

**Kyle James Daun, PhD, PEng
Curriculum Vitae**

Associate Professor
Department of Mechanical and Mechatronics Engineering
University of Waterloo
200 University Ave. W., Waterloo ON, N2L 3G1

CITIZENSHIP: Canadian

EDUCATION AND EXPERIENCE

PhD, 2003, Mechanical Engineering, The University of Texas at Austin
MAsc, 1999, Mechanical Engineering, University of Waterloo
BSc (with Distinction), 1997, Mechanical Engineering, University of Manitoba

PROFESSIONAL MEMBERSHIPS

Professional Engineers Ontario, Sigma Xi, American Society of Mechanical Engineers

PROFESSIONAL EXPERIENCE

**Department of Mechanical and Mechatronics Engineering,
University of Waterloo**

Associate Professor (July 2013-Present)
Assistant Professor (November 2007-July 2013)

**Centre for Nanointegration Duisburg Essen (CENIDE),
University of Duisburg-Essen**

DFG Mercator Visiting Professor (April 2016-Present)

**School for Advanced Optical Technologies (SAOT)
Friedrich Alexander University Nürnberg Erlangen**

Visiting Professor (January-March 2016)

Department of Mechanical Engineering, University of Ottawa

Part-Time Professor (September 2006-December 2006)

Department of Mechanical Engineering, The University of Texas at Austin

Lecturer (January 2004-April 2004)
Doctoral Candidate (September 1999-December 2003)

CONSULTING WORK

GenTex Oilfield Mfg., Red Deer AB (2009-2010)
Tangent Consulting, Calgary AB (2009-2012)
Royal Canadian Mounted Police, Ottawa ON (2007-2008)
International Sematech, Inc., Austin TX (2003)
Innocentre Alberta, Calgary AB (2003)

HONOURS, AWARDS, AND SCHOLARSHIPS

External Research and Service Awards

DFG Mercator Fellow, University of Duisburg-Essen	
<ul style="list-style-type: none">Supports long-term collaboration with the Centre for Nanointegration Duisburg Essen (CENEDE), funded by the German Research Foundation	2016-2018
Scientific Council of the International Centre for Heat and Mass Transfer	2016
<ul style="list-style-type: none">Elected by current members of the ICHMT scientific council	
Alexander von Humboldt Foundation Research Fellow	
<ul style="list-style-type: none">One of the most prestigious research awards in Germany, funds continuing collaboration with German academic institutions	2015
Spotlight on Optics, Optics Society of America	
<ul style="list-style-type: none">Applied Optics paper "Laser-Absorption Tomography Beam Arrangement Optimization using Resolution Matrices" recognized by the OSA editorial board	2012
Journal of Quantitative Spectroscopy and Radiative Transfer (JQSRT) Young Scientist Award (now Ray Viskanta award)	2010
<ul style="list-style-type: none">Awarded to the top international researcher in radiation heat transfer under 36 years of age	
ASME Journal of Heat Transfer Outstanding Reviewer Award	2012
Journal of Quantitative Spectroscopy and Radiative Transfer (JQSRT) Top Reviewer Award	2009, 2014

University of Waterloo Awards

Faculty of Engineering Teaching Excellence Award	2014
Faculty of Engineering Outstanding Performance Award	2013
<ul style="list-style-type: none">Awarded for outstanding teaching and research	
Faculty of Engineering Distinguished Performance Award	2011
<ul style="list-style-type: none">Awarded for outstanding teaching and research	

Scholarships and Fellowships

NSERC Postdoctoral Fellowship (\$45,000/a)	2004-2007
<ul style="list-style-type: none">Tenured at the National Research Council Canada	
Nominee, Outstanding Dissertation Award, UT Austin	2003
<ul style="list-style-type: none">One of 18 dissertations nominated across all graduate programs	
Houston Endowment President's Excellence Fellowship, UT Austin	2002-2003
<ul style="list-style-type: none">\$20,000 + tuition and fees. One of approximately 20 named graduate fellowships awarded annually at UT Austin.	
Professional Development Award, UT Austin (\$500)	2002
David Bruton Jr. Graduate School Fellowship, UT Austin (\$1,000)	2000
NSERC PGS B Scholarship (~\$19,000/a)	1999-2001
Graduate Scholarship, University of Waterloo (\$500)	1998, 1999
Dean's Honor Roll, Faculty of Engineering, University of Manitoba	1994-1997

RESEARCH AND SCHOLARSHIP*

Research Overview

My main research focus is on **inverse analysis**, and its application in three theme areas:

Laser-based nanoparticle diagnostics: There are many cases in which laser-based diagnostics are used to characterize the size and morphology of aerosolized nanoparticles: for example, to assess the compliance of combustion devices to environmental regulations, or to control gas-phase reactors used to synthesize engineered nanoparticles.

Time-resolved laser-induced incandescence (TiRe-LII) is a technique for determining the size and concentration of aerosolized nanospheres. In this diagnostic, a laser pulse heats the nanoparticles within a sample volume of aerosol, and their spectral incandescence is then measured at multiple wavelengths as they return to the ambient gas temperature. Since larger nanoparticles cool more slowly than smaller ones, the nanoparticle size distribution can be inferred by regressing a modeled temperature decay to pyrometrically-defined values. Interpreting TiRe-LII data requires two models: a spectroscopic model that relates the spectral incandescence to the nanoparticle temperature; and a heat transfer model that relates the temperature decay to the nanoparticle size. My research focuses on developing these models, along with inverse analysis techniques for inferring temperature, nanoparticle size, and other quantities from the TiRe-LII data.

My research group has mainly focused on extending the capabilities of TiRe-LII to include synthetic aerosols, which are important in a wide range of fields including photovoltaics, biomedical imaging, and novel cancer therapies. The functionality of these nanoparticles strongly depend on size, so there is a pressing need for an instrument that can make temporally- and spatially-resolved measurements of nanoparticle sizes and concentrations in a gas-phase reactor. One of the key challenges in extending TiRe-LII to new aerosols is the need to quantify the thermal accommodation coefficient, TAC, which defines the average energy transferred when a gas molecule scatters from the surface of a laser-energized nanoparticle. To this end, my students and I have extended a molecular dynamics procedure I conceived for investigating soot aerosols^{35,37} to metal and silicon aerosols¹⁹, using ab initio gas-surface potentials. We have validated these results through TiRe-LII measurements carried out in my laboratory^{12,62}, which also provide valuable insight into the fundamental physics underlying gas-surface scattering. We have also collaborated with the Center of Nanointegration Duisburg Essen (CENIDE), to carry out the first experimental LII measurements of silicon nanoparticles formed in a plasma reactor¹⁸. This ongoing collaboration is supported by the Alexander von Humboldt Foundation as well as German Research Foundation (DFG) through a Mercator Visiting Professorship. Finally, we are currently collaborating with the National Research Council's Institute for National Measurement Standards (NRC-INMS) to develop Bayesian techniques for inferring the concentration of aerosolized black carbon from LII data, along with associated uncertainties⁷.

In many scenarios aerosolized nanospheres (primary particles) agglomerate into fractal-like aggregates. The electromagnetic, chemical, and transport properties of the aerosol depend on the aggregate size and fractal structure. Since the angular distribution of light scattered by an aggregate depends uniquely on its size and structure, in principle these parameters can be inferred from multiangle elastic light scattering (MAELS) measurements. Most aerosols contain a range of aggregate sizes, however, and interpreting angular scattering data is complicated by the fact that the measured light scattering is due to contributions from a range of aggregate sizes. In this scenario the inference problem is mathematically ill-posed, since many candidate distributions exist that can explain the data within experimental resolution. We have shown how the measurement data can be combined with prior information to obtain statistically-robust estimates³¹, and how to arrange the detectors so that the ill-posedness is minimized²⁵. Most recently we have partnered with the Lehrstuhl für Technische Thermodynamik (LTT) at the Friedrich Alexander University Nürnberg Erlangen to develop Bayesian techniques for analyzing data from their Wide Angle Elastic Light Scattering (WALS) apparatus¹. This interaction is also sponsored by the Alexander von Humboldt Foundation.

Chemical Species Tomography: Chemical species tomography is used to make spatially- and temporally-resolved gas species concentration measurements in a wide-range of engineering

*Reference numbers correspond to submitted and published journal and conference papers listed below

applications, e.g. the air/fuel mixing in next-generation automotive and gas turbine engines. This diagnostic exploits the fact that gas species selectively absorb specific wavelengths of light. An array of collimated light sources are used to make simultaneous line-of-sight-attenuation measurements across the flow field, which are then used to tomographically reconstruct the concentration distribution of the target species. Because the number of measurement paths is limited, the LOSA data must be augmented with assumed information about the concentration distribution. My research group is presently developing algorithms that enhance reconstruction accuracy by incorporating information about the turbulent flow physics into a Bayesian inference procedure^{8,28,34}. Reconstruction accuracy also depends strongly on how the beams are arranged throughout the flow field, and to this end we have developed algorithms for finding the beam arrangement that maximizes the information content of the LOSA data^{3,22}; one of these papers²² was designated a “Spotlight on Optics” by the Optical Society of America.

