crystals Growth, (*accepted for the Proceedings of the 18th International Refrigeration and Air Conditioning Conference at Purdue University, West Lafayette, IN (USA), May 23-27,2021, Pages 1-10.*

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#### Conferences Papers or Abstract-only Reviewed Papers (12)

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1. Najmi, F., Cremaschi, L., Shen, W., and Cheng, Z., 2020, Achieving Directional Heat Flow by Complete Silent Operation for Electrocaloric Heat Pumping, *Proceedings of the 9th International Conference on Caloric Cooling and Applications of Caloric Materials (Thermag IX)*, June 7-11, University of Maryland, College Park, MD, USA
2. Deokar, P., and Cremaschi, L., 2020, Two-Phase Flow Boiling Heat Transfer Model for R410A and Nanolubricant Mixtures in a Smooth Tube, *ASHRAE Transactions*, ASHRAE Conference Paper No. OR-20-C017, ASHRAE Winter Conference, Orlando, FL, USA, Feb 2 – 5. (This was selected as **Best Paper Award** at the for 2020 ASHRAE Winter conference; Plaque reads “Honorable Mention in the student (Doctoral Level) category” at the 2020 ASHRAE Winter conference).
3. Harges, E., and Cremaschi, L., 2018, A New Model for Frost Growth Incorporating Droplet Condensation and Crystal Growth Phases, *ASHRAE Transactions*, ASHRAE Conference Paper No. CH, ASHRAE Winter Conference, Chicago, IL, USA, Jan 20 - 24. (This was selected as **Best Paper Award** at the for 2018 ASHRAE Winter conference; Plaque reads “Honorable Mention in the student (Doctoral Level) category” at the 2018 ASHRAE Winter conference).
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6. Bigi, A., M., A., Wong, T., Deokar, P., and Cremaschi, L., 2015, Experimental Investigation on Heat Transfer and Thermophysical Properties of Mixtures of Al<sub>2</sub>O<sub>3</sub> Nanolubricants and Refrigerant R410A, *2015 ASHRAE Transactions*, ASHRAE Conference Paper No. 15714, ASHRAE Winter Conference, Chicago, IL, USA, Jan 24-28.
7. Cai, S., and Cremaschi, L., 2014, An Experimentally Validated Model to Predict the Thermal Conductivity of Closed-Cell Pipe Insulation System With Moisture Ingress, *2014 ASHRAE Transactions, 120 (Part 1)*, ASHRAE Conference Paper No. NY-14-C090, ASHRAE Winter Conference, New York, Jan 22-27.
8. Biswas, A., Barve, A., and Cremaschi, L., 2013 ASHRAE Winter Conference, An experimental study of the performance of new Low Global Warming Potential (LGWP) Refrigerants at extreme high temperature ambient conditions in residential AC ducted split systems, *ASHRAE Transactions*, 119 (Part 1), Conference Paper No. DA-13-C013, ASHRAE Winter Conference, Chicago, Jan 24-29.
9. Moallem, E., Padhmanabhan, S., Fisher, D., E., Cremaschi, L., 2011, Effect of surface coating on frosting performance of microchannel heat exchangers for heat pump systems, *Proceedings of the International Conference on Air-Conditioning and Refrigeration ICACR 2011, July 6-8, 2011, Yongpyong Resort, Gangwon-Do, KOREA, paper no112, Page 197.*
10. Worthington, K., Cremaschi, L., and Aslan, O., 2011, A new experimental low temperature facility to measure comprehensive performance rating of unitary equipment and systems operating at design and off-design

conditions, *Proceedings of the International Conference on Air-Conditioning and Refrigeration ICACR 2011, July 6-8, 2011, Yongpyong Resort, Gangwon-Do, KOREA, paper no 147, Page 81.*

11. Cremaschi, L., Iverson, B., D., and Garimella, S., V., 2006, "Enhanced Electrohydrodynamic Pumping at the Microscale", *2006 ASME International Mechanical Engineering Congress and Exposition, Proceedings of IMECE 2006*, Paper No. 2006-13264, November 5-10, 2006, Chicago, IL, USA.
12. Hwang, Y., Cremaschi, L., Radermacher, R., Hirata, T., Ozaki, Y., and Hotta, T., 2002, "Oil Circulation Ratio Measurement in CO<sub>2</sub> Cycle," *Proceedings of the 2002 International Conference New Technologies in Commercial Refrigeration*, pp. 22-28, Urbana-Champaign, IL, USA, 2002.

#### **General Press and Magazine Articles (1):**

1. Cremaschi, L., 2007, Development trends for heat pump components, *Int. Energy Agency (IEA) Heat Pump Newsletter*, Vol. 25 (3), 2007.

#### **Presentations – General Invited Talks (14)**

1. Cremaschi, L., June 2021, Title: Pushing the Envelope of Energy Efficiency Research, Education, and Outreach, Seminar at the Center for Environmental Energy Engineering of Univ. of Maryland, College Park, Virtual Seminar on June 22 2021 (part of CEEE Inspirational Seminars Series for Graduate Students).
2. Cremaschi, L., May 2019, Title: Fin Structures That Combine Super-Hydrophilic and Super-Hydrophobic Surfaces to Prevent and Control Frost Formation, MAE Seminar at Univ. of California Davis, May 22 2019.
3. Cremaschi, L., May 2019, Title: Pushing The Envelope of Energy Efficiency Research, Education, and Outreach, Seminar at the Energy Efficiency Institute of the Univ. of California Davis, May 21 2019.
4. Cremaschi, L., September 19, 2016, Title: Nanolubricants Heat Transfer in Thermal Energy Systems: Past Work, Present Research, and Future Opportunities. 4<sup>th</sup> Tribology and Lubrication Science Minor Symposium at Auburn University, Auburn University, Auburn, AL, USA.
5. Cremaschi, L., July 10, 2016, Impact of oil on heat transfer and pressure drop, and oil retention in heat exchangers. This presentation was part of the short course session on oil Management in Compressors, Purdue University, West Lafayette, IN, USA.
6. Cremaschi, L., Auburn University, April 23, 2015, Title: Boosting Energy Conversion Efficiency of Heat Pump Systems through Frost Growth Mitigation and Nanolubricants in Microchannel Heat Exchangers, Auburn, AL, USA.
7. Cremaschi, L., ASHRAE Oklahoma North-Eastern Regional Chapter, October 15, 2014, Title: Research in Energy Systems and Building Integration at Oklahoma State University, Tulsa, OK.
8. Cremaschi, L., University of Illinois at Chicago, USA, April 26<sup>th</sup> 2013, Enhancements in Heat Transfer through Frost Mitigation and Nanolubricants in Microchannels.
9. Cremaschi, L., and Cai, S., 58<sup>th</sup> Annual Convention of the National Insulation Association, Bonita Springs (FL), April 17-20 2013, Title: Methodology to Measure Thermal Performance of Pipe Insulation at Below-Ambient Temperatures.
10. Cremaschi, L., and Cai, S., American Society for Testing and Materials (ASTM), Atlanta (GA), Oct. 22 2012, Title: Methodology to Measure Thermal Performance of Pipe Insulation at Below-Ambient Temperatures.
11. Cremaschi, L., Incheon University, Incheon, Korea, July 9 2011, Title: Buildup Phenomena in Enhanced and Compact Heat Exchangers: From Fouling in Braze Plate-Type Condensers to Frost and Defrost in Microchannel Heat Exchangers.
12. Cremaschi, L., Seoul National University, Seoul, Korea, July 5 2011, Title: Buildup Phenomena in Enhanced and Compact Heat Exchangers: From Fouling in Braze Plate-Type Condensers to Frost and Defrost in Microchannel Heat Exchangers.
13. Cremaschi, L., Sungkyunkwan University, Suwon, Korea, July 4 2011, Title: Buildup Phenomena in Enhanced and Compact Heat Exchangers: From Fouling in Braze Plate-Type Condensers to Frost and Defrost in Microchannel Heat Exchangers.
14. Cremaschi, L., ASHRAE Regional Lacrosse Chapter & Ingersoll Rand / Trane, May 18, 2011, Title: Actual Performance of Enhanced Compact Heat Exchangers: from Fouling on Braze Plate-type Condensers to Frost and Defrost on Microchannel Heat Exchangers, Trane Technology Center, La Crosse, WI.

