

Curriculum Vitae
As of January 2011

YIANNIS ANGELO LEVENDIS

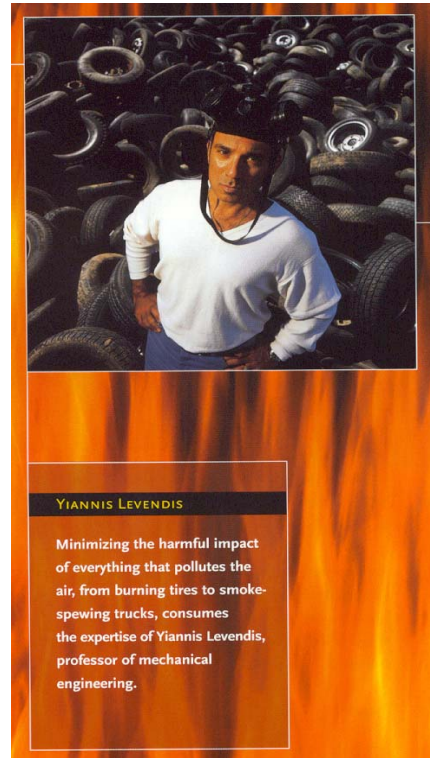
Professor of Mechanical Engineering
334 Snell Engineering Center
Northeastern University
Boston, Massachusetts 02115
Office: (617) 373-3806
Home: (617) 247-4037
[**y.levendis@neu.edu**](mailto:y.levendis@neu.edu)

EDUCATION:

- **Ph.D.**, Environmental Engineering Science, September 1987
California Institute of Technology (Caltech)
Thesis Subject: "A Fundamental Study on Char Oxidation
Using Model Materials"
Thesis Advisor: Professor Richard C. Flagan
- **M.S.** Mechanical Engineering, December 1982
University of Michigan
Thesis Subject: "Reduction of Diesel Particulate Emissions Using Oxygen-Enriched Air."
Thesis Advisors: Professors John Hilliard and Jay Bolt
- **B.S.** Mechanical Engineering, Cum Laude, December 1981
University of Michigan
Thesis Subject: "Design and Evaluation of Solar Stills"
Thesis Advisor: Professor John Clark

WORK EXPERIENCE:

- **College of Engineering Distinguished Professor**, 2006 – Present Northeastern University
- **Visiting Scholar**, 2008 University of Ulster, Northern Ireland
- **Visiting Professor**, 2004 Polytechnion, the National Technical University of Athens
- **Professor**, 1998 – Present Northeastern University
- **Visiting Professor**, 1998 – 1999 Massachusetts Institute of Technology (MIT)
- **Associate Professor**, 1994 – 1998 Northeastern University
- **Assistant Professor**, 1988 – 1994 Northeastern University
- **Post-Doctoral Research Scientist**, 1987 – 1988 California Institute of Technology (Caltech)
Research Topics: Combustion of coal: (a) studies concerning the effects of catalysis on the reactivity of carbonaceous chars and (b) studies concerning the vaporization of coal-ash.
- **Graduate Research Assistant**, 1983 – 1987 California Institute of Technology (Caltech)
Research Topic: Combustion of coal: Reactivity, temperature and heat release of burning



pulverized coal. Development of a nearly ideal synthetic char materials (artificial coal) for controlled laboratory studies of coal properties and oxidation kinetics.

- **Graduate Research Assistant**, 1981 – 1983 University of Michigan
Research topic: Investigated the effect of oxygen supercharging on the performance and exhaust emissions of various types of Diesel engines.
- **Teaching Assistant**, 1982 – 1983 University of Michigan
Subject: Conducted internal and external combustion engines laboratories.
- **Other:** Tutor for freshman and sophomore science courses (Tau, Beta, Pi) and grader for an undergraduate manufacturing process course. Tutor for high school students through Caltech secondary school project; taught electrical circuits - electronics.

TECHNICAL INTERESTS:

Technical interests include clean energy related problems, combustion of liquid, gaseous and solid fuels, internal and external combustion engines, turbomachinery, incineration of hazardous wastes, atmospheric pollution - acid rain, polynuclear aromatic hydrocarbons, soot, SO₂ and NO_x chemistry solar energy, materials and manufacturing processes.

Design and Construction of devices: Designed and constructed various aerosol and single particle generators and multi-stage laboratory reactors. Designed and constructed two multi-color near-infrared pyrometers. Designed and constructed several high-temperature laboratory furnaces and several diesel particulate control systems. Designed and constructed solar stills for desalination of saline water, several solar collectors and a multitude of laboratory equipment for instructional purposes.

Laboratory Techniques: Experienced in the use and maintenance of aerosol generating, aerosol detection and particle sizing instruments as well as in gaseous pollutant measurements. Experienced in pyrometry, calorimetry, microscopy (Optical and SEM), porosimetry (mercury, BET) and wet chemistry techniques. Experienced in X-Ray diffractometry (Small and Wide angle) and Nuclear Magnetic Resonance techniques. Experienced in the design, maintenance and testing of Internal Combustion Engines, as well as in engine exhaust emissions sampling and analysis. Experienced in the design, maintenance and evaluation of solar collectors, solar stills and passive solar systems. Experienced in materials, design, structures and manufacturing processes. Knowledgeable in welding, machining, casting and forming techniques from both a practical and a theoretical (microstructures and phase transformations) standpoint. Experienced in energy conservation techniques.

Computer Experience: Extensive programming in Fortran, MATLAB, EXCEL and Basic.

Courses Taught:

Undergraduate: Thermodynamics I, II and III, Internal Combustion Engines, Gas Turbines, Fluid Mechanics, Refrigeration and Air Conditioning, Capstone Senior Design Projects, Technical Laboratories, etc. Also Pre-engineering Design Experience for K-12 Science Teachers.

Graduate: Combustion and Air Pollution Fundamentals.

MAJOR RESEARCH PROJECTS:

Current research is dealing with topics related to Clean Energy, Combustion, Air Pollution and Acid Rain Prevention, Incineration of Municipal Wastes, and Engine Performance and Emissions. In particular 16 different projects have been funded by US-NSF, DOE, EPA, etc.

HONORS:

- Outstanding Oral Presentation Award, SAE International Congress and Exposition , 2010
- Outstanding Teaching Award, ASEE New England Section, 2007
- John J. McCambridge Award, Institute of Hazardous Materials Management, 2007
- Elected Fellow of the Society of Automotive Engineers SAE, 2007
- Elected Fellow of the American Society of Mechanical Engineers ASME, 2006
- Elected Distinguished Professor College of Engineering, Northeastern University, 2006
- SAE Outstanding Faculty Advisor Award, SAE, 2005
- Outstanding Teaching Award, College of Engineering, Northeastern University, 2005
- Outstanding Research Award, College of Engineering, Northeastern University, 2001
- Elected member of ΦΚΦ, Northeastern University, 2000
- Excellence in Teaching Award, University-wide, Northeastern University, 1995
- Outstanding Mechanical Engineering Professor (students' choice), 2010, 2002, 1998, 1995, 1993
- SAE Faculty Advisor Recognition Award, SAE, 1997
- SAE Outstanding Faculty Advisor Award, SAE, 1994
- Ralph E. Teetor Educational Award SAE, 1993
- Charipar Fellowship Cummins Engine Company, 1982, 1983
- Dean's honor list of University of Michigan, Ann Arbor 6 consecutive semesters, 1978-80
- Five yearly excellence awards Greek-Italian High School, Athens 1970-76

PROFESSIONAL AFFILIATIONS:

Member of honorary societies: ΤΒΠ, ΙΤΣ, ΦΚΦ. Member of professional societies: SAE (Society of Automotive Engineers), SME (Society Manufacturing Engineering), ASME (American Society of Mechanical Engineers), ACS (American Chemical Society), Air and Waste Management Association, and the Combustion Institute.