I have disseminated this research through several invited/keynote seminars^{151,153}, and a recent book chapter¹⁵⁶. Current research is focused on developing the world’s first broadband CST technology to measure fugitive emissions from Canada’s oil and gas sector in collaboration with Imperial Oil^{110,117}.

Heat Transfer in Materials Processing: I am presently collaborating Cosma, a division of Magna International, to develop Hot Forming Die Quenching (HFDQ), a technique for manufacturing lightweight, ultra-strong automotive parts. In HFDQ, ultrahigh strength steel sheets (blanks) are first austenitized in a furnace, and then stamped into a desired shape and held within the die while the blanks cool. The as-formed properties of the part are a function of the quenching rate, which in turn depends on the heat transfer coefficient between the part and the die. Since this parameter cannot be measured directly, my research group developed a technique for inferring this parameter from the transient response of a subsurface thermocouple within the die^{17,20}, which involves solving an inverse problem.

While most international efforts have focused on the stamping phase of HFDQ, we are currently working with Cosma to improve the performance of their roller hearth furnaces. Much of this work involves characterizing the thermophysical properties of Usibor[®] 1500P, 22MnB5 steel with a protective Al-Si coating, as it is heated in a furnace. To this end we have developed novel techniques to characterize the spectral emissivity of the Al-Si coating as it is transformed in a Gleeble thermomechanical simulator^{2, 9}, and the latent heat of austenitization of the substrate 22MnB5 through inverse analysis and calorimetry¹⁰. These results will be used to optimize roller hearth furnace processing, which are the mainstay of industrial HFDQ lines.

We are also developing an alternative non-furnace blank-heating technology with F&P Mfg. Inc., in which the Usibor blanks are heated by bringing them into contact with an electrically-heated nickel steel monolith. Preliminary results show that the 22MnB5 can be fully-austenitized within 30 seconds⁶ (compared to 5 minutes in a roller hearth furnace), while incomplete austenitization can be used to tailor the as-formed material properties by using die inserts having different thermal effusivities⁶³. Present work is focused on combining the heating and forming dies into a single hydraulic press, greatly simplifying the HFDQ process¹⁰⁷.

A. Journal Publications^{1,2}

1. F Huber, S Will, KJ Daun, "Sizing Aerosolized Fractal Nanoparticle Aggregates through Bayesian Analysis of Wide-Angle Light Scattering (WALS) Data", submitted to JQSRT.
2. **C-J Shi**, KJ Daun, MA Wells, 2016, "Evolution of the Spectral Emissivity and Phase Transformations of the Al-Si Coating on Usibor® 1500P Steel during Austenitization" submitted to Met. Trans. B.
3. **SJ Grauer**, **PJ Hadwin**, KJ Daun, 2016, A Stochastic Approach to the Design of Chemical Species Tomography Experiments, submitted to Appl. Opt.
4. KJ Daun, 2016, "Discussion of 'Normal Spectral Emissivity Measurement of Liquid Iron and Nickel Using Electromagnetic Levitation in Direct Current Magnetic Field.'" Met. Trans. A, in press (DOI 10.1007/s11661-016-3527-2).
5. **PJ Hadwin**, **G Galindo**, KJ Daun, M Zarartu, B Erath, E Cataldo, S Peterson, Non-Stationary Bayesian Estimation of Parameters from a Body Cover Model of the Vocal Folds" J. Acoust. Soc. Am., 139, pp. 2683-2696.
6. **JN Rasera**, KJ Daun, **C-J Shi**, M d'Souza, 2016, "Direct Contact Heating for Hot Forming Die Quenching," Appl. Therm. Eng., 98, pp. 1165–1173.
7. **PJ Hadwin**, **TA Sipkens**, KJ Daun, KA Thomson, F Liu, 2016, "Quantifying Uncertainty in Soot Volume Fraction Estimates using Bayesian Inference of Auto-Correlated Laser-Induced Incandescence Measurements," Appl. Phys. B, 122, pp. 1-16.
8. KJ Daun, **SJ Grauer**, **PJ Hadwin**, 2016, "Chemical Species Tomography of Turbulent Flows: Discrete Ill-posed and Rank Deficient Problems and the use of Prior Information," JQSRT, 172, 58–74
9. **C-J Shi**, KJ Daun, MA Wells, 2015, "Spectral Emissivity Characteristics of the Usibor® 1500P Steel during Austenitization in Argon and Air Atmospheres," Int. J. Heat Mass Trans., 91, pp. 818-828.
10. **KS Jhajj**, SR Slezak, KJ Daun, 2015, "Inferring the Specific Heat of an Ultra-high Strength Steel during the Heating Stage of Hot Forming Die Quenching, through Inverse Analysis," Appl. Therm. Eng., 83, pp. 98-107.
11. **F Memarian**, F Liu, KJ Daun, KA Thomson, DR Snelling, GJ Smallwood, 2015, "Effect of Recondensation of Sublimed Species on Nanoparticle Temperature Evolution in Time-Resolved Laser-Induced Incandescence," Appl. Phys. B, 119, pp. 607-620.
12. **TA Sipkens**, **NR Singh**, KJ Daun, N Bizmark, M Ioannidis, 2015, "Examination of the Thermal Accommodation Coefficient used in the Sizing of Iron Nanoparticles by Time-Resolved Laser-Induced Incandescence," Appl. Phys. B, 119, pp. 561-575.
13. **SJ Grauer**, **EJFR Caron**, **NL Chester**, MA Wells, KJ Daun, 2015, "Investigation of Melting in the Al–Si Coating of a Boron Steel Sheet by Differential Scanning Calorimetry," J. Mater. Process. Tech., 216, pp. 89–94.
14. JW Labahn, CB Devaud, **TA Sipkens**, KJ Daun, 2014, "Inverse Analysis and Regularisation in Conditional Source-Term Estimation Modelling," Combust. Theor. Model., 18, pp. 474-499.
15. **MG Twynstra**, KJ Daun, SL Waslander, 2014, "Line-of-Sight-Attenuation Chemical Species Tomography through the Level Set Method," JQSRT 143, 25–34.
16. **F Memarian**, KJ Daun, 2014, "Gas Dynamics of Sublimed Nanoclusters in High Fluence Time-Resolved Laser-Induced Incandescence," Num. Heat Trans. B 65, 393-409.

¹ Boldfaced authors denote supervised students

² Author order denotes significance of contribution to publication

17. **EJF Caron**, KJ Daun, MA Wells, 2014, "Experimental Heat Transfer Coefficient Measurements during Hot Forming Die Quenching of Boron Steel at High Temperatures," *Int. J. Heat Mass Trans.* 71 396–404.
18. **TA Sipkens**, N. Petermann, KJ Daun, JT Titantah, M Karttunen, H Wiggers, T Dreier, C Schulz, 2014, "In Situ Particle Size Measurements of Aerosolized Silicon Nanoparticles by Time-Resolved Laser-Induced Incandescence," *Appl. Phys. B.* 116, 623-636
19. KJ Daun, **TA Sipkens**, JT Titantah, M Karttunen, 2013, "Thermal Accommodation Coefficients for Laser-Induced Incandescence Sizing of Metal Nanoparticles in Monatomic Gases," *Appl. Phys. B:* 112, 409-420.
20. **EJF Caron**, KJ Daun, MA Wells, 2012, "Experimental Characterization of Heat Transfer Coefficients during Hot Forming Die Quenching of Boron Steel," *Met. Tran. B*, 44, 332-343
21. **TA Sipkens**, **G Joshi**, KJ Daun, Y Murakami, 2012, "Sizing of Molybdenum Nanoparticles using Time-Resolved Laser-Induced Incandescence," *ASME J. Heat Trans.* 135, 052401.
22. **MG Twynstra**, KJ Daun, 2012, "Laser-Absorption Tomography Beam Arrangement Optimization using Resolution Matrices," *Appl. Opt.* 51 7059–7068. (Selected as a "Spotlight on Optics" by the Optics Society of America editorial board.)
23. KJ Daun, **SC Huberman**, 2012, "Influence of Particle Curvature on Transition Regime Heat Conduction from Aerosolized Nanoparticles," *Int. J. Heat Mass Trans.* 55, 7668–7676.
24. KJ Daun, JT Titantah, M Karttunen, 2012, "Molecular Dynamics Simulation of Thermal Accommodation Coefficients for Laser-Induced Incandescence Sizing of Nickel Particles," *Appl. Phys. B* 107, 221-228.
25. **DW Burr**, KJ Daun, KA Thomson, GJ Smallwood, 2012, "Optimization of Measurement Angles for Soot Aggregate Sizing by Elastic Light Scattering, through Design-of-Experiment Theory," *JQSRT* 113, 355-365.
26. M Salehi, WK Busch, KJ Daun, 2011, "Application of Conditional Source-term Estimation model for Turbulence-Chemistry Interactions in a Premixed Flame," *Combust. Theor. Model.* 16, 301-320.
27. **AP Horsman**, KJ Daun, 2011, "Design Optimization of a Two-Stage Porous Radiant Burner through Response Surface Modeling," *Num. Heat Trans. A* 60, 727-745.
28. KJ Daun, SL Waslander, **BB Tulloch**, 2011, "Infrared Species Tomography of a Transient Flow Field using Kalman Filtering," *Appl. Opt.* 50, 891-900.
29. **AJ Marston**, KJ Daun, MR Collins, 2011, "Geometric Optimization of Radiant Enclosures containing Specularly-Reflecting Surfaces through Quasi Monte Carlo Simulation," *Num. Heat Trans. A* 59, 81-97
30. A Ashrafizadeh, R Mehdipour, KJ Daun, C Aghanajafi, 2011, "Dynamic Optimization of a Radiation Paint Cure Oven Using the Nominal Cure Point Criterion," *Drying Tech.*, 28, 1405-1415.
31. **DW Burr**, KJ Daun, O Link, KA Thomson, GJ Smallwood, 2010, "Determination of the Soot Aggregate Size Distribution from Elastic Light Scattering through Bayesian Inference," *JQSRT* 112, 1099-1107.
32. **AJ Marston**, KJ Daun, MR Collins, 2010, "Geometric Optimization of Concentrating Solar Collectors using Monte Carlo Simulation," *ASME J. Solar Energy Eng.* 132, 041002.
33. KJ Daun, 2010, "Effect of Selective Accommodation on Soot Aggregate Shielding in Time-Resolved Laser-Induced Incandescence Experiments," *ASME J. Heat Trans.* 132, 091202.
34. KJ Daun, 2010, "Infrared Species Limited Data Tomography through Tikhonov Reconstruction," *JQSRT* 111, 105-115.

