

JOSEPH D. SMITH CURRICULUM VITAE

Professor, Chemical and Biochemical Engineering
210-C Bertelsmeyer Hall
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SUMMARY

Joseph D. Smith was trained at the Advanced Combustion Engineering Research Center at Brigham Young University where he received a Ph.D. in Chemical Engineering in 1990. He has over 30 years' industrial experience in the Chemical and Petrochemical Industries. He has published over 70 papers, given more than 120 conference papers, and has 12 patents. Dr. Smith has contributed to the John Zink Combustion Handbook, the Industrial Burner Handbook, the Handbook of Chemical Engineering and recently published a book on the Application of CFD in the Process Industries. Dr. Smith has served as an expert witness for Flare Performance and Hydrocarbon Processing. Dr. Smith has developed and applied comprehensive CFD models for combustion and gasification systems and used CFD for optimization of industrial furnaces and burners. Dr. Smith founded and led three startup companies serving the petrochemical and fossil energy industries and developing advanced wireless sensor technology on mobile platforms. Dr. Smith served on faculties at Tennessee Technological University, University of Michigan, University of Illinois-Urbana/Champaign, University of Tulsa and currently at Missouri University of Science and Technology (formally Missouri Rolla). Dr. Smith serves as President of the American Institute of Chemical Engineers (AIChE)

SPECIALIZED PROFESSIONAL COMPETENCE

Environmental Monitoring and Control: As research leader for Dow Chemical, led efforts to understand and control PCDD/F formation in chlorinate hydrocarbon incineration, designed and conducted plant-scale tests using advanced IR sensors to monitor and control toxic air emissions from incineration devices; As director for John Zink, applied advanced sensors for Staged Combustion devices to monitor and reduce NOx emissions, Founded and led Elevated Analytics to develop and apply patented process using carbon-nanotube sensors to monitor and control air emissions in chemical and petrochemical industries with focus on elevated flares.

Industrial Flare Design and Operation: As leader of Flare Research Group for John Zink, developed strategic development plan for new flare technology. Has conducted many design analyses for Zeeco Corporation for enclosed flares, multi-point ground flares, and air and steam assisted elevated flares. Has served as an expert witness on flare performance and published many articles on flare design and performance and holds two patents related to flare technology. Has developed and applied advanced sensor technology to monitor and reduce air emissions from flares and other process equipment.

Reactive Chemical Evaluation: Extensive experience evaluating potential "reactive chemical" hazards in chemical manufacturing processes. Has led several explosion investigations to identify and mitigate "reactive chemicals" issues for Dow Chemical and Cabot Corporation.

Fossil Fuel Fired Power Generation: Trained at Advanced Combustion Engineering Research Center (ACERC) under Dr. L.D. Smoot and Dr. P.J. Smith. Member of LGTI gasifier development team at the Dow Chemical Company and helped optimize/trouble shoot the Wabash Coal Gasification Plant in Terra Haute, Indiana. Consultant for Chevron-Texaco (subsequently General Electric) on optimizing Gasifier design and operation. Analyzed/optimized coal fired power plants in Oklahoma (AEP) and Eastern Europe (AES) to debottleneck operation and reduce emissions.

Process Development and Optimization: Developed novel manufacturing processes for the chemical industry, worked and products. Developed new process to form high surface area fumed ceria for automotive catalyst. Developed highly stable gas flare pilot capable of operating in hurricane scale winds. Developed new low temperature catalytic devices to remove CO from home appliances and reduce NOx emissions from industrial boilers. Worked to obtain product approvals from Underwriters' Laboratory (UL) and ICC Evaluation Services (ICC-ES) for multiple products. Three patents related to Catalytic Devices and two patents related to production of nanoparticles.

Product Evaluation/Process Development: Extensive experience in developing novel manufacturing processes and products. Developed new process to form high surface area fumed ceria for automotive catalyst. Developed highly stable gas flare pilot capable of operating in hurricane scale winds. Developed new low temperature catalytic devices to remove CO from home appliances and reduce NOx emissions from industrial boilers. Worked to obtain product approvals from Underwriters' Laboratory (UL) and ICC Evaluation Services (ICC-ES) for multiple products. Three patents related to Catalytic Devices and two patents related to production of nanoparticles.

Fire Cause and Origin Inspection: Worked in fire and related fields for over 25 years. Certified Fire Cause and Origin Investigator. Member of National Fire Prevention Association, American Institute of Chemical Engineers, and American Society of Mechanical Engineers. Advanced degrees (MS, PhD in Chemical Engineering) with specialty in combustion engineering, holds five combustion related patents, serves as expert witness in fire related technology.

EXPERT WITNESS CASES (16)

- 1. Case Name: ARBITRATION BETWEEN CLARKE RAJCHEL ENGINEERING, LLC (USA) and STERCORAT HUNGARY KFT and INTECH, spol. s r.o., Vienna International Arbitral Centre of the Austrian Federal Economic Chamber Wiedner Hauptstrasse 63 1045 Vienna Austria**
Attorneys: G. Lehnert, s.r.o., Budova ORBIS, Rajská 7, 811 08 Bratislava, Slovak republic, Alix Frank Rechtsanwälte GmbH, A-1010 Wien, Schottengasse 10, HG Wien FN 273911k, Austria
The case involves the plaintiff's claim that their technology had been implemented in a chemical plant without license to use. Expert Report prepared and submitted. Arbitration found for defendants.
- 2. Case Name: Civil No. 4:21-cv-03048 Enjet LLC v. Chevron U.S.A. Inc. and Blessey Marine Service, Inc.: Case No. S-54249 (before UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF TEXAS HOUSTON DIVISION)**
Attorneys: Agnes O. Doyle; Holland & Knight LLP, 811 Main Street, Suite 2500 | Houston, TX 77002
Case involved a claim by the plaintiff that the slurry oil produced by Chevron was contaminated by high potassium levels which resulted in poor quality Carbon Black Feedstock produced and sold by the plaintiff. The case was dismissed with prejudice (no deposition was performed; no jury trial).
- 3. Case Name: SHELBY ELLEBRACHT (individually and on behalf of all others similarly situated) v. WALMART INC., CANDLE-LITE COMPANY, LLC, and LUMINEX HOME DÉCOR AND FRAGRANCE COMPANY: Case No. 20-00361-CV-W-BP (before UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF MISSOURI)**

Attorneys: Bryan T. White (WHITE GRAHAM BUCKLEY & CARR, LLC), A. Scott Waddell (WADDELL LAW FIRM, LLC), Eric S. Playter (PLAYTER & PLAYTER, LLC), Jack D. McInnes (MCINNES LAW LLC).

Case involved a serious safety-related defect in the design and manufacture of candles which led to the candles becoming fully engulfed in flames and/or exploding and injuring individuals and damaging their property. Case settled.

4. **Case Name: Advocates for a Cleaner Tacoma, Sierra Club, Washington Environmental Council, Washington Physicians for Social Responsibility, Stand.Earth, and the Puyallup Tribe of Indians – a federally recognized Indian tribe v. Puget Sound Clean Air Agency and Puget Sound Energy: Case No. PCHB No. 19-087c (before the State of Washington Pollution Control Hearings Board)**

Attorney: Joshua B. Frank, Baker Botts L.L.P., 700 K Street N.W., Washington, DC 20001

Case involved an LNG plant owned by Puget Sound Energy. I was hired to offer my expert opinions regarding the operation of the enclosed flare produced by LFG Specialties and supplied to Chicago Bridge and Iron (CB&I) for use in the Tacoma Liquefied Natural Gas (“Tacoma LNG”) project. My opinion was that the LFG flare would perform at a destruction removal efficiency (DRE) greater than 99% and likely as high as 99.99% during transition operation. Dr. Smith prepared several technical reports on this matter. He was also deposed during the case and gave sworn testimony before the Pollution Control Hearings Board. Verdict in favor of defendant.

5. **Case Name: The Kingsford Products Company, LLC v. Creative Spark, LLC, United States Patent and Trademark Office, Before the Patent Trial and Appeal Board, U.S. Patent Nos. 9,131,803 and 6,790,244**

Attorney: Mr. Byron Chin, Kilpatrick Townsend & Stockton LLP, Two Embarcadero Center Eighth Floor, San Francisco, CA 94111

Case concerned a patent dispute between Kingsford Products Company and Creative Spark related to design and fabrication of charcoal briquets. Dr. Smith participated as a subject matter expert and as a testifying witness related to flare performance. Dr. Smith was deposed in this case after preparing and submitting a declaration report. Verdict for plaintiff.

6. **Case Name: Conservation Law Foundation v. Broadrock Gas Services, LLC, et al., Civil Action No. 1:13-cv-00777-M-PAS**

Attorney: Ms. Diana A. Silva, Manko, Gold, Katcher & Fox, LLP, Bala Cynwyd, PA 19004 Cleveland, Ohio 44114

Case concerned a citizen suit litigation related to alleged violations of the federal Clean Air Act related to the operation of Broadrock’s facilities at the Central Landfill located in Johnston, Rhode Island. The dispute is related to claims that operation of landfill flares produced noxious gases that impacted the health of the plaintiffs and the environment in and around the landfill. Dr. Smith participated as a subject matter expert and as a testifying witness related to flare performance. Dr. Smith was deposed in this case after preparing and submitting an expert report. Verdict for defendant.

7. **Case Name: MDL Litigation in Texas City Refinery Ultracracker Emission Event (Litigation; In Re: MDL No. 12-UC-0004; Misty Stevens-Sheppard, et. al. v. BP Products North America, Inc. and Keith Casey)**

Attorney: James B. Galbraith, McLeod, Alexander, Powel & Apfel, P. C., 802 Rosenberg, Post Office Box 629, Galveston, Texas 77553

Case concerned a suit by plaintiffs living in and around the Texas City refinery in Texas City, Texas regarding an extended flaring event during April to May 2010. The dispute relates to claims the flaring event produced toxic emissions that impacted plaintiff’s health. Dr. Smith participated as a

subject matter expert related to flare performance. Dr. Smith was deposed but the case was dismissed before trial. Verdict for defendants.

8. Case Name: MDL Litigation in Texas City Refinery Ultracracker Emission Event (No. 10-UC-0001 in The District Court of Galveston County, Texas)

Attorney: Mr. Stephen M. Fazio, Squire Sanders (US) LLP, Cleveland, Ohio 44114

Case concerned a suit by Mr. Alton C. Todd (designated lead council for plaintiffs living in and around the Texas City refinery in Texas City, Texas) regarding an extended flaring event during April - May 2010. . The dispute was related to claims that the flaring event produced noxious gases that impacted the environment around the refinery and the health of residents living near the refinery. Dr. Smith served as a subject matter expert related to flare performance. Dr. Smith was deposed in and served as the testifying expert. Trial was held in September 2014. Verdict for defendants.