PROFESSIONAL SERVICE:

Senator at the Northeastern Faculty Senate.

Member of the University Financial Affairs and Financial Priorities Committees.

Member of the University Appeals Resolution Committee.

Reviewer for NSF, DOE, EPA, SAE, ASME, the Combustion Institute

Reviewer for the Journals of Environmental Engineering, Solar Energy, ASME Journal of Heat Transfer, AIChE Journal, Energy Resources Technology, Dynamic Systems, Measurement and Control, Combustion & Flame, Combustion Science and Technology, Review of Scientific Instruments, Journal of the Air & Waste Management Association, Hazardous Wastes and Hazardous Materials, Atmospheric Environment, Energy & Fuels, Environmental Science and Technology, etc.

Academic advisor for five completed Ph.D, thirty completed Master's theses and twenty completed undergraduate theses at NU. Co-advisor for four completed Ph.D theses at MIT and one at the Polytechnion of Athens.

Co-advisor for two completed Masters theses at Tufts University.

Currently, academic advisor for 4 PhD students and 2 MS students.

Founder and faculty advisor of the NU - SAE student branch from 1994-2009.

LANGUAGES: Greek, English (Oxford's "Proficiency in English"), Italian (Diploma di Esperto in Lingua e Letteratura Italiana), working knowledge of Spanish, and some knowledge of Latin.

PATENTS:

1. "Rotating Diesel Particulate Trap." U.S. Patent No. 5,013,340, 1991. Co-inventor M. Taslim.
2. "Pulsed, Reverse-Flow Regenerated Diesel Trap Capturing Soot, Ash and PAH's." U.S. Patent No. 5,253,476, 1993. Co-inventor N. Khalil.
3. "Production of Polymer Particles in Powder Form Using an Atomization Technique." U.S. Patent No. 5,269,980, 1993. Co-inventors T. Panagiotou and R.C. Flagan.
4. "Method of Simultaneously Removing SO₂ and NO_x Pollutants from Exhaust of a Combustion System." U.S. Patent No. 5,312,605, 1994. Co-inventor D. Wise.
5. "Use of Aromatic Salts for Simultaneously Removing SO₂ and NO_x Pollutants from Exhaust of a Combustion System." U.S. Patent No. 5,352,423, 1994. Co-inventor D. Wise.
6. "A Flow-Through Incinerator Coupled to an Aerodynamically-Cleaned Diesel Particulate Trap for Diesel Engine Exhaust Gas." U.S. Patent No. 5,390,492, 1995.
7. "Control of NO_x Emissions from Diesel Engines Using Filtered EGR." U.S. Patent No. 5,426,936, 1995. Co-inventor R. Abrams.
8. "Simultaneous Control of SO₂, NO_x, HCl and Particulates by In-Furnace High Temperature Sorbent Injection and Particulate Removal." U.S. Patent No. 5,785,936, 1998.
9. "Process for Producing Polymer Coatings with Various Porosities and Surface Areas." U.S. Patent No. 6,143,370, 2000. Co-inventor T. Panagiotou.

EDITED BOOKS:

"Calcium Magnesium Acetate. An Emerging Bulk Chemical for Environmental Applications." Co-editor with D.L. Wise and M. Metghalchi. Elsevier, Amsterdam, 1991.

BOOK CHAPTERS:

"A Waste-Derived Chemical for Acid Rain Control." in Environmental Biotechnology: Principles and Applications. Donald L. Wise, Judith Steciak and Yiannis A. Levendis. Moo-Young M., Anderson, W.A. and Chakrabarty, A.M. Editors, pp. 237-248. Kluwer Academic Publishers, Dordrecht/Boston/London, 1995.

"Control of Submicron Air Toxin Particles after Coal Combustion Utilizing Calcium Magnesium Acetate" Jianxi Zhao, Donald L. Wise, Edgar B. Guttoff, Joseph D. Gresser and Yiannis A.

Levendis. Contributed chapter in the book *Environmental Biotechnology and Cleaner Bioprocesses* Sanchez, G. and Hernandez, E., Eds., Taylor & Francis, London, 2000.

ENCYCLOPEDIA CHAPTERS: “Emission Purification Technologies,” Invited Chapter in the volume of *Environmental and Ecological Chemistry* (A. Sabljic, Editor) of the **UNESCO** On-line Encyclopedia of **Life Support Systems (UNESCO-EOLSS)**, 2004, updated 2007.

ARCHIVAL PEER-REVIEWED JOURNAL PUBLICATIONS:

- J1.** “Effect of Oxygen Enrichment on the Performance and Emissions of I.D.I. Diesel Engines” J. Ghojel, J. C. Hilliard and Y. A. Levendis. *SAE publication* 830245, p.1-14, 1983.
- J2.** “Combustion of Uniformly Sized Glassy Carbon Particles” Yiannis A Levendis and Richard C. Flagan, *Combustion Science and Technology* **53**, 2-3, p.117-136, 1987.
- J3.** “Physical Properties and Oxidation Rates of Chars from three Bituminous Chars.” Ranajit Sahu, Yiannis A. Levendis, Richard C. Flagan and George R. Gavalas. *Fuel* **67**, p.275-283, 1988.
- J4.** “Glassy Carbons from Poly(furfuryl alcohol) Copolymers: Structural Studies by High-Resolution Solid-State NMR Techniques.” Hellmut Eckert, Yiannis A. Levendis and Richard C. Flagan. *Journal of Physical Chemistry* **92**, p.5011-5019, 1988.
- J5.** “Synthesis, Formation and Characterization of Micron-Sized Glassy Carbon Spheres of Controlled Pore Structure.” Yiannis A. Levendis and Richard. C. Flagan. *Carbon* **27**, 2, p.265-283, 1989.
- J6.** “Oxidation Kinetics of Monodisperse Spherical Carbonaceous Particles of Variable Properties” Yiannis A. Levendis, Richard C. Flagan and George R. Gavalas. *Combustion and Flame* **76**, p.221-241, 1989.
- J7.** “Post-Ignition Phenomena in the Combustion of Single Coal Char Particles” Yiannis A. Levendis, Ranajit Sahu, Richard C. Flagan and George R. Gavalas. *Fuel* **68**, p.849-855, 1989.
- J8.** “Catalysis of the Combustion of Synthetic Char Particles by Various Forms of Calcium Additives” Yiannis A. Levendis, Sookwu Nam, Michael Loewenberg, Richard C. Flagan and George R. Gavalas. *Journal of Energy & Fuels* **3**, p.28-37, 1989.
- J9.** “Characterization of the Environment in a Laminar Flow Furnace with Applications to the Combustion of Coal and Coal-Water Slurries”, John G. Cumper, Yiannis A. Levendis and Mohamad Metghalchi. *ASME publication HTD-Vol* **148**, p.89-96, 1990.
- J10.** “Development of a Self-Cleaning Particle Trap for Diesel Engine Particulate Control” Yiannis A. Levendis, Thomai Panagiotou and Mo E. Taslim. *SAE publication 900601*, Vol. SAE SP-816, p.195-201, 1990.