35. KJ Daun, 2009, "Thermal Accommodation Coefficients between Polyatomic Gas Molecules and Soot in Laser-Induced Incandescence Experiments," *Int. J. Heat Mass Trans.* 52, 5081-5089.
36. MA Wells, KJ Daun, 2009, "Accurate Determination of Surface Heat Fluxes during Water Quench Operations Characterized by Boiling Water Heat Transfer," *J. ASTM Int.* 6, 10.1520/JAI101818.
37. KJ Daun, GJ Smallwood, F Liu, 2008, "Molecular Dynamics Simulations of Translational Thermal Accommodation Coefficients for Time-Resolved LII," *Appl. Phys. B* 94, 39-49.
38. KJ Daun, GJ Smallwood, F Liu, 2008, "Investigation of Thermal Accommodation Coefficients using Laser-Induced Incandescence," *ASME J. Heat Trans.* 130, 121201.
39. KJ Daun, KA Thomson, F Liu, 2008, "Simulation of Laser-Induced Incandescence Measurements in an Anisotropically Scattering Aerosol Through Backward Monte Carlo," *ASME J. Heat Trans.* 130, 112701.
40. **EO Åkesson**, KJ Daun, 2008, "Parameter Selection Methods for Axisymmetric Flame Tomography through Tikhonov Regularization," *App. Opt.* 47, 407-416.
41. KJ Daun, BJ Stagg, F Liu, GJ Smallwood, DR Snelling, 2007, "Determining Aerosol Particle Size Distributions using Time-Resolved Laser-Induced Incandescence," *App. Phys. B* 87, 363-372.
42. F Liu, KJ Daun, V Beyer, GJ Smallwood, DA Greenhalgh, 2007, "Some Theoretical Considerations in Modeling Laser-Induced Incandescence at Low-Pressures," *App. Phys. B* 87, 179-191.
43. F Liu, KJ Daun, DR Snelling, GJ Smallwood, 2006, "Heat Conduction from a Spherical Nano-Particle: Status of Modeling Heat Conduction in Laser-Induced Incandescence," *App. Phys. B* 83, 355-382.
44. KJ Daun, KA Thomson, F Liu, GJ Smallwood, 2006, "Deconvolution of Axisymmetric Flame Properties using Tikhonov Regularization," *App. Opt.* 45, 4638-4646.
45. KJ Daun, F França, M Larsen, G Leduc, JR Howell, 2006, "Comparison of Methods for Inverse Design of Radiant Enclosures," *ASME J. Heat Trans.* 128, 269-282.
46. KJ Daun, SB Beale, F Liu, GJ Smallwood, 2006, "Radiation Heat Transfer in Planar SOFC Electrolytes," *J. Power Sources* 157, 302-310.
47. KJ Daun, DP Morton, JR Howell, 2005, "Smoothing Monte Carlo Exchange Factors through Constrained Maximum Likelihood Estimation," *ASME J. Heat Trans.* 127, 1124-1128.
48. KJ Daun, JR Howell, 2005, "Methods for Inverse Design of Radiant Transfer Systems," *JQSRT* 93, 43-60.
49. KJ Daun, JR Howell, DP Morton, 2004, "Optimization of Heater Settings to Provide Spatially-Uniform Transient Heating in Manufacturing Processes involving Radiant Heating," *Num. Heat Trans. A* 46, 651-667.
50. KJ Daun, DP Morton, JR Howell, 2003, "Geometric Optimization of Radiant Enclosures Containing Specular Surfaces," *ASME J. Heat Trans.* 125, 845-851.
51. KJ Daun, JR Howell, DP Morton, 2003, "Design of Radiant Enclosures Using Inverse and Non-Linear Programming Techniques," *Inverse Problems in Engineering*, 11, 541-560.
52. KJ Daun, JR Howell, DP Morton, 2003, "Geometric Optimization of Radiant Enclosures through Nonlinear Programming," *Num. Heat Trans. B* 43, 203-219.
53. JR Howell, KJ Daun, H Ertürk, 2002, "Inverse Design Methods for High-Temperature Systems," *Arabian Journal for Science and Engineering*, 27, 3-48.

54. KJ Daun, KGT Hollands, 2001, "Infinitesimal-Area Radiative Analysis Using Parametric Surfaces, Through NURBS." ASME J. Heat Trans. 123, 249-256.

B. Papers in Refereed Conference Proceedings

55. J Menser, KJ Daun, T Dreier, C Schulz, 2016, "Laser Induced Atomic Emission of Silicon Nanoparticles during Synthesis in a Microwave Plasma Reactor" Laser Applications to Chemical and Environmental Analysis (LACEA), Heidelberg, Germany.
56. KJ Daun, J Menser, R Mansmann, T Dreier, C Schulz, 2016, "Laser-Induced Incandescence Measurements of Silicon and Copper Nanoparticles: Spectroscopic Model," Proc. 8th ISRT, Cappadocia, Turkey, Jun 6-10 2016.
57. **TA Sipkens**, KJ Daun, M Karttunen, JT Titantah, 2015, "Quantifying the thermal accommodation coefficient for iron surfaces using molecular dynamics simulations," Proc. 2015 ASME IMECE, Houston TX, Nov 15-19 2015.
58. **C-J Shi**, KJ Daun, MA Wells, 2015, "Effect of heating atmosphere on the spectral emissivity of the Al-Si coated Usibor® 1500P steel during austenitization," Proc. 2015 ASME IMECE, Houston TX, Nov 15-19 2015.
59. **C-J Shi**, KJ Daun, MA Wells, 2015, "Evolution of the Spectral Emissivity and Phase Transformations of the Al-Si Coating on Usibor® 1500P Steel during Austenitization," Proc. Conference of Metallurgists, Toronto ON, Aug 23-26 2015.
60. **SJ Grauer**, PJ Hadwin, KJ Daun, 2015, "An Analysis of Prior Information in Bayesian Tomographic Reconstruction," Proc. 1st Thermal Fluids Engineering Summer Conference, New York NY, Aug 9-12, 2015.
61. **PJ Hadwin**, **TA Sipkens**, KJ Daun, KA Thomson, DR Snelling, 2015, "Bayesian Inference of Soot Volume Fractions through Auto-correlated Laser-induced Incandescence," Proc. 1st Thermal Fluids Engineering Summer Conference, New York NY, Aug 9-12, 2015.
62. **NR Singh**, **TA Sipkens**, KJ Daun, 2015, "Time-Resolved Laser-Induced Incandescence for Sizing Aerosolized Silver Nanoparticles," Proc. 1st Thermal Fluids Engineering Summer Conference, New York NY, Aug 9-12, 2015.
63. **JN Rasera**, **NN Field**, M D`Souza, KJ Daun, 2015, "Forming Tailored Material Properties through Direct Contact Heating," Proc. 5th International Conference on Hot Sheet Metal Forming of High-Performance Steel, Toronto ON, May 31-June 3 2015.
64. **KS Jhajj**, KJ Daun, MA Wells, SR Slezak, 2015, "Incomplete Autenitization of Patched Blanks in Hot Forming Die Quenching," Proc. 5th International Conference on Hot Sheet Metal Forming of High-Performance Steel, Toronto ON, May 31-June 3 2015.
65. **JN Rasera**, KJ Daun, M d`Souza, 2014, "Direct Contact Heating for Hot Forming Die Quenching," Proc. ASME IMECE, Montreal Canada, Nov. 14-20 2014.
66. **KS Jhajj**, **EFJR Caron**, **NL Chester**, KJ Daun, 2014, "Accuracy of Thermocouples in Transient Surface Temperature Measurements," Proc. ASME IMECE, Montreal Canada, Nov. 14-20 2014.
67. **TA Sipkens**, **NR Singh**, **KJ Daun**, N Bizmark, M Ioannidis, JT Titantah, M Karttunen, 2014, "Using Time Resolved Laser Induced Incandescence for Sizing Aerosolized Iron Nanoparticles," Proc. ASME IMECE, Montreal Canada, Nov. 14-20 2014.
68. **NL Chester**, KJ Daun, MA Wells, 2014, "Experimental Measurements of Spectral Emissivity of Al-Si Coated Steel Blanks undergoing Rapid Heating," Proc. ASME IMECE, Montreal Canada, Nov. 14-20 2014.

