

## **Dr. Johney Green, Jr.**

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### **SUMMARY OF QUALIFICATIONS**

- Provided leadership that enabled Oak Ridge National Laboratory (ORNL) to become recognized as the office of Energy Efficiency and Renewable Energy's lead laboratory for energy-efficiency research (EERE Industry Day)
- Demonstrated ability to lead complex multi-disciplinary research teams (the AMIE demonstration project, 3D printed Shelby Cobra, and Strati)
- Demonstrated ability to expand science leadership across multiple disciplines (transportation, buildings, manufacturing, and energy systems integration)
- Demonstrated ability to capture programs (MAXLAB, selected as a Lead Lad for EERE's Small Business Voucher's Pilot Program, ARPA-E)
- Successful oversight of 3 DOE User Facilities (NTRC, BTRIC, and MDF)
- Demonstrated ability to link basic R&D in computing and neutron imaging to applied R&D in transportation, buildings, and manufacturing
- Demonstrated ability to collaborate with industry (several ETSD CRADAs, R&D 100 Awards, etc.)
- Increased the business volume of ETSD by over 30%
- Increased the publication output of ETSD (7 papers in journals with an Impact Factor greater than 10 in FY 2015 compared to 2 in FY 2014)

### **PROFESSIONAL EXPERIENCE**

#### ***Oak Ridge National Laboratory (ORNL), Oak Ridge, TN***

##### ***Director of the Energy and Transportation Science Division; March 2008–Present***

- Lead more than 170 staff of a science and technology organization that encompasses multiple scientific research areas and facilities and performs research and development (R&D) spanning the areas of building energy efficiency, sustainable industry and manufacturing, fuels, engines, and emissions, transportation policy and analysis, and vehicle systems integration
- Responsibilities include strategic planning, staff supervision, resource scheduling, program development, and budget management for an R&D organization with an annual budget of more than \$100M
- Member of the USDRIVE Advanced Combustion and Emission Control Technical Team

##### ***Fuels, Engines, and Emissions Research Group Leader; May 2003–February 2008***

- Led more than 30 R&D staff of a U.S. Department of Energy (DOE) User Center that specializes in the detailed characterization of energy conversion systems
- Responsibilities include staff supervision, resource scheduling, program development, and budget management of an R&D organization with an annual budget of more than \$15M
- Member of the Freedom CAR and Fuel Partnership Advanced Combustion and Emission Control and Vehicle Systems Analysis Technical Teams R&D Staff Member; June 1995- April 2003
- Led technical efforts to investigate low temperature combustion regimes in diesel engines and to develop combustion diagnostics that would detect the onset of low temperature combustion
- Served as technical coordinator of the 21st Century Truck Partnership during a one-year assignment at DOE
- Evaluated exhaust emissions control devices on spark-ignition and diesel engines
- Wrote control strategies for a full-pass diesel engine controller
- Investigated spark-ignited engine lean idle control during a one-year appointment at Ford Motor Company's Scientific Research Laboratory
- Explored the utilization of hydrogen fuel reformers on spark-ignition and diesel engines
- Conducted on-road and chassis dynamometer vehicle experiments to develop modal emissions and fuel consumption models
- Wrote algorithms for analyzing combustion data and developing spark-ignition combustion models

- Utilized advanced nonlinear dynamics to investigate and control combustion instabilities in spark-ignition engines. University of Tennessee (UT), Knoxville, TN

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***Adjunct Research Professor; August 2005–Present***

Collaborate with UT faculty in the Department of Mechanical, Aerospace, and Biomedical Engineering on proposal writing and developing programs related to advanced internal combustion engines

