

JONATHAN R. RAUSH, Ph.D., P.E.

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1. EDUCATION

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| 2016 | Ph.D., Mechanical Engineering Louisiana State University and A&M College, Baton Rouge, Louisiana |
| 2006 | Master of Science, Engineering - Mechanical University of Louisiana at Lafayette, Lafayette, Louisiana |
| 2004 | Bachelor of Science, Mechanical Engineering University of Louisiana at Lafayette, Lafayette, Louisiana |

2. GENERAL AREAS OF INTEREST

Areas of interest include: integrated computational materials engineering (ICME) with applications in advanced manufacturing, aerospace, biomedical, and energy systems; development of integrated multi-scale approaches to design of high performance metal alloys; development of advanced materials characterization techniques; integration of simulation methods including calculation of phase diagram (CALPHAD) analysis, classical molecular dynamics, phase field models, and continuum mechanics (FEA); the study of failure analysis and prevention; optimization of energy systems with special interest in solar energy, energy storage and fuel cell systems.

3. PROFESSIONAL EXPERIENCE:

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| April, 2020 to present | Associate Director, Institute of Materials Research and Innovation - University of Louisiana at Lafayette Assisting in IMRI program development, engineering and faculty outreach, proposal development, and strategic planning. |
| August, 2016 to present | Director, Cajun-Integrated Computational Materials Engineering (C- ICME) Laboratory Directing funded research activity regarding multi-scale computational material science and integrated experimental characterization for development of advanced materials and processes. Materials processed through a variety of methods, with the corresponding effect on material structure, properties, and performance quantified and modeled. A full suite of materials synthesis, processing, and characterization instruments (mechanical, thermophysical, structural) and software simulation packages utilized for development and optimization of high performance metal |
- April, 2021

alloys. Research funded by NSF, NASA, DOE, and Industry.

- August, 2016
to present
- Assistant Professor of Mechanical Engineering – University of Louisiana at Lafayette**
Teaching and advising both undergraduate and graduate students. Courses include Intro to Mechanical Engineering, Mechanics of Materials, Manufacturing Processes, Finite Element Analysis, Energy Systems Laboratory, Energy Systems and Sustainability, Kinetics and Thermodynamics of Materials. Currently performing research in metal alloy development, characterization methods, alternative energy systems, advanced manufacturing, and failure analysis. Mentoring student research at undergraduate and graduate levels.
- January, 2016
to May, 2016
- Adjunct Professor - Department of Mechanical Engineering, University of Louisiana at Lafayette**
Instructor of record of Department of Mechanical Engineering course, MCHE 478, “Finite Element Analysis.”
- July, 2015
to present
- President – Sustainable Energy Engineering, LLC**
Providing consulting services in the areas of failure analysis, forensic engineering, energy efficiency, and engineering design.
- August, 2011
December, 2011
- Adjunct Professor - Department of Mechanical Engineering, to University of Louisiana at Lafayette**
Instructor of record for multiple sections of Department of Mechanical Engineering course, MCHE 101, “Introduction to Mechanical Engineering.”
- January, 2011
to July, 2016
- Research Scientist - University of Louisiana at Lafayette**
Led the daily operations of the Solar Technologies Applied Research and Testing (START) Lab, housed under the umbrella of the Louisiana Energy Institute, a fundamental and applied research and testing laboratory focused on all aspects of solar energy. The facility to date has accumulated over \$4M of funding from DOE, NSF, Department of Education, Louisiana DNR, and Cleco Power, LLC. Managed and led all aspects of the design, purchasing, receiving, installation, start-up, testing, and reporting of the nation’s first university-owned and -operated solar thermal pilot plant. Directed R&D activity, and coordinated the work of faculty, graduate students, undergraduate students, and university staff with research, testing and project management. Acted as the Departmental Safety Coordinator of the Cleco Alternative Energy Center from August, 2013 to August, 2016.
- May, 2006
to October, 2010
- Consulting Engineer - Engineering Design & Testing Corp.**
Forensic engineering and failure analysis; technical investigations and
April, 2021

analysis of mechanical components and systems failures; technical investigation and reconstruction of vehicle accidents involving automobiles, pedestrians and commercial vehicles; testing and related analytical investigations of mechanical components and systems, including estimate of repair/replacement costs.

