

## ARISTIDES M. BONANOS

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### EDUCATION

- Virginia Tech – Aerospace and Ocean Engineering** 2002 – 2005  
Ph.D. in Aerospace Engineering Sept. 2005  
Thesis advisor: Dr. Joseph A. Schetz
- Masters of Science, Aerospace Engineering May 2004
- University of Virginia – Mechanical and Aerospace Engineering** 1998 – 2002  
Bachelor of Science, Mechanical and Aerospace Engineering  
Minor in Applied Mathematics

Degrees are officially recognized as equivalent to those granted by Greek universities.

### WORK EXPERIENCE

- Associate Research Scientist The Cyprus Institute, EEWRC  
May 2009 – Present Nicosia, Cyprus
- Cogeneration of electricity and desalinated water using concentrated solar power.
- Airman, 1<sup>st</sup> class (Sgt.) Hellenic Air Force  
May 2008 – May 2009 Hellenic Air Force Academy, Dekelia, Greece
- Part of one year mandatory military training.
  - Aided in setting up lab experiments in aerospace-related classes for HAFA students.
  - Selected amongst peers to assign duties to privates.
- Postdoctoral Scholar, Aeronautics California Institute of Technology  
Sept. 2005 – Apr. 2008 Pasadena, Ca, USA
- Designed and build \$250K experimental facility and associated instrumentation for investigation of shear-layer/jet interaction.
  - Aided in composition of funding proposals and annual reports as senior researcher in Caltech group.
  - Mentored a SURF student (Summer Undergraduate Research Fellowship) at California Institute of Technology, Summer 2006.
  - Performed experimental research on molecular mixing of reattaching shear layer in transonic and supersonic flows.
- Graduate Research Assistant Virginia Tech, Dept. of Aerospace Eng.  
Jan. 2003 – Aug. 2005 Blacksburg, Va, USA
- Performed experimental and computational research in various facilities, on supersonic injection, mixing and combustion systems.
  - Tutor for “Aerospace Engineering Laboratory” and grader for “Boundary Layer Theory,” senior level courses in aerospace engineering.
- Undergraduate Research Assistant Univ. of Virginia, Aerospace Research Lab  
June 2001 – May 2002 Charlottesville, Va, USA

- Experimental research work, for undergraduate thesis, on fuel plume imaging in a scramjet combustor.

#### Summer Internship

June 2000 – July 2000

Architectural office of J. Noussis  
Athens, Greece

- Hired to prepared architectural drawings using CAD software.

### **SKILLS**

- Fluent in English and Greek.
- Operating Systems: Windows, MacOS and Linux platforms.
- Applications: MS Office (Word, Excel, Powerpoint), AutoCad, SolidWorks, MatLab

### **RESEARCH SKILLS**

- Experimental research experience in several subsonic and supersonic wind tunnel facilities.
  - Continuous and blow-down type facilities.
- Design of experiments and associated data acquisition and reduction systems.
- Expertise in experimental diagnostic techniques including:
  - Aero-thermodynamic probing.
  - Schlieren imaging, knife-edge and color setups.
  - High-speed flow imaging.
  - Laser-induced fluorescence measurements.
- Use of Computational Fluid Dynamics as prediction and analysis tools in parallel with experiments:
  - GASP as the CFD solver
  - Grid generation and optimization using GridGen.

### **PROFESSIONAL ASSOCIATIONS**

- American Institute of Aeronautics and Astronautics (AIAA). Member since 2001.
- American Physical Society (APS). Member since 2007.

### **HONORS & ACTIVITIES**

- Hellenic Society, University of Virginia. President, 2000-2001.
- 3rd place in national AGATE–NASA–FAA and AFRL design competition, part of UVa design team under Dr. J. McDaniel, for the “Vector Evolution” general aviation aircraft, 2000-2001. Press-release available at <http://www.nasa.gov/centers/langley/news/releases/2001/01-072.html>
- 1st place in above competition, for utilizing air-force technologies in a general aviation aircraft, 2000-2001.
- Distinction in class-wide CAD design competition, 1999.

### **PUBLICATIONS**

#### Journal Papers

1. Matheou, G., **Bonanos, A.M.**, Pantano, C., and Dimotakis, P.E., “Large-eddy simulation of molecular mixing in a recirculating shear flow”, accepted for publication in *Journal of Fluid Mechanics*, 2009.

2. Bergthorson, J.M., Johnson, M.B., **Bonanos, A.M.**, Slessor, M., Su, W., and Dimotakis, P.E., "Molecular mixing and flowfield measurements in recirculating shear flow. Part I: Subsonic flow", in press in *Flow, Turbulence and Combustion*, 2009.
3. **Bonanos, A.M.**, Bergthorson, J.M. and Dimotakis, P.E., "Molecular mixing and flowfield measurements in recirculating shear flow. Part II: Supersonic flow", in press in *Flow, Turbulence and Combustion*, 2009.
4. **Bonanos, A.M.**, Bergthorson, J.M. and Dimotakis, P.E., "Mixing measurements in a supersonic expansion-ramp combustor", *Flow, Turbulence and Combustion*, Vol. 80, No. 4, pp. 489-506, 2008.
5. **Bonanos, A.M.**, Schetz, J.A., O'Brien, W.F. and Goyne, C.P., "Dual-mode combustion experiments with an integrated aeroramp-injector/plasma-torch igniter", *Journal of Propulsion and Power*, Vol. 24, No. 2, pp. 267-273, 2008.