69. D McCormick, **MG Twynstra**, KJ Daun, H McCann, 2013, "Optimising Laser Absorption Tomography Beam Arrays for Imaging Chemical Species in Gas Turbine Engine Exhaust Plumes," Proc. 7th World Congress on Industrial Process Tomography, Krakow Poland, September 2-5 2013.
70. **EJF Caron**, KJ Daun, MA Wells, 2013, "High Temperature Heat Transfer during Hot Stamping of Boron Steel," Proc. ASME Summer Heat Transfer Conference, Minneapolis MN, July 14-19 2013.
71. **MG Twynstra**, KJ Daun, **EJF Caron**, N Adam, D Womack, 2013, "Modeling and Optimization of a Batch Furnace for Hot Stamping," Proc. ASME Summer Heat Transfer Conference, Minneapolis MN, July 14-19 2013.
72. **F Memarian**, KJ Daun, 2013, "Gas Dynamics of Sublimed Carbon Nano-clusters in High Fluence Time-Resolved Laser-Induced Incandescence," Proc. ASME Summer Heat Transfer Conference, Minneapolis MN, July 14-19 2013.
73. **TA Sipkens**, N Petermann, KJ Daun, JT Titantah, M Karttunen, H Wiggers, T Dreier, C Schulz, 2013, "In-situ Particle Size Measurements of Gas-Borne Silicon Nanoparticles by Time-Resolved Laser-Induced Incandescence," Proc. ASME Summer Heat Transfer Conference, Minneapolis MN, July 14-19 2013.
74. **EJF Caron**, KJ Daun, MA Wells, 2013, "Heat Transfer Coefficient Characterization during Hot Forming Die Quenching of Boron Steel Blanks. Proc. 4th International Conference on Hot Sheet Metal Forming of High-Performance Steel - CHS2 2013, Luleå Sweden, June 9-12 2013.
75. **MG Twynstra**, KJ Daun, SL Waslander, 2013, "Laser Absorption Tomography Reconstruction through the Level Set Method," Proc. 7th International Symposium on Radiative Transfer, Kuşadası Turkey, June 2-8, 2013.
76. **TA Sipkens**, KJ Daun, JT Titantah, M Karttunen, 2012, "Thermal Accommodation Coefficients for Time-Resolved Laser-Induced Incandescence Sizing of Metal Nanoparticles in Monatomic Gases," Proc. ASME IMECE, Houston TX, Nov 9-15 2012.
77. **MG Twynstra**, KJ Daun, 2012, "Laser Absorption Tomography Beam Arrangement Optimization using Resolution Matrices," Proc. ASME IMECE, Houston TX, Nov 9-15 2012.
78. **F Memarian**, KJ Daun, 2012, "Prompt Transient Heat Transfer Effects in Low-Fluence Laser Induced Incandescence," Proc. ASME IMECE, Denver CO, Nov 9-15 2012.
79. KJ Daun, **SC Huberman**, 2012, "Applicability of the Wright Polynomial Correction for Time-Resolved Laser-Induced Incandescence in the Transition Regime," Proc. ASME Summer Heat Transfer Conference, San Juan PR, July 8-12 2012.
80. **TA Sipkens**, **G Joshi**, KJ Daun, Y Murakami, 2012, "Sizing of Molybdenum Nanoparticles using Time-Resolved Laser-Induced Incandescence," Proc. ASME Summer Heat Transfer Conference, San Juan PR, July 8-12 2012.
81. **EJF Caron**, KJ Daun, MA Wells, 2012, "Heat Transfer Coefficient Characterization for Hot Stamping of Boron Steel Blanks," Proc. ASME Summer Heat Transfer Conference, San Juan PR, July 8-12 2012.
82. **DW Burr**, KJ Daun, KA Thomson, GJ Smallwood, 2011, "Optimum Angles for Multi-Angle Elastic Light Scattering Experiments," Proc. ASME IMECE, Denver CO, Nov 11-17 2011.
83. KJ Daun, M Karttunen, JT Titantah, 2011, "Molecular Dynamics Simulation of Thermal Accommodation Coefficients for Laser-Induced Incandescence Sizing of Nickel Nanoparticles," Proc. ASME IMECE, Denver CO, Nov 11-17 2011.

84. **AJ Marston**, KJ Daun, MR Collins, 2010, "Geometric Optimization of Solar Concentrating Collectors through Quasi Monte Carlo Simulation," Proc. International Heat Transfer Conference, Washington DC, August 8-13 2010.
85. KJ Daun, SL Waslander, **BB Tulloch**, 2010, "Infrared Species Limited Data Tomography using Kalman Filtering (AIAA-2010-4914)," Proc. 27th AIAA Aerodynamics Measurement Technology and Ground Testing Conference, Chicago IL June 28-July 1 2010.
86. **DW Burr**, KJ Daun, O Link, KA Thomson, GJ Smallwood, 2010, "Soot Particle Sizing by Inverse Analysis of Multiangle Elastic Light Scattering," Proc. 6th International Symposium on Radiative Transfer, Antalya Turkey, June 13-19 2010.
87. KJ Daun, 2009, "Effect of Selective Accommodation on Soot Aggregate Shielding in Time-Resolved Laser-Induced Incandescence Experiments," Proc. ASME IMECE, Orlando FL, Nov 13-19 2009.
88. **AJ Marston**, KJ Daun, MR Collins, 2009, "Geometric Optimization of Concentrating Solar Collectors using Monte Carlo Simulation," Proc. ASME IMECE, Orlando FL, Nov 13-19 2009.
89. KJ Daun, 2009, "Reconstruction Algorithms for Laser-Based Infrared Species Tomography," Proc. ASME Summer Heat Transfer Conference, San Francisco CA, July 19-23 2009.
90. KJ Daun, 2008, "Thermal Accommodation Coefficients between Nitrogen and Soot in Laser-Induced Incandescence Experiments," Proc. ASME IMECE, Boston MA, Oct 31-Nov 6 2008.
91. KJ Daun, F Liu, GJ Smallwood, 2008, "Experimental and Molecular Dynamics Simulations of Translational Thermal Accommodation Coefficients for Laser-Induced Incandescence Experiments involving Soot," Proc. ASME Summer Heat Transfer Conference, Jacksonville FL, August 10-14 2008.
92. KJ Daun, KA Thomson, F Liu, 2007, "Analysis of In-Scattering Effects on Laser Induced Incandescence Measurements through Backwards Monte Carlo," Proc. ASME IMECE. Seattle WA November 11-15 2007.
93. KJ Daun, PH Mercier, GJ Smallwood, F Liu, Y Le Page, 2007, "Measurement of Thermal Accommodation Coefficients using Laser-Induced Incandescence," Proc. ASME-JSME Thermal Engineering Summer Heat Transfer Conference, Vancouver, BC, July 8-12 2007.
94. **EO Åkesson**, KJ Daun, 2007, "One- and Two-Dimensional Tikhonov-Regularized Tomography for Axisymmetric Flames," Proc. 37th AIAA Fluid Dynamics Conference and Exhibit, Miami FL, June 25-28 2007.
95. KJ Daun, BJ Stagg, F Liu, DR Snelling, GJ Smallwood, 2006, "Determining the Aerosol Particle Size Distribution from Time-Resolved Laser-Induced Incandescence Measurements," Proc. ASME IMECE, Chicago IL, November 5-10 2006.
96. KJ Daun, F Liu, 2006, "Modeling Transition-Regime Heat Conduction from Small Particles in Laser-Induced Incandescence Studies (AIAA-2006-3284)," Proc. 9th AIAA/ASME Joint Thermophysics and Heat Transfer Conference, San Francisco CA, June 5-8 2006.
97. KJ Daun, KA Thomson, F Liu, GJ Smallwood, 2005, "Solution of Abel's Integral Equation using Tikhonov Regularization," Proc. ASME IMECE, Orlando FL, November 5-11 2005.
98. KJ Daun, SB Beale, F Liu, GJ Smallwood, 2005, "Radiation Heat Transfer in SOFC Electrolytes. Proc. ASME Summer Heat Transfer Conference," San Francisco CA, July 17-22 2005.
99. KJ Daun, JR Howell, DP Morton, 2003, "Optimization of Industrial Processes involving Radiant Heating, through Non-Linear Programming," Proc. ASME IMECE, Washington D.C., November 15-21 2003.