#### **Presentations – Professional Societies and Other Conferences/Symposiums (38)**

1. Cremaschi, 2020, Enhanced Air Dehumidification through Electrically Charged Rotating Vortexes and Vapor Capturing Electrostatic Droplets, 5th International Thermal and Fluids Engineering Conference, April 5-8, 2020 (now postponed to 2021), New Orleans, LA.
2. Cremaschi, 2019, Electrospray Dehumidification for High Energy Efficiency of Buildings, Auburn University Research Symposium, Auburn, AL (USA), October 4.



3. Cremaschi, 2019, Density of Frost on Super-Hydrophobic and Super-Hydrophilic Surfaces Under Air Forced Convective Operating Conditions, *Seminar at the ASHRAE Annual Conference*, Kansas City, MO, USA, June 23, 2019
4. Cremaschi, 2019, Oil Retention in Microchannel Heat Exchangers of an R134a Refrigeration System and Effects on Their Energy Performance and System COP (ASHRAE RP-1564), *Seminar at the ASHRAE Annual Conference*, Kansas City, MO, USA, June 25, 2019
5. Cremaschi, L., 2019, Effect of Humidity and Airflow velocity on droplets elapsed time and radius at the onset of freezing and frost nucleation for super-hydrophilic and super-hydrophobic surfaces, *Proceedings of the 4<sup>th</sup> Thermal and Fluid Engineering Conference, TEFC2019*, Las Vegas, NV (USA), April 13-17, Paper No. TFEC-2019-26880, Pages 1-12.
6. Cremaschi, L., Harges, E., Adanur, B., and Strong, A., 2018, Frost nucleation and frost growth on hydrophobic and hydrophilic surfaces for heat exchangers fin structures, *17<sup>th</sup> International Refrigeration and Air Conditioning Conference at Purdue University*, West Lafayette, IN (USA), July 10, Paper No. 2508.
7. Cremaschi, L., 2018, Energy Efficiency of Heat Pump Systems During Frost Growth In High Humidity Environments, Panel Presentation at the Panel entitled "Heat and Mass Transfer in Extreme Humidity", *3<sup>rd</sup> Thermal and Fluid Engineering Conference*, Ft. Lauderdale, FL, Mar 4-7
8. Cremaschi, L., Deokar, P., and Bigi, A., A., M., 2017, Two Phase Flow Boiling Heat Transfer Coefficient and Pressure Drop of Refrigerant and  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> Based Nanolubricant Mixtures in a 9.5 mm Smooth Tube, *ASTFE (American Society of Thermal and Fluids Engineers)*, Las Vegas, NV, USA, April 2-5.
9. Cremaschi, L., Molinaroli, L., Andres, C., 2017, Oil Retention of Lower GWP Refrigerants and Lubricant Mixtures and Its Effect on Heat Transfer and Pressure Drop in Microchannel Type Air Conditioning Evaporators, Presentation at Seminar 39 at the ASHRAE Semiannual Conference, Las Vegas, NV, USA, Jan 31.
10. Cremaschi, L., Cai, S., Zhu, W., 2017, Recent ASHRAE Research on Thermal Conductivity of Pipe Insulation Systems Working at below-Ambient Temperature and in Wet Condensing Conditions with Moisture Ingress, Presentation at Seminar 10 at the ASHRAE Semiannual Conference, Las Vegas, NV, USA, Jan 29.
11. Cremaschi, L., Bigi, A., A., M., and Deokar, P., 2016, ASHRAE Innovative Research Grant-021: Smart Nanolubricants for HVAC&R Systems, Seminar Presentation at the ASHRAE Annual Conference, St. Luis, MO, USA, Jun 26-29.
12. Cremaschi, L., Mulgurthi, S., and Yatim, A., S., 2016, Lubricant Retention in a R410A Microchannel Evaporator and Its Effects on Heat Transfer and Pressure Drop, *ASHRAE Conference Paper No. OR-16-C014*, ASHRAE Winter Conference, Orlando, FL, USA, Jan 23 - 27.
13. Cremaschi, L., Smith, J., Wong, T., and Deokar, P., 2015, Heat Transfer and Pressure Drop of New LGWP Refrigerants and Lubricant Mixtures in a 9.5 mm micro-fin evaporator tube, *ASHRAE Conference Paper No. AT-15-C027*, ASHRAE Annual Conference, Atlanta, GA, USA, Jun 27-Jul. 1.
14. Yatim, A., Cremaschi, L., Fisher, D., E., 2015, Effect of Oil Retention on the Refrigerant-Side Heat Transfer Capacity and Pressure Drops of Microchannel Condensers for AC and Refrigeration Systems, 2015 ASHRAE Winter Conference, Chicago, IL, USA, Jan 24-28, 2015.
15. Bigi, A., M., Cremaschi, L., Wong, T., and Deokar, P., Experimental Investigation of Heat Transfer and Thermophysical Properties of Mixtures of Al<sub>2</sub>O<sub>3</sub> Nanolubricants and Refrigerant R410A, 2015 ASHRAE Winter Conference, Chicago, IL, USA, Jan 24-28, 2015.
16. Cremaschi, L., Ehsan, Moallem, Daniel E. Fisher, and Sankaranarayanan Padhmanabhan, 2013, Effect of surface coatings on frost growth on microchannel heat exchangers, Presentation for Seminar 5 at the 2013 ASHRAE Annual Conference, Denver, Jun 23 2013.
17. Cremaschi, L., and Wu, X., 2013, Two-phase flow heat transfer of a new low GWP developmental refrigerant in smooth tube evaporator, *Proceedings of the 4<sup>th</sup> IIR Conference on Themophysical Proprieties and Transfer Processes of Refrigeration*, Delft, The Netherlands, June 19 2013.
18. Cremaschi, L., and Wu, X., 2013, Effect of fouling on the thermal performance of condensers and on the water consumption of wet cooling tower systems, *Heat Exchanger Fouling and Cleaning Conference 2013*, Budapest, Hungary, June 11 2013.
19. Cremaschi, L., 2013, Effects of Lubricants on Refrigerant Flow Boiling Heat Transfer: Past Work, Present Research, and Future Possibilities, *ASHRAE Winter Meeting*, Dallas, Jan 27 2013.
20. Cremaschi, L., 2013, High Performance-Low Global Warming Potential Refrigerants in Heat Exchangers for Residential Air-Source Heat Pump Systems, *ASHRAE Winter Meeting*, Dallas, Jan 27 2013.
21. Cremaschi, L., 2013, Advances in Efficient Residential Design Presentation Title: An Experimental Study of the Performance of New Low Global Warming Potential (LGWP) Refrigerants at Extreme High Temperature Ambient Conditions in Residential AC Ducted Split Systems, *ASHRAE Winter Meeting*, Dallas, Jan 27 2013.
22. Cremaschi, L., 2012, A Fundamental View of the Flow Boiling Heat Transfer Characteristics of Nano-Refrigerants, *ASME IMECE 2012 International Mechanical Engineering Congress & Exposition*, Houston, Paper No. 87788, Nov 9-15, Houston, TX, USA.