Provide research guidance and direction to graduate and undergraduate students

**EDUCATION**

***Georgia Institute of Technology***

Ph.D. in Mechanical Engineering; December 2000

***Georgia Institute of Technology***

Master of Science in Mechanical Engineering; December 1993

***University of Memphis***

BSME - Magna Cum Laude, Minor: Mathematics; May 1992

**HONORS & AWARDS**

- SAE International, Elected to the Membership Grade of Fellow for R&D contributions to sustainable high-efficiency automotive transportation (2016)
- ORNL, Award for Research Leadership at the Division Level (2014)
- ORNL, Mentor-Protégé Program Champion Award (2013)
- Black Engineer of the Year, Special Recognition Award for “Distinguished Achievement, High Merit, Broad Impact on People in Other Disciplines, and Value to Society as a Whole” (2010)
- The National GEM Consortium, Employer Representative of the Year Award (2010)
- National Academy of Engineering, One of 60 Engineers Selected to Participate in the German
- American Frontiers of Engineering Symposium (2009)
- National Academy of Engineering, One of 83 Engineers Selected to Participate in the U.S. Frontiers of Engineering Symposium (2007)
- Knoxville Business Journal, Recognition as One of the Top 40 Business and Community Leaders Under 40 in East Tennessee (2007)
- ORNL, Esprit de Corps Award for “The Successful Launch of the African American Affinity Resource Council” (2007)
- Black Collegian Magazine, Highlighted as One of the Ten African American Role Models in Science and Technology (2007)
- 10 African American Role Models in Science and Technology (2007)
- Oak Ridge Institute for Science and Education, Award for Outstanding Mentoring (2006)
- Science Spectrum Magazine, Recognition as One of the 50 Most Important Blacks in Research Science (2004)
- U.S. DOE Office of Freedom CAR and Vehicle Technologies, Award for Technical Excellence in Collaborative Inter-Laboratory Research (2004)
- Black Engineer of the Year, Award in the Category of Outstanding GEM Alumnus (2000)
- ORNL, Significant Event Award for “Breakthrough Research in Diesel Engine Emissions Control” (2000)
- ORNL, Significant Event Award for “Breakthrough Research in Diesel Engine Emissions Control” (2000)
- ORNL, Technical Achievement Award for “Developing a Process to Improve Combustion Stability in Internal Combustion Engines” (1998)
- Black Engineer of the Year, Recognition as the Most Promising Engineer (1997)
- Tau Beta Pi, National Engineering Honor Society (1992)
- Pi Tau Sigma, International Mechanical Engineering Honor Society (1992)

## PATENTS & PUBLICATIONS

### PATENTS

Wagner, R. M., C. S. Daw, J. B. Green, and K. D. Edwards. "Method and Device for Diagnosing and Controlling Combustion Instabilities in Internal Combustion Engines Operating in or Transitioning to Homogeneous Charge Combustion Ignition Mode"; United States Patent Number 7,431,011; Issued October 7, 2008.

Green, J. B., C. S. Daw, and R. M. Wagner. "Combustion Diagnostic for Active Engine Feedback Control"; United States Patent Number 7,277,790; Issued October 02, 2007.

### PUBLICATIONS

Mo, J., S. M. Steen, F.-Y. Zhang, T. J. Toops, M. P. Brady, and J. B. Green, Jr. (2015). "Electrochemical Investigation of Stainless Steel Corrosion in a Proton Exchange Membrane Electrolyzer Cell," *International Journal of Hydrogen Energy* 40 (36), 12506-12511.

Finney, C. E. A., B. Kaul, C. S. Daw, R. M. Wagner, and J. Green, Jr. (2015). "Invited Review: A Review of Deterministic Effects in Cyclic Variability of Internal Combustion Engines," *International Journal of Engine Research* 16 (3), 366-378.

Curran, S., R. Wagner, R. Graves, M. Keller, and J. Green, Jr. (2014). "Well-to-Wheel Analysis of Direct and Indirect use of Natural Gas in Passenger Vehicles," *Energy* 75, 194-203.

Finney, C. E. A., M. K. Stoyanov, S. Pannala, C. S. Daw, R. M. Wagner, K. D. Edwards, C. G. Webster, and J. B. Green, Jr. (2013). "Application of High Performance Computing for Simulating the Unstable Dynamics of Dilute Spark-Ignited Combustion," *Proceedings of the International Conference on Theory and Application in Nonlinear Dynamics (ICAND 2012)*.

Kaul, B., R. Wagner, and J. Green, Jr. (2013). "Analysis of Cyclic Variability of Heat Release for High-EGR GDI Engine Operation with Observations on Implications for Effective Control," *SAE International Journal of Engines*, 6(1).

Jackson, R. K., G. Khowailed, and J. B. Green, Jr. (2013). "Lab Takes on Residential Energy Efficiency in the Southeast," *Home Energy*.

Wagner, R., S. Curran, and J. B. Green (2013). "A Perspective on the Future of High Efficiency Engines," *Proceedings of the XI<sup>th</sup> Conference on Engine Combustion Processes*.

Gao, Z., C. S. Daw, R. M. Wagner, C. S. Sluder, and J. B. Green, Jr. (2011). "Analysis of Combustion Trajectories of Advanced Combustion Modes in a CIDI Engine with a Two-Zone Phenomenological Model," *7th US National Technical Meeting of the Combustion Institute*.

Gao, Z., R. M. Wagner, C. S. Sluder, C. S. Daw, and J. B. Green, Jr. (2011). "Using a Phenomenological Computer Model to Investigate Advanced Combustion Trajectories in a CIDI Engine," *Fuel*, 90(5).

Daw, C. S., K. D. Edwards, R. M. Wagner, J. B. Green, Jr., and W. Glewen (2008). "Modeling Cyclic Variability in Spark Assisted HCCI," *Journal of Engineering for Gas Turbines and Power*.