100. JR Howell, KJ Daun, H Ertürk, M Gamba, MH Sarvari, 2003, "The Use of Inverse Methods for the Design and Control of Radiant Sources," Proc. 6th ASME-JSME Thermal Engineering Joint Conference, Hawaii Island HI, March 16-20 2003.
101. KJ Daun, JR Howell, DP Morton, 2002, "Design of Radiant Enclosures through Non-Linear Programming," Proc. International Heat Transfer Conference, Grenoble France, August 18-22 2002.
102. KJ Daun, JR Howell, KGT Hollands, 2001, "Application of a NURBS-Based Ray-Tracing Technique for Infinitesimal-Area Analysis of Radiant Enclosures," Proc. 35th ASME National Heat Transfer Conference, Anaheim CA, June 10-12 2001.

C. Non-refereed Conference Presentations

103. J Menser, KJ Daun, T Dreier, C Schulz, "Validation of the Evaporation Model for LII/LIBS Characterization of Silicon Nanoparticles," 7th International Workshop and Meeting on Laser-Induced Incandescence, Lake Tahoe CA, June 19-22 2016. (1 page abstract and presentation.)
104. KJ Daun, R Mansmann, J Menser, C Schulz, "LII Characterization of Copper Nanoparticles," 7th International Workshop and Meeting on Laser-Induced Incandescence, Lake Tahoe CA, June 19-22 2016. (1 page abstract and presentation.)
105. **TA Sipkens**, KJ Daun, "Investigation of Trends in High-Temperature Thermal Accommodation Coefficients using Cube Models," 7th International Workshop and Meeting on Laser-Induced Incandescence, Lake Tahoe CA, Jun 19-22 2016. (1 page abstract and poster.)
106. **PJ Hadwin, TA Sipkens**, KJ Daun, "Uncertainty Quantification for TiRe-LII," 7th International Workshop and Meeting on Laser-Induced Incandescence, Lake Tahoe CA, Jun 19-22 2016. (1 page abstract and poster.)
107. **NN Field, M DiCiano**, JN Rasera, M d'Souza, KJ Daun, A Gerlich, "Direct Contact Heating Technology for Tailoring in Hot Forming Die Quenching," 28th Canadian Materials Science Conference, Hamilton ON, June 7-10 2016.
108. **SJ Grauer, PJ Hadwin**, KJ Daun, "An A Priori Approach to Assessing a Bayesian Design-of-Experiment Procedure," Inverse Problems Symposium, Lexington, Virginia, June 5-7 2016. (3 page abstract and presentation.)
109. **PJ Hadwin, TA Sipkens**, KJ Daun, KA Thomson, F Liu, "Bayesian Analyses of Nuisance Parameters in Auto-Correlated Laser Induced Incandescence," Proc. CI/CS Spring Technical Meeting, Waterloo ON, May 10-12 2016. (6 page abstract and presentation.)
110. **RW Tsang, SJ Grauer**, KJ Daun, "Development, Calibration, and Testing of a Tomographic Open-Path Hydrocarbon Detection System," Proc. CI/CS Spring Technical Meeting, Waterloo ON, May 10-12 2016. (6 page abstract and presentation.)
111. **TA Sipkens, NR Singh**, KJ Daun, JT Titantah, M Karttunen, "Quantifying the thermal accommodation coefficient for iron nanoparticles," Proc. 2015 ASME International Mechanical Engineering Congress and Exposition, Houston TX, Nov 15-19 2015. (One page abstract and presentation.)
112. **TA Sipkens, PJ Hadwin**, KJ Daun, KA Thomson, F Liu, "Bayesian inference in auto-correlated laser-induced incandescence", Gordon Research Conference: Laser Diagnostics in Combustion, Waterville Valley NH, Aug 9-14 2015. (One page abstract and poster.)
113. R Pan, KJ Daun, T Dreier, C Schulz, "Uncertainty quantification and design-of-experiment in NIR spectroscopy using Bayesian inference," Gordon Research Conference: Laser Diagnostics in Combustion, Waterville Valley NH, Aug 9-14 2015. (One page abstract and poster.)
114. J Menser, KJ Daun, T Dreier, C Schulz, "Spectrally and temporally-resolved analysis of laser-induced emissions on gas-borne silicon nanoparticles during plasma synthesis," Gordon

Research Conference: Laser Diagnostics in Combustion, Waterville Valley NH, Aug 9-14 2015. (One page abstract and poster.)

115. KJ Daun, R Mansmann, J Menser, T Dreier, C Schulz, "Spectroscopy of aerosolized metal nanoparticles for laser-induced incandescence measurements," Network Meeting of the Alexander von Humboldt Foundation, Augsburg Germany, Oct 28-30 2015. (One page abstract and poster.)
116. **SJ Grauer**, **PJ Hadwin**, KJ Daun, 2015, "Basis Function Selection for Karhunen-Loève Laser Absorption Tomography, 2015 Inverse Problems Symposium, East Lansing, Michigan, May 31-June 2 2015. (3 page abstract and presentation.)
117. **RW Tsang**, **SJ Grauer**, KJ Daun, 2015, "Development of an Open-Path Hydrocarbon Detector for Tomographic Mass Flux Estimation," Proc. CI/CS Spring Technical Meeting, Saskatoon SK, May 11-14 2015. (6 page abstract and presentation.)
118. **F Memarian**, F Liu, KA Thomson, DR Snelling, KJ Daun, 2014, "Gas Dynamics of Sublimated Species in High-Fluence Laser Induced Incandescence," 6th International Workshop and Meeting on Laser-Induced Incandescence, Backafallsbyn, Sweden, June 10-12 2014. (1 page abstract and presentation.)
119. **TA Sipkens**, **NR Singh**, N Bizmark, KJ Daun, M Ioannidis, JT Titantah, M Karttunen, 2014, "Quantifying the Thermal Accommodation Coefficient for TiRe-LII Analysis of Iron Nanoparticles," 6th International Workshop and Meeting on Laser-Induced Incandescence, Backafallsbyn, Sweden, June 10-12 2014. (1 page abstract and presentation.)
120. **F Memarian**, F Liu, KA Thomson, DR Snelling, GJ Smallwood, KJ Daun, 2014, "Investigation of the Effect of Gas Dynamics on Soot Temperature Decay in Laser Induced Incandescence," Proc. CI/CS Spring Technical Meeting, Windsor ON, May 12-15 2014. (6 page abstract and presentation.)
121. **C Prodaniuk**, G Cupples, KJ Daun, 2014, "Method for Adaptive Combustion Control and Optimal Operation for a Liquid-Fueled Industrial Heater," Proc. CI/CS Spring Technical Meeting, Windsor ON, May 12-15 2014. (6 page abstract and presentation.)
122. **NR Singh**, **TA Sipkens**, KJ Daun, N Bizmark M Ioannidis, 2014, "Aerosolized Iron Nanoparticle Size Measurements Using Time Resolved Laser Induced Incandescence," Proc. CI/CS Spring Technical Meeting, Windsor ON, May 12-15 2014. (6 page abstract and presentation.)
123. **TA Sipkens**, KJ Daun, 2013, "Time-Resolved Laser-Induced Incandescence Measurements on Aerosolized Iron Nanoparticles," ASME IMECE, San Diego CA, Nov. 15-21 2013. (One page abstract and presentation.)
124. **JN Rasera**, **BJ Froese**, **PP Plaisier**, **CK Rush**, M d'Souza, KJ Daun, 2013, "Direct Contact Heating Technology for Hot Forming/Die Quenching," ASME IMECE, San Diego CA, Nov. 15-21 2013. (Poster presentation.)
125. **TA Sipkens**, **W Richards**, N Bizmark, **NR Singh**, KJ Daun, M Ioannidis, 2013, "Inferring the Thermal Accommodation Coefficient from Time-Resolved Laser-Induced Incandescence on Iron Nanoparticles," 2013 NanoOntario Conference, Kingston ON, Nov. 7-8 2013. (One page abstract and poster. Won second prize in graduate poster competition.)
126. **TA Sipkens**, N Petermann, KJ Daun, H Wiggers, T Dreier, C Schulz, 2012, "In situ Particle Size Measurements of Gas-Borne Silicon Nanoparticles by Time-Resolved Laser-Induced Incandescence," 2012 NanoOntario Conference, Oct. 11-12, 2012. (One page abstract and poster. Won first prize in graduate poster competition.)