9. Case Name: MDL Litigation in Texas City Refinery Ultracracker Emission Event (No. 10-UC-0001 in The District Court of Galveston County, Texas)

Attorney: Mr. Stephen M. Fazio, Squire Sanders (US) LLP, Cleveland, Ohio 44114

Case concerned suit brought by Mr. A. G. Buzbee (council for plaintiffs) regarding an extended flaring event during April – May 2010. The dispute was related to claims that the flaring event produced noxious gases that impacted the environment around the refinery and the health of residents living near the refinery. Dr. Smith served as a subject matter expert related to flare performance. Dr. Smith was deposed in and served as the testifying expert. Trial was held in September 2013. Verdict for defendants.

10. Case Name: Campbell’s Soup Company, LLC v. Direct Contact, LLC v. Lamar Industrial, LLC, Eclipse, Inc. and Summit Integration, Inc. (Case 4:18-cv-00843-ALM)

Attorney: Mr. José M. (Joe) Rubio, Dykema Gossett PLLC, Dallas, TX

Case concerned the design and operation of the Direct Fired Heater System installed for Campbell’s Soup Company at their Paris Texas Production Facility and the gas fired burner designed and provided by Eclipse, Inc. as requested by Direct Contact, who appears to have incorporated the burner into the Direct Fired Heater system. Dr. Smith participated as a subject matter expert related to combustion science and technology as it relates to burner operation and submitted an expert report related to the proper design and operation of the Eclipse burner in Direct Contact’s system. Case settled prior to deposition and trial in favor of the Eclipse (defendant).

11. Case Name: Kvaerner North American Construction Inc. and Siemens Energy, Inc. –v– Longview Power, LLC and Foster Wheeler North America Corporation (Case No. 50 158 T 00411 11)

Attorney: Mr. Bryan C. Keane, Dorsey & Whitney, LLP, Minneapolis, MN

Case concerned an arbitration related to the design and construction of a 695-megawatt supercritical coal-fired electric power generating facility located in Maidsville, West Virginia (Longview Power Plant). Dr. Smith participated as a subject matter expert related to coal combustion science and technology as it relates to plant operation and submitted an expert report related to coal quality and furnace design and their impact on furnace performance. Arbitration case presented to Tribunal in March 2015. Arbitration in favor of Plaintiff.

12. Case Name: AES-3C Maritza East 1 EOOD -v- Alstom Power Systems GmbH and Alstom Bulgaria EOOD (DDI 020 3400 404 3)

Attorney: Mr. Nicholas Fletcher, Berwin Leighton Paisner LLC, London, England

Case involved an arbitration between Alstom Power Systems GmbH/ Alstom Bulgaria EOOD (Alstom) and AES-3C Maritza East 1 EOOD (AES) related to a dispute related to the design and construction of a lignite fired power station in Bulgaria. Dr. Smith participated as a subject matter expert related to coal combustion and computational fluid dynamics modeling of the operation of

this plant. Dr. Smith provided several expert reports and rebuttal reports relating to the impact of fuel quality on furnace operations because of Alstom's poor furnace design. Dr. Smith was not deposed for the arbitration but did testify twice before the Tribunal during a hearing held at the International Arbitration Center, London, UK in October 2013. Arbitration settled.

13. Case Name: CARBON PROCESSING AND RECLAMATION, LLC v. VALERO MARKETING AND SUPPLY, CO. (Civil Action No. 2:09-CV-02127-STA-CGC)

Attorney: Mr. Randy J. Hart, Randy J. Hart, LLP, Beechwood, Ohio

Case involved a civil dispute between Carbon Processing and Reclamation, LLC (plaintiff) and Valero Marketing and Supply Company (defendant). The issue involves a dispute over the quality of oil purchased from Valero by CPR. Dr. Smith participated as a subject matter expert and provided expert opinions related to following questions: 1) Was the #6 Fuel Oil quality delivered by Valero to CPR according to their contract within the agreed upon specifications; 2) Did the #6 Fuel Oil have any unusual characteristics identified by the standard analytical tests performed to quantify oil quality; and 3) What impact did "out-of-spec" oil characteristics for the #6 Fuel Oil have on the oil delivered to CPR. Dr. Smith deposed, did not testify. Case settled before trial.

14. Case Name: U.S.V. LANXESS CORPORATION (DJ Number: 90-5-2-1-09264)

Attorney: Ms. Cathy Royko, Department of Justice, Washington DC

Case involved combustion efficiency from a steam flare used to treat process vapors from chemical manufacture. Dr. Smith participated as a subject matter expert and provided expert opinions related to flare design and operation. No expert report was issued in this case and Dr. Smith was not deposed. Case settled prior to trial.

15. Case Name: U.S.V. QUESTAR GAS MANAGEMENT COMPANY (DJ Number: 90-5-2-1-008432)

Attorney: Mr. Jerry Ellington, Department of Justice, Denver, Colorado

Case involved combustion efficiency from an enclosed flare used to treat process vapors coming from a gas processing facility. Dr. Smith participated as a subject matter expert and provided expert opinions related to flare design and operation. A Rule-26 expert report was prepared and submitted. Dr. Smith was deposed related to enclosed flare design and operation. Case settled prior to trial for Plaintiff in April 2012.

16. Case Name: Herschend Family Entertainment Corporation vs The Sherwin-Williams Company (Case No. 07-3133-CV-S-GAF)

Attorney: Ms. Patrica Keck, Keck and Austin, Springfield, Missouri

Case involved a slip and fall accident that occurred at Celebration Station in Branson MO. Dr. Smith was deposed as part of this work and provided expert testimony related to the "non-slip" surface coating used on this surface. Testing was performed to quantify the effectiveness of this surface coating. Dr. Smith deposed in case in February 2008. Case settled prior to trial.

EDUCATION

BRIGHAM YOUNG UNIVERSITY

Provo, UT

Thesis: A Detailed Evaluation of Comprehensive Simulation Software Describing Pulverized- Coal Combustion and Gasification Using Advanced Sensitivity Analysis Techniques.

PH.D. (CHEMICAL ENGINEERING)

April 1984 – December 1987

BRIGHAM YOUNG UNIVERSITY

Provo, UT

Thesis: Prediction of the Effects of Coal Quality on Utility Furnace Performance.

M.S. (CHEMICAL ENGINEERING)

August 1982 – April 1984

BRIGHAM YOUNG UNIVERSITY

Provo, UT

B.S. (CHEMICAL ENGINEERING)

June 1979 – April 1982

AWARDS

2022 SAE JOHN JOHNSON AWARD, OUTSTANDING RESEARCH IN DIESEL ENGINES, DETROIT, MICHIGAN
 2019 OUTSTANDING ALUMNUS AWARD, BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH
 2014 GARY LEACH AWARD, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, SAN ANTONIO, TEXAS
 AICHE FELLOW, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS
 CHEMICAL ENGINEERING ACADEMY, MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY, ROLLA, MISSOURI
 ENGINEER IN TRAINING CERTIFICATE (LICENSE NO. 7366) STATE OF UTAH, SALT LAKE CITY, UTAH
 AWU FELLOW, LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO
 EXXON GRADUATE SCHOLARSHIP, BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH
 WOODBADGE TRAINING, BOBWHITE PATROL, GRADUATE, OWASSO, OKLAHOMA
 EAGLE SCOUT, BOY SCOUTS OF AMERICA, ST. GEORGE, UTAH

PROFESSIONAL SOCIETIES

Member, American Institute of Chemical Engineers
 Member, Sigma Xi Scientific Research Society
 Member, Tau Beta Pi Honorary Engineering Society

PROFESSIONAL SERVICE

President – American Institute of Chemical Engineers (AIChE); 2023 - 2026
 Secretary- – American Institute of Chemical Engineers (AIChE); 2019 - 2022
 Treasurer – American Institute of Chemical Engineers (AIChE); 2017 - 2018
 Director – American Institute of Chemical Engineers (AIChE); 2014 - 2017
 Chair - National Student Chapters Committee (AIChE); 2011 - 2014
 Chair - National Student Paper Competition (AIChE); 1991 - 2010
 Chair - Mid-Michigan AIChE Local Section ; 1995
 Chair – Tulsa AIChE Local Section (Current); 2007
 Chair - Combustion Reaction Engineering (AIChE - Group 20)
 Volunteer - Discover "E" program (AIChE); Midland, MI; 1994
 Faculty Advisor - Tennessee Technological University (hosted 1988 regional student conference)
 Student Chapter President - Brigham Young University (hosted 1982 regional student conference)

PROFESSIONAL EMPLOYMENT

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY, ROLLA, MISSOURI **6/2011 - PRESENT**

PROFESSOR, CHEMICAL AND BIOCHEMICAL ENGINEERING

INAUGRAL WAYNE AND GAYLE LAUFER ENDOWED ENERGY CHAIR (2011 – 2021)

DIRECTOR, ENERGY RESEARCH AND DEVELOPMENT CENTER (2013 – 2018)

FOUNDER & DIRECTOR, SMALL MODULAR REACTOR EDUCATION AND RESEARCH CONSORTIUM (2013 – 2016)

CO-FOUNDER AND DIRECTOR, INDUSTRIAL MICROGRID CONSORTIUM (2016 – 2018)

Selected and served as the inaugural Wayne and Gayle Laufer Endowed Energy Chair conducting research on Hybrid Energy Systems combining renewable energy with fossil and nuclear energy technology; Directed 16 Doctoral /9 Master's thesis research projects on Unconventional Hydrocarbon Processing, Industrial Gas Flaring, Coal/Wind/Biomass Hybrid Systems, and LES based Numerical Modeling of Transient Turbulent Reacting Multiphase Flow Systems.

ELEVATED ANALYTICS, REXBURG, IDAHO

7/2016 – PRESENT

CO-FOUNDER AND CHIEF TECHNOLOGY OFFICER - Developed and applied nanotube sensor technology to measure air quality in residential and industrial environments from mobile platforms. Conducted CFD analysis of combustion-based technology in the chemical and petrochemical industries.

SYSTEMS ANALYSES & SOLUTIONS, OWASSO, OKLAHOMA

9/2006 – 7/2016

CO-FOUNDER AND PRESIDENT - Engineering analysis of combustion systems to assist with product

approvals, testing, environmental compliance, and process optimization. Investigative engineering services for insurance industry related to Fire C&O, mechanical & structural failure analysis, and evaluation of property loss.

IDAHO NATIONAL LABORATORY, IDAHO FALLS, IDAHO **10/2008 – 6/2011**

GROUP LEADER, ADVANCED PROCESS AND DECISION SYSTEMS - Developed advanced process technologies for clean and efficient energy production and use, technical lead for Hybrid Energy Systems Development. Arranged for and coordinated solicitations for bio-mass projects; collaboration with ConocoPhillips on installing Gas-to-Liquids Slurry Bubble Column equipment to produce Biofuels.