4. REGISTRATIONS AND CERTIFICATIONS

Registered Professional Engineer in Alabama (#30878)
Registered Professional Engineer in Mississippi (#19808)
Registered Professional Engineer in Louisiana (#35493)
Registered Professional Engineer in Tennessee (#114148) – (*inactive*)
National Council of Examiners for Engineering and Surveying (#40891)

5. PROFESSIONAL ORGANIZATIONS AND AFFILIATIONS

- Institute of Materials Research and Innovation – University of Louisiana at Lafayette
- Energy Institute of Louisiana – University of Louisiana at Lafayette
- Louisiana Consortium for Innovation in Manufacturing and Materials
- Louisiana Materials Design Alliance
- Pi Tau Sigma-National Honorary Mechanical Engineering Society
- American Society of Mechanical Engineers
- ASM International
- American Society for Engineering Education
- Louisiana Engineering Society
- Failure Analysis Society
- International Metallographic Society
- The Minerals, Metals and Materials Society
- American Institute of Aeronautics and Astronautics
- Order of the Engineer
- National Society of Professional Engineers (*past*)
- Society of Automotive Engineers (*past*)
- American Society for Testing and Materials (*past*)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (*past*)
- National Association of Professional Accident Reconstruction Specialists, Inc. (*past*)

6. FUNDED RESEARCH GRANTS

1. PI, 2021-2022, “Thermophysical property characterization of aerospace alloys for modeling In-Space Manufacturing processes (Appendix I: Modeling of Manufacturing

- Processes in Micro and Reduced Gravity Environments)”, NASA, University of Louisiana at Lafayette, Marshall Space Flight Center, (Funded amount \$99,553).
2. Co-PI, 2021-2024, “Modular Reactors for the Capture and Electro-Conversion of CO₂ in Various Industrial Processes to Value-Added Chemicals”, *DOE EERE Advanced Manufacturing Office*, University of Louisiana at Lafayette, University of Cincinnati, Idaho National Laboratory, (Award total \$4,008,475).
 3. PI, 2021-2022, “Development of In-Situ XRD Characterization of Levitated Aerospace Alloys for Optimization of Advanced Manufacturing Processes”, *Louisiana Space Grant Consortium (LaSPACE)*, University of Louisiana at Lafayette, (Funded amount \$38,893).
 4. PI, 2020-2021, “Electrostatic Levitation System Development for Advanced Material Characterization in Support of Laser-Based 3D Metal Printing”, *NSF/Louisiana Board of Regents*, NSFEPSCoR CIMM Seed Grant, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$10,000).
 5. Co-PI, 2020-2022, “High Performance Hybrid SOFC Systems for Range Extension of Commercial Aviation”, *Advanced Research Projects Agency – energy (ARPA-e)*, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$2,829,217).
 6. PI, 2020-2022, “START Lab Field Testing of Distributed Scale CSP Thermal Storage”, *U.S. Department of Energy SBIR Phase II/Norwich Technologies*, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$336,277).
 7. Co-PI, 2020-2022, “MRI: Acquisition of a Closed-Loop PPMS Enhanced for Multidisciplinary Research and Education at the University of Louisiana at Lafayette” *NSF Major Research Instrumentation*, University of Louisiana at Lafayette, Lafayette, LA (Award total \$518,246).
 8. Co-PI, 2020-2025, “Louisiana Materials Design Alliance (LAMDA)”, *NSF/Louisiana Board of Regents*, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$2,690,986).
 9. PI, 2020, “Electrostatic Levitation Measurement of Thermophysical Properties of Aerospace Alloys”, *Louisiana Space Grant Consortium*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$12,470)
 10. Co-PI, 2020-2021, “Ultra-high BRILLIANCE multi-cusp ion source for research users at the Louisiana Accelerator Center (BRILLIANCE@LAC)”, *Louisiana Board of Regents*

Support Fund Departmental Enhancement”, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$182, 972)