- J11.** “Evaluation of a Self-Cleaning Particulate Control System for Diesel Engines” Yiannis A. Levendis, Kevin McInerney and Thomai Panagiotou. *SAE publication 910333*, Vol. SAE SP-240, p.183-193, 1991.
- J12.** “Combustion Behavior and Kinetics of Synthetic and Coal-derived Chars: Comparison of Theory and Experiment” Michael Loewenberg and Yiannis A. Levendis. *Combustion and Flame* **84**, p. 47-65, 1991.
- J13.** “Combustion Characteristics of Carbonaceous Residues from Heavy Oil Fired Boilers” Paul S. Northrop, George R. Gavalas and Yiannis A. Levendis, *Journal of Energy and Fuels* **5**, p. 587-594, 1991.
- J14.** “Generation of Spherical and Monodisperse Particles of Poly(styrene) and Poly(methyl methacrylate) by Atomization of Monomers or Dissolved Polymer Precursors” Thomai Panagiotou and Yiannis A. Levendis. *Journal of Applied Polymer Science* **43**, p.1549-1558, 1991.
- J15.** “Development of a Diesel Particulate Control System with Wall-Flow Filters and Reverse Cleaning Regeneration.” Najib Khalil and Yiannis A. Levendis, *SAE publication 920567*, Vol. SAE SP-896, p.217-231, 1992. Also selected for the **1992 SAE Transactions**.
- J16.** “Optimization of a Self-Cleaning Particulate Control System - Evaluation of the Retention of PACs and HC Emissions.” Iraklis Pavlatos and Yiannis A. Levendis, *SAE publication 920568*, Vol. SAE SP-896, p.233-247, 1992.
- J17.** “Preparation of Monodisperse Carbonaceous Particles with Micro-, Meso-, and Macro-porous Structures” Khaled M. Daer and Yiannis A. Levendis. *Journal of Applied Polymer Science* **45**, p.2061-2073, 1992.
- J18.** “Development of Multi-Color Pyrometers to Monitor the Transient Response of Burning Carbonaceous Particles.” Yiannis A. Levendis, Kelvin Rafael Estrada, and Hoyt C. Hottel. *Review of Scientific Instruments* **63** (7), p.3608-3622, 1992.
- J19.** “The Effectiveness of Calcium Magnesium Acetate (CMA) as an SO_x Sorbent in Coal Combustion” Yiannis A. Levendis, Wenqi Zhu, Donald L. Wise and Girard A. Simons. *AIChE Journal*, **63** (7), p.761-773, 1993.
- J20.** “Observations on the Combustion Behavior of Coal Water Fuels and Coal Water Fuels Impregnated with Calcium Magnesium Acetate” Ajay Atal and Yiannis A. Levendis. *Combustion and Flame*, **39** (5), p.61-89, 1993.
- J21.** “Design of a Diesel Particulate Trap-Incinerator with Simultaneous Filtration and Compressed-Air Regeneration (CAR).” Sung Ho Kim and Yiannis A. Levendis, *SAE publication 930367*, Vol. SAE SP-943, p.183-194, 1993. Also selected for the **1993 SAE Transactions**.

- J22.** “On-Road Testing of a Reverse Air-Flow Cleaning, Soot-Oxidizing Diesel Particulate Trap System.” Sandeep Mehta Yiannis A. Levendis and Najib Khalil, *SAE publication 930368*, Vol. SAE SP-943, p.195-211, 1992. Also selected for the **1993 SAE Transactions**.
- J23.** “An Exploratory Study on the Combustion and PAH Emissions of Selected Municipal Waste Plastics” Lloyd Wheatley, Yiannis A. Levendis and Paul Vouros. *Environmental Science and Technology*, **27** (13) p.2885-2895, 1993.
- J24.** “Control of Diesel Soot and NO_x Emissions with a Particulate Trap and EGR.” Yiannis A. Levendis, Iraklis Pavlatos and Richard Abrams. *SAE publication 940460*, Vol. SAE SP-1020, p.225-233, 1994.
- J25.** “An Aerodynamically Regenerated Diesel Particulate Trap with a Flow-through Soot Incinerator Section” Sandeep Mehta, Frederick Oey, Christiano Sumbung, Chester Li, and Yiannis A. Levendis. *SAE publication 940461*, Vol. SAE SP-1020, p.235-248, 1994.
- J26.** “Combustion of CWF Agglomerates from Pulverized or Micronized Bituminous Coal, Carbon Black and Diesel Soot.” Ajay Atal and Yiannis A. Levendis. *Combustion and Flame*, **98** (4), p.326-349, 1994.
- J27.** “A Study on the Combustion Characteristics of PVC, Poly(styrene), Poly(ethylene) and Poly(propylene) Particles under High Heating Rates.” Thomai Panagiotou and Yiannis A. Levendis. *Combustion and Flame*, **99** (1), p.53-74, 1994.
- J28.** “The Effectiveness of Calcium (Magnesium) Acetate and Calcium Benzoate as NO_x Reduction Agents in Coal Combustion.” Judith Steciak, Yiannis A. Levendis and Donald L. Wise. *Combustion Science and Technology*, **102** (1-6), p.193-211, 1994.
- J29.** “Combustion Behavior of Poly(styrene) Particles of Various Degrees of Crosslinking and Styrene Monomer Droplets” Thomai Panagiotou, Yiannis A. Levendis and Michael A. Delichatsios. *Combustion Science and Technology*, **103** (1-6), p.63-84, 1994.
- J30.** “Combustion and SO₂-NO_x Emissions of Bituminous Coal Particles Treated with CMA” Ajay Atal, Judi Steciak and Yiannis A. Levendis. *Fuel*, **74** (4), p.495-506, 1995.
- J31.** “Diesel Vehicle Application of an Aerodynamically Regenerated Trap and EGR System.” Frederick Oey, Sandeep Mehta and Yiannis A. Levendis. *SAE publication 950370*, Vol. SAE SP-1073, p.103-116, 1995.
- J32.** “An Aerodynamically Regenerated Diesel Particulate Trap Coupled to an Electric Soot Incinerator with Dual Wall-Flow Filters.” Jorge Caceres and Yiannis A. Levendis. *SAE publication 950371*, Vol. SAE SP-1073, p.117-126, 1995.
- J33.** “Reducing Diesel Particulate and NO_x Emissions via Filtration and Particle-Free Exhaust Gas Recirculation.” Najib Khalil, Yiannis A. Levendis and Richard Abrams. *SAE publication*

950736, Vol. SAE SP-1073, p.165-174, 175-186, 1995.