127. **MG Twynstra, G Guerette**, KJ Daun, 2012, "Optimal Beam Configuration for Laser Absorption Spectroscopy Tomography," Inverse Problems Symposium, East Lansing MI, June 10-12 2012. (Two page abstract and presentation.)
128. **EJFR Caron**, KJ Daun, MA Wells, 2012, "Heat Transfer Coefficient Characterization in Hot Stamping of Boron Steel," Inverse Problems Symposium, East Lansing MI, June 10-12 2012 (Two page abstract and presentation.)
129. KJ Daun, **SC Huberman**, 2012, "Applicability of Wright's Correction to Fuchs's Boundary Sphere Method for TiRe-LII Calculations," 5th International Workshop on Laser-Induced Incandescence, Le Touquet France, May 9-11 2012. (One page abstract and poster.)
130. KJ Daun, JT Titantah, M Karttunen, **TA Sipkens**, 2012, "Extending Time-Resolved LII to Metal Nanoparticles: Simulating the Thermal Accommodation Coefficient," 5th International Workshop on Laser-Induced Incandescence, Le Touquet France, May 9-11 2012. (One page abstract and presentation.)
131. **TA Sipkens**, KJ Daun, JT Titantah, M Karttunen, 2012, "Sizing Molybdenum Nanoparticles using Time-Resolved Laser-Induced Incandescence," Proc. CI/CS Spring Technical Meeting, Toronto ON, May 13-16 2012. (Six page abstract and presentation.)
132. **MG Twynstra**, KJ Daun, 2012, "Detection Array Optimization for Limited-Data Absorption Tomography," Proc. CI/CS Spring Technical Meeting, Toronto ON, May 13-16 2012. (Six page abstract and presentation.)
133. **TA Sipkens, G Joshi**, KJ Daun, Y Murakami, 2011, "Sizing of Molybdenum Nanoparticles using Time-Resolved Laser-Induced Incandescence," 61st Canadian Chemical Engineering Conference, London ON, Oct 23-26 2011. (One page abstract and poster. Won first prize in graduate poster competition.)
134. **AP Horsman**, KJ Daun, 2011, "Design Optimization of a Two-Stage Porous Radiant Burner through Response Surface Modeling," Proc. USNCCM, Minneapolis MN, July 25-28 2011. (One page abstract and presentation.)
135. **SC Huberman**, KJ Daun, 2011, "Applicability of the Wright Polynomial Correction for Time-Resolved Laser-induced Incandescence in the Transition Regime," Proc. CI/CS Spring Technical Meeting, Winnipeg MB, May 8-11 2011. (Six page abstract and presentation.)
136. **S Hajitaheri**, KJ Daun, JL Wright, 2011, "Design Optimization of a 300 kW Methane Furnace," Proc. CI/CS Spring Technical Meeting, Winnipeg MB, May 8-11 2011. (Six page abstract and presentation.)
137. **B Ratnam**, KJ Daun, MA Wells, 2010, "Optimal Thermocouple Location in Materials Processing Experiments through Fisher Information Analysis," Inverse Problems Symposium, East Lansing MI, June 6-8 2010. (Two page abstract and presentation.)
138. **AP Horsman**, KJ Daun, 2010, "Design Optimization of a Porous Radiant Burner," Proc. CI/CS Spring Technical Meeting, Ottawa ON, May 9-12 2010. (Six page abstract and presentation.)
139. **DW Burr**, KJ Daun, O Link, KA Thomson, GJ Smallwood, 2010, "Soot Particle Sizing by Inverse Analysis of Multiangle Elastic Light Scattering Using Bayesian Inference," Proc. CI/CS Spring Technical Meeting, Ottawa ON, May 9-12 2010. (Six page abstract and presentation.)
140. **DW Burr**, KJ Daun, O Link, KA Thomson, 2009, "Soot Particle Sizing by Inverse Analysis of Multiangle Elastic Light Scattering," Particle Technology Research Centre Conference, London ON, July 9-10 2009. (One page abstract and poster.)
141. KJ Daun, 2009, "Tikhonov Reconstruction for Laser-Based Infrared Species Tomography," Proc. CI/CS Spring Technical Meeting, Montreal QC, May 11-13 2009. (Six page abstract and presentation.)

142. KJ Daun, GJ Smallwood, F Liu, 2008, "Molecular Dynamics Simulation of Thermal Accommodation Coefficients for Laser-Induced Incandescence Experiments," Proc. CI/CS Spring Technical Meeting, Toronto ON, May 12-14 2008. (Six page abstract and presentation.)
143. KJ Daun, GJ Smallwood, F Liu, 2007, "Investigation of Thermal Accommodation using Laser-Induced Incandescence," Proc. CI/CS Spring Technical Meeting, Banff AB, May 13-16 2007. (Six page abstract and presentation.)
144. KJ Daun, KA Thomson, 2006, "Axisymmetric Flame Deconvolution using Automated Tikhonov Regularization," Proc. CI/CS Spring Technical Meeting, Waterloo ON, May 14-17 2006. (Six page abstract and presentation.)
145. F Liu, KJ Daun, GJ Smallwood, DR Snelling, 2006, "Heat Conduction from Spherical Nanoparticles," 2nd International Bunsen Discussion Meeting and Workshop on Laser-Induced Incandescence, Bad Herrenalb Germany, Aug. 2-4 2006. (One page abstract and presentation.)
146. KJ Daun, F Liu, GJ Smallwood, BJ Stagg, DR Snelling, 2006, "Inverse Analysis of Time-Resolved LII Data," 2nd International Bunsen Discussion Meeting and Workshop on Laser-Induced Incandescence, Bad Herrenalb Germany, August 2-4 2006. (One page abstract and presentation.)
147. KJ Daun, GJ Smallwood, F Liu, DR Snelling, 2006, "Measuring Thermal Accommodation Coefficients using Laser-Induced Incandescence," 2nd International Bunsen Discussion Meeting and Workshop on Laser-Induced Incandescence, Bad Herrenalb Germany, August 2-4 2006. (One page abstract and poster.)
148. KJ Daun, JR Howell, DP Morton, 2003, Design of Radiant Enclosures using Inverse and Non-linear Programming Techniques. Inverse Problems in Engineering Symposium, Tuscaloosa AL, June 9-10 2003. (One page abstract and presentation.)

D. Invited Presentations

149. "KJ Daun "Laser-Induced Incandescence Characterization of Synthetic Nanoparticles" King Abdullah University of Science and Technology (KAUST), Saudi Arabia, Dec 7 2015. (Invited seminar.)
150. KJ Daun "Laser-Induced Incandescence Characterization of Synthetic Nanoparticles," Center for Nanointegration Duisburg Essen (CENIDE), Duisburg Germany, Nov 27 2015. (Invited seminar.)
151. KJ Daun, **SJ Grauer**, **PJ Hadwin**, 2015, "Chemical Species Tomography of Turbulent Flows," Computational Thermal Radiation in Participating Media V, Albi France, Mar 31-Apr 3 2015. (Keynote address.)
152. KJ Daun, 2014, "Time-Resolved Laser-Induced Incandescence for Sizing Synthetic Nanoparticles," Department of Applied Physics, University of East Finland, Kuopio Finland, June 5 2014. (Invited seminar.)
153. KJ Daun, 2012, "Spatial Resolution – What does it mean for Sparsely-Sampled Systems?" Chemical Species Tomography of Reacting Flows, Manchester UK, Nov 5-9 2012. (Keynote address.)
154. KJ Daun, JR Howell, 2004, "Methods for Inverse Design of Radiant Transfer Systems," Proc. 4th Intl. Symposium on Radiative Transfer, Istanbul Turkey, June 20-25 2004. (Keynote address and paper.)
155. JR Howell, KJ Daun, 2004, "Optimization of Heater Settings to Provide Spatially-Uniform Transient Heating in Manufacturing Processes involving Radiant Heating," Proc. Inverse Problems, Design, and Optimization Symposium, Rio de Janeiro Brazil, March 17-19 2004. (Keynote address.)

E. Refereed Book Chapters

156. H McCann, P Wright, KJ Daun, 2015, "Chapter 9: Chemical Species Tomography," in Industrial Tomography: Systems and Applications, M Wang, Ed., Woodhead Publishing, Sawston UK.
157. KJ Daun, J Porter, 2010, "Numerical Methods for Inverse Radiation Problems," in Inverse Problems in Radiation Heat Transfer (Thermopedia article), JR Howell, SA Rukolaine, Eds., Begell House, Redding CT.