11. PI, 2020, “Large Format Wire Arc Additive Manufacturing (WAAM)”, Undergraduate Research Mini-Grant, *University of Louisiana at Lafayette* (Funded amount \$2,000).
12. PI, 2020, “In-Situ XRD Characterization of Micro-Structural Evolution of Lightweight Alloys for Laser-Based 3D Metal Printing” *NSF/Louisiana Board of Regents*, NSF EPSCoR CIMM Seed Grant, University of Louisiana at Lafayette, Lafayette, LA; Center for Advanced Microstructures and Devices (CAMD), Baton Rouge, LA, (Funded amount \$10,000).
13. Senior Investigator, 2019-2022, “Acquisition of Focused Ion Beam-Scanning Electron Microscope for the Multidisciplinary Research and Education at the University of Louisiana at Lafayette”, *National Science Foundation Major Research Instrumentation*, University of Louisiana at Lafayette, Lafayette, LA, (Award total \$1,425,129).
14. Co-PI, 2019-2020, “Improving the Electric Vehicle Charging Infrastructure to Offset NOx Production and Promote the Wider Adoption of Electric Vehicles in Louisiana” *Louisiana Department of Environmental Quality*, University of Louisiana at Lafayette, Lafayette, LA (Funded amount \$120,000).
15. Co-PI, 2019-2021, “Curriculum: Louisiana Advanced Manufacturing Progress (CLAMP),” *NASA*, University of Louisiana at Lafayette, Delgado Community College (Total funded amount: \$415,547. UL share with Raush PI: \$9,885).
16. Senior Investigator, 2019-2020, “Environment, Energy, Business and Sustainability Nexus” Cultural Services French Embassy in the U.S., University of Louisiana at Lafayette, University of Poitiers, Excelia Group, Poitiers, LaRochelle, France, (Funded amount \$19,500).
17. PI, 2019-2022, “Integrated Computational and Experimental Optimization of Materials and Methods for In-Space Manufacturing of Lightweight Metal Alloys (ISM-LMA),” *NASA*, University of Louisiana at Lafayette, Lafayette, LA, (Award total \$1,573,197).
18. PI, 2019-2020, “Modeling and Prediction of Slip and Tong Die Tooth Penetration”, *Frank’s International*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$66,279).
19. Co-PI, 2019, “UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 6,” *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$188,717).

20. PI, 2018-2019, "Implementation of Virfac (Virtual Factory) Software Package", UL Lafayette Student Technology Enhancement Program, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$27,000).
21. PI, 2018, "START Lab Field Test of SunTrap Receiver," *U.S. Department of Energy/Norwich Technologies*, University of Louisiana at Lafayette, Lafayette, LA (Award total \$50,228).
22. PI, 2018-2019, "Development of Material Properties of Inconel, Titanium, and Nickel alloys for Process Optimization of Selective Laser Melting Additive Manufacturing." NASA, University of Louisiana at Lafayette, Lafayette, LA; NASA Marshall Space Flight Center, Huntsville, AL, (Award total \$92,779).
23. PI, 2018-2019 "Thermophysical Property Measurement and Microstructural Evolution of Liquid Metal Alloys for Laser-Based 3D Metal Printing Simulation," *NSF/Louisiana Board of Regents*, NSF EPSCoR CIMM Seed Grant, University of Louisiana at Lafayette, Lafayette, LA; NASA Marshall Space Flight Center, Huntsville, AL, (Funded amount \$10,000).
24. Co-PI, 2018, "UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 5," *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$197,434).
25. PI, 2017-2018, "Thermophysical Property Measurements by Electrostatic Levitation for Additive Manufacturing and Materials Design" *Louisiana Space Grant Consortium (LaSPACE)*, (Award total \$66,052).
26. PI, 2017-2018, "Measurement and Characterization of Thermophysical and Thermochemical Properties of Liquid Metal Alloys for Laser-Based 3D Metal Printing Modelling and Optimization" *NSF/Louisiana Board of Regents*, NSF EPSCoR CIMM Seed Grant, University of Louisiana at Lafayette, Lafayette, LA; NASA Marshall Space Flight Center, Huntsville, AL, (Funded amount \$10,000).
27. PI, 2017, "Materials Characterization for the Design of Embedded Sensors for Monitoring Structural Health" Undergraduate Research Mini-Grant, *University of Louisiana at Lafayette* (Funded amount \$2,000).
28. Co-PI, 2017, "UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 4," *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$197,434).

29. Co-PI, 2016, “UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 3,” *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$197,434).
30. Co-PI, 2015, “UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 2,” *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$183,823).
31. Co-PI, 2014, “UL Lafayette/Cleco Solar Thermal Power Plant Supplement, Amendment 1,” *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$172,964).
32. Co-PI, 2013, “UL Lafayette/Cleco Solar Thermal Power Plant Supplement,” *Cleco Power LLC*, University of Louisiana at Lafayette, Lafayette, LA, (Funded amount \$172,964).