- J34.** “A Thermally Regenerated Diesel Particulate Trap Using High-Temperature Glass-Fiber Filters.” Sandeep Mehta, Yiannis A. Levendis and Joseph Adiletta. *SAE publication 950737*, Vol. SAE SP-1073, p.175-186, 1995.
- J35.** “The Effectiveness of Calcium Magnesium Acetate as a Dual SO₂-NO_x Emission Control Agent.” Judith Steciak, Yiannis A. Levendis and Donald L. Wise, *AIChE Journal*, **41**, 3, p.712-722, 1995.
- J36.** “Dual SO₂-NO_x Concentration Reduction by Calcium Salts of Carboxylic Acids.” Judith Steciak, Yiannis A. Levendis, Donald L. Wise and Gerard Simons. *Journal of Environmental Engineering*, **121**, 8, p.595-604, 1995.
- J37.** “Comparison of the Combustion Behavior of Pulverized Waste Tires and Coal.” Ajay Atal and Yiannis A. Levendis. *Fuel*, **74** (11), p.1570-1581, 1995.
- J38.** “NO_x and SO₂ Emissions from Pulverized Coal and Waste Tire: The Role of Devolatilization and Char Combustion Phases.” Ajay Atal, Judi Steciak and Yiannis A. Levendis. *IMECE Proceedings of the ASME Heat Transfer Division*, HTD-Vol. **317-2**, p.1-9, 1995.
- J39.** “An Optimization Study on the Control of NO_x and Particulate Emissions from Diesel Engines.” Chris Larsen, Frederic Oey and Yiannis A. Levendis. *SAE publication 960473*, Vol. SAE SP-1140, p.175-191, 1996.
- J40.** “Measurements of Particle Flame Temperatures Using Three-Color Optical Pyrometry” Thomai Panagiotou, Yiannis A. Levendis and Michael A. Delichatsios. *Combustion and Flame*, **104**, (3), p.272-277, 1996.
- J41.** “Control of Air Toxin Particulate and Vapor Emissions after Coal Combustion Utilizing Calcium Magnesium Acetate.” Judith I. Shuckerow, Judith A. Steciak, Donald L. Wise, Yiannis A. Levendis, Girard A. Simons, Joseph D. Gresser, Edgar B. Guttoff and C. David Livengood. *Resources, Conservation and Recycling*, **16**, p.15-69, 1996.
- J42.** “Observations on the Combustion of Pulverized PVC and Poly(ethylene)” Thomai Panagiotou and Yiannis A. Levendis. *Combustion Science and Technology*, **112**, p.117-140, 1996.
- J43.** “Comparative Study on the Combustion and Emissions of Waste Tire Crumb and Pulverized Coal” Yiannis A. Levendis, Ajay Atal, Joel Carlson, Yuriy Dunayevskiy and Paul Vouros. *Environmental Science and Technology*, **30**, 9, p.2742-2754, 1996.
- J44.** “Aromatic Hydrocarbon Emissions from Burning Poly(styrene), Poly(ethylene) and PVC Particles at High Temperatures” Thomai Panagiotou, Yiannis A. Levendis, Joel Carlson, Yuriy M. Dunayevskiy and Paul Vouros. *Combustion Science and Technology*, **116-117** (1-6), p.91-128, 1996.

- J45.** “The Effect of Bulk Equivalence Ratio on the PAH Emissions from the Combustion of PVC, Poly(styrene) and Poly(ethylene).” Thomai Panagiotou, Yiannis A. Levendis, Joel Carlson and Paul Vouros. *Proceedings of the Combustion Institute*, **26**, p. 2421-2430, 1996.
- J46.** “On the Survivability and Pyrosynthesis of PAHs During Combustion of Pulverized Coal and Tire Crumb” Ajay Atal, Yiannis A. Levendis, Joel Carlson, Yuriy Dunayevskiy and Paul Vouros. *Combustion & Flame*, **110**, 4, p.462-478, 1997.
- J47.** “An Integrated Diesel Engine Particulate ART-EGR Retrofit System with Engine Sensory Inputs.” Chris Larsen and Yiannis A. Levendis. *SAE publication 970477*, Vol. SAE SP-1140, p. 183-201, 1997.
- J48.** “A Laboratory Study on the NO, NO₂, SO₂ and CO Emissions from the Combustion of Pulverized Coal, Municipal Waste Plastics and Tires” Bonnie Courtemanche and Yiannis A. Levendis, *Fuel*, **77**(3), p. 183-196, 1998.
- J49.** “Burning Characteristics and Gaseous/Solid Emissions of Blends of Pulverized Coal with Waste Tire-Derived Fuel” Yiannis A. Levendis, Ajay Atal, Bonnie Courtemanche and Joel Carlson. *Combustion Science and Technology*, **131**, 1-6, p. 147-185, 1998.
- J50.** “Control of the HCl Emissions from the Combustion of PVC, by In-Furnace Injection of Calcium/Magnesium Based Sorbents” Bonnie Courtemanche and Yiannis A. Levendis. *Environmental Engineering Science*, **15**, 2, pp. 123-135, 1998.
- J51.** “On the Effectiveness and Economy of Operation of ART-EGR Systems that Reduce Diesel Emissions.” Chris Larsen and Yiannis A. Levendis. *SAE publication 980537*, Vol. SAE SP-1313, p. 97-115, also selected for the **SAE Transactions**, 1998.
- J52.** “PAH and Soot Emissions from Combustion of Coal and Waste Tire-Derived-Fuel in Fixed Beds” Yiannis A. Levendis, Ajay Atal and Joel Carlson. *Combustion Science and Technology*, **134**, 1-6, p. 407-432, 1998.
- J53.** “Observations on the Combustion of Polymers (Plastics): from Single Particles to Groups of Particles.” Thomai Panagiotou and Yiannis A. Levendis . *Combustion Science and Technology*, **137**, 1-6, p. 121-148, 1998.
- J54.** “On the Correlation of CO and PAH Emissions from the Combustion of Pulverized Coal and Waste Tires” Yiannis A. Levendis, Ajay Atal and Joel Carlson. *Environmental Science and Technology*, **32**, p. 3767-3777, 1998.
- J55.** “Filtration Assessment and Thermal Effects on Aerodynamic Regeneration in Silicon Carbide and Cordierite Particulate Filters.” Chris Larsen, Yiannis A. Levendis and Koji Shimato. *SAE Publication 1999-01-0466*, Vol. SAE SP-1414, 1999.
- J56.** “Use of Ozone-Enriched Air for Diesel Particulate Trap Regeneration” Chris Larsen and Yiannis A. Levendis. SAE, *SAE publication 1999-01-0114*, Vol. SAE SP-1414, 1999.