23. Cremaschi, L., Moallem, E., Fisher, D., E., Hong, T., and Padhmanabhan, S., 2012, Frosting Performance of Fin-and-Tube Evaporators with Small Copper Tubes Diameter, *14th International Refrigeration and Air Conditioning Conference at Purdue*, Paper No 2193, July 16-19, West Lafayette, IN, USA.
24. Cremaschi, L., Spitler, J., D., Lim, E., and Ramesh, A., 2012, Waterside fouling performance in brazed-plate type condensers for cooling tower applications, ASHRAE Winter Meeting, Chicago, Jan 22 2012.
25. Cremaschi, L., Cai, S., Worthington, K., M., Ghajar, A., J., 2011 A methodology to measure thermal performance of pipe insulation at below-ambient temperatures and its practical impact in condensation control, ASHRAE Summer Meeting, Montreal, June 27 2011.
26. Cremaschi, L., Moallem, E., Padhmanabhan, S., and Fisher, D., E., 2011, Effect of surface coating on frosting performance of microchannel heat exchangers for heat pump systems, *International Conference on Air-Conditioning and Refrigeration ICACR 2011, July 6-8, 2011, Yongpyong Resort, Gangwon-Do, KOREA*.
27. Cremaschi, L., Worthington, K., and Aslan, O., 2011, A new experimental low temperature facility to measure comprehensive performance rating of unitary equipment and systems operating at design and off-design conditions, *Proceedings of the International Conference on Air-Conditioning and Refrigeration ICACR 2011, July 6-8, 2011, Yongpyong Resort, Gangwon-Do, KOREA*.
28. Cremaschi, L., Moallem, E., Padhmanabhan, S., Fisher, D., E., 2010, Experimental study of onset and growth of frost on outdoor coils of air-source heat pump systems, *ASME-ATI-UTI International Conference on Thermal and Environmental Issues in Energy Systems*, May 19, 2010, Sorrento, Italy.
29. Cremaschi, L., Padhmanabhan, S., Fisher, D., E., A scaling approach for predicting frost growth in a heat exchanger – application to fin and tube, *ASME-ATI-UTI International Conference on Thermal and Environmental Issues in Energy Systems*, May 18, 2010, Sorrento, Italy.
30. Padhmanabhan, S., Moallem, E., Fisher, D., E., Cremaschi, L., 2010, Microchannel Coils in Compact Heat Pump Systems, ASHRAE North-East Regional Chapter Meeting, April 8, 2010, Tulsa, OK, USA.
31. Emre Ozdemir, Cremaschi, L., 2009, Heat Transfer Comparison Between Microchannel and Round Tube Heat Exchangers, ASHRAE Regional Chapter Meeting, April 8 2009, Oklahoma City, OK, USA.
32. Padhmanabhan, S., Cremaschi, L., Fisher, D., E., and Knight, J., 2008, Comparison of frost and defrost performance between microchannel coil and fin-and-tube coil for heat pump systems, *12th International Refrigeration and Air Conditioning Conference at Purdue*, July 16 2008, West Lafayette, IN, USA.
33. Padhmanabhan, S., Fisher, D., E., Cremaschi, L., 2008, Studying of frosting on heat exchanger coils – fin-tube vs microchannel, ASHRAE Central Oklahoma Regional Chapter Meeting, April 18, 2008, Oklahoma City, OK, USA.
34. Cremaschi, L., and Lifferth, S., 2008, “Design and heat transfer analysis of a new psychrometric environmental chamber for heat pump and refrigeration systems testing”, *ASHRAE Annual Meeting*, Jun 24 2008, Salt Lake City, UT, USA.
35. Cremaschi, L., Groll, E., A., and Garimella, S., V., 2007, “Potential Performances and Challenges of Future Refrigeration Cooling Techniques as Electronics Cooling Systems”, *2007 Thermal Challenges in the Next Generation Electronics System II (THERMES II)*, January 7-10, 2007, Santa Fe, New Mexico, USA
36. Cremaschi, L., Daqing, Li, and Groll E. A., 2006, “Theoretical Performance Evaluation of a Carbon Dioxide Based Environmental Control Unit (ECU) with Microchannel Heat Exchangers”, c-dig Meeting March 16-17, 2006, Purdue University, West Lafayette, IN, USA.
37. Cremaschi, L., Schwenker, R., A., and Radermacher R., 2006, “Modeling of Oil Retention in the Suction Line and Evaporator of Air Conditioning Systems”, 2006 ASHRAE Winter Meeting, Jan. 24 2006, Chicago, IL, USA.
38. Radermacher R, Cremaschi, L., and Hwang, Y., 2004, “Comparison of Oil Retention in R134a and CO<sub>2</sub> Climate Control Systems”, 2004 Alternate Refrigerant Systems Symposium, Scottsdale, Arizona, USA.

