

## ANN R. KARAGOZIAN

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Department of Mechanical & Aerospace Engineering  
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### PROFESSIONAL EXPERIENCE

#### **University of California, Los Angeles**

##### [Department of Mechanical and Aerospace Engineering](#)

Distinguished Professor, July 2016 to present

Professor, July, 1993 to June, 2016

Associate Professor, July, 1988 to June, 1993

Assistant Professor, July, 1982 to June, 1988

##### [Office of the Vice Chancellor for Research](#)

Interim Vice Chancellor for Research, January 2016 to June 2017

##### **Head, UCLA [Energy and Propulsion Research Laboratory](#)**

##### **Director, UCLA-AFRL [Collaborative Center for Aerospace Sciences](#)**

#### **Member, Board of Trustees:**

[Institute for Defense Analyses](#) (2011 – present)

Chair, Visiting Committee (2015 – present)

Member, Executive Committee (2015 – present)

Mentor, Defense Science Study Group (2014 – present)

[American University of Armenia Corporation](#), a UC affiliate (2012 – present)

Chair, Educational Policy Committee (2013 – present)

#### **Technical Consultant:**

U.S. Air Force (1997-2001, 2002-10, 2018-present)

Sandia National Laboratories (2003-5)

TechFinity (2004-5)

Pacific-Sierra Research (1986-8)

Rand Corporation (1979-83)

Registered Professional Engineer (Mechanical Engineering), State of California, 1983-present

Associate Member of the Technical Staff, Aerospace Corp. (1978)

Engineering Student Intern, Hughes Aircraft Co. Missile Systems Division (1976-8)

### EDUCATION

#### **California Institute of Technology**

Ph.D. in Mechanical Engineering, June, 1982

Thesis Advisor: Professor Frank E. Marble

Thesis: "An Analytical Study of Diffusion Flames in Vortex Structures"

M.S. in Mechanical Engineering, June, 1979

#### **University of California, Los Angeles**

B.S. in Engineering, summa cum laude, June, 1978

### HONORS, AWARDS & SPECIAL RECOGNITION

Member, U.S. [National Academy of Engineering](#), 2018

Member, Air Force Scientific Advisory Board, 2018 – present, 2002-2010 and 1997-2001

W. Duncan Rannie Memorial Invited Lecture, Caltech, 2014

American Physical Society/Division of Fluid Dynamics [Invited Lecture](#), Nov, 2013

**Fellow**, American Society of Mechanical Engineers, 2013

Midwest Mechanics Seminar Invited Speaker (10 universities), 2013-14

**Chair**, American Physical Society/Division of Fluid Dynamics, 2011

U.S. Air Force Decoration for Exceptional Civilian Service, 2010 and 2001  
UCLA Henry Samueli Teaching Award, MAE Department, 2009  
**Vice Chair**, Air Force Scientific Advisory Board (AFSAB), 2005-2009  
**Fellow**, American Physical Society, 2004  
**Fellow**, American Institute of Aeronautics and Astronautics, 2004  
UCLA Faculty-Staff Partnership Award, 2004  
Invited Topical Speaker, SIAM 50th Anniversary and Annual Meeting, 2002  
Recipient, NASA Recognition for Exemplary Service, 2001  
Member, Defense Science Study Group, 1994-96  
TRW-UCLA Excellence in Teaching Award, 1987  
NASA-ASEE Summer Faculty Fellowship, 1983  
Shell Companies Fellowship, Caltech, 1980-81  
Daniel and Florence Guggenheim Fellowship, Caltech, 1978-79  
Outstanding Young Women of America Award, 1978, 1982  
Phi Beta Kappa Honor Society  
Tau Beta Pi Engineering Honor Society