ALION SCIENCE & TECHNOLOGY, OWASSO, OKLAHOMA **5/2005 – 12/2008**

SENIOR PROGRAM MANAGER - Established Oklahoma office and developed new business unit for Alion Science & Technology to provide process modeling support for the chemical and hydrocarbon process industries.

CDA-ACCES, OWASSO, OKLAHOMA **01/2003 – 05/2005**

CO-FOUNDER AND PRESIDENT - Founded and grew a new joint venture business to provide advanced analysis for the Chemical and Petro-Chemical Industries. Performed advanced engineering analysis of the Texaco coal gasification process for Chevron-Texaco to optimize the gasifier design and operation.

JOHN ZINK COMPANY, TULSA, OKLAHOMA **01/2000 – 01/2003**

R&D DIRECTOR - Led R&D group to establish strategic development plan for advanced gas flare technology and to provide advanced combustion analysis for Petro-chemical industries using CFD.

CABOT CORPORATION, TUSCOLA, ILLINOIS **08/1997 – 07/1999**

CORPORATE LEADER, PROCESS DEVELOPMENT - Led corporate group to develop new fumed-metal oxide based products for large clients including DuPont, PPG, Dow Corning, and others. Graduated from Executive Business Management course at "Cabot College". Directed Cabot's first "Reactive-Chemistry Analysis" team and led two explosion investigations required to safely restart treated silica plant. Developed and patented new fumed Ceria production process for Auto Catalysts.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN **05/1990 – 08/1997**

RESEARCH LEADER - Led design and optimization of Wabash Coal Gasifier to produce 150 MW electric power. Improved vapor distribution in distillation columns using advanced CFD tools. Used advanced tools to increase combustion efficiency of Vent Incinerators burning hazardous wastes. Optimized rotary kiln incinerator to reduce CO emissions and slag buildup by improving gas mixing. Increased operating capacity of dryer ovens by optimizing airflow distribution through dryer section. Certified facilitator for "Consulting Skills" and "Managing Interpersonal Relations" training courses.

TENNESSEE TECHNOLOGICAL UNIVERSITY, COOKEVILLE, TENNESSEE **1/1988 - 5/1990**

ASSISTANT PROFESSOR, CHEMICAL ENGINEERING - Advised Undergraduate and graduate students in novel methods to extract oil from tar sands and advanced process control strategies to reduce emissions from coal fired power plants. I taught courses in Fluid Mechanics, Heat Transfer, Applied Numerical Methods, Unit Operations Laboratory, and Transport Processes.

ADVANCED COMBUSTION ENGINEERING RESEARCH CENTER, PROVO, UTAH **6/1989 - 9/1989**

VISITING SCIENTIST - Performed advanced sensitivity analysis of CFD based computer models for High-Pressure Coal Gasification. Results published in Joint Canadian/Western States Combustion Section, May 1990

THE DOW CHEMICAL COMPANY, PLAQUEMINE, LOUISIANA **6/1988 - 9/1988**

VISITING SCIENTIST - Developed advanced CFD based computer model for LGTI, Dow's high-pressure coal gasifier. Results published in Tennessee Academy of Science, November 1989

LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO

10/1985 - 6/1986

AWU FELLOW - Performed non-linear sensitivity analysis of CFD model for Pulverized-Coal Combustion, Results published in AIChE Journal, October 1993.

PROFESSIONAL ACCOMPLISHMENTS

U.S. Patents - Similar Foreign Patents Not Listed (12)

Patent US 10,928,371 B1, “*Hand-Held Sensor and Monitor System*,” February 23, 2021

Patent US 10,866,226 B1, “*Multi-Point Ground Flare System*,” December 15, 2020.

Patent #10,836,639, “*Air Quality Measurement System*,” November 17, 2020.

Patent Pending #62/492,336, “*Sensor System to Enhance Human Health and Safety*,” May 1, 2017

Patent #9,114,984 B2, “*System and Process for Upgrading Hydrocarbons*,” August 25, 2015.

Patent #2009/0099060, “*Exhaust Flue Cap and Filter Device for a Gas Fired Appliance*,” Apr 2, 2009.

Patent #2009/0017741 A1, “*Chimney Cap with Replaceable or Recyclable Ceramic Catalytic Filter Insert*,” Jan 15, 2009.

Patent #7,318,381 B2, “*Methods and Systems for Determining and Controlling the Percent Stoichiometric Oxidant in an Incinerator*,” Jan 15, 2008.

Patent #2006/0039846 A1; “*Ceria Composition and Process for Preparing Same*,” Feb 23, 2006.

Patent #6,887,566 B1; “*Ceria Composition and Process for Preparing Same*,” May 3, 2005.

Patent # 6,702,572 B2, “*Ultra-Stable Flare Pilot and Methods*,” Mar 9, 2004.

Patent #6,667,012, “*Catalytic Converter*,” Dec 23, 2003.

Books and Book Chapters (11)

1. **Smith, J. D.**, Al-Rubaye, H., Zangana, M. H. S., Nagapurkar, P., Zhou, Y., Gelles, G. (2024). Optimum Operation of Microgrid Systems that Employ PV Solar and Battery Systems. *Science and Technology - Recent Updates and Future Prospects Vol. 3*, 13–30; <https://doi.org/10.9734/bpi/strufp/v3/7829A> (<https://youtu.be/mXteeQOOz7Y>)
2. **Smith, J.D.**, “Chemistry and Modelling of Biomass Combustion,” (edited by Frede Blaabjerg, Aalborg University), Invited Chapter in *Encyclopedia of Renewable Energy Engineering*, Elsevier, Submitted, January 2026.
3. **Smith, J.D.**, Gelles, G., and Roege, P., *Hybridized Energy Technology for Improved Energy Resilience, Sustainability and Efficiency*. Wiley, In-preparation.
4. **Smith, J.D.**, *Industrial Gas Flare Technology*, *Omni Scriptum GmbH & Co KG*, In-preparation.
5. **Smith, J.D.**, (2022) “Impact of Densified Biomass Feedstocks on Biofuel Production from Biomass Gasification,” Chapter 7, pp. 189–217, *Densification impact on raw, chemically, and thermally pre-treated biomass: Physical properties and biofuels production*. (Edited By: J.S. Tumuluru) *World Scientific Press*, London, England; <https://doi.org/10.1142/q0406>
6. **Smith, J.D.**, (2019), Section 24: “Thermal Energy Conversion and Utilization,” *Perry's Chemical Engineers' Handbook*. Green, D.W., Southard, M.S. (Editors), ISBN: 9780071834087, *McGraw-Hill Education*, New York, NY.
7. **Smith, J.D.**, (2020) *Computational Fluid Dynamics for the Chemical and Petrochemical Process Industries*. *Linus Publications, Inc.*, Ronkonkoma, New York.
8. **Smith, J.D.**, Buchheit, K., Zhang, H., Golpour, H., Hartvigsen, J., Al-Rubye, H., “Hybrid Energy Systems,” *Encyclopedia of Chemical Processing*. *Taylor and Francis* (2018); <https://doi.org/10.108/E-ECHP-140000498>.
9. **Smith, J.D.**, Lorra, M., Hixson, E.M., and Eldredge, T., “CFD in Burner Development”, Chapter 5, *Handbook of Industrial Burners*. C.E. Baukal, editor, *CRC Press*, (2003).

10. Henneke, M., **Smith, J.D.**, Jayakaran, J.D., Lorra, M., “Computational Fluid Dynamics (CFD) Based Combustion Modeling”, Chapter 9, *The John Zink Combustion Handbook*. C.E. Baukal, R.E. Schwartz, editors, *CRC Press*, (2001).
11. Berg, L.D., Bussman, W., Hong, J., Henneke, M., Chung, I., **Smith, J.D.**, “Mathematical Modeling of Combustion Systems”, Chapter 8, *The John Zink Combustion Handbook*. C.E. Baukal, R.E. Schwartz, editors, *CRC Press*, (2001).

Technical Papers (96)

1. Ugochukwu E., Ania, P. C., Yusuf, A. O., Smith, J. D., Okoronkwo, M.U., (2026) “Investigation of Portland Limestone Cement Blended with Biochar from Downdraft Gasification: Hydration Kinetics, Microstructure, Rheology, and Performance Mechanisms Construction and Building Materials,” *Construction and Building Materials* 526 (2026) 146426; <https://doi.org/10.1016/j.conbuildmat.2026.146426>
2. Maarroof, A., Zangana, M., Smith, J.D. (2026) “The Cost of Inefficiency: A Techno-Economic Assessment of Gas Flaring in Iraq,” *Energy Policy*, 213, 115215; <https://doi.org/10.1016/j.enpol.2026.115215>
3. Ani, P.C., Zeitoun, Z., Al-Abedi, H.J., Smith, J.D. (2026) “Graphene synthesis: A reactor-oriented review of conventional and emerging production methods,” *Chemical Engineering & Processing: Process Intensification*, 222, 110762 <https://doi.org/10.1016/j.cep.2026.110752>
4. Alhameedi, H.A., Athmar A. Alzubaidi, A.A., **Smith, J.D.**, Saud Aldawood, S., Ani, P. (2025) “Systematic Hazard Analysis of Flare System Nodes in Chemical Process Safety,” *Al-Qadisiyah Journal for Engineering Sciences*, 18, 257– 264; <https://doi.org/10.30772/qjes.2025.158282.1517>
5. Ani, P.C., Al-Abedi, H.J., **Smith, J.D.**, Zeitoun, Z. (2025) “Comparative Morphological and Thermal Analysis of Biochar from Oak, and from Oak, Pine and RDF Blends, in a Downdraft Gasifier,” *Fuels*, 6 (73); <https://doi.org/10.3390/fuels6030073>
6. Ani, P.C., Al-Abedi, H.J., **Smith, J.D.**, Zeitoun, Z. (2025) “Biochar Surface Chemistry Modification by Blending Hardwood, Softwood, and Refuse-Derived Fuel: Insights from XPS, FTIR, and Zeta Potential Analysis,” *Fuels*, 6 (71); <https://doi.org/10.3390/fuels6030071>
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3. **Smith, J.D.** "The International Role of AIChE in Eliminating Energy Poverty," 12th World Congress of Chemical Engineering & 21st Asian Pacific Confederation of Chemical Engineering Congress, Plenary Lecture, Beijing, China, July 15 (2025).
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11. **Smith, J.D.** "Vision and Influence: Doug Leng's Focus on Computational Fluid Dynamics at the Dow