Research Support

Researchers	Title & Agency	Amount (% my share)	Years
KJ Daun (PI) AP Gerlich	Direct Contact Heating for Hot Forming Die Quenching (NSERC-CRD, with F&P)	\$143,775 (70%)	2014-2016
KJ Daun	Robust Bayesian Analysis for Time-Resolved Laser-Induced Incandescence Sizing of Black Carbon Aerosols (NRC)	\$55,135	2014-2016
KJ Daun (PI) SL Waslander MR Johnson	Infrared Absorption Chemical Species Tomography for Monitoring Fugitive Emissions (NSERC-CRD, with Imperial Oil)	\$99,550 (90%)	2013-2016
KJ Daun	Quantifying Fugitive Gas Emissions through Infrared Absorption Tomography (Imperial Oil University Research Award)	\$75,000	2013-2016
KJ Daun	Laser-based Metrology for Engineered Aerosolized Nanoparticles (NSERC DG)	\$175,000	2013-2018
KJ Daun	Development of a Direct Contact Heating Apparatus for Hot Forming (IAMI)	\$59,400	2013-2014
KJ Daun (PI) MA Wells	Reheating Furnace Analysis and Optimization for Hot Stamping Automotive Parts (NSERC-APC, with Cosma)	\$372,225 (80%)	2013-2016
KJ Daun	Laser Induced Incandescence Instrument for Characterizing the Size and Concentration of Aerosolized Nanoparticles (CFI IOF)	\$16,500	2013-2017
KJ Daun	Development of a Direct Contact Heating Apparatus for Hot Forming (NSERC Engage)	\$25,000	2013
KJ Daun	Thermal Modeling and Design Optimization of a Reheat Furnace (Mitacs-Accelerate)	\$25,000	2012
KJ Daun	Control System for a Diesel-Fired Process Heater (NRC-IPS, with GenTex)	\$42,000	2012-2014
MJ Worswick (PI) MA Wells KJ Daun	Tailored Hot Stamping and Crash Response of Boron Steels (NSERC APC, IAMI, with Cosma, Honda, Arcelor-Mittal)	\$605,886 (~20%)	2012-2014
KJ Daun	Laser Induced Incandescence Instrument for Characterizing the Size and Concentration of Aerosolized Nanoparticles (CFI LOF/ORF-RI)	\$143,100	2012
MR Johnson (PI) KJ Daun and four others	Oil and Gas Industry Air Emissions Quantification and Reduction (NRCan PERD)	\$370,000 (5%)	2011-2012
KJ Daun	Numerical Modeling of a Diesel-Fired Process Heater (NSERC Engage, with GenTex)	\$24,750	2011
JG Person (PI) J Abbott KJ Daun	200M TexHeater Design and Optimization (NRC-IRAP, with GenTex and Tangent Design Engineering)	\$195,400 (12%)	2010-2011
KJ Daun	Advanced PM Measurement Technologies and Applications (NRCan PERD)	\$67,630	2009-2012
MJ Worswick (PI) MA Wells KJ Daun	Crash Properties of Ultra-High Strength Hot Formed Boron Steels (NSERC CRD, IAMI, with Cosma, Honda, Arcelor-Mittal)	\$407,942 (10%)	2009-2011
WSE Epling (PI) EJ Weckman KJ Daun	Development of Novel Composite Coatings for Emissions Catalyst Performance Improvement (NSERC Engage, with Fireball Coatings)	\$25,000 (20%)	2010
KJ Daun	Optimal Design and Inverse Analysis of Industrial Combustion Devices (NSERC DG)	\$119,250	2008-2013

TEACHING RECORD

Course Evaluations

University of Waterloo						
Term	Course	Subject	Aggregate ³	Overall ⁴	N Enr	% resp.
W'15	ME 653	Radiation Heat Transfer	90%	100%	7	86%
F'14	ME 760	Inverse Analysis	91%	93%	8	88%
S'14	ME 456	Heat Transfer 2	97%	98%	14	86%
W'14	ME 353	Heat Transfer 1	93%	95%	82	67%
W'14	ME 653	Radiation Heat Transfer	81%	80%	10	100%
S'13	ME 456	Heat Transfer 2	95%	97%	27	70%
S'13	ECE 309	Intro. Thermo. and Heat Trans.	92%	94%	125	54%
W'13	ME 760	Inverse Analysis	86%	92%	6	100%
S'12	ECE 309	Intro. Thermo. and Heat Trans.	94%	96%	116	78%
W'12	ME 653	Radiation Heat Transfer	82%	92%	6	100%
W'12	ME 353	Heat Transfer 1	93%	97%	65	65%
F'11	ME 760	Inverse Analysis	-	-	4 ⁵	-
S'11	ME 456	Heat Transfer 2	92%	97%	32	75%
S'11	ECE 309	Intro. Thermo. and Heat Trans.	94%	94%	105	69%
W'11	ME 353	Heat Transfer 1	87%	86%	83	52%
S'10	ECE 309	Intro. Thermo. and Heat Trans.	90%	90%	96	82%
W'10	ME 653	Radiation Heat Transfer	-	-	3 ⁶	-
F'09	ME 760	Inverse Analysis	-	-	4 ⁶	-
S'09	ECE 309	Intro. Thermo. and Heat Trans.	92%	94%	98	48%
W'09	ECE 309	Intro. Thermo. and Heat Trans.	91%	91%	121	54%
W'09	ME 653	Radiation Heat Transfer	90%	85%	8	63%
W'08	ECE 309	Intro. Thermo. and Heat Trans.	91%	91%	110	77%
W'08	ME 653	Radiation Heat Transfer	86%	94%	6	67%

University of Ottawa							
Term	Course	Subject	Q1	Q4	Q9	N Enr	% resp.
W'06	MCG 2135	Thermodynamics 1	4.55/5 ⁶	4.12/5 ⁷	4.19/5 ⁸	74	64%

University of Texas at Austin						
Term	Course	Subject	Course	Instructor	N Enr	% resp.
S'04	ME 339	Heat Transfer 1	92%	84%	38	76%
S'04	ME 330	Fluid Mechanics 1	84%	84%	49	80%
F'03	ME 339	Heat Transfer 1	84%	78%	20	90%
F'01	ME 339	Heat Transfer 1	88%	80%	34	79%

³ Average of all metrics excluding "Overall teaching quality" (undergrad) and "Overall course quality" (grad)

⁴ "Overall teaching quality" (undergrad); "Overall course quality" (grad)

⁵ Class sizes smaller than 5 are not surveyed

⁶ "I find the professor well prepared for class (almost always = 5, almost never = 1)"

⁷ "I think the professor conveys the subject matter effectively (almost always = 5, almost never = 1)"

⁸ "I find that the professor as a teacher is (excellent = 5, very poor = 1)"

Thesis Supervisions

Name	Level	Thesis Title	Publications ⁹	Period
S Talebi Moghaddam	PhD	Inverse Bremsstrahlung heating during laser-induced incandescence		S'16-present
Q Sommeville ¹⁰	MASc	Characterization of the spectral emissivity of zinc dip coated steels		S'16-present
N Field ¹¹	MASc	Integrated direct contact heating and hot forming die quenching	63, 107	F'14-present
S Grauer	PhD	Tomographic reconstruction of fugitive emissions from infrared absorption spectroscopy	3, 8, 13, 60, 108, 110, 116, 117	S'14-present
TA Sipkens	PhD	Development and selection of models in laser-induced incandescence	12, 14, 18, 19, 21, 57, 61, 62, 67, 73, 80, 105, 109, 111, 112, 119, 123, 125, 126, 131	W'15-present
R Tsang	MASc	Measurement of BTEX emissions from infrared light attenuation	110, 117	W'14-present
NR Singh	MASc	Experimental analysis of laser-induced incandescence from metal nanoparticles	12, 62, 67, 122	F'13-present
JN Rasera	MASc	Development of a direct contact heating apparatus for hot forming	6, 63, 65, 124	S'13-W'15
KS Jhaji	MASc	Analysis and process optimization of a roller-hearth furnace for hot stamping	10, 64, 66	S'13-W'15
N Chester ¹²	PhD	Analysis and process optimization of a batch furnace for hot stamping	13, 66, 68	W'13-F'15
C Prodaniuk	MASc	Dynamic control system for a diesel-fired process heater	121	S'12-W'14
F Memarian	MASc	Investigation of transient gas dynamics from laser-energized nanoparticles	11, 16, 72, 78, 118, 120	F'11-F'13
MG Twynstra	MASc	Optimal beam arrangement for laser absorption tomography	15, 22, 69, 71, 75, 77, 127, 132	F'11-F'13
TA Sipkens ¹³	MASc	Time-resolved laser induced incandescence on metal nanoparticles	(see above)	F'11-F'14
SAM Tonekaboni ¹⁴	MASc	Modeling and Analysis of the Buckling Phenomena in the Homogeneous and Heterogeneous Biomembranes		W'12-S'13
S Hajitaheri ¹⁵	MASc	Design optimization and combustion simulation of two gaseous and liquid-fired combustors	136	F'09-W'12
DW Burr	MASc	Inverse analysis of light scattering by soot aggregates	25, 31, 82, 86, 139, 140	W'08-F'11
AJ Marston ¹⁶	MASc	Geometric optimization of solar concentrating collectors using quasi-Monte Carlo Simulation	29, 32, 88	F'08-W'11
AP Horsman	MASc	Design optimization of a porous radiant burner	27, 134, 138	S'08-S'11
EO Åkesson	MSc	Tomography for axisymmetric flames	40, 94	F'05-S'06

