Gregory E. Bogin Jr., Ph.D.

Assistant Professor, Mechanical Engineering
Colorado School of Mines, College of Engineering and Computational Sciences
1610 Illinois St. Golden, CO 80401
Phone: 3030-273-3655, E-mail: gbogin@mines.edu

RESEARCH: Combustion, alternative fuels, chemical kinetics, computational fluid dynamics, multi-phase modeling, explosion modeling, Advanced Combustion Engines.

EDUCATION:

Ph.D., Applied Science & Technology (Applied Physics), 2008 **University of California - Berkeley**
Major Field: Thermo-fluids & Combustion
Minor Field: Astronomy
Dissertation Title: *Characterization of Ion Production Using Gasoline, Ethanol, and N-Heptane in a Homogeneous Charge Compression Ignition (HCCI) Engine*
Advisor: Robert Dibble, Ph.D.

M.S., Applied Science & Technology (Applied Physics), 2006 **University of California – Berkeley**
Major Field: Thermo-fluids & Combustion
Minor Field: Astronomy
Thesis Title: *A Comparison of Infrared Light Emitting Diodes (IR-LED) versus IR Helium-Neon Lasers (3.39 μm He-Ne) for Fuel Concentration Measurements in Lean Premixed Combustors*
Advisor: Robert Dibble, Ph.D.

B.S., Physics, 2003 **Xavier University of Louisiana**
Major Field: Physics and Engineering
Minor Field: Mathematics
Thesis Title: *Interactions of sedimenting glass spherical beads through viscous fluid in a quasi-2D interface*
Advisor: Kathleen McCloud, Ph.D.

PROFESSIONAL EXPERIENCE:

Assistant Professor **08/10 – Present**
Colorado School of Mines (CSM), Dept. of Mechanical Engineering Golden, CO

Joint-Appointment researcher **08/10 – Present**
National Renewable Energy Laboratory (NREL) Golden, CO

Combustion Engineering Consultant **01/11 – 12/15**
Denver Zoological Foundation Denver, CO
(Gasification of animal waste and trash for electricity and heat production)

Assistant Research Professor **11/09 – 08/10**
Colorado School of Mines, Dept. of Chemical Engineering Golden, CO

Adjunct Physics & Astronomy Instructor **06/09 – 08/10**
Red Rocks Community College (RRCC) Lakewood, CO

Post-Doctoral Researcher **11/08 – 11/09**
Colorado School of Mines /NREL Golden, CO

Graduate Research Assistant **08/03 – 05/08**
University of California, Berkeley Berkeley, CA

Graduate Teaching Assistant **01/04 – 05/07**
University of California, Berkeley Berkeley, CA

NSF/MRI Summer Research (MS) **05/02 – 08/02**
Northwestern University Evanston, IL

NSF/AGEP SRI Summer Research (EE) **05/01 – 08/01**
SUNY-Stony Brook Stony Brook, NY

Summer Intern in Wireless Security (EE) **05/00 – 08/00**
GTE Laboratory/Verizon Waltham, MA

TEACHING EXPERIENCE:

Courses Taught:

- Vehicle Dynamics [CSM, co-taught with 3 other faculty] Spring 2016
- Combustion [graduate course, CSM] Fall 2010 – present
- Computational Fluid Dynamics [graduate course, CSM] Spring 2011 – present
- Internal Combustion Engines [CSM] Spring 2012 – present
- Physics 111 (Algebra based) [RRCC] Summer 2010
- Physics 105 (Conceptual) [RRCC] Summer 2010
- Astronomy 101 [RRCC] Summer 2010
- Physics 211(Calculus based) [RRCC] Summer 2009
- Physics 212 (Calculus based) [RRCC] Summer 2009
- Physics 7A [UC Berkeley] Summer 2007, 2008
- ME 107B (Cam & Valve Dynamics Lab.) [UC Berkeley] Spring 2004, 2005
- ME 107B (Power Generation Lab.) [UC Berkeley] Spring 2007
- ME 107B (Tensile Strength Testing Lab.) [UC Berkeley] Spring 2007