- Chemical Company," *2022 AIChE National Conference, Session 77 - Division Plenary: In Memoriam — Dr. Douglas E. Leng, Phoenix Convention Center – N-227C, Phoenix, Arizona, November 14 (2022).*
12. **Smith, J.D.**, Dugue, J., Euzenat, F., Suo-Antilla, A., Smith, Z., Sreedharan, V. "Analysis of Multi-Point Ground Flare Design and Operation: General Guidelines," *Mathias Days 2022: Computational Science Engineering, Data Science & Artificial Intelligence by OneTech's R&D - TotalEnergies, Magny-Le-Hongre (France), October 3-6 (2022).*
 13. **Smith, J.D.**, Keckler, R.M., Suo-Antilla, A., Smith, Z., Sreedharan, V. "Analysis of burner operation inside an Enclosed Ground Flare," *AFRC 2022: Industrial Combustion Symposium, Greenville, South Carolina, September 12-14 (2022).*
 14. **Smith, J.D.**, Suo-Antilla, A., Smith, Z., Sreedharan, V. "Analysis and Design of Multi-Point Ground Flares," *AFRC 2022: Industrial Combustion Symposium Greenville, South Carolina, September 12-14 (2022).*
 15. Maarroof, A.A., **Smith, J.D.**, Zangana, M.H.S., Coanda Effect Enhanced Air-Assisted Flare for Low Flow Operation: Cold Flow CFD Analysis," *AFRC 2022: Industrial Combustion Symposium Greenville, South Carolina, September 12-14 (2022).*
 16. Rushd, S., Alhameedi, H., Hassan, A., Hayder Al-Atabi, H., Al-Sharify, Z., **Smith, J.D.**, "Production of Syngas Via Gasification Using Aspen Hysys Simulation," *2021 AIChE National Conference, Session 621 - Sustainable Fuel from Renewable Resources, John B. Hynes Veterans Memorial Convention Center, Boston, Massachusetts, November 11, 2021*
 17. Rushd, S., Alhameedi, H., Hassan, A., Hayder Al-Atabi, H., Al-Sharify, Z., **Smith, J.D.**, "Optimizing Syngas Production Process By Downdraft Gasifier Using Response Surface Methodology," *2021 AIChE National Conference, Session 709 - Integrated Process Engineering and Economic Analysis, John B. Hynes Veterans Memorial Convention Center, Boston, Massachusetts, November 16, 2021.*
 18. Alhameedi, H., Hassan, A., Al-Naddaf, Q., **Smith, J.D.**, "High Performance Air Assisted Flare Design to Handle Purge Flow Conditions," *2021 AIChE National Conference, Session 52 - Atmospheric Chemistry and Physics: Laboratory Studies - Virtual, John B. Hynes Veterans Memorial Convention Center, Boston, Massachusetts, November 18, 2021.*
 19. **Smith, J.D.**, Alhameedi, H. "High Performance Air-Assisted Flare Design for Low Waste Gas Flow Conditions," *AFRC 2021: Industrial Combustion Symposium Houston, Texas, October 10 -12 (2021).*
 20. **Smith, J.D.**, Suo-Antilla, A., Smith, Z., Sreedharan, V. "Solving Noise Problems in the Process Industry," *AFRC 2021: Industrial Combustion Symposium, Houston, Texas, October 10 -12 (2021).*
 21. **Smith, J.D.**, Gelles, G., Zhou, Y., "Energy Economics in the GCC: A Synergistic Product of Engineering and Economics at Missouri S&T," *International Conference on the Role of Oil Prices in the Future Economy of GCC Region, Crown Plaza, Muscat, Oman, May 25-26 (2021).*
 22. **Smith, J.D.**, Zangana, M.H.S., Al-Rubaye, H., Gelles, G., "Advances in Energy Hybridization for Resilient Supply: A Sustainable Approach to Meet the Growing Demand in the Middle East," *International Conference on the Role of Oil Prices in the Future Economy of GCC Region, Crown Plaza, Muscat, Oman, May 25-26 (2021).*
 23. **Smith, J.D.**, Buchheit, K.L., Al-Rubaye, H., Usman, S., "Next Generation Nuclear Power for Non-Power Applications in the Middle-East Region," *International Conference on the Role of Oil Prices in the Future Economy of GCC Region, Crown Plaza, Muscat, Oman, May 25-26 (2021).*
 24. **Smith, J.D.**, "New World Energy," *Dallas Local AIChE Section Meeting (online), February 20, 2021.*
 25. **Smith, J.D.**, Suo-Antilla, A., Sreedharan, V., Smith, Z., "Modeling Sulfur-Nitrogen Chemistry inside a Claus Reaction Furnace," *AFRC 2020 Industrial Combustion Symposium (Online), October 19-20, 2020.*

26. **Smith, J.D.**, Suo-Anttila, A., Sreedharan, V., Smith, Z., "Simulation of the Thermal-Acoustic Coupling Inside an Industrial Hazardous Waste Incinerator," *AFRC 2020 Industrial Combustion Symposium (Online)*, October 19-20, 2020.
27. **Smith, J.D.**, Gelles, G., Roege, P.E., "Advances in Energy Hybridization for Resilience: A Sustainable Approach to Meet Rural Community Needs," *2nd Inter Conf (online) on Environmental Sustainability and Climate Change*, August 29, 2020.
28. Alhameedi, H.A., Hassan, A.A., **Smith, J.D.**, "Numerical Study of Radial Slot Jet into Crossflow," *2020 AIChE Annual Meeting (online)*, November 10, 2020.
29. Hassan, A., Al-Hameedi, H., **Smith, J.D.**, "Two-step Sub/supercritical Water and Ethanol Processes for Non- catalytic Biodiesel Production," *2019 AIChE Annual Meeting, Transforming the Future through Chemical Engineering*, Hyatt Regency, Orlando, Orlando, FL November 10 - 15, 2019.
30. **Smith, J.D.**, Jackson, R.E., Smith, Z.P., Giedd, R., (2019) "Advanced Emissions Monitoring from Elevated Gas Flares for Early Warning System and Optimization of Plant Operations," *AFRC 2019 - AFRC Industrial Combustion Symposium*, Hilton Waikoloa Village, Hawaii September 9-11, 2019
31. **Smith, J.D.**, Jackson, R.E., Sreedharan, V., Smith, Z.P., Suo-Antilla, A., "Lessons Learned from Transient Analysis of Combustion Equipment in the Process Industries," *AFRC 2019 - AFRC Industrial Combustion Symposium*, Hilton Waikoloa Village, Hawaii September 9-11, 2019.
32. Alhameedi, H.A., Hassan, A.A., **Smith, J.D.**, Jackson, R.E., Smith, Z.P., "An Air-Assisted Flare for Biomass Gasifier," *AFRC 2019 - AFRC Industrial Combustion Symposium*, Hilton Waikoloa Village, Hawaii September 9-11, 2019.
33. Nagapurkar, P.; **Smith, J.D.**, "Advances in Energy Hybridization for Resilient Supply: A Sustainable Approach to Meet Growing Energy Demand," *Enterprise and Infrastructure Resilience Conference*, Kingsgate Hotel and Conference Center, Cincinnati, OH, August 12-13, 2019.
34. Zhang, H. and **Smith, J.D.**, "Investigating Influences of Geometric Factors on a Solar Thermochemical Reactor for Two-Step Carbon Dioxide Splitting Via CFD Models", *2019 AIChE Spring Meeting*, Paper 56d, Hilton New Orleans Riverside - Grand Salon, New Orleans, LA, April 1, 2019.
35. Alhameedi, H. Hassan, A., **Smith, J.D.**, "Experimental and Theoretical Investigation of Radial Slot Jet Flow into Stagnant and Cross Flow Environments," 2019 AIChE Spring Meeting, Paper, Paper 59ab, Hilton New Orleans Riverside - Grand Salon, New Orleans, LA, April 1, 2019.
36. Zhang, H. and **Smith, J.D.**, "Simulation of Structural Effects of Monolith Catalyst on Methane Dry Reforming in a Solar Thermochemical Reactor," 2019 AIChE Spring Meeting, Paper 65b, Hilton New Orleans Riverside – Parish, New Orleans, LA, April 2, 2019.
37. Hassan, A., Nagapurkar, P. and **Smith, J.D.**, "Optimizing Catalyst Free-Biodiesel Production with Super-Critical Ethanol and CO₂ Co-Solvent Using Response Surface Methodology," 2019 AIChE Spring Meeting, Paper 99b, Hilton New Orleans Riverside - Cambridge, New Orleans, LA, April 2, 2019.
38. Hassan, A., Alhameedi, H. and **Smith, J.D.**, "Using Ethanol in Continuous Biodiesel Production with Trace Catalyst and CO₂ Co-Solvent," 2019 AIChE Spring Meeting, Paper 190d, Hilton New Orleans Riverside - Prince of Wales, , New Orleans, LA, April 3, 2019.
39. Hassan, A., **Smith, J.D.**, "Laboratory-Scale Research of Non-Catalyzed Super-Critical Alcohol Process for Continues Biodiesel Production," *2018 AIChE Annual Meeting, Chemical Engineering: Today, Tomorrow & Leading the Future*, David L. Lawrence Convention Center, Pittsburgh, PA October 28 - November 2, 2018.
40. Al-Rubaye, H., **Smith, J.D.**, Manchenahalli, M. "Process Simulation and Experimental Investigation of Biofuel Production in a High RATE Anaerobic Digestion Process," *2018 AIChE Annual Meeting*,

Chemical Engineering: Today, Tomorrow & Leading the Future, David L. Lawrence Convention Center, Pittsburgh, PA October 28 - November 2, 2018.