- J57.** “Particulates Generated from Combustion of Polymers (Plastics)” Brooke Shemwell and Yiannis A. Levedis. *Journal of the Air & Waste Management Association*, 50, pp. 94-102, 2000. **Also, first-place winner of the student paper competition of the 1999 ASME, Power Generation Division.**
- J58.** “A Laboratory Investigation on Combined In-Furnace Sorbent Injection and Hot Flue-Gas Filtration to Simultaneously Capture SO₂, NO_x, HCl and Particulate Emissions” Brooke Shemwell, Ajay Atal, Yiannis A. Levedis and Girard A. Simons. *Environmental Science and Technology*, **34**, pp. 4855-4866, 2000.
- J59.** “Laboratory Study on the High-Temperature Capture of HCl Gas by Dry-Injection of Calcium-Based Sorbents” Brooke Shemwell, Yiannis A. Levedis and Girard A. Simons. *Chemosphere*, **42**, 5-7, pp.783-794, 2001.
- J60.** “PAH and Soot Emissions from Burning Components of Medical Waste: Examination/Surgical Gloves and Cotton Pads” Yiannis A. Levedis, Ajay Atal, Joel B. Carlson and Maria del Mar Esperanza Quintana. *Chemosphere*, **42**, 5-7, pp.773-781, 2001.
- J61.** “Polycyclic Aromatic Hydrocarbon and Particulate Emissions from Two-Stage Combustion of Polystyrene. The Effect of the Primary Furnace Temperature” Jun Wang, Yiannis A. Levedis, Henning Richter, Jack B. Howard and Joel B. Carlson. *Environmental Science and Technology*, **35**, pp. 3541-3552, 2001.
- J62.** “Polycyclic Aromatic Hydrocarbon and Particulate Emissions from Two-Stage Combustion of Polystyrene. The Effects of (a) the Secondary Furnace (Afterburner) Temperature and (b) Soot Filtration” Jun Wang, Yiannis A. Levedis, Henning Richter, Jack B. Howard and Joel B. Carlson. *Environmental Science and Technology*, **36**, pp. 797-808, 2002.
- J63.** “Economics of an Integrated Approach to Control SO₂, NO_x, HCl and Particulate Emissions from Powerplants” Brooke Shemwell, Ali Ergut and Yiannis A. Levedis. *Journal of the Air & Waste Management Association*, **52**, 521-534, 2002.
- J64.** “A Study on Toxic Organic Emissions from Butch Combustion of Styrene” Charlotte Westblad, Yiannis A. Levedis, Henning Richter, Jack B. Howard and Joel B. Carlson. *Chemosphere*, **49** (4), 395-412, 2002.
- J65.** “Comparative Study on Destruction of Polycyclic Aromatic Hydrocarbons from Combustion of Waste Polystyrene.” Jun Wang, Gerardo Ferreiro, Henning Richter, Jack B. Howard, Yiannis A. Levedis, and Joel B. Carlson. *Proceedings of the Combustion Institute*, **29**, pp. 2477-2484, 2002.
- J66.** “High-Temperature Injection of Sorbent-Coal Blends Upstream of a Ceramic Filter for SO₂, NO_x and Particulate Pollutant Reductions” Ali Ergut, Yiannis A. Levedis and Girard A. Simons. *Combustion Science & Technology*, **175**, pp. 579-617, 2003.

- J67.** “Emissions from Batch Combustion of Waste Tire Chips: The Afterburner Effect.” Jeferson Caponero, Jorge Alberto Soares Tenorio, Yiannis A. Levendis and Joel Carlson *Energy & Fuels*, **17**, pp. 225-239, 2003.
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- C70.** “Toxic Emissions from Pyrolysis and Combustion of Waste Tire Chips.” Jeferson Caponero, Yiannis A. Levendis, Joel Carlson and Jorge Alberto Soares Tenorio, [Proceedings of the Conference on Recycling and Waste Treatment in Mineral and Metal Processing: Technical and Economic Aspects](#), Lulea, Sweden, 16-20 June 2002.

- C71.** “A Low Emission Powerplant: An Integrated Technique to Remove Major Pollutants.” Ali Ergut and Yiannis A. Levendis. [Proceedings of the International Mechanical Engineering Congress and Exposition](#), CD-ROM, New Orleans, Louisiana, USA, 17-22 November 2002.
- C72.** “Temperature Measurements in Pulverized Coal Combustion.” Yiannis A. Levendis. [Proceedings of the 28th Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, March 9-13, 2003.
- C73.** “Capture of SO₂ Emissions from Combustion of Coal Treated with Tall Oil Pitch and Carboxylic Salts of Calcium and Magnesium.” Vince Giampa, Ali Ergut and Yiannis A. Levendis. [Proceedings of the 28th Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, March 9-13, 2003.
- C74.** “PAH Emissions from Atmospheric-Pressure Premixed Combustion of Ethyl-Benzene using a Flat Flame Burner.” Ali Ergut, Yiannis A. Levendis, Henning Richter, Jack B. Howard, Joel Carlson and Jude Jordan. [Proceedings of the Third Joint Meeting of the US Sections of the Combustion Institute](#), CD-ROM, Chicago, IL, March 16-19, 2003.
- C75.** “Emissions from Burning of Jet Fuel JP-8 and Diesel Oil in Diffusion Flames.” Murat Topal, Yiannis A. Levendis, Joel Carlson and Jude Jordan. [Proceedings of the Third Joint Meeting of the US Sections of the Combustion Institute](#), CD-ROM, Chicago, IL, March 16-19, 2003.
- C76.** “PAH Generation in Fuel-Rich Ethanol Flames.” Ali Ergut, Yiannis A. Levendis, Joel Carlson and Jude Jordan. [Proceedings of the 2004 Spring Meeting of the Central States US Sections of the Combustion Institute](#), CD-ROM, University of Texas at Austin, Austin, TX, March 21-23, 2004.
- C77.** “Emissions from Combustion of Pulverized Polystyrene at a High Equivalence Ratio.” Jennifer Pantalone, Ali Ergut, Yiannis A. Levendis, Joel Carlson and Jude Jordan. [Proceedings of the 2004 Spring Meeting of the Central States US Sections of the Combustion Institute](#), CD-ROM, University of Texas at Austin, Austin, TX, March 21-23, 2004.
- C78.** “Comparison of the Products of Incomplete Combustion of Polystyrene and Styrene in Diffusion Flames and Ethyl-Benzene in Fuel-Rich Flames.” Ali Ergut, Yiannis A. Levendis and Joel Carlson. [Proceedings of ASME POWER 2004](#), March 30 - April 3, Baltimore, Maryland USA, 2004.
- C79.** “On the Measurement of Flame Temperatures Using Thermocouples.” Ali Ergut and Yiannis A. Levendis. [Proceedings of the Fourth International Symposium on Radiative Heat Transfer](#), CD-ROM, Istanbul, Turkey, June 20-25, 2004.
- C80.** “Liquid Nitrogen as a Fire Extinction Agent.” Yiannis A. Levendis. [Proceedings of the First Joint Meeting of the Italian and Greek Sections of the Combustion Institute](#), CD-ROM, Corfu, Greece, June 17-20, 2004.