#### Patents and Inventions (2)

- 2021, Cremaschi L., Electrospray Vortical Flow Exchanger, US Patent No. US 2021/0093996A1. Publication Date April 1 2021.
- 2010, Cremaschi L., Fisher, D., E., and Knight, J., K., Multichannel Heat Exchanger, US Patent App. 12/501,224. (application number 12501224, serial number 32420\_3093/JOCI:0028) entitled “Multichannel Heat Exchanger” .

#### Books (1)

Ayub, Z., and Cremaschi, L, 2025 (expected), Handbook of Industrial Refrigeration: Principles and Components, Elsevier, (in preparation)

#### Book Chapters Revised (4)

1. 2011 ASHRAE Handbook HVAC Applications – Chapter 1 “Residences”.

2. 2012 ASHRAE Handbook HVAC Systems and Equipment – Chapter 49 “Unitary Air Conditioners and Heat Pumps”.
3. 2012 ASHRAE Handbook HVAC Systems and Equipment – Chapter 50 “Room Air Conditioners and Packaged Terminal Air Conditioners”.
4. 2016 ASHRAE Handbook--HVAC Systems and Equipment – Chapter 39 “Condensers”.

#### **Standards Revised (2)**

1. 2014, ASHRAE Standard 22, Methods of Testing for Rating Liquid-Cooled Refrigerant Condensers, Members of the Standard Project Committee 22: Joseph B. Huber, (Chair) James T. Schaefer, Lorenzo Cremaschi, Kenneth J. Shultz, Steven J. Eckels, Thomas P. Carter, Satheesh Kulankara, Reference to ASHRAE ISN 1041-2336, Available by request from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide) or toll free 1-800-527-4723.
2. 2014, ASHRAE Standard 181P, Methods of Testing for Rating Liquid to Liquid Heat Exchangers 2014, Members of the Standard Project Committee 181P: Joseph B. Huber, (Chair), James T. Schaefer, Lorenzo Cremaschi, Kenneth J. Shultz, Steven J. Eckels, Thomas P. Carter, Justin P. Kauffman, Available by request from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide) or toll free 1-800-527-4723.

#### **Thesis (24)**

##### **Ph.D. Dissertations (7)**

1. Experimental and Analytical Investigation of Early Frost Growth on Surfaces with Varying Wettability under Typical Heat Pump Operating Conditions, Ellyn N. Harges, (Ph. D. Mech. Eng.), Auburn University, May 2021.
2. Experimental and theoretical investigation of saturated flow boiling of R410A refrigerant and nanoparticle laden lubricant mixtures in a smooth tube, Pratik S. Deokar, (Ph. D. Mech. Eng.), Auburn University, Aug. 2019.
3. Investigation of Al<sub>2</sub>O<sub>3</sub> Nanoparticle Laden Lubricants and Refrigerant Mixtures During Two-Phase Flow Boiling, Andrea A. M. Bigi, (Ph. D. Mech. Eng.), Auburn University, May 2018.
4. Experimental Investigation of Oil Retention and Its Effects on Heat Transfer and Pressure Drop in Microchannel Heat Exchangers, Ardiyansyah S. Yatim, July 2015.
5. Thermal Performance of Mechanical Pipe Insulation Systems at Below-Ambient Temperature, Shanshan Cai (Ph.D. Mech Eng.), Oklahoma State University, Dec 2013.
6. Experimental and Theoretical Investigation of Effect of Fin Geometry on Frost Formation on Microchannel Heat Exchangers, Ehsan Moallem (Ph. D. Mech. Eng.), Oklahoma State University, July 2012.
7. Study of Frost Growth on Outdoor Coils of Air-Source Heat Pumps, March 2011. Sankaranarayanan K P (Ph. D. Mech. Eng.), co-advisor, Oklahoma State University.

##### **M.S. Thesis (17)**

1. Experimental Methods for the Analysis of Frost Nucleation and Frost Growth on Hydrophilic and Hydrophobic Coated Flat Plate Surfaces in Forced Convection Channel Flows, Burak Adanur, (M.S. Mech. Eng.) Auburn University, Dec 2019.
2. Development of a Test Facility and Preliminary Testing of Flow Boiling Heat Transfer of R410A Refrigerant with Al<sub>2</sub>O<sub>3</sub> Nanolubricants, Thiam Wong, (M.S. Mech. Eng.), Oklahoma State University, Dec 2015.
3. Oil Retention and its Effects on Pressure Drop and Heat Transfer in Microchannel Evaporators of Air Conditioning and Refrigeration Systems, Sarath Kumar Mulugurthi, (M.S. Mech. Eng.), Oklahoma State University, Dec 2015.
4. Development of a Load-Based Method of Testing for Light Commercial Unitary HVAC, Pedro Pablo Perez Paez, (M.S. Mech. Eng.), Oklahoma State University, Dec 2015.
5. Experimental Investigation of Two Phase Flow Boiling Heat Transfer and Pressure Drop of LGWP Refrigerants in an Internally Enhanced Tube Evaporator, Jeremy Smith (M.S. Mech. Eng.), Oklahoma State University, July 2015.
6. Measurement of Thermal Conductivity of Pipe Insulation Systems at Below-ambient Temperature and in Wet Condensing Conditions with Moisture Ingress, Weiwei Zhu (M.S. Mech. Eng.), Oklahoma State University, Dec 2014.
7. Experimental and Theoretical Study of Water Side Fouling Thermal Performance of Refrigerant to Water Condenser, Xiaoxiao Wu (M.S. Mech. Eng.), Oklahoma State University, Dec 2013.

