

# Christos Chryssakis

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## Professional Experience

**Institut Français du Pétrole (IFP)**, Rueil-Malmaison, Paris, France

**Post-Doctoral Research Fellow**, December 2005 – present

- Coupling of a 1-D injection model and a 3-D combustion code for internal combustion (IC) engine simulations and unsteady engine phenomena

**University of Michigan, W.E. Lay Automotive Lab.**, Ann Arbor, MI, USA

**Graduate Student Research Assistant (GSRA)**, May 2001 – November 2005

- Fuel spray modeling for IC engines, effect on engine performance and emissions
- Advising of new students and visiting scholars

**Korea Advanced Institute of Science & Technology, Engine Lab.**, Daejeon, South Korea

**Visiting under UM-KAIST Collaboration, BK21 Program**, August 2004

- Diesel injection, combustion and soot formation visualization experiments in an optical single-cylinder engine. Supervisor: Prof. C. Bae

**University of Hiroshima, Spray & Combustion Lab.**, Hiroshima, Japan

**Visiting under Rackham Grad. School Fellowship**, June 2002

- Gasoline spray visualization experiments using a high-speed camera, Supervisors: Prof. K. Nishida & Dr. J. Lee

**Robert Bosch GmbH**, Stuttgart, Germany

**Internship**, December 1999 – March 2000

- Department of High Pressure Diesel Injection Pumps, Quality Control

## Education

**University of Michigan**, Ann Arbor, MI, USA

**Ph.D. in Mechanical Engineering**, September 2002 - October 2005

- Ph.D. Thesis: “*A Unified Fuel Spray Breakup Model For Internal Combustion Engine Applications*”, Faculty Advisor: Prof. D.N. Assanis

**University of Michigan**, Ann Arbor, MI, USA

**M.Sc. in Mechanical Engineering**, September 2000 - August 2002

- Fellowship, September 2000 – April 2001
- M.Sc. Thesis: “*Modeling Gasoline Sprays Emerging from High-Pressure Swirl Injectors for DISI Engines*”, Faculty Advisor: Prof. D.N. Assanis

**University of Stuttgart**, Stuttgart, Germany

**Institute for Nuclear Energy and Energy Systems (IKE)**, March 1999 – February 2000

- European Exchange Program Fellowship (Erasmus)
- Diploma thesis: “*Application of the Numerical Code VOFCSF to Jet Formation and Drop Deformation in the Field of Nuclear Reactor Safety*”

**National Technical University of Athens (NTUA)**, Athens, Greece

**Diploma in Mechanical Engineering**, September 1994 – March 2000

- Coursework focused on energy generation and conservation systems

## Awards

- ILASS-Americas Student Travel Fellowship for the ICLASS 2003 meeting
- Hewlett International Travel Grant, H.H. Rackham Grad. School, 2002 and 2003

## Skills - Interests

- **Languages:** English (fluent), German (very good), French (good), Swedish (elementary), Greek (mother tongue),
- **Computer skills:** Microsoft Office, UNIX, Linux, FORTRAN, C/C++, KIVA-3V, AMESim, IFP-C3D, AutoCAD, HyperMesh, AVL FIRE/SWIFT
- **Workshops attended:**
  - “Academic Careers in Science & Engineering”, Univ. of Michigan, Fall 2004
  - “Cross-Cultural Training Series” Univ. of Michigan, Fall-Winter 2004-2005
- **Management/Organization skills:**
  - Treasurer, UM Gliding and Soaring Club, Spring-Summer-Fall 2005
  - Vice-president, Hellenic Student Association, Univ. Michigan, 2004-2005
  - Organization of educational trip from Greece to France for 65 students, April 1998
- **Professional Organizations Membership:**
  - Society of Automotive Engineers (SAE)
  - American Society of Mechanical Engineers (ASME)
  - Institute for Liquid Atomization and Spray Systems (ILASS)
- **Interests/Hobbies:**
  - Traveling
  - Photography
  - Sailing (U.S. Red Cross Certificate[2005], Hellenic Offshore Racing Club Certificate[2000])
  - Gliding (U.S. Private Pilot License [2005])