7. PEER REVIEWED JOURNAL PUBLICATIONS

1. Zeng, C., Wen, H., Bernard, B., Ding, H., Raush, J., Gradl, P., Khonsari, M., Guo, S., “Tensile Properties of Additively Manufactured C-18150 Copper Alloys” *Metals and Materials International*, Accepted, May, 2021.
2. Zeng, C., Wen, H., Bernard, B., Raush, J., Gradl, P., Khonsari, M., Guo, S. “Effect of temperature history on thermal properties of additively manufactured C-18150 alloy samples” *Manufacturing Letters*, 28 (2021) 25-29, March 2021. Available: <https://www.sciencedirect.com/science/article/pii/S2213846321000092>
3. Ettefagh, A., Guo, S., Raush, J. “Corrosion performance of additively manufactured stainless steel parts: A review”, *Additive Manufacturing*, 101689, November 2020.
4. Zeng, C., Wen, H., Ettefagh, A., Zhang, B., Gao, J., Haghshenas, A., Raush, J., Guo, S. “Laser nitriding of titanium surfaces for biomedical applications”, *Surface and Coatings Technology*, Volume 385, March 2020. Available: <https://www.sciencedirect.com/science/article/abs/pii/S0257897220300669>
5. Ettefagh, A., Zeng, C., Guo, S., Raush, J., “Corrosion behavior of additively manufactured Ti-6Al-4V parts and the effect of post annealing”, *Additive Manufacturing*, Vol. 28, August, 2019, pp. 252-258. Available: <https://doi.org/10.1016/j.addma.2019.05.011>
6. Ezeanya, E., Massiha, G.H., Simon, W., Raush, J., Chambers, T., “System Advisor Model (SAM) Simulation Modelling of a Concentrating Solar Thermal Power Plant with
April, 2021

- Comparison to Actual Performance Data,” *Cogent Engineering*, Vol. 5, October, 2018. Available at: <https://doi.org/10.1080/23311916.2018.1524051>
7. Raush, J., Ritter, K., Prilliman, M., Hebert, M., Pan, Z., Chambers, T., “Numerical Model and Performance Validation of a Small-Scale Concentrating Solar Thermal Power Plant in Louisiana”, *Journal of Power and Energy Engineering*. 6, pp. 112-140. September, 2018. Available at: http://file.scirp.org/Html/8-1770440_87674.html
 8. Ritter, K., Prilliman, M., Chambers, T., Raush, J., “Maintenance of a Small-Scale Parabolic Trough Concentrating Solar Power Plant in Louisiana”, *International Journal of Sustainable and Green Energy*, Vol. 6, No. 6, 2017, pp. 104-11. Available at: <http://article.sciencepublishinggroup.com/pdf/10.11648.j.ijrse.20170606.12.pdf>
 9. Raush, J., Chambers, T., Russo, B., Crump, K., 2016, “Assessment of local solar resource measurement and predictions in south Louisiana,” *Energy, Sustainability, and Society*, Vol. 6, No. 1. Published July, 2016. Available at: <http://link.springer.com/article/10.1186/s13705-016-0083-y>
 10. Kelly, J., Raush, J., Massiha, G.H., 2016, “Optimization of a Solar Thermal Power Plant Using an Automated Control System,” *International Journal of Applied Power Engineering (IJAPE)*, Vol.5, No.1, pp. 31-38. Published April, 2016.
 11. Raush, J., Chambers, T., 2014, “Initial field testing of concentrating solar photovoltaic (CSPV) thermal hybrid solar energy generator utilizing large aperture parabolic trough and spectrum selective mirrors,” *International Journal of Renewable and Sustainable Energy (IJRSE)*, Vol. 3, No. 6, pp. 123 - 131. Published November, 2014.
 12. Raush, J., Chambers, T., Russo, B. 2013, “Demonstration of Pilot Scale Large Aperture Parabolic Trough Organic Rankine Cycle Solar Thermal Power Plant in Louisiana,” *Journal of Power and Energy Engineering*, Vol. 1, No.7, pp. 29 - 39. Published December, 2013. Available at: <http://dx.doi.org/10.4236/jpee.2013.17006>.
 13. Chambers, T. L., Raush, J. R., Massiha, G. H., 2013, “Pilot Solar Thermal Power Plant Station in Southwest Louisiana,” *International Journal of Applied Power Engineering (IJAPE)*, Vol. 2, No. 1, April 2013, pp. 31 - 40. ISSN: 2252-8792.