8. Development of an Experimental Methodology for Measurement of Oil Retention and its Effect on the Microchannel Heat Exchanger, Pratik Deokar, (M.S. Mech. Eng.), co-advisor, Oklahoma State University, July 2013.
9. Performance and Capacity Comparison of Two New LGWP Refrigerants Alternative to R410A in Residential Air Conditioning Applications, Auvi Biswas (M.S. Mech. Eng.), Oklahoma State University, Dec 2012.
10. Study of Low Global Warming Potential Refrigerants in Heat Pump Systems for Stationary Applications Atharva Barve (M.S. Mech. Eng.), Oklahoma State University, Dec 2012.
11. Measurements of Frost Growth on Louvered Folded Fins of Microchannel Heat Exchangers Tommy Hong (M.S. Mech. Eng.), Oklahoma State University, Dec 2011.
12. Calibration of the OSU Psychrometric Chamber and First Experiments Kasey Worthington (M.S. Mech. Eng.), Oklahoma State University, July 2011.
13. An Experimental Facility to Measure Fouling Resistance in Condensers Annamalai, Ramesh (M.S. Mech. Eng.), Oklahoma State University, May 2010.
14. A preliminary Investigation of Fouling in Brazed Plate Heat Exchangers Ellisa Lim (M.S. Mech. Eng.), co-advisor, Oklahoma State University, May 2010.
15. Design of an Experimental Facility for Frost Growth Study in Microchannel Heat Exchangers Shanshan Cai (M.S. Mech. Eng.), Oklahoma State University, July 2009.
16. Thermal Performance Comparison between Microchannel and Round Tube Heat Exchangers Emre Ozdemir (M.S. Mech. Eng.), Oklahoma State University, May 2009.
17. Design and Construction of a new psychrometric chamber Spencer Lifferth (M.S. Mech. Eng.), Oklahoma State University, May 2009.

#### Technical Reports (9)

1. Cremaschi, L., and Cai, S., Critical Literature Review of Polystyrene Rigid Foam Insulation Water Absorption, Expanded PolyStyrene Industry Alliance (EPSIA), Available upon request from Betsy Steiner (EPSIA executive director), Address: 1298 Cronson Boulevard, Suite 201, Crofton, MD, 21114, Date: Sept 30, 2016.
2. Perez, P., and Cremaschi L., ASHRAE RP-1608 Final Report "Development of a Load Based Testing of Light Commercial Unitary HVAC, ASHRAE Archives (available by request to ASHRAE), July 2016.
3. Yatim, A., S., Cremaschi, L., Bigi, A. A. M., Mulugurthi, S., Dell'Orto, S., ASHRAE RP 1564 Final Report "Measurements of Oil Retention in Microchannel Heat Exchangers", ASHRAE Archives (available by request to ASHRAE), August 2015.
4. Zhu, W., Cremaschi, L., Cai, S., 2015, ASHRAE 1646 Final Report, "Measurement of Thermal Conductivity of Pipe Insulation Systems at Below-ambient Temperature and in Wet Condensing Conditions with Moisture Ingress", ASHRAE Archives (available by request to ASHRAE), July 2015.
5. Cai, S., Zhu, W., and Cremaschi, L., 2013, Measurements of Thermal Conductivity of Polyisocyanurate (PIR) Pipe Insulation Systems at Below-Ambient Temperatures and in Wet Condensing Conditions with Moisture Ingress, Report to the North American Insulation Manufacturers Association (NAIMA), Available by request from NAIMA, July 2013.
6. Zhu, W., Cai, S., and Cremaschi, L., 2013, Measurements of Thermal Conductivity of Mineral Fiber Pipe Insulation Systems at Below-Ambient Temperatures and in Wet Condensing Conditions with Moisture Ingress, Report to the North American Insulation Manufacturers Association (NAIMA), Available by request from NAIMA, July 2013.
7. Cremaschi, L., Fisher, D., E., Moallem, E., Hong, T., Deokar, P., ASHRAE 1589-RP Final report, "Effect of Fin Design on Frost and Defrost Thermal Performances of Microchannel Heat Exchangers", ASHRAE Archives (available by request to ASHRAE), March 2012.
8. Cremaschi L., Spitler J., D., Wu, X., Barve, A., Lim, E., Ramesh, A., ASHRAE Project 1345-RP Final report, "Waterside fouling performance of brazed-plate type condensers in cooling tower applications", ASHRAE Archives (available by request to ASHRAE), Feb 2012.
9. Cremaschi L., Ghajar A., Cai, S., and Worthington, K., ASHRAE Project 1356-RP Final report, "Methodology to measure thermal performance of pipe insulation at below-ambient temperatures, ASHRAE Archives (available by request to ASHRAE), Jan 2012.

## **SERVICE AND PROFESSIONAL DEVELOPMENT ACTIVITIES**

### **Service and Participation in Organizations as Proposal Referee**

I participated as research proposal referee, panel reviewer, and provide feedback on research topics, programs, and FOAs and evaluate large proposals and research projects status for the following organizations and agencies:

- Member of ASHRAE Research Administration Committee (RAC) (July 1, 2019 – Present)
- National Science Foundation, Chemical, Bioengineering, Environmental, and Transport Systems – Thermal Transport Processes (CBET - TTP)
- U.S. Department of Energy (through the Energy Efficiency Division)
- U.S. Department of Energy (through the Building Technology Office (BTO)).
- U.S. Department of Energy's Office of Technology Transitions (DOE OTT) Technology Commercialization Fund (TCF).
- U.S. Department of Defense through the Weapons Systems and Platforms Program Area of the Strategic Environmental Research and Development Program (SERDP)
- California Energy Commission (through the Building Energy Research Grant (BERG) Program)
- California Energy Commission (through the California Energy Innovations Small Grant (EISG) Natural Gas Program (EISG))
- Oklahoma State University Planning Grants for Establishing Interdisciplinary Programs (Oklahoma State Univ.,)
- Texas Higher Education Coordinator Board
- International Copper Association

### **Participation in Journals, Conferences, and Proceedings as Reviewer or Referee**

I participated as reviewer of the following journals and conferences:

1. International Journal of Heat and Mass Transfer
2. International Journal of Refrigeration
3. International Journal of Applied Energy
4. International Journal of Thermal Science
5. American Society of Mechanical Engineers (ASME) Journal of Heat Transfer
6. Journal of Micromechanics and Microengineering
7. Heat Transfer Engineering Journal
8. Science and Technology for the Built Environment Journal
9. Energies Journal
10. International Journal of Energy Research
11. IEEE Transactions on Components, Packaging and Manufacturing Technologies
12. IEEE Transactions on Very Large Scale Integration System
13. IEEE Transactions on Mechatronics
14. ASHRAE Transactions (American Society of Heating, Refrigerating and Air-Conditioning Engineers)
15. Energies Journal
16. Energy Conversion and Management Journal
17. Journal of Thermal Engineering
18. Journal of Cryogenics
19. Proceedings of the International Institute of Refrigeration World Congress, Prague 2011, China 2013
20. Proceedings of the ASME IMECE 2012 International Mechanical Engineering Congress & Exposition, Houston, Nov 9-15, Houston, TX, USA
21. Proceedings of the 2012 ASME Conference ESFuelCell2012 – July 23-26, 2012, San Diego, CA, USA
22. Proceedings of 2006 11<sup>th</sup> International Refrigeration and Air Conditioning Conference at Purdue
23. Proceedings of 2006 ITherm (Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic System) International Conference, San Diego, CA, USA May 30 – June 2, 2006
24. Proceedings of 2006 ACEEE (American Council for an Energy-Efficient Economy) Conference on Energy Efficiency in Buildings
25. 2<sup>nd</sup> Thermal and Fluid Engineering Conference, Las Vegas, NV, USA, April 2-5, 2017.
26. 3<sup>rd</sup> Thermal and Fluid Engineering Conference, Ft. Lauderdale, FL, USA, Mar 4-7, 2018
27. ASME 2018 16<sup>th</sup> International Conference on Nanochannels, Microchannels, and Minichannels, June 10-13, 2018, Dubrovnik, Croatia
28. Proceedings of the 16th International Heat Transfer Conference, IHTC-16, August 10-15, 2018, Beijing, China
29. National Institute of Science and Technology (NIST); I served as external reviewer and commentator for a NIST technical manuscript on Nanolubricants