Course Development Activities:

- MEGN 498: Vehicle Dynamics, Co-developed an undergraduate course with three other faculty on the aspects of vehicle dynamics which also included a hands-on project allowing students to implement material covered in class. The course was developed in part to support several university student led vehicle teams (e.g. Shell Eco-marathon, SAE-Baja, FSAE) which compete nationally.
- MEGN 553: Intro to Computational Fluid Dynamics, Introduction of ANSYS Fluent Software to incorporate practical applications with theory. Students focus on semester long project to enhance their experience with Fluent and provides direct experience with setting up a project from beginning to end.

- MEGN 466: Intro to Internal Combustion Engines, Developed new senior-level undergraduate course focused on IC Engines with lab to provide hands-on experience with rebuilding an engine and performing engine analysis on a research engine.
- ME 107B (Cam & Valve Dynamics Lab), ME 107 B (Power Generation Lab), ME 107B (Tensile Strength Testing Lab)

PROFESSIONAL MEMBERSHIP

- American Society of Mechanical Engineers (ASME), 2009 – present
  - Associates Board member of the American Society of Mechanical Engineers Internal Combustion Engines Division (ASME ICED) (2012 – present)
- SAE International
- The Combustion Institute
- American Chemical Society (ACS)
- National Society of Black Engineers (NSBE)

SERVICE TO THE PROFESSION

- Reviewer for the journal *Energy & Fuels*
- Reviewer for the journal *Combustion Science and Technology*
- Reviewer for the journal *SAE Journal of Fuels & Lubrications*
- Reviewer for the journal *Combustion*
- Reviewer for the journal *Energy Resources Technology*
- Reviewer for the journal *Fuel*
- Fuels Track co-Organizer/Organizer, American Society of Mechanical Engineers, Internal Combustion Engine Division, Fall Technical Conference, 2013 – present
- Session co-Chair/Chair in Fuels Track, American Society of Mechanical Engineers, Internal Combustion Engine Division, Fall Technical Conference, 2010 – 2013

SERVICE TO THE UNIVERSITY

- Graduate Curriculum Committee, 2011, 2012
- Undergraduate Curriculum Committee, 2012, 2013
- Faculty Search Committee, 2011, 2012, 2013
- Advisor to the CSM student SAE chapter, 2011 – present
- Advisor to CSM student National Society of Black Engineers (NSBE), 2014 – present

OUTREACH AND MENTORING ACTIVITIES:

- Mentor and Judge for Undergraduate and Graduate Researchers at the Emerging Researchers National (ERN) Conference, hosted by the American Association for the Advancement of Science (AAAS) and the National Science Foundation (NSF), 2008 – present
- Colorado Association of Black Professional Engineers and Scientists (CABPES), High School after-school STEM program instructor

GRADUATE STUDENTS & POST-DOCTORAL RESEARCHERS SUPERVISED

Post-doctoral Researcher Advisor

- Eric Osecky, Ph.D.

Graduate Thesis Advisor – Ph.D.

- Richard Gilmore, "Computational Fluid Dynamics Modeling of Underground Coal Longwall Gob Ventilation Systems using a Developed Universal Meshing Approach, Ph.D., 2015, CSM
- Mario Saldana, "The Design of a Variable Pressure Flow Reactor and Investigation of C2 – C7 Alkane Pyrolysis at High Conversion and High Pressure", Ph.D., 2016, CSM
- Matthew Fig, Ph.D., 2017, Colorado School of Mines, Expected
- Claire Strebinger, Ph.D., 2019, Colorado School of Mines, Expected

Graduate Thesis Co-Advisor – Ph.D.

- Jon Marts, "Nitrogen Injection in Progressively Sealed Longwall Gobs and the Formation of a Complete and Dynamic Seal", Ph.D., 2015, CSM
- Saqib Saki, "Gob Ventilation Borehole Design and Performance Optimization for Longwall Coal Mining Using Computational Fluid Dynamics", Ph.D., 2016, CSM
- Sam Lolon, Ph.D., 2017, Mining Engineering, Colorado School of Mines, Expected
- Allie Anderson, Ph.D., 2017, Metallurgical and Materials Engineering, Expected
- Aditya Juganda, Ph.D., 2018, Mining Engineering, Colorado School of Mines, Expected

Graduate Thesis Advisor – M.S.