- C81.** “Emissions from the Combustion of Ethyl Alcohol, Comparizon with Other Fuels.” Yiannis A. Levendis, Ali Ergut, Joel Carlson and Jude Jordan. [Proceedings of the First Joint Meeting of the Italian and Greek Sections of the Combustion Institute](#), CD-ROM, Corfu, Greece, June 17-20, 2004.
- C82.** “On the Evolution of the Surface Area of Combustion-Generated Soot.” Angelo W. Kandas, Gokhan Senel, Yiannis A. Levendis and Adel Sarofim. [Proceedings of the First Joint Meeting of the Italian and Greek Sections of the Combustion Institute](#), CD-ROM, Corfu, Greece, June 17-20, 2004.
- C83.** “Investigation of Soot Onset Threshold in One-Dimensional, Laminar, Atmospheric Pressure, Premixed, Ethylbenzene Flames” Ali Ergut, Yiannis A. Levendis, Henning Richter and Joel Carlson. [Proceedings of the Fourth Joint Meeting of the US Sections of the Combustion Institute](#), Drexel University, Philadelphia PA, March 20-23, 2005.
- C84.** “ Pyrolysis and Oxidation of Anthracene in a Two-Stage Laminar-Flow, Drop-Tube Furnace” Jennifer DeCoster, Ali Ergut, Yiannis A. Levendis, Henning Richter and Joel Carlson. [Proceedings of the Fourth Joint Meeting of the US Sections of the Combustion Institute](#), Drexel University, Philadelphia PA, March 20-23, 2005.
- C85.** “Capture of SO₂ Emissions from Combustion of Coal Treated with Tall Oil Pitch and Calcium 3-Hydroxy Propionate.” Vince Giampa, Douglas Cameron, Timothy Abraham, Paris Tsobanakis, Ali Ergut and Yiannis A. Levendis. [Proceedings of the 30th Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, April 17-21, 2005.
- C86.** “Oxygen-Enriched Combustion of Coal Chars.” Yiannis A. Levendis. [Proceedings of the 30th Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, April 17-21, 2005.
- C87.** “Emissions of Batch Combustion of Waste Tire Chips: Effects of Chemical Additives” Yiannis A. Levendis, Jefferson Caponero, Jorge A. S. Tenório, Joel B. Carlson, [Proceedings of the 30th Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, April 17-21, 2005.
- C88.** “An Investigation on Thermocouple-based Temperature Measurements in Sooting Flames” Ali Ergut and Yiannis A. Levendis. [Proceedings of the 2005 ASME International Mechanical Engineering Congress and Exposition \(IMECE2005\)](#), Orlando, Florida, November 5-11, 2005.
- C89.** “Recycling of Waste Tires into a ‘Clean-Burning’ Pyrolysis Gas” Yiannis A. Levendis. [Invited lecture at the 2005 International Chemical Congress of Pacific Basin Societies \(PacifiChem 2005\)](#), Honolulu, Hawaii, December 15-20, 2005.
- C90.** “Reaction Times of Burning Bituminous Chars at High O₂ Partial Pressures.” Yiannis A. Levendis and Paula Bejarano. [Proceedings of the 31st Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, May 21-25, 2006.

- C91.** “Emissions of SO₂ and NO_x from Bituminous Coal Volatile Flames and Burning Chars.” Yiannis A. Leventis. Proceedings of the 31st Coal Utilization & Fuel Systems International Conference, CD-ROM, Clearwater, Florida, May 21-25, 2006.
- C92.** “Diesel Engine Performance and Pollutant Emissions with Air-Side vs. Fuel-Side Oxygen Addition” Theodore C. Zannis, Efthimios G. Pariotis, Dimitrios T. Hountalas, Constantinos D. Rakopoulos and Yiannis A. Leventis. Proceedings of the 19th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS), CD-ROM, Aghia Pelagia, Crete, Greece, July 12-14, 2006.
- C93.** “On Soot Formation/Emissions from Ethyl-Alcohol Flames” Ali Ergut, Yiannis A. Leventis, Henning Richter, Jack B. Howard and Joel Carlson, Poster Presentation at the 31st International Symposium on Combustion, Heidelberg, Germany, August 6-11, 2006.
- C94.** “Soot Threshold in Premixed Ethyl-benzene Flames” Ali Ergut, Yiannis A. Leventis, Henning Richter, Jack B. Howard and Joel Carlson, Poster Presentation at the 31st International Symposium on Combustion, Heidelberg, Germany, August 6-11, 2006.
- C95.** “Avaliação das Emissões Gasosas na Pirólise Seguida de Combustão do Polistireno em Fluxo Contínuo” Cecília Korber Gonçalves, Jorge Alberto Soares Tenório and Yiannis A. Leventis, Proceedings of the Congresso ICTR 2006 (Gestao Ambiental e Desenvolvimento Sustentavel. Residuo : Desafio Brasileiro - Environmental Management and Sustainable Development. Residues: Brazilian Challenge) Sao Pedro, Brazil, 6-9 August 2006.
- C96.** “Emission Yields from Pyrolysis Followed by Combustion of Polyethylene in Steady Flow.” Cecília Korber Gonçalves, Jorge Alberto Soares Tenório and Yiannis A. Leventis. To be presented at the 2007 TMS Annual Meeting and Exhibition, Orlando FL, 25 February - 1 March, 2007.
- C97.** “Effects of Replacing N₂ with CO₂ Gas in Coal Combustion at Various O₂ Partial Pressures” Paula Bejarano and Yiannis A. Leventis. Proceedings of the 5th US Combustion Meeting of the Combustion Institute, San Diego, March 25-28, 2007.
- C98.** “Temperature Dependence of Soot Onset Threshold in Premixed Ethylbenzene Flames” Ali Ergut, Rick Therrien, Yiannis A. Leventis. Proceedings of the 5th US Combustion Meeting of the Combustion Institute, San Diego, March 25-28, 2007.
- C99.** “Pool Fire Extinction by Direct Application of Liquid Nitrogen” Yiannis A. Leventis and Michel A. Delichatsios. Proceedings of the 5th US Combustion Meeting of the Combustion Institute, San Diego, March 25-28, 2007.
- C100.** “A Vertically-Aligned Contextualized Pre-Engineering Design Course for Middle- and High-School Science Teachers” Yiannis A. Leventis, Christos Zahopoulos, Cheryl Hall and Jonathan McLaughlin. Proceedings of the ASEE New England Section Meeting, CD-ROM, University of Rhode Island, Kingston, April 20-21, 2007.