### Participation in Books, Book Chapters and Reports Revisions

I participated as referee and reviewer of the following books and book chapters:

1. 2020, National Institute of Science and Technology (NIST); I reviewed the article “Pool Boiling of R514A, R1224yd(Z), and R1336mzz(E) on a Reentrant Cavity Surface; Extensive Measurement and Analysis” as WERB reviewer for NIST – Nov. 2020
2. 2018, National Institute of Science and Technology (NIST); I reviewed the article “Specific heat of aluminum-oxide nanolubricants” as WERB reviewer for NIST – Mar. 2018
3. 2016, National Institute of Science and Technology (NIST); I reviewed the Mixture Boiling Chapter of the NIST Heat Transfer Handbook that was submitted to the Washington Editorial Review Board, Nov. 2016

### OTHERS

My professional development expanded tremendously during the last three years. On a national level I am an active member of the American Society of Heating, Refrigerating, and Air Conditioning Engineering (ASHRAE). I am the chair of a Technical Committee TC8.4 for Refrigerant to Air Heat Transfer Equipment. I participate in five (5) Technical Committees and in two (2) Standard Committees in ASHRAE as active voting member, organizer, and reviewer. On an international arena I am a commission member of the International Institute of Refrigeration (IIR) and an active member of the International Energy Agency Heat Pump Program/U.S. National Team. These societies provide collaborations, networking, and the exchange of scientific intellectual ideas among scientist and researchers. I served as program chair for the Purdue Refrigeration and Air Conditioning Conference in 2006 and I served as technical session chair of several programs at the ASHRAE meetings.

### OTHER SERVICE

#### Administrative – College Services

- Auburn University, Member of the Graduate Council, Representative of the Samuel Ginn College of Engineering (Aug. 2019 to Present)
- Auburn University, Member of the Auburn University Delegation for Developing International Collaborations (R&D, academic course/curriculum, faculties/students exchange programs) with German Universities and Industries, (May 2016 to April 2017).
- Oklahoma State University, Student Technical Fee Committee, College of Engineering, Architecture, and Technology (CEAT), Jan 2013 – Dec. 2015
- Oklahoma State University, Planning Grants for Establishing Interdisciplinary Programs (Oklahoma State Univ.) May 2012
- Oklahoma State University, Halliburton Outstanding Young Faculty Award Committee (CEAT of Oklahoma State University), Jan – Feb 2013
- Oklahoma State University, 2013 Halliburton Undergraduate Program Review Committee (Oklahoma State Univ.) April 2013

#### Departmental Services

- Auburn University, Member of the ME Search Committee for Recruiting New Faculty Members in the ME Department (Jan 2017 – present)
- Oklahoma State University, Chair of the College of Engineering, Technology, and Architecture (CEAT) Energy Systems New Undergraduate Laboratory Development Committee (May 2015 – Dec. 2015)
- Oklahoma State University, Chair of the Mechanical and Aerospace Engineering (MAE) Graduate Activity Committee (Jan 2014 – Dec. 2015)
- Oklahoma State University, Chair of the MAE Laboratory Development Committee (Aug 2012 – Dec 2013)
- Oklahoma State University, Member of the MAE Search Committee for Recruiting Faculty in the Computational Heat Transfer and Fluid Dynamic area (Aug 2014 – Dec 2014)
- Oklahoma State University, Member of the MAE Search Committee for Recruiting Faculty in the Thermal Energy Systems area (Aug 2013 – Jan 2014)
- Oklahoma State University, Member of the MAE Undergraduate Student Program Committee (Aug 2012 – Dec 2013)
- Oklahoma State University, Member of the MAE Computer and Software Laboratory Committee (Jan. 2007 to Aug 2012)

#### External Reviews for Faculty Tenure and/or Promotion at other Institutions (2)

- External Reviewer for Faculty Member Tenure and Promotion in the Department of Mechanical and Manufacturing Engineering at Miami University (1 Faculty Member - Aug. 2012)

- External Reviewer for Faculty Member Promotion and Tenure in School of Mechanical and Aerospace Engineering at Oklahoma State University (1 Faculty Member - Aug. 2019)

## Professional Organizations

### Professional Societies

- Member of the International Institute of Refrigeration (IIR) / U.S. National Committee (Jan. 2007– present)
- Commission member of the IIR Commission B2 - Refrigerating Equipment (Jan 2012 – present) and Commission E2 - Heat pumps, energy recovery (Aug. 2007 – present)
- Member of the International Energy Agency Heat Pump Program/U.S. National Team (Jan. 2007 –present)
- ASHRAE member (American Society of Heating, Refrigerating and Air-Conditioning Engineers) (Jul. 2005 – present)  
Voting Member of Technical Committees of ASHRAE: TC8.5 Liquid to Refrigerant Heat Transfer (Jul. 2012 – present), TC1.3 Heat Transfer & Fluid Flow (Jul. 2009 – July 2018), Corresponding member of TC8.4 Air-to-Refrigerant Heat Transfer Equipment; TC8.11 Unitary and Room Air Conditioners and Heat Pump; TC 8.9 Residential Refrigerators and Food Freezers.
- Member of the American Society of Thermal and Fluids Engineers (ASTFE, Feb. 2015 – present).