41. Hassan, A., **Smith, J.D.**, "Investigation of Microwave Assisted Transesterification Reactor of Waste Cooking Oil," *2018 AIChE Annual Meeting, Chemical Engineering: Today, Tomorrow & Leading the Future*, David L. Lawrence Convention Center, Pittsburgh, PA October 28 - November 2, 2018.
42. Al-Hameedi, H. A., **Smith, J.D.** "New Air Assisted Flare Design to handle Low Flowrate of Waste Gases," *2018 Spring Technical Meeting Central States Section of the Combustion Institute*, Minneapolis, Minnesota, May 20–22, 2018
43. **Smith, J.D.**, Jackson, R.E., Smith, Z.P., Rusakiewicz, S. "Real-Time Measurement of Industrial Gas Flare Emissions via UAS Technology," *AFRC 2018 – American Flame Research Committees - University of Utah, Salt Lake City, Utah September 17-19 (2018)*.
44. **Smith, J.D.**, Jackson, R.E., Smith, Z.P., Allen, D., Smith, S. "Transient Ignition of Multi-Tip Ground Flares," *American Flame Research Committees - AFRC 2018 Industrial Combustion Symposium*, University of Utah, Salt Lake City, Utah September 17-19, 2018
45. Alhameedi, H.A., **Smith, J.D.** "New Air Assisted Flare Design to Handle Low Flow Rates of Waste Gases," *AIChE 2018 Spring Meeting, Global Congress on Process Safety*, Orlando World Center Marriott, Orlando, Florida, April 23, 2018.
46. Zhang, H. and **Smith, J.D.**, "Influences of Geometric Factors on a Solar Thermochemical Reactor for Two-Step CO₂ Splitting," *AIChE 2018 Spring Meeting, Global Congress on Process Safety*, Orlando World Center Marriott, Orlando, Florida, April 24, 2018.
47. Al-Rubaye, H., **Smith, J.D.**, Ghorbanian, M., Manchenahalli, M., Karambelkar, S. "Biogas Production and Hydrogen Gas Injection Effect in Expanded Granular Sludge Bed Reactor Under Thermophilic Temperature Range," *AIChE 2018 Spring Meeting, Global Congress on Process Safety*, Orlando World Center Marriott, Orlando, Florida, April 24, 2018
48. Nagapurkar, P., Nuernberger, C., Sutton, E., Vasuthevan, M., Hoefler, R., **Smith, J.D.** "Techno-Economic and Environmental Life Cycle Assessment (LCA) of Biodiesel Production Process from Waste Cooking Oil Via Supercritical Transesterification," *AIChE 2018 Spring Meeting, Global Congress on Process Safety*, Orlando World Center Marriott, Orlando, Florida, April 25, 2018.
49. Yu, J., Al-Rubaye, H., **Smith, J.D.**, "Experimental Investigation of Tar Recycling in Biomass Gasification," *Session 745 Conversion of Biomass Based Renewable Resources to Synthesis Gases and Pyrolysis Oils*, 2017 AIChE Annual Meeting, Minneapolis, MN, Thursday, November 2 (2017).
50. Shivashankaraiah, M.M., Al-Rubaye, H., Karambelkar, S.S., **Smith, J.D.**, "Implementation of Six Sigma in a Methane Generation Process," *Session 54 - Biofuels Production: Design, Simulation, and Economic Analysis*, 2017 AIChE Annual Meeting, Minneapolis, MN, Monday, October 30 (2017).
51. Al-Rubaye, H., **Smith, J.D.**, Shivashankaraiah, M.M., Karambelkar, S.S., "Hydraulic Retention Time and Temperature Impacts on Biogas Production in Expanded Granular Sludge Bed Reactor," *Session 258 Alternative Fuels including Biofuels, Hydrogen, Renewable Hydrogen, and Syngas*, 2017 AIChE Annual Meeting, Minneapolis, MN, Tuesday, October 31 (2017).
52. Zhang, H. and **Smith, J.D.**, "Evaluating the Performances of Reduction Process in the Solar Thermochemical Two-Step CO₂ Splitting Based on Ceria Redox Reactions," *Session 346 CO₂ Capture, Utilization, and Disposal: Key to Clean Energy Production I*, 2017 AIChE Annual Meeting, Minneapolis, MN, Tuesday, October 31 (2017).
53. **Smith, J.D.**, Sreedharan, V., Jackson, R., Smith, Z.P., Allen, D. and Smith, S. (2017) "Using CFD to Optimize Flow Distribution in Gas Flare Piping," *AFRC 2017 – Industrial Combustion Symposium*, Hyatt Regency Hotel Houston, Texas - September 17 –20 (2017).

54. **Smith, J.D.**, Adams, B.R., Jackson, R.E., Smith, Z.P., Suo-Antilla, A., Smith, S. and Allen, D., (2017) "RANS vs LES CFD for Gas-Fired Combustion Equipment Analysis," *AFRC 2017 – Industrial Combustion Symposium*, Hyatt Regency Hotel Houston, Texas - September 17 –20 (2017).
55. **Smith, J.D.**, Jackson, R.E., Smith, Z.P. (2017) "Unmanned Aerial System Based Flare Emissions Monitoring," *AFRC 2017 – Industrial Combustion Symposium*, Hyatt Regency Hotel Houston, Texas - September 17 –20 (2017).
56. **Smith, J.D.**, and Rao, V., "Numerical simulation and analysis of flow instabilities, thermal-hydraulics and fluid-structure interactions in a small modular reactor (SMR)," *Energy & Process CFD Symposium*, Houston, Texas, May 17 – 18 (2017).
57. **Smith, J.D.**, (17-19 April 2017) "Estimated Flare Emissions Created During Flare Ignition Transient Operation - Introduction," *International Conference on Environmental Impacts of the Oil and Gas Industries: Kurdistan Region of Iraq as a Case Study* Invited Keynote: Koya, Kurdistan Region-Iraq, (Invited Keynote)
58. **Smith, J.D.** (17-19 April 2017) "Estimated Flare Emissions Created During Flare Ignition Transient Operation – Analysis and Conclusions," *International Conference on Environmental Impacts of the Oil and Gas Industries: Kurdistan Region of Iraq as a Case Study*: Koya, Kurdistan Region-Iraq, (Invited Keynote)
59. Al-Rubaye, H., Shivashankaraiah, M., Karambelkar, S., **Smith, J.D.** and Ghorbanian, M., "Process Waste Water Treatment in A High Rate Anaerobic Digestion Reactor (EGSB) Under Various Hydraulic Retention Times (HRTs)" *International Conference on Environmental Impacts of the Oil and Gas Industries: Kurdistan Region of Iraq as a Case Study* Invited Keynote: Koya, Kurdistan Region-Iraq, 17-19 April (2017).
60. Nagapurkar, P. and **Smith, J.D.**, "A review of the risks to water resources due to unconventional Shale gas development in the US - An application to the Kurdistan region of Iraq" *International Conference on Environmental Impacts of the Oil and Gas Industries: Kurdistan Region of Iraq as a Case Study* Invited Keynote: Koya, Kurdistan Region-Iraq, 17-19 April (2017).
61. **Smith, J.D.**, Jackson, R., Sreedharan, V., Suo-Anttila, A., Smith, Z., Allen, D. DeShazer, D. and Smith, S., "Safe Operation of Adjacent Multi-Point Ground Flares: Predicted and Measured Flame Radiation in Cross Flow Wind Conditions," *AFRC 2016 – Industrial Combustion Symposium*, Sheraton Kauai Resort, Kauai, Hawaii - September 9 –11 (2016).
62. **Smith, J.D.**, "Achieving Environmental Compliance through Proper Destruction Efficiency of Low-Profile Flare Systems," Invited Seminar, Brewer Science, Rolla, MO, 12 December (2016). (Invited)
63. **Smith, J.D.**, Rao, V.M., Landon, M., "Design Optimization of BioEnergy Combustion Systems Using Sculptor® with CFD," *2016 AIChE Annual Meeting*, San Francisco, CA November 14 (2016).
64. Yu, J., **Smith, J.D.**, "A Kinetic Model for Updraft Biomass Gasification by Aspen Plus," *2016 AIChE Annual Meeting*, San Francisco, CA November 14 (2016).
65. Al-Rubaye, H., **Smith, J.D.**, "Experimental Investigation on Expanded Granular Sludge Bed Reactor to Maximize the Methane Gas Production in the Biogas" *2016 AIChE Annual Meeting*, San Francisco, CA November 16 (2016).
66. Al-Rubaye, H., **Smith, J.D.**, "Fuel Gas Production from Grey Water Using a Hybrid Anaerobic Digestion- Biomass Gasification Energy System," *2016 AIChE Spring Meeting & 12th Global Congress on Process Safety*, Houston, TX April 10-14 (2016).
67. Hartvigsen, J., **Smith, J.D.**, "Optimization of Production of Syn-Gas, Methane, and Ethylene in Solid Oxide Electrochemical Reactors," *AIChE Annual Meeting*, Salt Lake City, UT, November 11 (2015).
68. Alembath, A., **Smith, J.D.**, "Multi-zonal Modeling of Biomass Gasifier using Aspen Simulation," *AIChE*

Meeting, Session: Advances in Biofuels, Salt Lake City, November (2015).

69. **Smith, J.D.**, Rao, V. Landon, M., "Advanced Design Optimization of Combustion Equipment for Bio-Energy Systems Using Sculptor® with CFD Tools," *8th Sino-US Joint Conference of Chemical Engineering*, Shanghai, China, October 12 – 16 (2015). (Invited)
70. **Smith, J.D.**, Gelles, G., Buchheit, K., Nagapurkar, P., "Resilient Energy through Hybridization in Microgrid Applications," *8th Sino-US Joint Conference of Chemical Engineering*, Shanghai, China, October 12 – 16 (2015). (Invited)
71. Alembath, A. and **Smith, J.D.**, "Optimizing Reactor Parameters in Ex-Situ Oil Shale Reactor," *Oil Shale Symposium*, Salt Lake City, October (2015).
72. **Smith, J.D.**, Jackson, R., Suo-Anttila, A., Hefley, K., Smith, Z.P., Wade, D., Smith, S., "Radiation Effects on Surrounding Structures from Multi-Point Ground Flares," *AFRC 2015 – Industrial Combustion Symposium*, Historic Fort Douglas Officers Club, University of Utah, Salt Lake City, Utah - September 9 –11 (2015).
73. **Smith, J.D.**, "Resilient Energy through Hybridization in Microgrid Applications," *International Conference on Smart Grid Technologies, Biomass gasification, Biopower generation, and Biofuels production*, Amrita Vishwa Vidyapeetham University, School of Engineering, Coimbatore, India, August 6-8 (2015). (Invited)
74. **Smith, J.D.**, "Tutorial on Biomass Gasification, Bioenergy and Biofuels," *International Conference on Smart Grid Technologies, Biomass gasification, Biopower generation, and Biofuels production*, Amrita Vishwa Vidyapeetham University, School of Engineering, Coimbatore, India, August 6-8 (2015). (Invited)
75. Alembath, A., **Smith, J.D.**, "Process Modeling of Shale Oil Extraction in Rotary Reactor using Aspen" *AIChE Meeting, Session: Unconventional Shale Oil*, Atlanta, November (2014).
76. **Smith, J.D.**, Jackson, R., Suo-Anttila, A., Smith, S., Allen, A., "Achieving Environmental Compliance through Proper Destruction Efficiency of Low-Profile Multi-Tip Flare Systems," *American Flame Research Committees 2014 – Industrial Combustion Symposium*, Hyatt Regency Hotel Houston, Texas - September 7 –10 (2014).
77. **Smith, J.D.**, Sreedharan, V., Rao, V., Landon, M., Smith, Z.P. "Advanced Design Optimization of Combustion Equipment Using Sculptor® with CFD Tools," *American Flame Research Committees 2014 – Industrial Combustion Symposium*, Hyatt Regency Hotel Houston, Texas - September 7 –10 (2014).
78. Rao, V.M., **Smith, J.D.**, "Coolant Flow Simulation in a Small Modular Reactor (SMR) Fuel Rod Assembly", *AIChE Annual Meeting*, San Francisco, CA, November 6 (2013).
79. Rao, V.M., **Smith, J.D.**, "Thermal-Hydraulic (T-H) Analysis of Impinging Jet Flows on the Pressurizer Plate in a Small Modular Reactor", *AIChE Annual Meeting*, San Francisco, CA, November 7 (2013).
80. Buchheit, K., **Smith, J.D.**, "Techno-Economic Analysis of a Sustainable Coal, Wind and Nuclear Hybrid Energy System," *AIChE Annual Meeting*, San Francisco, CA, November 5 (2013).
81. Golpour, H., **Smith, J.D.**, "Optimizing Rotary Reactor Parameters to Achieve Higher Process Yield in Ex-Situ Oil Shale Processing," *AIChE Annual Meeting*, San Francisco, CA, November 7 (2013).
82. Peterson. B.A., **Smith, J.D.**, "Techno-Economic Modeling and Analysis of Energy Storage Options for a Self-Sustained Solar PV Array," *AIChE Annual Meeting*, San Francisco, CA, November 7 (2013).
83. **Smith, J.**, "Small Modular Nuclear Reactors for In-Situ Recovery of Unconventional Hydrocarbons," *Invited Seminar for Saudi Chemical Engineering Society*, Riyadh, Saudi Arabia, February 9 (2013)
84. **Smith, J.**, "Teaching Safety in the Senior Capstone Process Design Class," *Department of Chemical*