- C101.** “Comparative Analysis of Lignite and Bituminous Coal Particles Burning in O₂-N₂ & O₂-CO₂ Environments” Paula Bejarano and Yiannis A. Levendis. Proceedings of the [32nd Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, June 10-15, 2007.
- C102.** “Study on the Particulate Emissions from Indirect Combustion of Polyethylene Wastes.” Cecília Korber Gonçalves, Jorge Alberto Soares Tenório and Yiannis A. Levendis. Proceedings of the [62nd International Annual Congress of ABM](#) (Associação Brasileira de Metalurgia e Materiais), Vitoria, Brazil, 23-27 July, 2007.
- C103.** “Volatile Emissions from Indirect Combustion of Municipal Waste Plastics” Cecília Korber Gonçalves, Jorge Alberto Soares Tenório and Yiannis A. Levendis. Proceedings of the [62nd International Annual Congress of ABM](#) (Associação Brasileira de Metalurgia e Materiais), Vitoria, Brazil, 23-27 July, 2007.
- C104.** “Liquid Assets” Yiannis A. Levendis and Michel A. Delichatsios. [Fire Prevention Fire Engineers Journal](#) of the British Fire Protection Association. September 2007 issue, pp.54-56.
- C105.** “Introduction of the Engineering Design Process to Middle- and High-School Science Teachers through the Re-Design of a Toy” Yiannis A. Levendis and Christos Zahopoulos. Presented at the [NSTA National Conference](#), Boston, March 27-30, 2008.
- C106.** “Combustion of two Lignite Coals in O₂-N₂ & O₂-CO₂.” Yiannis A. Levendis and Kulbhushan Joshi . Proceedings of the [33rd Coal Utilization & Fuel Systems International Conference](#), CD-ROM, Clearwater, Florida, June 2-6, 2008.
- C107.** “Chemical Speciation of Premixed Ethylbenzene Flames at the Soot Onset Limit at various (ϕ , T) pairs.” Ali Ergut, Richard J. Therrien, Yiannis A. Levendis, Henning Richter, Jack B. Howard and Joel Carlson, Presented at the [32nd International Symposium on Combustion](#), Montreal, Canada, August 3-8, 2008.
- C108.** “Cryogenic Extinction of Liquid Pool Fires.” Yiannis A. Levendis and Michael Delichatsios, Presented at the [32nd International Symposium on Combustion](#), Montreal, Canada, August 3-8, 2008.
- C109.** “Emissions Generated during the Co-Combustion of Coal and Biomass Fuel Blends.” Marcia Bragato, Kulbhushan Joshi, Joel Carlson, Jorge A. S. Tenorio and Yiannis A. Levendis, Presented at the [32nd International Symposium on Combustion](#), Montreal, Canada, August 3-8, 2008.
- C110.** “Emergency Fire Extinction by Direct Application of Liquid Nitrogen.” Yiannis A. Levendis, Invited presentation at the [ACHMM 2008 National Conference and Exposition](#), Minneapolis, Minnesota, Canada, September 7-10, 2008.
- C111.** “Emissions from Direct or Indirect Combustion of Tire-Derived Fuel.” Yiannis A. Levendis,

Proceedings of the 2008 ASME International Mechanical Engineering Congress and Exposition (IMECE2008), Boston, Massachusetts, October 31-November 6, 2008.

- C112.** “Cryogenic Extinction of Liquid Pool Fires” Yiannis Leventis, Ali Ergut and Michael Delichatsios. Invited paper presented at the 2009 AIChE Spring National Meeting and 5th Global Congress on Process Safety, Tampa, FL., April 26-30, 2009.
- C113.** “Comparative emission yields from Combustion of beds of various solid fuels.” Yiannis A. Leventis. Proceedings of the 34th Coal Utilization & Fuel Systems International Conference, CD-ROM, Clearwater, Florida, June 1-6, 2009.
- C114.** “Intake-Air Oxygen-Enrichment of Diesel Engines as a Power Enhancement Method and Implications on Pollutant Emissions” Theodoros C. Zannis, Dimitrios T. Houndalas, Elias Yphantis, Roussos Papagiannakis and Yiannis A. Leventis. Proceedings of the Internal Combustion Engine Division Fall Technical Conference (ICE FTC 09), Lucerne, Switzerland, Sept. 27-30, 2009.
- C115.** “Influence of Reactant Fuel Class on the Flame Synthesis of Carbon Nanostructures.” Brendan Hall, Chuanwei Zhuo, Henning Richter and Yiannis A. Leventis, Presented at the Eastern Section Meeting of the Combustion Institute, College Park, Maryland, October 18-21, 2009.
- C116.** “Analysis of Light Hydrocarbon Gases in the Pyrolysis and Combustion Processes of Waste Tires” Joner O. Alves, Chuanwei Zhuo, Yiannis A. Leventis and Jorge A. S. Tenorio. Presented at the 2010 TMS Annual Meeting and Exhibition. Seattle, WA, February 14-18, 2010.
- C117.** “Ignition of Single Coal Particles in O₂/N₂/CO₂ Atmospheres.” Chris Stivers and Yiannis A. Leventis. Proceedings of the 35th Coal Utilization & Fuel Systems International Conference, CD-ROM, Clearwater, Florida, June 7-10, 2010.
- C118.** “Analysis of Light Hydrocarbon Gases in the Pyrolysis Process of Sugarcane Bagasse.” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Leventis and Jorge A. S. Tenorio. Proceedings of the 65th International ABM Congress; Jul 26-30, 2010; Rio de Janeiro, Brazil.
- C119.** “Recovery of Waste Tires in the Synthesis of Carbon Nanotubes.” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Leventis and Jorge A. S. Tenorio. Proceedings of the XVIII International Symposium on Automotive Engineering; Sep 22-23, 2010; Sao Paulo, Brazil.
- C120.** “Assessment and Control of Gaseous Emissions Generated during the Pyrolysis Process of wastes from Bio-Ethanol Industry.” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Leventis and Jorge A. S. Tenorio. Proceedings of the 5th International Bioenergy Congress; Aug. 10-13, 2010; Curitiba, Brazil.
- C121.** “Feasibility Study of the Use of Sugarcane Bagasse as Raw Material to Produce

Nanomaterials” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Levendis and Jorge A. S. Tenorio. [Proceedings of the 5th International Bioenergy Congress](#); 2010 Aug. 10-13, 2010; Curitiba, Brazil.