## Synergistic Activities

- Member of ASHRAE Research Administration Committee (RAC) (July 1<sup>st</sup> 2019 – Present)  
This Committee consists of 13 individuals and its scope is to evaluate and oversight research proposals and research projects within ASHRAE
- Chairman of the International Institute of Refrigeration (IIR) / U.S. National Committee (Jan. 2020 – Present)
- Conference Technical Program Co-Chair for the *5<sup>th</sup> Thermal and Fluid Engineering International Conference*, ASTFE, New Orleans, LA, USA, April 5-8, 2019 (May 2019 – April 2020)
- Conference Technical Program Chair for the *4<sup>th</sup> Thermal and Fluid Engineering International Conference*, ASTFE, Las Vegas, NV, April 14-17, 2019 (April 2018 – May 2019)
- Co-Chair of the ASTFE Task Group in Energy and Sustainability (ASTFE TG, April 2017 – present)
- Vice-President of Commission for the International Institute of Refrigeration (IIR) (April 2020 – Present)
- Conference Track Chair for a track entitled “Condensation and Freezing”, at the ASME 2019 17<sup>th</sup> International Conference on Nanochannels, Microchannels, and Minichannels, June 23-26, 2019, St. Johns, Canada, (Jan 2019 – June 2019)
- Conference Session Chair for a technical papers session entitled “Advances in Refrigerants”, on the Refrigeration Track of the ASHRAE 2019 Winter Conference, Jan 12-16, 2019, Atlanta, GA, USA.
- Conference Track Chair for a track entitled “Condensation and Freezing”, at the ASME 2018 International Conference on Nanochannels, Microchannels, and Minichannels, June 10-13, 2018, Dubrovnik, Croatia (Jun 2017 – Jun 2018).
- Conference Chair for two technical paper sessions and one Panel/Forum session, 2018, Conference Sessions Title “Fundamental in Fluid and Heat/Mass and Momentum Transfer – 1, and “CFD: Natural and Mixed Convection”, and Panel Title “Heat and Mass Transfer in Extreme Humidity”, *3rd Thermal and Fluid Engineering Conference*, Ft. Lauderdale, FL, Mar 4-7
- Conference Session Chair for a technical papers session entitled “Improvements in Heat Transfer Equipment”, on the Heat Exchange Equipment Track of the ASHRAE 2018 Winter Conference, (Jan 20-24, 2018, Chicago, IL, USA).
- Conference - Forum Panel Chair on Low GWP Refrigerants within the contest of the Kyoto Protocol, ASHRAE 2018 Winter Conference, (January 20-24, 2018, Chicago, IL, USA).
- Conference Session Chair for one technical papers session on Energy, Water, and Sustainability and Thermal Cycles – Part 1, 2nd Thermal and Fluids Engineering Conference of the ASTFE (April 2-5, 2017, Las Vegas, Nevada, USA)
- Conference Session Chair for one technical papers session on Energy, Water, and Sustainability and Thermal Cycles – Part 2, 2nd Thermal and Fluids Engineering Conference of the ASTFE (April 2-5, 2017, Las Vegas, Nevada, USA)
- Conference - Forum Panel Chair on LGWP Refrigerant within the contest of the Kyoto Protocol, 2nd Thermal and Fluids Engineering Conference of the ASTFE (April 2-5, 2017, Las Vegas, Nevada, USA)
- Program subcommittee chair of TC1.3 Heat Transfer & Fluid Flow (Jul. 2011 – June 2017)
- Treasurer of the International Institute of Refrigeration (IIR) / U.S. National Committee (Jan. 2016– Jan 2020)
- Chair of ASHRAE Technical Committee TC8.4 Air-to-Refrigerant Heat Transfer Equipment (2013 – 2016)

- Member of the ASHRAE Standard Committees to review and update the standards SPC 181P, Methods of Testing for Rating Liquid to Liquid Heat Exchangers (March 2011 – May 2014), and SPC 22, Methods of Testing for Rating Water-Cooled Refrigerant Condensers (March 2011 – May 2014)
- Session chair of the Technical Session “Refrigeration for the Future, Latest Research on Refrigeration Systems and Components” at the summer ASHRAE annual meeting in Albuquerque, NM, (Jun. 26 – 30, 2010)
- Vice-chair of ASHRAE Technical Committee TC8.4 Air-to-Refrigerant Heat Transfer Equipment (Jul. 2011 – June 2013)
- Chairman of the ASHRAE Handbook sub-committee for TC8.11 Unitary and Room Air Conditioners and Heat Pump (Jul 2008 – July 2011)
- Program Chairman of the 11<sup>th</sup> International Refrigeration and Air Conditioning Conference at Purdue, Purdue University, West Lafayette, IN (Jan. 2005 – Jul, 2006)
- Assistant Coordinator of the Carbon Dioxide Interested Group (C-DIG) meeting, Purdue University, West Lafayette, IN (Mar. 12 – 17, 2006)

## **INDEPENDENT PROFESSIONAL CONSULTING ACTIVITIES ( 2 )**

I conducted independent professional consulting activities in the following suits:

1. Expert Witness in a Nationwide legal litigation about HVAC Systems and Equipment; Retained by Law Firm Hogan Lovells US LLP, in Washington D.C. and Miami, FL, USA (case style: St. Gregory Cathedral School, et al. v. LG Electronics, Inc., et al., Case No. 6:12-cv-739 (MHS), filed in the U.S. District Court for the Eastern District of Texas). Oct. 2014 to July 2015.
2. Expert Consultant in a legal litigation about HVAC Systems and Refrigerants; Retained by Law Firm Pignato, Cooper, Kolker, & Roberson, P.C., Oklahoma City, OK, USA Jan. 2015 to Dec 2015.

## **OUTREACH ACTIVITIES**

### **Outreach to K-12 school programs (1)**

- Judge at Middle School Science and Engineering Fair (Greater East Alabama Regional Science and Engineering Fair – GEARSEF, Auburn, AL, March 4-5, 2020)

### **Short Courses and Workshops outside Auburn University (1)**

- Oil Management in Compressors. Lecture from L. Cremaschi on the Topic “Impact of oil on heat transfer and pressure drop, and oil retention in heat exchangers”. This short course was organized at Purdue University, West Lafayette, IN, USA on July 10 2016.