8. **PEER REVIEWED CONFERENCE PROCEEDINGS**

1. Tulasigeri, S., Zeng, C., Guo, S., Raush, J., “Experimental and Simulation Study of

April, 2021

- Solidification and Micro-structural Evolution of Ti and Ni Based Alloys”, *Proceedings of Louisiana EPSCoR RII CIMM 2019 Symposium*, pp. 45-48, June, 2019. Available: https://cimmhub.laepscor.org/resources/458/download/CIMM2019_Symposium_Proceedings.pdf.html
2. Brambles, O., Ritter, K., Johnson, L. McBride, T., Snyder, S., Stettenheim, J., Chambers, T., Raush, J., “Field Testing of Manufacturable Advanced Low-Cost Receiver for Parabolic Trough Solar Power,” *2019 IEEE Green Technologies Conference (GreenTech)*, April, 2019, Lafayette, LA. DOI: 10.1109/GreenTech.2019.8767118. Available at: <https://ieeexplore.ieee.org/document/8767118>
 3. Yao, H., Katona, R., Zhou, J., Islam, M., Raush, J., Lu, F., Guo, S., “Defects Evaluation of Selective Laser Melting Stainless Steel 316 Parts Using Positron Annihilation Lifetime Measurement”, *Proceedings of the ASME 2018 International Mechanical Engineering Congress and Exposition IMECE2018*”, IMECE2018-86729, November, 2018.
 4. Alam T. Raush, J., Zeng, C., Guo, S., “Validation of Methods for Mechanical and Microstructural Property Measurement of Sub-standard Sized SLM Test Specimens”, *Contributed Papers from Materials Science & Technology Conference and Exhibition 2018 (MS&T'18)*, October, 2018.
 5. Yao, H., Katona, R., Zhou, J., Islam, M., Raush, J., Lu, F., Guo, S., “Defects Evaluation of Tensile Tested Selective Laser Melting Stainless Steel 316 Parts Using Positron Annihilation Lifetime Measurement”, *Proceedings of Louisiana EPSCoR RII CIMM 2018 Symposium*, July, 2018.
 6. Zeng, C., Raush, J., Guo, S., “Making Aluminum 7075 Parts Using Fused Deposition Modeling Based Additive Manufacturing”, *Proceedings of Louisiana EPSCoR RII CIMM 2018 Symposium*, July, 2018.
 7. Alam, T., Zeng, C., Guo, S., Raush, J., “Validation of Methods for Mechanical Property Measurement of Sub-standard Sized SLM Test Specimens with Conventional Testing Apparatus”; *Proceedings of Louisiana EPSCoR RII CIMM 2018 Symposium*, pp. 233-236, July, 2018.
 8. Raush, J., Novak, K., Moldovan, D., Meng, W.J., Guo, S., SanSoucie, M., “Thermophysical and thermochemical measurements and simulation of Ti-based liquid metal alloys by electrostatic levitation”; *Proceedings of Louisiana EPSCoR RII CIMM 2017 Symposium*, July, 2017.

9. Novak, B., Raush, J., Zhang, X., Moldovan, D., Meng, W., Guo, S., “Properties of liquid Ti-Al alloys from classical MD simulation and comparison to electrostatic levitation (ESL) experiments”; *Proceedings of Louisiana EPSCoR RII CIMM 2017 Symposium*, July, 2017.
10. Raush, Zhang, B., Zhang, X., Meng, W., Guo, S., 2016, “Thermophysical property measurements of Ti-based liquid metal alloys by electrostatic levitation”; *Proceedings of Louisiana EPSCoR RII CIMM 2016 Symposium*, July, 2016.
11. Novak, B., Tong, X., Raush, J., Moldovan, D., “Bulk properties of liquid titanium using molecular dynamics simulations”; *Proceedings of Louisiana EPSCoR RII CIMM 2016 Symposium*, July, 2016.
12. Chambers, T. L., Raush, J., Russo, B., 2013, “Installation and Operation of Parabolic Trough Organic Rankine Cycle Solar Thermal Power Plant in South Louisiana,” *Energy Procedia*, 49 (Proceedings of the SolarPACES 2013 International Conference), 2014, pp. 1107-1116. doi:10.1016/j.egypro.2014.03.120.

9. OTHER PUBLICATIONS

1. Raush, J. “Thermophysical and Thermochemical Property Measurement and Prediction of Liquid Metal Titanium Alloys with Applications in Additive Manufacturing,” Ph.D. Dissertation; Louisiana State University, 2016. Ph.D. Advisor: Shengmin Guo, Professor, Mechanical Engineering, Louisiana State University.
2. Leger, J., Raush, J.R., Chambers, T.L., 2012, “Parametric Study of Solar Thermal Power Plant Configuration Considering Effects of Solar Multiple, Thermal Storage, Plant Size, and Plant Location Utilizing System Advisor Model (SAM),” SAM Virtual User Conference, Hosted by the National Renewable Energy Laboratory, June 20, 2012. Available online at: <https://sam.nrel.gov/content/sam-virtual-conference-june-20-2012>
3. Raush, J., Liechty, J., 2008, “Throttle Control Malfunction,” *ASM Journal of Failure Analysis and Prevention*, Feature, Volume 8, October, 2008, pp. 406-409.
4. Raush, J. “Current Technology and Feasibility Study of Hydrogen Fuel Cell Development for the Automotive Industry,” M.S. Thesis; University of Louisiana at Lafayette, 2006.