- Dana Sledz, "Investigation on Improvements of TCO processing on CdTe thin film solar cells", M.S., 2012, CSM.
- Jeffrey Croxall, "Design of a high pressure flow reactor for mechanism validation with emphasis on fuel pyrolysis" Colorado School of Mines, May 2013, CSM.
- Joseph Taglialegami, "Simulation of n-heptane and fuels for advanced combustion engines (FACE) surrogates in a single-cylinder compression ignition engine" M.S., May 2013, CSM.

Graduate Committee

- Justin Blasi, Ph.D. 2015, CSM
- Kun Wang, Ph.D. 2015, CSM
- Yogesh Koirala, Ph.D. 2015, CSM
- Anna Trendewicz, Ph.D. 2015, CSM
- Eric Osecky, Ph.D. 2014, CSM
- Danielle Murphy, Ph.D. 2013, CSM
- Sean Duran, Ph.D. Candidate, expected 2016, CSM
- Jeffrey Wheeler, M.S. 2013, CSM
- Brandon Blakely, M.S. Candidate, CSM
- Nicholas Lumley, M.S., 2013

Undergraduate Student

- Parker Bryant, B.S. May 2013
- Robert Hickham, B.S. December 2013
- Oscar Ferut, B.S. May 2013
- Andrew Osborne, B.S. December 2013
- Reed Sanchez, B.S. May 2015
- Corbin Smith, B.S. May 2015

JOURNAL PUBLICATIONS
CSM students and post-doctoral researchers marked by "*".

Published:

1. Fig*, M.; **Bogin Jr., G.E.**; Brune, J.F.; Grubb, J.W. Experimental and numerical investigation of methane ignition and flame propagation in cylindrical tubes ranging from 5 to 71 cm – Part I: Effects of scaling from laboratory to large-scale field studies, *Journal of Loss Prevention in the Process Industries*, **2016**, Vol. 41, pp. 241 – 251, **DOI**:10.1016/j.jlp.2016.03.018.
2. Saldana*, M.; **Bogin Jr., G.E.**; Investigation of Pentane Pyrolysis at elevated pressures and temperatures in a variable pressure flow reactor, *Journal of Analytical and Applied Pyrolysis*, **2016**, Vol. 118, pp. 286 – 297, **DOI**:10.1016/j.jaap.2016.02.012.
3. Saki*, S.A.; Brune, J.F.; Gilmore*, R.C.; **Bogin Jr, G.E**.; Grubb, J.W.; Marts*, J.A. CFD Study of Face Ventilation Effects on CH4 in Returns and EGZs in Progressively Sealed Longwall Gobs, *Journal of the South African Institute of Mining and Metallurgy***, 2016, Accepted**.
4. Brune, J.F.; Grubb, J.W.; **Bogin Jr, G.E.**; Marts*, J.A.; Gilmore*, R.C.; Saki*, S.A. Lessons learned from Research About Methane in Coal Mine Gobs. International *Journal of Mining and Mineral Engineering*, **2016**, Vol. 7(2), pp. 155 – 169.
5. Lolon*, S.; Brune, J.F.; **Bogin Jr., G.E.**; Grub, J.W.; Saqib*, S.; Aditya*, J. Computational Fluid Dynamics Simulation on the Longwall Gob Breathing. *International Journal of Mining Science and Technology*, **2016, Accepted**.
6. Gilmore*, R.; Marts*, J.; Brune, J.; Saki*, S.;, **Bogin, G.;** Grubb, J. Simplifying CFD Modeling of Longwall Gob with Modular Meshing Approach. *Mining Engineering*, **2015,** Vol. 67, No. 3, pp. 68-72; *SME Transactions*, **2015,** Vol. 338.
7. Marts*, J.; Gilmore*, R.; Brune, J.; **Bogin, G.;** Grubb, J.; Saki*, S. Dynamic Gob Response and Reservoir Properties for Active Longwall Coal Mines, *Mining Engineering* , **2014**, Vol. 66, No. 12, p. 41-48; *SME Transactions*, **2014**, Vol. 336.
8. **Bogin Jr., G.E.**; Osecky*, E.; Chen, J.Y.; Ratcliff, M.A.; Luecke, J.; Zigler, B.T.; Dean, A.M. Experiments and Computational Fluid Dynamics Modeling Analysis of Large n-Alkane Ignition Kinetics in the Ignition Quality Tester (IQT) *Energy Fuels*, **2014**, 28 (7), pp 4781 – 4794. **DOI:** 10.1021/ef500769j
9. **Bogin Jr., G.E**.; Osecky*, E; Ratcliff, M.A.; Luecke, J.; Zigler, B.T.; Dean, A.M. An Ignition Quality Tester (IQT) Investigation of the Negative Temperature Coefficient Region of Alkane Autoignition *Energy Fuels*, **2013,** 27(3), 1632-1642**. DOI:** 10.1021/ef301738b
10. **Bogin Jr., G.E**.; DeFilippo, A.; Chen, J.Y.; Chin, G.; Luecke, J.; Ratcliff, M.A.; Zigler, B.T.; Dean, A.M. Numerical and Experimental Investigation of n-Heptane Autoignition in the Ignition Quality Tester (IQT) *Energy Fuels*, **2011**, 25 (12), 5562-5572. **DOI**: 10.1021/ef201079g
11. **Bogin, G**.; Dean, A.M.; Ratcliff, M.A.; Luecke, J. Zigler, B.T. Expanding the Experimental Capabilities of the Ignition Quality Tester for Autoigniting Fuels, *SAE Int. J. Fuels Lubr.* **2010**, 3(1), 353-367. **DOI**: 10.4271/2010-01-0741
12. **Bogin Jr., G.E**.; Mack, J.H.; Dibble, R.W. Fuel Effects on Ion Sensing in a Homogeneous Charge Compression Ignition (HCCI) Engine, *SAE Int. J. Fuels Lubr*. **2009**, 2(1), 817-826. **DOI**: 10.4271/2009-01-1805
13. **Bogin Jr., G.E**.; Chen, J.Y.; Dibble, R.W. The effects of intake pressure, fuel concentration, and bias voltage on the detection of ions in a Homogeneous Charge Compression Ignition (HCCI) Engine *Proc. Combust. Inst.* **2009**, 32, 2877-2884. **DOI**: 10.1016/j.proci.2008.08.012

Submitted:

14. **Bogin Jr., G.E.**; Luecke, J; Ratcliff, M.A.; Zigler, B.T. The Impact of ethanol/iso-octane blend ratios on observed NTC region within the Ignition Quality Tester (IQT), *Fuel*, **2016**, **Submitted**
15. Osecky*, E.; **Bogin Jr., G.E**.; Ratcliff, M.A.; Luecke, J.; Zigler, B.T.; Dean, A.M. Investigation of Iso-octane in Ignition Qaulity Tester (IQT) and development of multi-zone model, *Energy Fuels*, **2016**, **Submitted**.

In-preparation:

Draft papers undergoing internal review in preparation for journal submission.

16. Saldana*, M.; **Bogin Jr., G.E.**; Dean, A.M.; Investigation of pressure effects on Ethane pyrolysis and molecular weight growth at elevated temperatures, *Journal of Analytical and Applied Pyrolysis*, **2016**, **In-preparation**.
17. Fig*, M.; **Bogin Jr., G.E.**; Brune J.F.; Grubb J.W. Experimental and numerical investigation of methane ignition and flame propagation in cylindrical tubes ranging from 5 to 71 cm – Part II: Effects of rock rubble from laboratory to large-scale field studies, *Journal of Loss Prevention in the Process Industries*, **2016, In-preparation.**