- C122.** “Analysis of Gaseous Emissions Generated in the Pyrolysis Process of DDGS.” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Levendis and Jorge A. S. Tenorio. [Proceedings of the XXVIII National Congress of Maize and Sorghum](#); Aug. 30-Sep. 02, 2010; Goiania, Brazil.
- C123.** “A Novel Technology for Green(er) Manufacturing of CNTs via Recycling of Waste Plastics” Chuanwei Zhuo, Brendan Hall, Henning Richter and Yiannis A. Levendis, [Proceedings of the 2010 MRS Fall Meeting](#), November 29 – December 2, 2010.
- C124.** “Converting Plastic Waste into Sustainable Clean Power” Chuanwei Zhuo, Jeff Young, Shane McElroy, David Laskowski, Jason Lee, Paul Conroy, Brendan Hall and Yiannis A. Levendis, Presented at the NSF CMMI Contractors Conference, themed [Engineering for Sustainability and Prosperity](#), Atlanta, Georgia, January 3-7, 2011.
- C125.** “NO_x and SO₂ Emissions of Coal/Biomass Blend from Combustion in CO₂/O₂ and N₂/CO₂ Environments” Paula Manoel Crnkovic, Fayza Kazanc, Reza Khatami and Yiannis A. Levendis. To be presented at the [14th Annual Energy, Utility & Environment Conference – EUEC 2011](#); Phoenix Arizona. Jan.31-Feb 2, 2011.
- C126.** “Microstructural Characterization of Nanomaterials Produced from co-products of the Ethanol Production (DDGS).” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Levendis and Jorge A. S. Tenorio. To be presented at the [2011 TMS Annual Meeting & Exhibition](#). San Diego, CA, February 27 – March 3, 2011.
- C127.** “Microstructural Analysis of Nanomaterials Synthesized from Unserviceable Tires.” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Levendis and Jorge A. S. Tenorio. To be presented at the [2011 TMS Annual Meeting & Exhibition](#). San Diego, CA, February 27 – March 3, 2011.
- C128.** “Analysis and Control of Light Hydrocarbon Gases in the Pyrolysis and Combustion Process of Several Solid Wastes” Joner Oliveira Alves, Chuanwei Zhuo, Yiannis A. Levendis and Jorge A. S. Tenorio. To be presented at the [2011 TMS Annual Meeting & Exhibition](#). San Diego, CA, February 27 – March 3, 2011.

Other Activities include invited talks at the Chemical and Mechanical Engineering departments of MIT (1989 and 1998), Tufts University (1990) and University of Connecticut (1992), as well as serving as co-organizer, chairman and speaker at the International Symposium on CMA held at Northeastern University, April 11-14 1991. Invited speaker at a workshop on “How Elastic is Technology to Regulatory Pressure?” held at Tufts University on May 13, 1994. Presentations were given at three University Coal Research Contractors' Review Conferences at DOE-PETC in Pittsburgh. Presentations were also made at Northeastern University's Science Days (6), at the High

School Science Teachers program (3), at the NU Presidential Inauguration week, January 1997 (1), at the NU Centennial Poster Session, May 1998 (2), at the first Materials Showcase, September 1998 (2) and at the NU Research & Scholarship EXPO Showcases 2001-2010. In 2010 our poster won the competition. Member of the Scientific Committee of the 4th International Symposium on Feedstock Recycling of Plastics and Other Polymer Materials, September 2007, Jeju, Korea. Gave an invited talk on “The Effect of Temperature of Premixed Flames on their Critical Equivalence Ratio for Soot Formation” at the University of Ulster, Northern Ireland, in May of 2008. Invited presentation on a “Self-Sustaining Pyrolyzer/Combustor for Waste Plastics” at the 2010 MIT Energy Conference.

As of January 2011.

K-12 Education Outreach

In 2010, I conducted for the sixth year my annual NSF-BSP 2-week summer course on Pre-engineering Design experience (NU Graduate School of Education course GSE3601). Over this five-year period approx. 100 high- and middle-school STEM teachers took this course, most of them as receive credit towards a graduate Masters degree in STEM Education and paid tuition to NU. The NSF-funded Boston Science Partnership (BSP) is a partnership between UMass Boston, Northeastern University and Boston Public Schools, as core partners, and the Education Development Center, Harvard Medical School, The College Board and Lesley University as supporting partners. A few highlights are presented below to illustrate the success of the BSP:

- i. **Broad reaching BSP Impact** – BSP included teachers from more than 80% of the 28 middle schools and 30 high schools in the district.
- ii. **Increased Student Achievement is Attributable to BSP Participation** - High-participation schools demonstrate a 43% increase in the percent of students passing the state MCAS compared to nonparticipating schools.
- iii. **Contextualized Content Courses (CCC)** - Eleven unique CCC courses have been offered multiple times. For example, 240 teachers in Year 4 exhibited increases in their content knowledge by between 26 and 97% on pre/post content tests. Students of these teachers realized increases of 8 to 13% over students of the same teachers the previous year on the district’s end-of-year science exams. **One of these eleven courses was a novel course, entitled, “From Science to Engineering: Pre-Engineering design experience” developed and taught by Professor Yiannis Levendis.**
- iv. **Vertical Teaming (VT)** - In Year 5, 52 participants from middle and high school, university and community college examined relationships between and among concepts in grades 6-13 through an improved College Board model and created articulation maps that demonstrate the learning of concepts from middle school through AP exams and freshman college science courses.
- v. **Collaborative Coaching and Learning in Science (CCLS)** - In Year 5 alone, 182 teachers in 30 middle and high schools in BPS engaged in 10-12 week learning cycles composed of identification of a course of study on inquiry topics, peer observations, and follow-up reflection. Facilitation was provided by classroom teachers, with coaching by 2 staff equivalents supported by the BSP.

- vi. **Faculty Seminars (SUP)** - 40 STEM faculty members at UMass Boston, Northeastern University, and Roxbury Community College (RCC) have participated in PD to improve their college teaching.
- vii. **AP Science Support (SUP)** - In Year 5, 308 students (up from 73 in 2006) from 11 schools participated in our AP Science Support Program, 337 students from 14 schools took AP science exams, and 234 passed. 46 AP teachers participated in BSP-supported Urban-Focused AP Institutes.
- viii. **Highly Qualified Teachers** - In the past three years, the number of science courses taught by teachers with the appropriate science license increased by 47%. The number of science courses taught by teachers with no license or a non-relevant license decreased by 22%. The number of licensed physics teachers has increased from 7 to 28 in the last 6 years, and 25% of all the teachers of science added a STEM license to their credentials.
- ix. **Sustainability** - All 11 CCC courses have been approved at the Universities; two science education Centers (The Center of Science and Mathematics In Context (COSMIC) at UMass Boston and the Center for STEM Education at Northeastern) have been established; BPS has established staff positions that support CCLS; an M.Ed. in middle school science has been established at Northeastern; and \$1.35M in additional related science education grants have been received by the three core partners to continue aspects of the BSP.
- x. **Dissemination** - Over 20 presentations based on BSP work and research have been presented at national conferences, 2 peer-reviewed journal papers have been submitted, 1 is in preparation, and 1 book is in press. One of them is: [“A Vertically-Aligned Contextualized Pre-Engineering Design Course for Middle- and High-School Science Teachers”](#), by Yiannis. A. Levendis, Christos Zahopoulos, Cheryl Hall and Jonathan McLaughlin. Proceedings of the ASEE New England Section Meeting, CD-ROM, University of Rhode Island, Kingston, April 20-21, 2007.
- xi. **Cultural Change** - The BSP has made tremendous progress at shifting the culture of University and District participants. University professors have gained respect for K-12 teachers for their skills and pedagogical content knowledge, teachers have benefited working with content knowledgeable University faculty, and teachers look forward to working together across grade bands and across disciplines. PD is much more efficient and effective when all participants "play well in the sand box". The involvement of University faculty is critical to maintaining the accuracy of the scientific content, vertically aligning knowledge with university-level expectations, and maintaining the excitement that the new discoveries of science bring to all participants.