Edwards, K. D., R. M. Wagner, C. S. Daw, and J. B. Green (2007). "Understanding the Dynamics of Spark Assisted HCCI," *Proceedings of the American-Japanese Flame Research Committees International Symposium*.

Daw, C. S., K. D. Edwards, R. M. Wagner, and J. B. Green (2007). "Modeling Cyclic Variability in Spark-Assisted HCCI," *Proceedings of the ASME Internal Combustion Engine Division 2007 Fall Technical Conference, ICEF2007-1685*.

- Edwards, K. D., R. M. Wagner, C. S. Daw, and J. B. Green (2007). "Hybrid SI-HCCI Combustion Modes and the Potential for Control," Fifth Joint Meeting of the U.S. Sections of the Combustion Institute.
- Daw, C. S., K. D. Edwards, R. M. Wagner, and J. B. Green (2007). "Modeling Cyclic Variability during the Transition between Spark-Ignited Combustion and HCCI," Fifth Joint Meeting of the U.S. Sections of the Combustion Institute.
- Daw, C. S., R. M. Wagner, K. D. Edwards, and J. B. Green (2006). "Understanding the Transition between Conventional Spark-Ignited Combustion and HCCI in a Gasoline Engine," 31st International Symposium on Combustion.
- Edwards, K. D., C. S. Daw, R. M. Wagner, and J. B. Green (2006). "Cyclic Variability During the Transition Between Spark-ignited Combustion and HCCI," Technical Meeting of the Central States Section of the Combustion Institute.
- Partridge, W. P., T. J. Toops, J. B. Green, and T. R. Armstrong (2006). "Intra-Fuel Cell Stack Measurements of Transient Concentration Distributions," Journal of Power Sources.
- Huff, S. P., B. H. West, J. E. Parks, M. Swartz, J. B. Green, and R. L. Graves (2006). "In-Cylinder Regeneration of Lean NOx Trap Catalysts Using Low Temperature Combustion," SAE Paper No. 2006-01-1416.
- Wagner, R. M., K. D. Edwards, C. S. Daw, J. B. Green, Jr., and B. G. Bunting (2006). "On the Nature of Cyclic Dispersion in Spark Assisted HCCI Combustion," SAE Paper No. 2006-01-0418.
- Edwards, K. D., R. M. Wagner, V. K. Chakravarthy, C. S. Daw, and J. B. Green, Jr. (2005). "A Hybrid 2-Zone/Wave Engine Combustion Model for Simulating Combustion Instabilities During Dilute Operation," SAE Paper No. 2005-01-3801.
- Green Jr., J. B. and C. S. Daw (2003). "Engine Control Improvement through Application of Chaotic Time Series Analysis," Oak Ridge National Laboratory, ORNL95-0337.
- Wagner, R. M., J. B. Green Jr., T. Q. Dam, K. D. Edwards, and J. M. Storey (2003). "Simultaneous Low Engine-Out NOx and Particulate Matter with Highly Diluted Diesel Combustion," SAE Paper No. 2003-01-0262.
- Wagner, R. M., J. B. Green Jr., T. Q. Dam, K. D. Edwards, and J. M. Storey (2003). "A Novel Combustion Regime for Lower Engine-Out Emissions in Light Duty Diesel Engines," Proceedings of the United States Technical Meeting of the Combustion Institute.
- Edwards, K. D., R. M. Wagner, J. B. Green Jr., and C. S. Daw (2003). "Adaptive Dynamic Control of Cyclic Dispersion in a Lean Spark-Ignition Combustion Model," Third Joint Meeting of the U.S. Sections of the Combustion Institute.
- Green Jr., J. B., R. M. Wagner, and C. S. Daw (2002). "Model Based Control of Lean Cyclic Dispersion in Lean Spark Ignition Combustion," Technical Meeting of the Central States Section of the Combustion Institute.
- Daw, C. S., J. B. Green, Jr., R. M. Wagner, C. E. A. Finney, L. I. Davis, L. A. Feldkamp, J. W. Hoard, F. Yuan, and F. T. Connolly (2002). "Controlling Cyclic Combustion Variations in Lean-Fueled Spark-Ignition Engines," Experimental Chaos Vol. 622.
- Wagner, R. M., C. S. Daw, and J. B. Green Jr. (2001). "Low-Order Map Approximations of Lean Cyclic Dispersion in Premixed Spark Ignition Engines," SAE Transactions Journal of Fuels and Lubricants, SAE Paper No. 2001-01-3559.
- Wagner, R. M., C. S. Daw, and J. B. Green, Jr. (2001). "Characterizing Lean Spark Ignition Combustion Instability in Terms of a Low-Order Map," Second Joint Meeting of the U.S. Sections of the Combustion Institute.
- Nixdorf, R. D., J. B. Green, Jr., J. M. Storey, R. M. Wagner, and H. D. Kimrey (2001). "Microwave Regenerated Diesel Exhaust Particulate Filter," SAE Paper No. 2001-01-0903.