CONFERENCE PROCEEDINGS

Peer-reviewed Conference Papers:

1. Brune, J.F.; Grubb, J.W.; **Bogin Jr., G.E.**; Marts*, J.A.; Gilmore*, R.C.; Lolon*, S.A. A Critical Look at Longwall Bleeder Ventilation, 15th North American Mine Ventilation Symposium, Virginia Polytechnic Institute and State University, Blacksburg, VA, **2015,** p. 427 – 432 .
2. Grubb, J.W.; Brune, J.F.; Zipf, R.K.; **Bogin Jr., G.E.**; Marts*, J.A.; Gilmore*, R.C.; Saki*, S.A. Managing the Risk of Spontaneous Combustion in Underground Coal Mines, 15th North American Mine Ventilation Symposium, Virginia Polytechnic Institute and State University, Blacksburg, VA, **2015,** p. 547 – 554.
3. Lolon* S.A.; Gilmore*, R.C.; Brune, J.F.; **Bogin Jr., G.E.**; Grubb, J.W.; Zipf, R.K.; Juganda*, A.; Saki*, S.A. Effects of Decreasing Barometric Pressure on Explosize Gas Zones in Bleeder Ventilated Longwall Gobs, 15th North American Mine Ventilation Symposium, Virginia Polytechnic Institute and State University, Blacksburg, VA, **2015,** p. 439 – 444**.**
4. Saki*, S.A.; Brune, J.F.; **Bogin Jr., G.E.**; Gilmore*, R.C.; Grubb, J.W.; Zipf, R.K.; Marts*, J.A. Gob Ventilation Boreholes Design Optimization for Longwall Coal Mining, 15th North American Mine Ventilation Symposium, Virginia Polytechnic Institute and State University, Blacksburg, VA, **2015,** p. 453 – 460.
5. Gilmore*, R.; Brune, J.; Marts*, J.; Saki*, S.; **Bogin, G**.; Grubb, J. Gob Ventilation Modeling on HPC pltaforms using GPGPU/CPU Combinations. Application of Computers and Operations Research in the Mineral Industry (APCOM), Fairbanks, AK, **2015**, p. 904 - 910.
6. Goertz,* B.; Brune ,J.F.; Parmar A.; McDaniel S.; Rockley T.;, Soares, F.; **Bogin, G**. [2015]: Development of Mine Dust Sampling Instrument for use in Underground Coal Mines, 15th North American Mine Ventilation Symposium, Virginia Polytechnic Institute and State University, Blacksburg, VA, 2015, p. 391 – 397.
7. Gilmore*, R.; Marts*, J.; Brune, J, **Bogin, G**, Grubb, J and Saki*, S. (2014): CFD Modeling Explosion Hazards - Bleeder vs. Progressively Sealed Gobs. 10th International Mine Ventilation Congress (IMVC), Sun City, South Africa, **2014**, p. 47 – 54.
8. Marts*, J.; Gilmore*, R.; Brune, J.; **Bogin, G.;** Grubb, J.; Saki*, S. Accumulations of Explosive Gases in Longwall Gobs and Mitigation through Nitrogen Injection and Face Ventilation Method. 6th Aachen International Mining Symposia (AIMS), Aachen, Germany, **2014**, p. 347 – 358.
9. Taglialegami*, J.; **Bogin Jr., G.E.**[#]; Osecky*, E.; Dean, A.M. CFD simulation of Low-Temperature Combustion (LTC) within a single-cylinder Hatz diesel engine, ASME-ICEF2013-19257, **2013**. DOI:10.1115/ICEF2013-19257

10. **Bogin Jr., G.**; Mack, J.H.; Dibble, R.W. Spark plug modifications for improving ion-sensing capabilities in a Homogeneous Charge Compression Ignition (HCCI) engine, ASME-ICES2009-76161, pp.351-358. **2009**. DOI:10.1115/ICES2009-76161

Non peer-reviewed Conference Papers:

All papers are in print and included on CD or USB for conference attendees.