10. COURSES TAUGHT

April, 2021

Thermodynamics & Kinetics of Solids. The basic scientific principles and concepts of thermodynamics and kinetics of materials used in engineering practices. The discussion will pertain to the atomic level interactions in mostly solid materials. Major topics studied include: structure and defects in solids; solid-state diffusion; and phase transformations in solids.

Energy Systems & Sustainability. Principles of sustainable energy systems. The use of systems engineering tools, economics, and fluid-thermal engineering principles to study a broad range of sustainable energy systems, including wind, solar, biomass, energy storage, and product lifecycle. Course offered in Study Abroad format. Overall course evaluation score: 5.0/5.0 (Summer, 2019), with 5.0 being the best.

Energy Systems Laboratory. Experimental design from statistical analysis to testing of selected energy systems. Teaching methods include lectures, cooperative learning, laboratory based projects. Overall course evaluation score: 4.6/5.0 (Spring, 2019), with 5.0 being the best.

Manufacturing Processes. Design for manufacturability and assembly of metals, plastics and composites. Teaching methods include lectures, cooperative learning, laboratory based projects, industry lead experiential learning. Overall course evaluation score: 4.8/5.0 (Fall 2018), with 5.0 being the best.

Mechanics of Materials. Instruction in the theory and application of solid mechanics to structural and mechanical problems. Teaching methods include lectures, cooperative learning, student-led instruction. Overall course evaluation score: 4.0/5.0 (Spring 2017), with 5.0 being the best.

Finite Element Analysis. Instruction in the theory and application of the finite element method. Teaching methods include lectures, computer based laboratories, cooperative learning, project-based learning. Overall course evaluation score: 4.2/5.0 (Fall 2016), with 5.0 being the best.

Introduction to Mechanical Engineering. Teaching methods included lecture style, cooperative learning, project-based learning, and collaborative work. Used industry examples as teaching aides, and brought in industry speakers and presenters that could relate professional experience with classroom experience. Overall course evaluation score: 4.3/5.0, with 5.0 being the best.

11. SUBMITTED AND * INVITED LECTURES AND CONFERENCE PRESENTATIONS

Raush, J., “Multi-Dimensional Digital Image Correlation System”, Louisiana Materials Design Alliance (LAMDA) Technical Conference, April 23, 2021, Virtual meeting.

Raush, J., “Energy Systems and Sustainability”, Pôle Universitaire Léonard de Vinci (PULV) De Vinci International Week 2021, March 29 and March 30, 2021, Virtual meeting.

April, 2021

Petculescu, G., Dada, D., Deoli, N., Raush, J. Guo, S., “Elastic Properties of Additively-Manufactured Alloys”, ASA 179th Meeting, Wednesday, December 9th, 2020, Virtual meeting.

*Raush, J., “Solar Energy Fundamentals”, UL Lafayette Guest Lecture, CHEE 440 Renewable Energy, Lafayette, Louisiana, September 24, 2020.

*Raush, J. “Advanced Materials Characterization of High-Performance Alloys for Additive Manufacturing in Aerospace Applications” CIMM Symposium, July 20, 2020, Online

*Raush, J., “IMCE of High-Performance Metal Alloys in Support of NASA Strategic Objectives,” UL Lafayette College of Engineering Doctoral Seminar, Online, March 17, 2020

*Raush, J., “MCHE Research Activities at UL”, IMRI workshop series Research and Refreshments, Lafayette, Louisiana, February 20, 2020.

*Raush, J., “Field Testing of Low-Cost and High Performance Receiver for Parabolic Trough Solar Power”, 2nd Workshop on Water, Energy, Environment, and Health Nexus, Lafayette, Louisiana, January 21, 2020.

*Raush, J., “Solar Energy Fundamentals”, UL Lafayette Guest Lecture, CHEE 440 Renewable Energy, Lafayette, Louisiana, October 10, 2019.

*Raush, J., “ICME of High-Performance Metal Alloys in Support of NASA Strategic Objectives,” UL Lafayette CHEE Grad Seminar, Lafayette, Louisiana, September 16, 2019.

*Raush, J., “Cities & Energy Transition: Urban Energy Systems and Sustainability,” VerTech International Summer School, Namur, Belgium, July 13-19, 2019.

Raush, J., “Field Testing of Manufacturable Advanced Low-Cost Receiver for Parabolic Trough Solar Power, IEEE Green Technologies Conference, Lafayette, Louisiana, April 4, 2019.

Raush, J., *Tulasigeri, S., Zeng, C., Guo, S., SanSoucie, M., “Experimental and Simulation Study of Solidification and Micro-structural Evolution of Ti and Ni Based Alloys for Laser Based Additive Manufacturing”, TMS Annual Meeting & Exhibition, San Antonio, Texas, March 13, 2019.