- Engineering Seminar, Riyadh, Saudi Arabia, February 10 (2013)
85. **Smith, J.**, "Clean Fossil Based Hybrid Systems for Future Energy Technology," Seminar for King Abdullah City for Atomic and Renewable Energy, Riyadh, Saudi Arabia, February 10 (2013)
 86. **Smith, J.**, "Small Modular Nuclear Reactors for In-Situ Recovery of Unconventional Hydrocarbons," Saudi Chemical Engineering Society, Riyadh, Saudi Arabia, February 9 (2013)
 87. **Smith, J.D.**, Suo-Anttila, A., Jackson, R., Smith, S.K., "Prediction of Plume Formation and Dispersion from Gas Flares," *2012 Annual American Flame Research Committee Meeting*, Salt Lake City, Utah, September 5-7 (2012).
 88. Golpor, H., **Smith, J.D.**, "Addressing Commercialization Issues for an Ex-Situ Oil Shale Process by Addressing Critical Operational Issues", *32th Oil Shale Symposium*, Colorado School of Mines, Golden, Colorado, October 15-17 (2012).
 89. **Smith, J.D.**, "Clean Fossil Based Hybrid Systems for Future Energy Technology," Invited Lecture to The Saudi Chemical Engineering Society, Riyadh, Saudi Arabia, October 3 (2012).
 90. **Smith, J.D.**, "Chemical Engineering Process Design Capstone Course – ABET criteria," Invited Lecture to the College of Engineering, King Saud University, Riyadh, Saudi Arabia, October 2 (2012).
 91. **Smith, J.D.**, "Product and Process Design Capstone Course for Chemical Engineers," Invited Lecture to Department of Chemical Engineering, King Saud University, Riyadh, Saudi Arabia, October 2 (2012).
 92. **Smith, J.D.**, "Is Cheap Natural Gas a Sustainable Threat to Coal - What are the Issues driving this question?" *2012 CoalGen*, Louisville, KY, August 13-17 (2012). (invited plenary lecture)
 93. **Smith, J.D.**, Berg, L.D., Goldring, J.G., Billet, S. "Burner Stability and NOx Reduction in the Tulsa Power Plant," *AEP BRO Forum 2012 Optimizing our Future*, Columbus, OH, Thursday, August 9 (2012). (Invited lecture)
 94. Suo-Anttila, A., **Smith, J.D.** Berg, L.D., "Development and Application of an LES based CFD Code to Simulate Coal and Biomass Combustion in General Reactor Configurations," *9th European Conference on Industrial Furnaces and Boilers*, Estoril, Portugal, April 26-29 (2011)
 95. Berg, L.D., **Smith, J.D.**, Gerhold, B., "CFD Analysis of Oil/Water/Gas Separator" *Engineering the System, 2011 ANSYS Regional Conference*, Houston, Texas, August 31 - September 1 (2011)
 96. **Smith, J.D.**, Berg, L.D., "Increasing Slug Catcher Capacity with CFD", *Engineering the System, 2011 ANSYS Regional Conference*, Houston, Texas, August 31 - September 1 (2011)
 97. Suo-Anttila, A., **Smith, J.D.**, Berg, L.D., "Comparison and Application of an LES based CFD Code to Simulate Coal and Biomass Combustion in General Reactor Configurations", *ASME Power 2011*, Denver, CO, July 12-14 (2011)
 98. **Smith, J.D.** and Aumeier, S. "Increasing Awareness of Nuclear Power as an Alternative Source of Energy", *6th Annual Military Energy Alternatives*, Washington DC, February 23 (2011)
 99. **Smith, J.D.**, "Using Nuclear Heat for In-Situ Recovery of Unconventional Hydrocarbons: A Case for the High Temperature Gas Reactor (HTGR)", *30th Oil Shale Symposium*, Colorado School of Mines, Golden, Colorado, October 18-22 (2010)
 100. **Smith, J.D.**, Suo-Anttila, A., Smith, S.K., Philpott, N., "Prediction and Measurement of Flare Ignition," *American Flame Research Committees - International Pacific Rim Combustion Symposium Advances in Combustion Technology: Improving the Environment and Energy Efficiency*, Sheraton Maui, Hawaii - September 26 –29 (2010).
 101. **Smith, J.D.**, Boardman, R.D., Smoot, L.D., Omar, K., Coats, R.L., Hatfield, K.E., "Oil Shale Nuclear Hybrid Transportation Fuels," *29th Oil Shale Symposium*, Colorado School of Mines, Colorado Energy

Research Institute, October 19-23 (2009)

102. **Smith, J.D.**, Smoot, L.D., and Jackson, R.E., "Technical Foundations of New Performance Criteria for Efficient Operation of Industrial Steam-Assisted Gas Flares," *IFRF 16th International Members' Conference: Combustion and Sustainability - New Technologies, New Fuels, New Challenges*, Boston, Massachusetts June 8-10 (2009).
103. **Smith, J.D.**, Smoot, L.D., and Jackson, R.E., "Application of Hybrid Energy Systems to Manage Carbon Footprint and Reduce Environmental Impact of Energy Processes," *IFRF 16th International Members' Conference: Combustion and Sustainability - New Technologies, New Fuels, New Challenges*, Boston, Massachusetts June 8-10 (2009).
104. **Smith, J.D.**, Price, R., Chen, X., Hill, S.C., "Nitric Acid Plant Noise Reduction Using CFD and Acoustic Modeling," *23rd Annual ACERC Conference*, Provo, Utah, February 23 (2009).
105. **Smith, J.D.**, Berg, L.D., and Chen, X., "Solving Fossil Energy Problems: Approach and Application," *2008 ASME International Mechanical Engineering Congress IMECE2008*, Boston, Massachusetts, November 2 – 7 (2008).
106. **Smith, J.D.**, "Solving Problems for Fossil Energy Industry," *2008 Chongqing International Boiler Safety Operation and Energy-Saving and Emission Reduction Technology Conference*, Chongqing, People's Republic of China, April 19 (2008).
107. **Smith, J.D.**, "Design and Operation of Emission Control Equipment," *2008 Chongqing International Boiler Safety Operation and Energy-Saving and Emission Reduction Technology Conference*, Chongqing, People's Republic of China, April 19 (2008).
108. Berg, L.D., Chen, X., **Smith, J.D.**, Price, P., "Fluid Modeling for the Pipe-Line Industry," *PIPE LINERS CLUB OF TULSA*, November 17 (2008)
109. **Smith, J.D.**, Suo-Anttila, A., Smith, S.K., and Modi, J., "Evaluation of the Air-Demand, Flame Height, and Radiation Load on the Wind Fence of a Low-Profile Flare Using ISIS-3D," *AFRC-JFRC 2007 Joint International Combustion Symposium*, Marriott Waikoloa Beach Resort, Hawaii, October 21-24, (2007).
110. **Smith, J.D.**, Suo-Anttila, A., "A 3d Computer Code for Simulating Gas Flares Under a Variety of Wind Conditions," *2006 American Flame Research Committee International Symposium*, Houston, TX, October 16-18 (2006).
111. **Smith, J.D.**, Berg, L.D., Smith, S.K., "Comparing CFD Predicted Air Egression Rates into Flare Stacks to Estimates by Husa Methodology," *2006 American Flame Research Committee International Symposium*, Houston, TX, October 16-18 (2006).
112. **Smith, J.D.**, "From Research to Design – A Perspective View of CFD Modeling of Industrial Combustion Equipment," *19th Annual ACERC/ICES Conference*, Provo, Utah, February 17-18, (2005).
113. **Smith, J.D.**, "Detailed Analysis of PF Fired Coal Furnaces: Effect of Different Fuels," *2004 CoalGen*, Overland Park, Kansas, July 28 (2004).
114. **Smith, J.D.**, Henneke, M., Petersen, J., McDonald, J., Wilson, D., "CFD modeling ensures safe and environmentally friendly performance in Shell Claus Off-Gas Treating (SCOT) Unit," *AFRC-JFRC 2004 Joint International Combustion Symposium*, Maui, Hawaii, October 10-13, (2004).
115. **Smith, J.D.**, "Combustion Analysis of Environmental Issues in the Environmental Issues in the CPI/HPI," *American Flame Research Committee Spring Meeting*, Salt Lake City, Utah, March 18-19 (2004).
116. Henneke, M., Lewellen, J., **Smith, J.D.**, "Evaluating burner replacement projects using CFD," *Proceedings of the International Combustion Symposium: AFRC Ottawa, Canada*, May 8-10 (2002).