- Davis Jr., L. I., L. A. Feldkamp, J. W. Hoard, F. Yuan, F. T. Connolly, C. S. Daw, and J. B. Green, Jr. (2001). "Controlling Cyclic combustion Variations in Lean-Fueled Spark Ignition Engines," SAE Paper No. 2001-01-0257.
- Green Jr., J. B. (2000). "Application of Deterministic Chaos Theory to Cyclic Variability in Spark-Ignition Engines," PhD Dissertation, Georgia Institute of Technology.
- Daw, C. S., J. B. Green, Jr., R. M. Wagner, C. E. A. Finney, and F. T. Connolly (2000). "Synchronization of Combustion Variations in a Multi-Cylinder Spark Ignition Engine," Twenty-Eighth International Combustion Symposium.
- Wagner, R. M., J. B. Green, Jr., J. M. Storey, and C. S. Daw (2000). "Extending Exhaust Gas Recirculation Limits in Diesel Engines," 2000 Annual Conference and Exposition of the Air & Waste Management Association, Paper 643.
- Daw, C. S., J. B. Green, Jr., R. M. Wagner, C. E. A. Finney, and F. T. Connolly (2000). "Synchronization of Combustion Variations in Multi-Cylinder Spark-Ignition Engines," Global Powertrain Congress.
- Green Jr., J. B., N. Domingo, J. M. Storey, R. M. Wagner, J. S. Armfield, L. Bromberg, D. R. Cohn, A. Rabinovich, and N. Alexeev (2000). "Experimental Evaluation of SI Engine Operation Supplemented by Hydrogen Rich Gas from a Compact Plasma Boosted Reformer," SAE Paper No. 2000-01-2206.
- Daw, C. S., J. B. Green, Jr., R. M. Wagner, C. E. A. Finney, and F. T. Connolly (2000). "Synchronization of Combustion Variations in a Multi-Cylinder Spark-Ignition Engine," Central States 2000 Technical Meeting of the Combustion Institute.
- Wagner, R. M., J. A. Drallmeier, C. S. Daw, and J. B. Green, Jr. (1999). "Repeating Cyclic Variability Patterns in Spark Ignition Engines," Eastern, Central, and Western States Joint Technical Meeting of the Combustion Institute.
- Green Jr., J. B., C. S. Daw, J. S. Armfield, C. E. A. Finney, R. M. Wagner, J. A. Drallmeier, M. B. Kennel, and P. Durbetaki (1999). "Time Irreversibility and Comparison of Cyclic-Variability Models," SAE Paper No. 1999-01-0221.
- Green Jr., J. B., C. S. Daw, J. S. Armfield, C. E. A. Finney, and P. Durbetaki (1998). "Time Irreversibility of Cycle-by-Cycle Engine Combustion Variations," Proceedings of the Technical Meeting of the Central States Section of the Combustion Institute.
- Finney, C. E. A., J. B. Green, Jr., and C. S. Daw (1998). "Symbolic Time-Series Analysis of Engine Combustion Measurements," SAE Paper No. 980624.
- Armfield, J. S., T. S. Bigelow, C. S. Daw, R. L. Graves, J. B. Green, Jr., G. R. Hanson, J. H. Whealton, and J. B. Wilgen (1997). "The Effect of Energy Fields on Combustion in a Real Engine Geometry," Proceedings of the Technical Meeting of the Central States Section of the Combustion Institute.
- West, B. H., J. M. Storey, S. A. Lewis, G. L. Devault, J. B. Green, C. S. Sluder, J. W. Hodgson, and B. L. Moore (1997). "Experimental and Numerical Assessment of On-Road Diesel and Biodiesel Emissions," Proceedings of the 1997 Diesel Engine Emissions Reduction Workshop.
- Daw, C. S., J. B. Green, Jr., M. B. Kennel, J. F. Thomas, C. E. A. Finney, and F. T. Connolly (1996). "A Simple Model for Cyclic Variations in a Spark-Ignition Engine," SAE Paper No. 962086.
- Daw, C. S., J. B. Green, Jr., M. B. Kennel, J. F. Thomas, C. E. A. Finney, and F. T. Connolly (1996). "A Simple Model for Cyclic Variations in a Spark-Ignition Engine," Proceedings of the 1996 Technical Meeting of the Central States Section of the Combustion Institute.
- West, B. H. and J. B. Green, Jr. (1994). "Effects of Piston Surface Treatments of Performance and Emissions of a Methanol-Fueled, Direct Injection, Stratified Charge Engine," National Renewable Energy Laboratory, NREL/TP-425-6161.