*Raush, J., “Pilot Scale Solar Power Investigations in Intermediate Solar Resource Areas”, 1st Workshop on Water, Energy, Environment, and Health Nexus, State University of Ponta Grossa (UEPG), Ponta Grossa, Parana, Brazil, March 18, 2019.

*Raush, J., “Electrostatic Levitation Experiments in Material Property and Process Characterization”, UL Lafayette Department of Physics Seminar, Lafayette, Louisiana, January 30, 2019.

*Raush, J., “ICME of high-performance metal alloys in support of advanced manufacturing”, UL April, 2021

Lafayette Institute for Materials Research and Innovation (IMRI) Research Retreat, Lafayette, Louisiana, December, 10, 2018.

*Raush, J., “Characterization of Thermophysical Properties of Liquid Metal Alloys in Support of NASA Strategic Objectives“, Louisiana Space Grant Consortium (LaSPACE) Fall 2018 Council Meeting, Shreveport, Louisiana, November 9, 2018

Raush, J., “Cajun-Integrated Computational Materials Engineering (C-ICME) Lab”, Presentation to Bell Helicopters, Lafayette, Louisiana, January 22, 2018.

Raush, J., Chambers, T., Bentley, R., “Initial Field Testing of Concentrating Solar Photovoltaic (CSPV) Thermal Hybrid Solar Energy Generator Utilizing Large Aperture Parabolic Trough and Spectrum Selective Mirrors.” VerTech, 2017 Conference, Lafayette, Louisiana, October, 2017.

Novak, B., Raush, J., Zhang, X., Moldovan, D., Meng, W., Guo, S., “Properties of liquid Ti-Al alloys from classical MD simulation and comparison to electrostatic levitation (ESL) experiments”; Louisiana EPSCoR RII CIMM 2017 Symposium, July, 2017.

Raush, J., Novak, B., Moldovan, D., Meng, W.J., Guo, S., SanSoucie, M., “Thermophysical and thermochemical measurements and simulation of Ti-based liquid metal alloys by electrostatic levitation”; Louisiana EPSCoR RII CIMM 2017 Symposium, July, 2017.

Raush, J., Novak, B., Zhang, X., Moldovan, D., Meng, W., Guo, S., “Measurement and Calculation of Liquid Ti Alloy Properties with Application to 3D Printing”, TMS-ICME 2017, May, 2017.

Novak, B., Raush, J., Zhang, X., Moldovan, D., Meng, W., Guo, S., “Properties of liquid Ti alloys from electrostatic levitation experiments and simulation”; American Physical Society March 2017 Meeting, March, 2017.

Raush, J., “Measurement of Thermophysical Properties of Metallic Liquids for 3D Printing by Electrostatic Levitation”; 2nd CIMM Technical Meeting, Baton Rouge, Louisiana, February, 2017

Raush, J., Zhang, B., Zhang, X., Zhang, Bin, Guo, S., Meng, W., SanSoucie, M., Rogers, J., “Thermophysical property measurements of Ti-based liquid metal alloys by electrostatic levitation”; Materials Science & Technology 2016, October, 2016.

Raush, J. “Measurement of Thermophysical Properties of Metallic Liquids by Electrostatic Levitation”; NSF EPSCoR Research Infrastructure Improvement (RII) Award 2016 *LA-CIMM* RII Symposium, July, 2016.

Raush, J., “Electrostatic levitation measurements of liquid thermophysical properties”; 1st CIMM Technical Conference, Baton Rouge, Louisiana, April, 2016

*Raush, J., “UL START Lab Overview”; UL Lafayette Department of Industrial Technology April, 2021

course ITEC 415; Crowley, Louisiana; May, 2015.

Raush, J., “Initial Field Testing of Concentrating Solar Photovoltaic (CSPV) Thermal Hybrid Solar Energy Generator Utilizing Large Aperture Parabolic Trough and Spectrum Selective Mirrors”; LSU ME Graduate Student Conference; April, 2015.

*Raush, J., “Solar Thermal Power Plant”; UL Lafayette Department of Industrial Technology course ITEC 415; Crowley, Louisiana; May, 2014.

*Raush, J., “Installation and Operation of a Solar Thermal Power Plant in Louisiana”; UL Lafayette Department of Chemical Engineering Graduate Seminar; Lafayette, Louisiana; September, 2014.

Chambers, T. L., Raush, J., Russo, B., 2013, “Installation and Operation of Parabolic Trough Organic Rankine Cycle Solar Thermal Power Plant in South Louisiana,” *Energy Procedia*, 49 (Proceedings of the SolarPACES 2013 International Conference), 2014, pp. 1107-1116. doi:10.1016/j.egypro.2014.03.120.