117. **Smith, J.D.**, "All You Ever Wanted to Know About CFD but were Afraid to Ask," AIChE Seminar on Combustion Technology, Baton Rouge, LA October 8 (2002)
118. **Smith, J.D.**, Henneke, M., Schnepfer, C., and Hixson, E.M., "Furnace Optimization using CFD," American Flame Research Committee Fall Meeting, Houston, TX, October 5-6 (2002).
119. **Smith, J.D.**, "Advanced Problem Solving Using Computational Fluid Dynamics at John Zink Company," Invited Seminar to College of Engineering, Chou University, Tokyo, Japan, October 2, (2002).
120. **Smith, J.D.**, Henneke, M., Schnepfer, C., and Lorra, M., "Application of Computational Fluid Dynamics to Industrial Opportunities at the John Zink Company," *Chemical Reaction Engineering VII: Computational Fluid Dynamics*, Quebec, Canada, August 6-11 (2000).
121. **Smith, J.D.**, "Computational Fluid Dynamics in the U.S. Chemical Process Industry," Invited Seminar to College of Engineering, Chou University, Tokyo, Japan, July 19, (1999).
122. **Smith, J.D.**, "Using Numerical Tools for Process Development in the Chemical Industry," Invited Lecture at the Workshop on Validation of Multiphase Combustion Models, National Institute of Standards & Technology (NIST), Gaithersburg, Maryland, June 8, (1999).
123. **Smith, J.D.** "CFD Modeling of Flame Processes: Turbulent Mixing Coupled with Detailed Reaction Kinetics," Invited lecture to Graduate School of Chemical Engineering, Colorado School of Mines, Golden, Colorado, September 26, (1997).
124. **Smith, J.D.**, Smith, P.J., Harvey, A., "Recent Developments in Computational Fluid Dynamics for the Chemical Processing Industry," Invited Lecture, *Basel World CFD User Days 1996: Third World Conference in Applied Computational Fluid Dynamics*, Freiburg, Germany, May 19 - 23, (1996).
125. Nelson, C.M., **Smith, J.D.**, Van Dell, R.D., Bonanno, A.S., and Solomon, P.R., "Comparison of Extractive and *In Situ* FT-IR Measurements During Incineration of Chlorinated Hydrocarbons," *Optical Remote Sensing for Environmental and Process Monitoring symposium*, San Francisco, California, September 27, (1995).
126. Van Dell, R.D., **Smith, J.D.**, "Determination of Near Flame Front Temperature and Chemical Composition using FTIR Spectroscopy," *Fourth International Congress on Toxic Combustion By-Products*, June 5-7, The University of California at Berkeley, Berkeley, California (1995).
127. **Smith, J.D.**, "Application of Computational Fluid Dynamics to Combustion Related Opportunities at The Dow Chemical Company," Invited Lecture to the Japanese Section of the World Users Association of Applied Computational Fluid Dynamics, Tokyo, Japan, November 15-16, (1994).
128. **Smith, J.D.** and Moreno, P.O., "Evaluation of an Industrial Thermal Oxidizer Burning Chlorinated Hydrocarbon Streams: Prediction and Experiment," Annual Fall meeting of the American Institute of Chemical Engineers, San Francisco, California, November 13-18 (1994).
129. **Smith, J.D.**, "Computational Fluid Dynamics for the Chemical Processing Industry," Invited Panel Member at Basel World CFD User Days: *Second World Conference in Applied Computational Fluid Dynamics*, Basel, Switzerland, May 1 to 5, (1994).
130. **Smith, J.D.**, "Application of Computational Fluid Dynamics to Industrial 'Opportunities' at The Dow Chemical Company," Invited Lecture at the Basel World CFD User Days: *Second World Conference in Applied Computational Fluid Dynamics*, Basel, Switzerland, May 1 to 5, (1994).
131. **Smith, J.D.**, Van Dell R.D., and Hixson, E.M., "Application of Computational Fluid Mechanics to Thermal Oxidizers," *Third International Congress on Toxic Combustion By-Products*, June 14-16, Massachusetts Institute of Technology, Cambridge, Massachusetts, (1993).
132. Ackermann, P., **Smith, J.D.**, and Tsatsaronis, G., "Development of an Expert System Data Base for

- NOx Control in Power Plants," Analysis of Thermal and Energy Systems, *Proceeding of the International Conference*, Athens, Greece, June 3-6, (1991).
133. **Smith, J.D.** "Study of High-Pressure Gasification Using the Advanced Process Simulation Software PCGC-2," Invited lecture to Graduate School of Chemical Engineering, Auburn University, Auburn, Alabama (1990).
134. **Smith, J.D.**, Smith, P.J., "Effect of Parametric Uncertainty on High Pressure Gasification Using Advanced Simulation Software," *Combined Western States/Canadian Sections/The Combustion Institute*, Banff, Canada, May (1990).
135. **Smith, J.D.**, Askew, N., Cothran, G., and Garrett, T., "Economic and Environmental Issues Related to an Integrated Tar Sands Processing Facility," *9th Miami International Congress on Energy and Environment*, Miami Beach, Florida, December 11-13 (1989).
136. **Smith, J.D.** and Henley, J.P., "Application of PCGC-2 to Opposed Gasifier Nozzles," Industrial Applications of ACERC Technology, Invited Lecture, *Third Annual Technical Review Meeting*, Advanced Combustion Engineering Research Center, Brigham Young University, Provo, UT (1988).
137. **Smith, J.D.**, Smith, P.J., and Hill, S.C., "Parametric Sensitivity Study of an Entrained-Flow Pulverized-fuel Combustion Model, *Western States Section/The Combustion Institute*, Honolulu, HI, November (1987).
138. **Smith, J.D.**, Smith, P.J., Smoot, L.D., and Rees, D.P., "Part I: Prediction of the Effects of Coal Quality on Utility Furnace Performance," *Third International Conference on Slagging and Fouling Due to Impurities in Combustion Gases*, Copper Mountain, CO, August (1984).

Online News Reports (14)

1. Posted by Kaitlin Brothers "[Ethanol: clean fuel, stronger economy – insights with S&T experts](#)" *Missouri University of Science and Technology, University News*, Picked up by MSN, June 2, 2025.
2. Posted in ChEnected by AIChE "[A Message from 2025 AIChE President Joseph D. Smith: It's Great to Be a Chemical Engineer in 2025](#)," published in Chemical Engineering Progress, (January 2025), picked up by NewsBreak, January 9, 2025
3. Posted by Greg Edwards "[Missouri S&T professor to serve as AIChE president](#)," *Missouri University of Science and Technology, University News*, November 13, 2024
4. Posted by Patrick Collins "[2023 Laufer Energy Symposium to highlight life-changing new energy technologies](#)," *Missouri University of Science and Technology, University News*, March 1, 2023
5. Posted by Sarah Potter "[Missouri S&T secures \\$2 million contract to develop engineering program in Kuwait](#)," *Missouri University of Science and Technology, University News*, March 12, 2019
6. Posted by Peter Ehrhard "[The power of recycling could fuel vehicles in the future](#)," *Missouri University of Science and Technology, University News*, September 19, 2017
7. Posted by Joe McCune "[Smith elected treasurer of national chemical engineering organization](#)," *Missouri University of Science and Technology, University News*, January 30, 2017
8. Posted by James Conca "[Can SMRs lead the US into a Clean Energy Future?](#)", Forbes Magazine, ENERGY, 16 February, 2015

9. Posted by Peter Ehrhard "[S&T modular reactor consortium funds two initiatives](#)," *Missouri University of Science and Technology, University News*, January 14, 2014
10. Posted by Jacob Barker "[Missouri utility still interested in nuclear](#)," Associated Press/St. Louis Post-Dispatch, Friday, August 15, 2014; Picked up by "Daily Journal Online", St. Paul, Minnesota; "Miami Herald>Business>Technology; The Sacramento Bee (www.sacbee.com) - wire technology
11. Posted by Peter Ehrhard "[New radio talk show to enlighten and energize](#)," *Missouri University of Science and Technology, University News*, November 22, 2013
12. Posted by Mary Helen Stoltz "[S&T to lead partnership with industry in modular reactor consortium](#)," *Missouri University of Science and Technology, University News*, July 29, 2013
13. Posted by Andrew Careaga "[Joseph Smith to lead Missouri S&T energy center](#)," *Missouri University of Science and Technology, University News*, August 29, 2012
14. Posted by Mary Helen Stoltz "[Idaho energy expert named Laufer Chair at S&T](#)," *Missouri University of Science and Technology, University News*, April 12, 2011

Broadcast Radio Show on NPR affiliate KMST (10)

Hosted and co-produced radio show broadcast on university's public radio station, **KMST**, called "**Energy Today**". Shows broadcasts focused on topics of global interest related to energy. Shows broadcast with date broadcast include:

1. "*Energy in Nepal*," interviewed: Jagan Nath Shrestha, founder, Center for Renewable Energy, Kathmandu, Nepal, Prem Paudel, Businessman, Nepal, Shyam Paudel, Student at Missouri S&T, citizen of Nepal; broadcast date: June 2015
2. "*Water, Energy, Fuel Nexus*," interviewed: Greg Gelles, Chair of Economics department, Missouri University of Science and Technology, Richard Darton, Professor Emeritus, Oxford University, Hank Kohlbrand, Dow Chemical (ret), Consultant; *Broadcast date*: February 2015
3. "*Alternative Fuels*," interviewed: Vince Memmott, Chief Technology Officer, Uinta Partners, Joe Hartvigsen, Researcher, Ceramitech; Broadcast date: December 2014
4. "*The Grid*," interviewed: Angela Rolufs, Director, Office of Sustainable Energy and Energy Efficiency, Missouri University of Science and Technology, Pourya Shamsi, Professor, Electrical Engineering, Missouri University of Science and Technology, Col. Paul Roege, U.S. Army (ret), Idaho National Laboratory; Broadcast date: October 2014
5. "*Coal*," interviewed: Jacob Williams, Peabody Energy, St. Louis, MO, Kimball Rasmussin, Deseret Power, South Jordan, Utah John Goldring, RJM International, Winchester, Hampshire, UK; Broadcast date: September 2014
6. "*Using Biomass for Energy*," interviewed: Sam Weaver, majority owner, Proton Power, Dr. Peter Becker, Forest Ecologist and Researcher; Broadcast date: June 2014
7. "*Nuclear Waste*," interviewed: Dr. Shannon Bragg-Sitton, Associate Lab Director, Idaho National Laboratory, Dr. Carlos Castano, Nuclear Engineering, Missouri University of Science and Technology; Broadcast date: May 2014

8. *“Energy in the Military,”* interviewed: Col. Steve Williamson, Southern Command, United States Army, Col. Paul Roege, (Retired Army) Idaho National Laboratory, Dr. Kevin Geiss, Deputy Asst. Secretary for Energy, USAF; Broadcast date: April 2014
9. *“Green Energy,”* interviewed: Steve O'Rourke, Vice President of Consulting Services – Microgrid, Joel Burken, Chair, Environmental Engineering, Missouri University of Science and Technology, Chris Neaville, Asset Development Director, Doe Run Corporation; Broadcast date: February 2014
10. *“Small Modular Nuclear Reactors,”* interviewed: Robin Rickman, Director, Westinghouse SMR Program, Warren Wood, Engineer and Policy Analyst, Ameren, MO
John Gahl, Bill Miller, Gayla Neumeyer, University of Missouri Nuclear Program; Broadcast date: January 2014