11. Gilmore*, R.C.; Brune, J.F.; Lolon*, S.A., Juganda*, A.; Saki*, S.A.; **Bogin, Jr., G.E**., Zipf Jr., R.K.; Grubb, J.W. Explosive Gas Zone Formation in Underground Coal Longwall Bleeder Ventilated Gobs with an Adjacent Panel using CFD Modeling. SME Annual Conference and Expo. Phoenix, AZ. February, **2016**.
12. Lolon*, S.A.; Brune, J.F.; Gilmore*, R.C., **Bogin Jr., G.E.;** Grubb, J.W.; Saki*, S.A.; Juganda*, A. CFD Studies on the Phenomenon of Gob Breathing Induced by Barometric Pressure Fluctuations. SME Annual Conference and Expo. Phoenix, AZ. February, **2016**.
13. Saki*, S.A., Brune, J.F.; **Bogin, Jr.; G.E**., Grubb, J.W.; Gilmore*, R.C.; Lolon*, S.A. (2016). "Optimization of Gob Ventilation Boreholes Completion Parameters". SME Annual Conference and Expo. Phoenix, AZ. February, **2016**.
14. Gilmore*, R.; Marts*, J.; Brune, J.; Saki*, S.; **Bogin, G**.; Grubb, J. Impact of Regulator Settings on the Formation of Explosive Gas Zones in Bleeder Ventilated Longwall Gobs. SME PrePrint no. 15 – 086, SME 2015 Annual Meeting, February **2015**, Denver, CO.
15. Marts*, J.; Gilmore*, R.; Brune, J.; Saki*, S.; **Bogin, G**.; Grubb, J. Optimizing Nitrogen Injection for Progressively Sealed Panels. SME Preprint no.15 – 093, SME 2015 Annual Meeting, February **2015,** Denver, CO.
16. Saki*, S.; Marts*, J.; Gilmore*, R.; Brune, J.; **Bogin, G**.; Grubb, J. CFD Study of Face Ventilation Effect on Tailgate Methane Concentration and Explosive Mixture of Gob in Underground Longwall Coal Mining. SME Preprint no. 15 – 001, SME 2015 Annual Meeting, February **2015**, Denver, CO.
17. Brune, J.F.; Grubb, J.W.; **Bogin Jr., G.E**.; Marts*, J.A.; Gilmore*, R.C.; Saki*, S.A. Lessons Learned from Research About Methane in Coal Mine Gobs. SME Preprint no. 15 – 073, SME 2015 Annual Meeting, February **2015**, Denver, CO.
18. Goertz*, B.; Brune, J.F.; Bakhsh, K.J.; McDaniel, S.; Rockley, T, **Bogin, G.E**.. Development of a Dust Sample Collection Prototype for use in Underground Coal Mines. SME Preprint no. 15 – 104, SME 2015 Annual Meeting, February **2015**, Denver, CO.
19. Gilmore*, R.; Marts*, J.; Brune, J.; Saki*, S.; **Bogin, G.;** and Grubb, J. Simplifying Innovative Meshing Approach to Modeling Longwall Gob Gas Distributions and Evaluation of Back Return Using Computational Fluid Dynamics. SME Preprint no. 14 – 154, SME 2014 Annual Meeting, February **2014,** Salt Lake City, Utah.
20. Osecky*, E.; **Bogin Jr., G.E.**; Villano, S.M.; Ratcliff, M.A.; Luecke, J.; Zigler, B.T.; Dean, A.M. Using the Ignition Quality Tester (IQT) as a Tool for Mechanism Validation and Improvement, Western States Section of the Combustion Institute, **October 2013**, Fort Collins, CO.
21. Gilmore*, R.C.; Marts*, J.A.; Brune, J.F.; **Bogin Jr., G.E.**; Grubb, J.W. Control of Explosive Zones in Longwall Gobs through Nitrogen Injection, World Mining Congress, **August 2013,** Montreal, Canada**.**
22. **Bogin Jr., G.E.**; DeFilippo, A.; Chen, J.Y.; Chin, G.; Luecke, J.; Ratcliff, M.A.; Zigler, B.T.; Dean, A.M. Modeling the Fuel Spray and Combustion Process of the Ignition Quality Tester™ with KIVA-3V Western States Section of the Combustion Institute, **October 2009**, Irvine, CA.
23. **Bogin Jr., G.E.**; Chen, J.Y.; Dibble, R.W. Numerical & Experimental Investigation of Ions in a Homogeneous Charge Compression Ignition (HCCI) Engine, Western States Section of the Combustion Institute, **October 2007**, Livermore, CA.
24. Girard, J.W.; **Bogin, G.E.**; Mack, J.H.; Chen, J.Y.; Dibble, R.W. A Comparison of Infrared Light Emitting Diodes (IR-LED) versus Infrared Helium-Neon (He-Ne) Lasers for Tomographic Reconstruction of Mean and RMS Fuel Concentration in Combustors, Western States Section of the Combustion Institute, **October 2005**, Stanford, CA.