*Raush, J., Chambers, T., Russo, B., “Installation and Operation of Parabolic Trough Organic Rankine Cycle Solar Thermal Power Plant in South Louisiana”; VerTech 2013 Conference; La Rochelle, France; May 2013.

*Chambers, T., Raush, J., Russo, B., Crouch, B., “Potential for Solar Thermal Power in Louisiana”; VerTech 2012 Conference; Lafayette, Louisiana; November, 2012.

*Raush, J., “UL Solar Energy Project”; Department of Natural Resources ‘Save Energy Now’ Project; Crowley, Louisiana; October, 2012.

*Chambers, T. L., Raush, J., “Solar Thermal Power Plant”; Lafayette Economic Development Authority, Acadian Alternative Energy Committee Lecture Series; Lafayette, Louisiana; October, 2011.

*Raush, J., “UL/Cleco Alternative Energy Research Center Solar Thermal Power Plant”; UL Lafayette College of Engineering course ENGR 301; Lafayette, Louisiana; July, 2011.

Raush, J., “Uncertainty Analysis in Accident Reconstruction”; 2008 Annual Engineers Meeting - Engineering Design & Testing Corp.; Memphis, Tennessee; February 8, 2008.

12. STUDENTS SUPERVISED

Graduate Students Advised

Arghavan Shamsipoor (M.S., 2021-present)

Keagan Yates (M.S., 2021-present)

Abdelrahman Garbie (M.S., 2020-present)

Neil Sand (M.S., 2020-present)

John Carroll (Ph.D., 2020-present)

Chukwudalu Uba (Ph.D., 2020-present)

John Hebert (M.S., 2019-2020) – Degree conferred December, 2020

Benjamin Bernard (Ph.D., 2019-present)

Sanjeev Tulasigeri (Ph.D., 2017-present)

Srikrishna Raman (M.S., 2016 - 2018) – Degree conferred December, 2018

Tanni Alam Dola (M.S., 2016 - 2019) – Degree conferred May, 2019

Undergraduate Research Apprentices

Brock Miller (2020-present)

Isaiah Parfait (2020-present)

Stephen Barker (2020-present)

Dylan Rogers (2019-present)

Beau Callais (2019-present)

Logan Sullivan (2018-2019)

Dell Portwood (2017-2019)

Ashton Young (2017-2018)

Neil Sand (2016-2020)

Brian Hinkamp (2016-2020)

Remington Martin (2016)

13. SERVICE ACTIVITIES

Journal Review – *Crystals* (2019-present)

Journal Review – *ASME Journal of Energy Resources and Technology (JERT)* (2019-present)

Journal Review – *Materials* (2018-present)

Journal Review – *Metals* (2018-present)

Mechanical Engineering Curriculum of the Future Committee: (2021-present)

University Study Abroad Committee (2020-present)

Ragin Cajun Resiliency Committee (2020-present)

TMS Solidification Committee (2020-present)

Center for Gifted Education Steering Committee (2019-present)

Session Chair – IEEE 2019 Green Technologies Conference

University Sustainability Committee (2019-present)

University Export Control Committee (2019-present)

College of Engineering Dean Search Committee (elected) (2019-present)

Faculty Senate (elected) (2018-present)

Mechanical Engineering Seminar Committee (2019-present)

Mechanical Engineering Graduate Affairs Committee (2019-present)

April, 2021

Mechanical Engineering Curriculum Committee (2018-present)
University Athletics Committee (2017-present)
Mechanical Engineering Department Head Search Committee (2017-18)
Mechanical Engineering Faculty Search Committee (2017-2018)
VerTech Organizing Committee for Student Design Competition (2017)
Undergraduate Research Apprentice Advisor (2016-present)
Engineering & Technology Day, Arrival and Welcome Team (2015-present)
Departmental Safety Coordinator – Cleco Alternative Energy Center (2014-2016)
Graduate Committees of MS and PhD students (15 students to date)
Undergraduate Senior Design Advisor (7 projects to date)
Mechanical Engineering Internship for credit mentor (9 students to date)
Mechanical Engineering Co-Op Student mentor (1 student to date)
Student-Athlete Recruiting Activities (2011-present)

14. AWARDS AND HONORS

Pi Tau Sigma-National Honorary Mechanical Engineering Society
UL Lafayette Sustainability Faculty Fellow
Phi Kappa Phi-National Honor Society
2021 UL Lafayette College of Engineering Early Career Researcher of the Year

15. REFERENCES PROVIDED IN A SEPARATE DOCUMENT