Special Research Symposium Organized and Hosted (7)

Smith, J.D., *4th International Laufer Energy Symposium*, Marrakesh, Morocco, jointly sponsored by Missouri University of Science and Technology, University Mohammed VI Polytechnic, Applied Chemistry & Engineering Research (ACER), TechCell, INNOVX, OCP, University of Illinois – Urbana-Champaign, Pittsburgh Technical, Gulf University of Science and Technology, May 7 - 9, 2025. Selected Invited Speakers: [Paul Roege](#) (Director, Advanced Nuclear and Production Experts Group), [Benj Conway](#) (CEO and Co-Founder, Zap Energy), [Dr. Bassam Alameddine](#) (President, Gulf University for Science and Technology), <https://laufer2025.mst.edu/>

Smith, J.D., *3rd Laufer Energy Symposium*, St. Louis, Missouri, jointly sponsored by Missouri University of Science and Technology, Washington University in St. Louis, University of Illinois-Urbana/Champaign, Gulf University of Science and Technology, and Elevated Analytics Consulting, March 30 – April 1, 2023. Selected Invited Speakers: [Alex Epstein](#) (**Center for Industrial Progress**), [Dr. John Wagner](#) (Director, Idaho National Laboratory), [Dr. Ryan Umstatt](#) (Vice President of Product and Partnerships, Zap Energy), [Dr. Bassam Alameddine](#) (President, Gulf University for Science and Technology), [Wayne McFarland](#) (CEO, SynTech Bioenergy, LLC), [Dr. Richard Axelbaum](#) (Professor, Washington University in St. Louis), [Gale Hauck](#) (Senior Advisor, Office of Nuclear Energy, U.S. Department of Energy) <https://lauferenergy.mst.edu>

Smith, J.D., *“2nd Laufer Energy Symposium”*, St. Louis, Missouri, Jointly Sponsored by Missouri Energy Initiative, American Institute of Chemical Engineers, Missouri University of Science and Technology, October 4-5, 2016. Selected Invited Speakers: [Alex Epstein](#) (**Center for Industrial Progress**), [Michael Webber](#) (**University of Texas Austin**), [Sid Green](#) (Univ. of Utah), [Joe Abrenio](#) (**Midwest Cybersecurity Alliance and Delta Risk**). <http://www.moenergy.org/mepc/>

Smith, J.D., *“1st Laufer Energy Symposium”*, St. Louis, Missouri, Jointly Sponsored by Boeing Corporation/ Ameren Corporation/ Missouri University of Science and Technology, April 3-5, 2013. Selected Invited Speakers: COL P. Roege (**US ARMY**), John Eash (**Boeing Military Aircraft**), Warren Wood (**Ameren**), David Hughes (**Global Sustainability Research Inc.**), Dan Rastler (**EPRI**) <http://lauferenergy.mst.edu/pastsymposiums/>

Smith, J.D., "*Incineration of Chlorinated Hydrocarbon Wastes*," Freeport, Texas, Jointly Sponsored by ER/MD Laboratory / Cooperative Research of The Dow Chemical Company, May 7 (1996).
Invited Speakers: E. Altwicker, R. Addink – Rennecker Polytechnic Institute; C. Presser – National Institute of Standards and Technology; P.J. Smith – The University of Utah; C.W. Lipp – The Dow Chemical Company

Smith, J.D., "*Formation of Products of Incomplete Combustion During RCl Incineration*," Midland, MI, Jointly Sponsored by ER&PD Laboratory / External Research of The Dow Chemical Company, January 10 (1995). Invited Speakers: B. Dellinger – University of Dayton; M.M. Tirtowidjojo, R.F. Cope – The Dow Chemical Company; P.J. Smith – The University of Utah

Smith, J.D., Thompson, T., "*Incineration of Chlorinated Hydrocarbon Wastes*," Midland, MI, Jointly Sponsored by ER&PD Laboratory / Cooperative Research of The Dow Chemical Company, February 22 (1994). Invited Speakers: P.R. Westmoreland - University of Massachusetts; E.M. Hixson, M.M. Tirtowidjojo, R.D. Van Dell - The Dow Chemical Company; P.J. Smith – The University of Utah.

SUPERVISED STUDENTS (25)

1. **Alexander Alonzo** "*Biodigester/ Biomass Gasification Hybrid Energy System*," Master's Thesis, In Progress.
2. **Katarina Zagorac**, *Graphene Analysis and Characterization*," *Master's Thesis. #*, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2025).
3. **Paul Ani** "*Production of Graphene using Biochar in an Ultrasonic Reactor*," *Doctoral Dissertation*, Chemical and Biochemical Engineering, Missouri University of Science and Technology, (In progress).
4. **Ahmed Maarooif** "*Analysis and Development of an Aerodynamically Controlled High Efficient Air Flare for Low Flow Conditions*," *Doctoral Dissertation*, Oil and Gas Engineering, Koya University, Koya, Kurdistan region of Iraq (Fall 2024).
5. **Hasan Jawad Hammood Al-Abedi** "*Investigating the Potential of Blended Feedstocks for Biofuel Production via Pyrolysis Process: Experimental and Aspen Simulation Approach*," *Doctoral Dissertations. 3342*, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2024);
https://scholarsmine.mst.edu/doctoral_dissertations/3342.
6. **Rania Almusafir** "*Improving Syngas Quality in a Downdraft Biomass Gasifier with Blended Feedstocks*," *Doctoral Dissertation. 3344*, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2024);
https://scholarsmine.mst.edu/doctoral_dissertations/3344.
7. **Ghana "Shyam" Paudel** "*Novel Supercritical biodiesel plant design and process scale-up*," *Doctoral Dissertations. 3286*, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2024);
https://scholarsmine.mst.edu/doctoral_dissertations/3286.
8. **Hayder Alhameedi**, "*Development and Testing of a new air-assisted flare system for low flow conditions*," *Doctoral Dissertations. 3210*, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2022);
https://scholarsmine.mst.edu/doctoral_dissertations/3210.

9. **Anand Alembath** "Investigation of Urea Decomposition and Deposit Formation in Diesel Exhaust After-Treatment System," *Doctoral Dissertations*. 3085 Chemical and Biochemical Engineering, Missouri University of Science and Technology (Summer, 2020); https://scholarsmine.mst.edu/doctoral_dissertations/3085.
10. **Jermey Hartvigsen** "Process intensification of fuel synthesis and electrolysis," *Doctoral Dissertations*. 2951, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Fall, 2020); https://scholarsmine.mst.edu/doctoral_dissertations/2951.
11. **Aso Hassan** "Comprehensive study of bio-diesel continuous flow synthesis," *Doctoral Dissertations*. 3037, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2020); https://scholarsmine.mst.edu/doctoral_dissertations/3037.
12. **Han Zhang** "Developing and evaluating a partition-cavity solar thermochemical reactor for syngas production via computational fluid dynamics," *Doctoral Dissertations*. 2798, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2019); https://scholarsmine.mst.edu/doctoral_dissertations/2798.
13. **Prashant Nagapurkar**, "Techno-economic optimization and environmental life cycle assessment of microgrids using genetic algorithm and artificial neural networks" *Doctoral Dissertations*. 2787, Chemical and Biochemical Engineering, Missouri University of Science and Technology, (Spring 2019); https://scholarsmine.mst.edu/doctoral_dissertations/2787.
14. **Jia Yu** "Experimental and numerical investigation on tar production and recycling in fixed bed biomass gasifiers," *Doctoral Dissertations*. 2693, Chemical and Biochemical Engineering, Missouri University of Science and Technology, (Spring 2018); https://scholarsmine.mst.edu/doctoral_dissertations/2693.
15. **Haider Al-Rubaye** "Process simulation and experimental investigation of biofuel production in a high-rate anaerobic digestion process," *Doctoral Dissertations*. 2664, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2018); https://scholarsmine.mst.edu/doctoral_dissertations/2664.
16. **Shadha Khalid Jebur**, "Carbon black production, analyzing and characterization," *Master's Theses*. 7869, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2018); https://scholarsmine.mst.edu/masters_theses/7869.
17. **Manohar Manchenahalli Shivashankaraiah**, "Recycling effect in expanded granular sludge bed reactor and implementation of Six Sigma in a methane generation process," *Master's Theses*. 7768, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2018); https://scholarsmine.mst.edu/masters_theses/7768.
18. **Shruti Karambelkar** "Effect of variation of parameters on biogas production using Aspen Plus & Dynamic Simulation using Mimic," *Master's Theses*. 7764, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2018); https://scholarsmine.mst.edu/masters_theses/7764.
19. **Rajesh Ramkrushna Patharabe** "Design and modeling of an aluminum smelting process to analyze aluminum smelter and identify the alternative uses of nuclear power small modular reactor," *Master's Theses*. 7860, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2017); https://scholarsmine.mst.edu/masters_theses/7860.

20. **Hasan Golpour** "Design, fabrication, operation and Aspen simulation of oil shale pyrolysis and biomass gasification process using a moving bed downdraft reactor," *Doctoral Dissertations*. 2474, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2016); https://scholarsmine.mst.edu/doctoral_dissertations/2474.
21. **Sai Chandra Teja Boravelli**, "Design, scale-up, six sigma in processing different feedstocks in a fixed bed downdraft biomass gasifier," *Master's Theses*. 7592, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Fall 2016); https://scholarsmine.mst.edu/masters_theses/7592.
22. **Anand Alembath** "Aspen simulation of oil shale and biomass process," *Master's Thesis*. 7493, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring, 2016); https://scholarsmine.mst.edu/masters_theses/7493.
23. **Kyle Buchheit** "Process design, dynamics, and techno-economic analysis of a sustainable coal, wind, and small modular nuclear reactor hybrid energy system," *Doctoral Dissertations*. 2439, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Fall 2015); https://scholarsmine.mst.edu/doctoral_dissertations/2439.
24. **Brian Peterson** "Techno-economic and life-cycle modeling and analysis of various energy storage technologies coupled with a solar photovoltaic array," *Master's Theses*. 7269, Chemical and Biochemical Engineering, Missouri University of Science and Technology (Spring 2014); https://scholarsmine.mst.edu/masters_theses/7269.
25. **Uday Guntupalli** "Technical Modeling and Control System Development of Hybrid Energy System Using Coal, Nuclear, Wind and Diesel," *Master's Theses*. 7375, Electrical Engineering, Missouri University of Science and Technology (Summer 2013); https://scholarsmine.mst.edu/masters_theses/7375.