## Publications – Presentations

- "Simulation of a 4-Cylinder Turbocharged Gasoline Direct Injection Engine Using a Direct Temporal Coupling Between a 1D Simulation Software and a 3D Combustion Code", Bohbot, J., Chryssakis, C., Miche, M., submitted to SAE Powertrain & Fluid Systems Conference 2006, Toronto, Canada, October 2006
- "In-Cylinder Reduction of PM and NO<sub>x</sub> Emissions from Diesel Combustion with Advanced Injection Strategies", C.A. Chryssakis, J.R. Hagena, A. Knafl, V. Hamosfakidis, Z.S. Filipi, D.N. Assanis, *Int. J. of Vehicle Design*, Vol. 41, No. 1-4, pp.83-102, 2006
- "Development and Validation of a Comprehensive CFD Model of Diesel Spray Atomization Accounting for High Weber Numbers ", C.A. Chryssakis, D.N. Assanis, Choongsik Bae, *SAE Technical Paper Series 2006-01-1546*, Detroit, MI, USA, April 2006
- "A Secondary Atomization Model for Liquid Droplet Deformation and Breakup under High Weber Number Conditions", C.A. Chryssakis, D.N. Assanis, ILASS Americas, *18<sup>th</sup> Annual Conference on Liquid Atomization and Spray Systems*, Irvine, California, USA, May 2005
- "Evaluation of A Narrow Spray Cone Angle, Advanced Injection Timing Strategy to Achieve Partially Premixed Compression Ignition Combustion in a Diesel Engine", G.A. Lechner, T.J. Jacobs, C.A. Chryssakis, D.N. Assanis, R.M. Siewert, *SAE 2005 Transactions, Journal of Engines 2005-01-0167*, Detroit, MI, USA, April 2005
- "Effect of Multiple Injection on Fuel-Air Mixing and Soot Formation in Diesel Combustion Using Direct Flame Visualization and CFD Techniques", C.A. Chryssakis, D.N. Assanis, S. Kook, C. Bae, *ASME ICES2005-1016*, Chicago, IL, USA, April 2005
- "Modeling of Gasoline Direct Injection Mixture Formation Using KIVA-3V: Development of Spray Breakup and Wall Impingement Models and Validation with Optical Engine Planar Laser Induced Fluorescence", B. Vanzieleghem, C. Chryssakis, R. Grover, D. Assanis, H. Im, V. Sick, *COMODIA 2004*, Yokohama, Japan, August 2004
- "Gasoline Direct Injection Modeling and Validation with Engine Planar Laser Induced Fluorescence Experiments", B.P. Vanzieleghem, C.A. Chryssakis, R.O. Grover, D.N. Assanis, H.G. Im, V. Sick, *14<sup>th</sup> International Multidimensional Engine Modeling User's Group Meeting*, Detroit, MI, USA, March 2004
- "An Investigation of the Breakup Mechanisms for Swirl Sprays from High-Pressure Swirl Injectors", C.A. Chryssakis, D.N. Assanis, J.-K. Lee, K. Nishida, *ICLASS 2003, 9<sup>th</sup> International Conference on Liquid Atomization & Spray Systems*, Sorrento, Italy, July 2003
- "Fuel Spray Simulation of High-Pressure Swirl-Injector for DISI Engines and Comparison with Laser Diagnostic Measurements", C.A. Chryssakis, D.N. Assanis, J.-K. Lee, K. Nishida, *SAE Technical Paper Series 2003-01-0007*, Detroit, MI, USA, March 2003
- "Validation of an Enhanced Liquid Sheet Atomisation Model Against Quantitative Laser Diagnostic Measurements", C.A. Chryssakis, K.D. Driscoll, V. Sick, D.N. Assanis, *ILASS Europe, 18<sup>th</sup> Annual Conference on Liquid Atomization and Spray Systems*, Zaragoza, Spain, September 2002