#### Conference Papers

1. **Bonanos, A.M.**, Maddalena, L., and Dimotakis, P.E., "Observations on a supersonic shear layer", *47<sup>th</sup> AIAA Aerospace Sciences Meeting*, AIAA-2009-26, Orlando, Florida, January 2009.
2. Maddalena, L., Hosder, S., **Bonanos, A.M.** and Dimotakis, P.E., "Extended conical flow theory for design of pressure probes in supersonic flows", *47<sup>th</sup> AIAA Aerospace Sciences Meeting*, AIAA-2009-1072, Orlando, Florida, January 2009.
3. Bergthorson, J.M., Johnson, M.B., **Bonanos, A.M.** and Dimotakis P.E., "Measurements of molecular mixing in an expansion-ramp combustor," *21<sup>st</sup> ICDERS conference*, Poitiers, France, July, 2007.
4. **Bonanos, A.M.**, Bergthorson, J.M. and Dimotakis P.E., "Molecular mixing and flowfield measurements in an expansion-ramp combustor: supersonic flow," *43<sup>rd</sup> AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, AIAA-2007-5417, Cincinnati, Ohio, July 2007.
5. **Bonanos, A.M.**, Schetz, J.A., O'Brien, W.F. and Goyne, C.P., "Integrated aeroramp-injector/plasma-torch-igniter for methane and ethylene fueled scramjets," *44<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit*, AIAA-2006-813, Reno, Nevada, January 2006.
6. **Bonanos, A.M.**, Schetz, J.A., O'Brien, W.F. and Goyne, C.P., "Scramjet operability range studies of a multifuel integrated aeroramp injector/plasma igniter," *AIAA 13<sup>th</sup> International Space Planes and Hypersonics Systems and Technologies Conference*, AIAA-2005-3425, Capua, Italy, May, 2005.
7. **Bonanos, A.M.**, Sanders, D., Schetz, J.A., O'Brien, W.F. Goyne, C.P., Krauss, R.H. and McDaniel, J.C., "Hot-flow testing of an integrated aeroramp injector/plasma igniter for scramjets with hydrocarbon fuel," *12<sup>th</sup> AIAA International Space Planes and Hypersonic Systems and Technologies Conference*, AIAA-2003-6987, Norfolk, Virginia, December 2003.

#### Theses

1. **Bonanos A.M.**, "Scramjet operability range studies of an integrated aerodynamic-ramp-injector/plasma-torch igniter with hydrogen and hydrocarbon fuels," Ph.D. Dissertation, Department of Aerospace and Ocean Engineering, Virginia Tech, Blacksburg VA, 2005.
2. **Bonanos A.M.**, "Investigation of Fuel Plume Temporal Variation in a Scramjet Combustor," Undergraduate dissertation, Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville VA, 2002.

## Patents

1. "A high-spatial-resolution probe, with simplified calibration technique for simultaneous total and static pressure measurements in supersonic flows with moderate flow angularity and swirl", Maddalena, L., **Bonanos, A.M.**, Dimotakis, P.E. and Ferrante, A, U.S. Provisional Patent Application No. 29,373 (filed Jan. 2008).

## Presentations

1. "Experiments and simulations of molecular mixing in a reattaching shear layer," 60<sup>th</sup> Annual Meeting of the American Physical Society - Division of Fluid Dynamic, Salt Lake City, Utah, November 2007.
2. "Molecular mixing and flowfield measurements in an expansion-ramp combustor: Supersonic flow," 43<sup>rd</sup> AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Cincinnati, Ohio, July 2007.
3. "Compressible turbulent mixing with ramp injection," Fluid Mechanics Research Conference, Graduate Aeronautical Laboratories of the California Institute of Technology, Pasadena, California, March 2006.
4. "Integrated aeroramp-injector/plasma-torch-igniter for methane and ethylene fueled scramjets," 44<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, January 2006.
5. "Scramjet operability limits of an integrated aeroramp-injector/plasma-igniter with hydrogen and hydrocarbon fuels," Aerospace Engineering Research Seminar, Virginia Tech, Blacksburg, Virginia, August 2005
6. "Scramjet operability range studies of a multifuel integrated aeroramp injector/plasma igniter," 13<sup>th</sup> AIAA International Space Planes and Hypersonic Systems and Technologies Conference, Capua, Italy, May 2005.
7. "Research progress report," NASA Langley Research Center, Hampton, Virginia, September 2004.
8. "Supersonic combustion experiments in a Mach 2 freestream with hydrogen fuel," Annual review of the research programs of the Virginia Tech Center for Turbomachinery and Propulsion Research (CTPR), Blacksburg, Virginia, February 2004.
9. "Hot-flow testing of an integrated aero-ramp-injector/plasma-igniter for scramjets with hydrogen and hydrocarbon fuels," 12<sup>th</sup> AIAA International Space Planes and Hypersonic Systems and Technologies Conference, Norfolk, Virginia, December 2003.
10. "Research progress report," NASA Langley Research Center, Hampton, Virginia, August 2003.