

Albert Ratner

Assistant Professor
Department of Mechanical & Industrial Engineering
3131 Seamans Center
University of Iowa, Iowa City, IA 52242

Tel: (319) 384-0883
Fax: (319) 335-5669
email: aratner@engineering.uiowa.edu
web: www.engineering.uiowa.edu/~aratner

EDUCATION:

University of Michigan, Ann Arbor, MI

Ph.D. Aerospace Engineering, 2000

Dissertation: “Highly Turbulent Combustion: A Study of Lifted and Shredded Flames”

M.S. Mathematics, 1999

M.S. Aerospace Engineering, 1996

California Institute of Technology (Caltech), Pasadena, CA

B.S. Engineering and Applied Science – Concentration in Aerospace Engineering, 1995

PROFESSIONAL EXPERIENCE:

Assistant Professor, University of Iowa, 8/03 – present

Post-Doctoral Scholar, California Institute of Technology, 10/00 – 7/03

HONORS and AWARDS:

Old Gold Summer Faculty Fellowship, 2004

Guggenheim Post-Doctoral Fellow (Caltech), 2001-2002

National Research Council Post-Doctoral Fellowship Competition Winner (declined fellowship in lieu of position at Caltech), 2000

Francois-Xavier Bagnoud Fellow, 1995-2000

(One award a year, lasting 5 years, most prestigious in the department)

Lewis Kingsley Scholar in Space Research, 1994-1995

Marion and Earle Jorgensen Scholar, 1993-1994

National Merit Scholar (Winner of National Competition), 1991-1992

American Mathematical Society, Math Exchange Scholar, 1991

(One of 25 students selected nationally to travel to the Soviet Union as ambassador-scholars)

RECENT PUBLICATIONS:

Huang, Y., Ratner, A., and Kang, D. M., “Experimental investigation of thermoacoustic coupling for low-swirl lean premixed flames,” Submitted to *Combustion and Flame*, 2006.

Kang, D. M., Ratner, A., and Culick, F. E. C., “Measurements of Swirl Burner Thermo-acoustic Coupling,” Submitted to *Combustion and Flame*, 2006.

Kang, D. M., Ratner, A., and Culick, F. E. C., “Consequences for Flame Behavior from Coupling of Combustor Pressure and Fuel/Oxidizer Mixing,” Submitted to *Combustion Science and Tech.*, 2006.

Bathel, B., Huisenga, M., Stephen, N., Johnson, L., and Ratner, A., “Prediction of Post-contact Deformation for a Fluid Droplet Impact on a Solid, Smooth Surface,” Conditionally accepted by *AIAA Journal*, 2006.

Kang, D. M., Fernandez, V., Ratner, A., and Culick, F. E. C., “Combined Acetone PLIF and IR Laser Absorption Probe Measurements of Fuel Mixture Fraction Oscillations,” Conditionally accepted by *Experiments in Fluids*, 2006.

- Ratner, A., Palm, S. L., Pun, W., and Culick, F. E. C., "Phase-Resolved NO Planar Laser-Induced Fluorescence of a Jet Flame in an Acoustic Chamber with Excitation at Frequencies <60 Hz," *Proceedings of the Combustion Institute*, Vol. 29, pp. 85-90, 2002.
- Ratner, A., Driscoll, J. F., Huh, H., and Bryant, A. B., "Combustion Efficiency of Supersonic Flames," *AIAA Journal of Propulsion and Power*, Vol.17, No.2, pp. 301-307, 2001.
- Ratner, A., Driscoll, J. F., Donbar, J. M., Carter, C. D. and Mullin, J. A., "Reaction Zone Structure of Non-premixed Turbulent Flames in the 'Intensely Wrinkled' Regime," *Proceedings of the Combustion Institute*, Vol. 28, pp. 245-252, 2000.

RECENT CONFERENCE PROCEEDINGS (Past 5 years):

- Bathel, B., Stephen, N., Johnson, L., Ratner, A. and Huisenga, M., "Prediction of Post-Contact Parameters of a Fluid Droplet Impact on a Smooth Surface," *45th AIAA Aerospace Sciences Meeting*, AIAA paper 2007-932, Reno, NV, Jan. 8-11, 2007.
- Gao, H., Ratner, A., and Driscoll, J. D., "Correlation of Reaction Zone Curvature and Thickness in Highly Turbulent Non-premixed Flames," Central States Meeting of the Combustion Institute, Cleveland, OH, May 21-23, 2006.
- Huang, Y., Gao, H., and Ratner, A., "An Experimental Study of Thermoacoustic Coupling for Low-swirl Lean Premixed Flames," Central States Meeting of the Combustion Institute, Cleveland, OH, May 21-23, 2006.
- Bathel, B., Huisenga, M., Stephen, N., Johnson, L., and Ratner, A., "Prediction of Post-contact Deformation for a Fluid Droplet Impact on a Solid, Smooth Surface," *American Physical Society Fluids Section meeting*, Chicago, IL, Nov. 19-22, 2005.
- Kang, D. M., Ratner, A., and Culick, F. E. C., "An Experimental study of Coupling between Combustor Pressure, Fuel/Air Mixing, and Flame Behavior," 4th Joint Sections Meeting of the Combustion Institute, Philadelphia, PA, March 20-23, 2005.
- Kang, D. M., Pinedo, C., Ratner, A., and Culick, F. E. C., "Imaging of Fuel Mixture Fraction Oscillations in a Driven System using Acetone PLIF," Central States Meeting of the Combustion Institute, Austin, TX, March 21-23, 2004.
- Ciucci, F., Kang, D. M., Ratner, A., and Culick, F. E. C., "Detection of NO in a Methane-Air, Steady, Flat Flame with CO₂/N₂ Seeding Using Degenerate Four-Wave Mixing and Laser-Induced Fluorescence," *39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference*, AIAA-2003-4492, Huntsville, AL, July 20-23, 2003.
- Fernandez, V., Ratner, A., and Culick, F. E. C., "Measured Influence of Oscillations in Fuel Mixture Fraction on Flame Behavior," *3rd Joint Sections Meeting of the Combustion Institute*, Chicago, IL, March 16-19, 2003.
- Ratner, A., Palm, S. L., Pun, W., Ramirez, B., and Culick, F. E. C., "Flame Response to Excitation at Frequencies <60 Hz as Measured by Phase-Resolved NO PLIF," *40th Aerospace Sciences Meeting*, AIAA Paper 2002-0195, Reno, NV, Jan. 14-17, 2002.
- Pun, W., Ratner, A., and Culick, F. E. C., "Phase-Resolved Chemiluminescence of an Acoustically Forced Jet Flame at Frequencies <60 Hz," *40th Aerospace Sciences Meeting*, AIAA Paper 2002-0194, Reno, NV, Jan. 14-17, 2002.

PROFESSIONAL ACTIVITIES:

AIAA: Member, Iowa Section Program Chair, and University of Iowa Chapter Advisor
 Combustion Institute: Member and Premixed Combustion Working Group Committee Member
 Iowa Academy of Science: Member and 2007 Meeting Fluids Section Co-Chair
 Reviewer: *Combustion and Flame*, *International Symposium on Combustion*, *Experiments in Fluids*, ASME Gas Turbine Expo, National Science Foundation

COLLABORATORS AND JOINT ACTIVITIES:

F. E. C. Culick, California Institute of Technology; H. Clack, Illinois Institute of Technology