⁹ Numbers refer to journal and conference papers above

¹⁰ Principal supervisor is M Brochu at Ecole Polytechnique

¹¹ Co-supervised with A Gerlich

¹² Co-supervised with MA Wells, did not complete degree requirements

¹³ **Governor General Gold Medal winner, MASc. Level**

¹⁴ Co-supervised with M Karttunen

¹⁵ Co-supervised with JL Wright

¹⁶ Co-supervised with MR Collins

Other Supervisory Experience

Student	Level	Location	Start	End	Comments	Pubs
M DiCiano ¹⁷	Postdoc	Waterloo	F'15		In progress	107
PJ Hadwin ¹⁸	Postdoc	Waterloo	F'14		In progress	3, 5, 7, 8, 60, 61, 106, 108, 109
G Galindo ¹⁸	PhD	Waterloo	W'15	S'15	Visiting student from Universidad Técnica Federico Santa María	5
C Shi ¹⁷	Postdoc	Waterloo	F'14	S'15	Engineer at Cosma	2, 6, 9, 58, 59
E Caron ¹⁷	Postdoc	Waterloo	S'11	S'14		17, 20, 74, 81, 128
S Grauer ¹⁷	USRA	Waterloo	S'13	S'13	PhD Candidate, U. Waterloo	(see above)
W Richards	USRA	Waterloo	S'13	S'13	MASc Candidate UTIAS	
TA Sipkens	USRA	Waterloo	S'11	S'11	PhD Candidate, U. Waterloo	(see above)
S Huberman	USRA	Waterloo	S'10	S'10	PhD candidate, MIT	23, 135
S O'Neill ¹⁹	USRA	Waterloo	W'10	S'10		
B Tulloch	USRA	Waterloo	S'09	S'09	Engineer at Apple, San Francisco CA	28
R Yoxon ²⁰	USRA	NRC	S'07	S'07	Jazz singer, Ottawa ON	
R Armstrong	USRA	UT Austin	S'02	S'02	IP lawyer, Houston TX	
V Bolton	USRA	UT Austin	S'02	S'02	Engineer at Boeing, Houston TX	
D Crosswell B Sincennes E Waugh A Wigle	ME481 ME482	Waterloo	F'14	S'15	4 th -year design project	
S King P Robinson A Jahed N Bodd	MTE481 MTE482	Waterloo	F'13	W'14	4 th -year design project	
S King	ME482	Waterloo	S'13	S'13	4 th -year research project	
KS Jhajj	ME482	Waterloo	W'13	W'13	4 th -year research project, MASc candidate at U. Waterloo	
R Chu	ME482	Waterloo	W'13	W'13	4 th -year research project	
B Froese P Plaisier J Rasera C Rush	ME481 ME482	Waterloo	F'12	W'13	4 th -year design project	
N Dyck ²¹	ME482	Waterloo	W'12	W'12	4 th -design project, PhD candidate at Western U.	
TA Sipkens	ME482	Waterloo	W'12	W'12	4 th -year research project	
C Prodaniuk	ME482	Waterloo	W'12	W'12	4 th -year research project	
T Leung	ME482	Waterloo	W'12	W'12	4 th -year research project, PhD candidate at U. Toronto	
D Love	ME481	Waterloo	F'11	F'11	4 th -design project	
N Dyck ¹⁰	ME481	Waterloo	F'11	F'11	4 th -design project	
G Guerette	ME482	Waterloo	S'11	S'11	4 th -year research project	
J Rochussen	ME481	Waterloo	S'11	S'11	4 th -design project	
G Joshi	ME482	Waterloo	W'11	W'11	4 th -year research project, PhD candidate at McMaster	21, 80, 133

¹⁷ Co-supervised with M Wells

¹⁸ Co-supervised with S Peterson

¹⁹ Co-supervised with EJ Weckman and WSE Epling

²⁰ Co-supervised with KA Thomson

²¹ Co-supervised with J Medley

S Huberman	ME482	Waterloo	W'11	W'11	4 th -year research project	See above
S McCallion	ME482	Waterloo	W'11	W'11	4 th -year research project	
S McCallion	ME481	Waterloo	F'10	F'10	4 th -design project	
S Huberman	ME481	Waterloo	F'10	F'10	4 th -design project	
P Vandenberg	ME481	Waterloo	F'10	F'10	4 th -design project	
M Twynstra	ME481	Waterloo	F'10	F'10	4 th -design project	
M Podbevsek M Purvis L McCulloch	MTE481 MTE482	Waterloo	F'09	W'10	4 th -year design project	
L Barton C Hay P McClelland S Witmell	SYDE 362	Waterloo	W'09	W'09	3 rd -year design project	
U Nemallen	ME482	Waterloo	W'08	W'08	4 th -year research project	

PhD/MASc Committee Membership

- J Labahn, "Investigation of the conditional source-term estimation (CSE) approach to modelling MILD combustion", PhD thesis, 2016, uWaterloo
- G Galindo, "A multi-modal Bayesian estimation of vocal fold model parameters and its application on clinical assessment of vocal function," PhD comp report, 2014, Universidad Técnica Federico Santa Maria
- M Didomizio, "An investigation of the thermal degradation mechanisms of wood-framed construction assemblies in fires," PhD comp report, 2014, uWaterloo.
- A Lipponen, "Nonstationary flow fields, model reduction and approximation errors in process tomography," PhD thesis, 2014, University of East Finland
- H Lui, "Simulation of biomass gasification using a circulating fluidized bed reactor," PhD thesis, 2014, uWaterloo
- D Adeosun, "Analysis of fire performance, smoke development, and combustion gases from flame retarded rigid polymer foams," PhD thesis, 2014, uWaterloo
- C Prince, "Investigation of the impact of wavy walls on flow modalities in curved vessels", PhD thesis, 2014, uWaterloo
- A El Sayed, "Modelling of ignition and extinction in turbulent flames using conditional moment closure methods," PhD thesis, 2013, uWaterloo
- A Ahmadzadegan, "Molecular simulation of chemically reacting flows in microchannels and nanochannels," PhD thesis, 2013, uWaterloo
- S Ali, "An online input estimation algorithm for a coupled inverse heat conduction-microstructure problem," PhD thesis (external examiner), 2009, McMaster U
- C McCartney, "Application of genetic algorithms to CFD," Ph. D. comp. report, 2008, uWaterloo.
- J Waring, "Examination of performance of Brayton cycle engine with positive displacement compression and expansion," PhD comp. report, 2008, uWaterloo
- K Omer, "Development and testing of a hot stamped axial crush member with tailored properties," MASc thesis, 2014, uWaterloo
- T Kirk, "Later stages of transition in laminar separation bubbles on airfoils," MASc thesis, 2014, uWaterloo
- X Zhang, "Fiber Bragg grating sensors through on-fiber metallic coating produced by laser-assisted maskless microdeposition and electroless plating," MASc thesis, 2013, uWaterloo
- C Pereira, "Novel economical emission monitoring techniques for liquid storage tanks (LST)," MASc thesis, 2012, Carleton University
- B-J Lee, "Single phase pump: non-mechanical valvular conduit," MASc thesis, 2011, uWaterloo
- R George, "Hot forming of boron steels with tailored mechanical properties: experiments and numerical simulations," MASc thesis, 2011, uWaterloo
- S Kheirkhah, "Vortex-induced vibrations of a pivoted circular cylinder and their control using a tuned-mass damper," MASc thesis, 2011, uWaterloo
- P Mehraram, "Measuring heat transfer during twin roll casting of metals," MASc thesis, 2011, uWaterloo
- Y Li, "Multi-phase multi-dimensional analysis of PEM fuel cells with carbon monoxide poisoning and oxygen bleeding," MASc thesis, 2010, Waterloo
- N Norris, "Numerical analysis of natural convection heat transfer for windows with porous screening material," MASc thesis, 2009, uWaterloo
- V Halder, "Upgrading a broad area illuminating integrating sphere and solar transmittance measurement of a sheer blind," MASc thesis, 2008, Waterloo

SERVICE AND PROFESSIONAL ACTIVITIES

Thermal Group Representative, Department Chair Appointment Committee (S'12-W'13)
Representative, Engineering Faculty Council (W'09-W'12)
Member, Waterloo Cases for Design Engineering, University of Waterloo (W'10-present)
Representative, Faculty Undergraduate Studies Committee (W'11-W'12)
Thermal Group Representative, Undergraduate Teaching Committee (W'08-F'10)

Faculty Class Representative:

- Mechatronics 3A, S'09, S'10, S'11, S'12, S'13
- Mechanical 3B, W'12, W'14
- Mechatronics 4A, F'12

Conference Chair, International Conference on Inverse Problems in Engineering, Waterloo ON, May 24-26 2017.

Minisymposium co-chair, USNCCM-11 Minisymposium in Honour of George Raithby, Minneapolis MN, July 25-29 2011

Co-Editor, Special Issue in Honour of George Raithby, Numerical Heat Transfer, 2011

Conference co-organizer, 3rd International Bunsen Workshop on LII, July 2008, Ottawa ON

ASME Heat Transfer Division K-6 Organizing Committee:

- Chair, 2013-2016
- Vice-Chair, 2011-2013
- 2012 ASME Summer Heat Transfer Conf. Session Chair (Radiation)
- 2011 IMECE Session Chair (Radiation), Session Chair (Inverse problems)
- 2009 IMECE Session Chair (Radiation), Session Co-chair (Inverse problems)
- 2008 ASME Summer Heat Transfer Conf. Session Chair (Inverse problems)
- 2007 ASME IMECE Session Chair (Radiation)
- 2005 ASME Summer Heat Transfer Conf. Session Chair (Radiation)

VOLUNTEER ACTIVITIES

Waterloo Unlimited (Program for high-school students)	2010-present
NRC Engineering Challenge (Program for elementary students)	2005-2006
Graduate Representative, Selection Committee for Lockheed-Martin Engineering Teaching Award	Spring 2002, Spring 2003
Graduate Representative, Ad Hoc Graduate Student Experience Committee, Department of Mechanical Engineering	Spring 2003
Graduate Representative, Ad Hoc Committee to Review the Administration of Dean Ben Streetman	Jan 2002-Mar 2002
Graduate Engineering Council UT Austin	President Jan 02-Apr 03 Vice-President Aug 01-Dec01
Representative Senate of College Councils, UT Austin	Aug 2001-Apr 2003