## **OTHER RELEVANT INFORMATION AND MATERIAL**

### **Professional meetings and conferences attended (48)**

1. 2021 ASTFE (American Society of Thermal and Fluids Engineers), 5/6<sup>th</sup> Thermal and Fluids Engineering Conference, Virtual Conference, (May 26-28, 2021).
2. 2020 ASHRAE Annual Conference (Austin, TX, but Virtual Conference due to Covid-19, Jun 26-30, 2020).
3. 2020 ASHRAE Winter Conference (Orlando, FL, Feb 1 to 4, 2020).
4. 2019 ASHRAE Annual Conference (Kansas City, MO, June 22 - 26, 2019).
5. 2019 ASTFE (American Society of Thermal and Fluids Engineers), 4<sup>th</sup> Thermal and Fluids Engineering Conference, Las Vegas, NV, USA, (April 14-17, 2019).
6. 2019 ASHRAE Semi-Annual Winter Conference, and IIR USNC Meeting, Atlanta, GA, USA, (Jan 12-16, 2019).
7. 2018 ASTFE (American Society of Thermal and Fluids Engineers), 3<sup>rd</sup> Thermal and Fluids Engineering Conference, Ft. Lauderdale, FL, USA, (Mar 4-7, 2018).
8. 2018 ASHRAE Semi-Annual Winter Conference, Chicago, IL, USA, (Jan 21 -24, 2018).
9. 2017 ASTFE (American Society of Thermal and Fluids Engineers) Conference, Las Vegas, NV, USA, (April 2-5).
10. 2017 ASHRAE Semi-Annual Winter Conference, Las Vegas, NV, USA, (Jan 29-Feb1, 2017).
11. 2017 IIR- USNT (International Institute of Refrigeration – U.S. National Team) Meeting, Las Vegas, NV, USA, Jan 31.
12. 2016 15<sup>th</sup> Int. Refrigeration and Air Conditioning Conference, 22<sup>nd</sup> Int. Compressor Conference, and 3<sup>rd</sup> Int. High Performance Building Conference at Purdue, West Lafayette, IN, USA, July 11-14, 2016.
13. 2016 ASHRAE Annual Conference (St. Luis, MO, June 26 - 29, 2016).
14. 2016 ASHRAE Semi-Annual Winter Conference (Orlando, FL, Jan 23 -27, 2016).
15. 2015 ASHRAE Annual Conference (Atlanta, GA, Jun 27 – Jul 1, 2015).
16. 2015 ASHRAE Semi-Annual Winter Conference (Chicago, IL, Jan 24 -27, 2015).



17. 2014 ASHRAE Annual Conference (Seattle, WA, Jun 27 – Jul 2, 2014).
18. 2014 ASHRAE Oklahoma North-East Regional Chapter Meeting, Oct 15, Tulsa, OK.
19. 2014 ASHRAE Semi-Annual Winter Conference (New York City, NY, Jan 22-27, 2014).
20. 2013 ASHRAE Annual Conference (Denver, CO, Jun 22-26, 2013).
21. 4<sup>th</sup> Conference on Thermophysical Properties and Transfer Processes of Refrigerants (Delft, The Netherlands, June 17-19, 2013).
22. 2013 International Conference on Heat Exchanger Fouling and Cleaning (Budapest, Hungary, Jun 9 to 14, 2013).
23. 2013 ASHRAE Semi-Annual Conference (Dallas, TX, Jan 24-29, 2013).
24. ASME IMECE 2012 International Mechanical Engineering Congress & Exposition, Houston, Nov 9-15, Houston, TX, USA.
25. 2012 14th Int. Refrigeration and Air Conditioning Conference, 21<sup>st</sup> Int. Compressor Conference and 2<sup>nd</sup> Int. High Performance Building Conference at Purdue, July 16-19, West Lafayette, IN, USA.
26. 2012 ASHRAE Annual Conference, 2012 International Institute of Refrigeration Meeting (San Antonio, TX, USA, June 24-27).
27. 2012 ASHRAE Winter Conference, 2012 International Institute of Refrigeration Meeting, (Chicago, IL, Jan 22-25).
28. 2011 ASHRAE Annual Conference, 2011 International Institute of Refrigeration Meeting (Montreal, QC, Canada, June 25-29).
29. 2011 International Conference on Air-Conditioning and Refrigeration ICACR 2011, July 6-8, 2011, Yongpyong, Korea.
30. 2011 ASHRAE Winter Conference, 2011 International Institute of Refrigeration Meeting, 2011 IEA US Heat Pump National Team Meeting, (Las Vegas, NV, January 29-February 2).
31. 2010 13th International Refrigeration and Air Conditioning Conference at Purdue, July 12-15, West Lafayette, IN.
32. 2010 ASHRAE Annual Conference, 2010 International Institute of Refrigeration Meeting, 2010 IEA US Heat Pump National Team Meeting (Albuquerque, NM, June 26-30).
33. 2010 ASME-ATI-UTI International Conference on Thermal and Environmental Issues in Energy Systems, Sorrento, Italy.
34. 2010 ASHRAE Oklahoma North-East Regional Chapter Meeting, April 2010, Tulsa, OK.
35. 2010 ASHRAE Winter Conference, 2010 International Institute of Refrigeration Meeting, 2010 IEA US Heat Pump National Team Meeting (Orlando, FL, January 23-27).
36. 2009 ASHRAE Annual Conference, 2009 International Institute of Refrigeration Meeting, 2009 IEA US Heat Pump National Team Meeting (Louisville, KY, June 20-24).
37. 2009 ASHRAE Regional Chapter Meeting, April 8 2009, Oklahoma City, OK.
38. 2009 ASHRAE Winter Conference, 2009 International Institute of Refrigeration Meeting, 2009 IEA US Heat Pump National Team Meeting (Chicago, IL, January 24-28).
39. 2008 12th Int. Refrigeration and Air Conditioning Conference at Purdue, West Lafayette, IN.
40. 2008 ASHRAE Annual Meeting, 2008 International Institute of Refrigeration Meeting, 2008 IEA US Heat Pump National Team Meeting (Salt Lake City, UT, June 21-25).
41. 2008 ASHRAE Central Oklahoma Regional Chapter Meeting, April 18, 2008.
42. 2008 ASHRAE Winter Meeting, 2008 International Institute of Refrigeration Meeting, 2008 IEA US Heat Pump National Team Meeting (New York, Jan 19-23).
43. 2007 ASHRAE Annual Meeting, 2007 International Institute of Refrigeration Meeting, 2007 IEA US Heat Pump National Team Meeting (Long Beach, CA June 22-26).
44. 2007 ASHRAE Winter Meeting, 2007 International Institute of Refrigeration Meeting, 2007 IEA US Heat Pump National Team Meeting (Dallas, Jan 28-31).
45. 2007 THERMES, Thermal Challenges in Next Generation Electronic Systems, (Santa Fe, NM, Jan 7 – 10).
46. 2006 ASHRAE Winter Meeting, 2006 International Institute of Refrigeration Meeting (Chicago, Jan 24-28).
47. 2003 ASHRAE Winter Meeting (Chicago, Jan 23-27).
48. 2002 ASHRAE Winter Meeting (Atlantic City, Jan 15-18).