INVITED SEMINARS AND PRESENTATIONS

1. Boulder Fluid Dynamics Seminar Series, University of Colorado – Boulder, July 28, 2015, Boulder, CO.
2. Biology and Chemistry Department Seminar, California State University – Pomona, May 29, 2015, Pomona, CA.
3. Mechanical Engineering Department Seminar. Colorado State University, February 15, 2013, Fort Collins, CO.
4. Mechanical Engineering Department Seminar. University of Colorado – Colorado Springs, November 16, 2012, Colorado Springs, CO.
5. *Symposium on Fuels of the Future.* American Chemical Society (ACS) Rocky Mountain Region Meeting, Invited Presentation. October 19, 2012, Denver, CO.

CONTRACTS AND GRANTS AWARDED

List of sponsored research projects, 2010 -2016 (Total Project Funding = $4.7M, with ~$1.7M share):

2016 – 2017 Topic: Development of a three dimensional multiphase CFD model to predict the temporal and spatial distribution of hydrate formation in a subsea production tree at 136 MPa
Sponsor: OneSubsea; **PI: Gregory Bogin Jr.**

2015 – 2016 Topic: Fuel Ignition Kinetic Mechanism Development Using the Ignition Quality Tester
Sponsor: National Renewable Energy Laboratory; **PI: Gregory Bogin Jr**.

2014 – 2019 Topic: Combustion Modeling and Spon Com Prevention in Longwall Gobs
Sponsor: Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; PI: Jürgen Brune, **co-PI: Gregory Bogin Jr.**, co-PI: John Grubb

2013 – 2016 Topic: Development of New Rock Dust Sampler
Sponsor: Alpha Foundation for the Improvement of Mine Safety and Health
PI: Jürgen Brune, **co-PI: Gregory Bogin Jr.**, co-PI: Masami Nakagawa

2010 – 2016 Topic: Experimental Validation of Kinetic Ignition Models for Alkanes and Methyl Esters
Sponsor: National Renewable Energy Laboratory **; PI: Gregory Bogin Jr.**

2012 – 2016 Topic: Heterogeneously-Catalyzed Endothermic Fuel Cracking
Sponsor: Air Force Office of Scientific Research; PI: Anthony M. Dean, co-PI: Robert J. Kee, **co-PI: Gregory Bogin Jr.**

2014 – 2015 Topic: Combustion Modeling of Explosive Gas Zones in Longwall Gobs
Sponsor: Alpha Foundation for the Improvement of Mine Safety and Health;
PI: Gregory Bogin Jr., co-PI: Jürgen Brune, co-PI: John Grubb

2012 – 2013 Topic: Comparison of FORTE simulations to engine experiments under HCCI, RCCI, and GDI operating conditions
Sponsor: Oak Ridge National Laboratory; **PI: Gregory Bogin Jr.**

2009 – 2014 Topic**:** Computational Fluid Dynamic Modeling for Underground Mines
Sponsor: Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; PI: Jürgen Brune, co-PI: David Munoz, co-PI: John Grubb, **co-PI: Gregory Bogin** (added to the project in 2012 *($1.2M for this project not included in Total Project Funding listed above*)