## **UNIVERSITY ADMINSTRATIVE/LEADERSHIP EXPERIENCE**

### **Office of the Vice Chancellor for Research**

Interim Vice Chancellor for Research, January 2016 to June 2017

### **UCLA Academic Senate**

Chair of the UCLA Academic Senate, 2010-11 (also Vice Chair/Chair-Elect, Past Chair)  
Senate Parliamentarian, 2015

Chair and Member of various Administration/Senate Committees, 2009 - 2015

Member, Council on Academic Personnel, 2003-2007

Reviews cases for faculty tenure, promotion, and tenured appointments

### **UCLA Department of Mechanical and Aerospace Engineering**

Vice Chair for Industrial Relations, 2008 – 2010 and 2011 - 2012

Industrial Liaison, 2000-2002

Vice Chair for Undergraduate Affairs, 1993-1994

Chair of various recruitment, review, and departmental committees, 1990-present

### **UCLA Henry Samueli School of Engineering and Applied Science**

Chair, Faculty of Engineering (elected position), 1999-2001

Member, Faculty Executive Committee, 2012-15

## **PROFESSIONAL SERVICE**

### **Air Force Scientific Advisory Board**

Member, 2018 – present, 2002-2010 and 1997-2001

Vice Chair, 2005-2009

Chair, AFSAB Study on Future Launch Vehicle Systems, 2009-10

Chair, AFSAB Study on Improved Air Vehicle Fuel Efficiency, 2005-6

Chair, AFSAB Study on Persistence at Near Space Altitudes, 2005

Chair, Air Force Research Lab Science & Technology Review, Propulsion, 2004

Chair, AFSAB Panel on Targets and Effects, Long Range Strike Study, 2003

Chair, AFSAB Panel, Sensor Technologies - Hard & Deeply Buried Targets, 2001

Member of various SAB technical studies and reviews, 1997 - present

### **American Physical Society/Division of Fluid Dynamics**

Division Councilor, 2015 – present

Division Chair (also Vice-Chair, Chair-Elect, Immediate Past Chair), 2009 – 2012

Chair, Fellowship Committee, 2009 – 2010

Member, Local Organizing Committee, APS/DFD Long Beach meeting, 2010

Member, Frankiel award committee, 2005-7

Member, Fluid Dynamics Prize Committee, 2004-6

Member, Executive Committee, 1998-2001

Member and Chair, Nominating Committee, 1998-2000 and 1993-95

## **US National Committee on Theoretical and Applied Mechanics (USNC/TAM)**

Member-at-Large, 2011-present  
Member, Congress Committee, Intl. Union of Theor. & Appl. Mech, 2012-present  
Member, IUTAM Symposia Panel for Fluid Mechanics, 2018-present  
Member, Executive, Strategic Planning, and Reports Committees, 2014 - 2017  
Co-Chair, Combustion and Flames Thematic Sessions, ICTAM Montreal, 2016

## **Combustion Institute**

Member, Silver Medal Award Committee, 2013-15  
Member, Gold Medal Awards Committee, 2007-10  
Member, Editorial Board, **Proceedings of the Combustion Institute**, 2008 – 2015  
Chair, Western States Section/The Combustion Institute Fall meeting, UCLA, 2003  
Member, Executive Committee, Western States Section, 1999-present  
Co-Organizer, Colloquium on Supersonic Combustion, 26th Int. Symposium, 1996

## **Technical Committees for the U.S. National Academies/National Research Council**

Member, NRC Committee on NASA's Strategic Directions, 2012  
Member, Science Council, National Center for Microgravity Research, 2004-7  
Member, ASEB Committee on Breakthrough Technologies and Long-term R&D Goals in Aeronautics and Space Transportation Technology, 1997-98  
Member, NAS NSB Technology for Future Naval Forces Study, 1996-1997  
Member, NAS ASEB Committee on Space Facilities, 1993-94

## **NASA**

Member, NASA Aerospace Technology Advisory Committee, 1995-2001  
Member, NASA Federal Lab Review Task Force, 1994-95

## **AIAA**

Member, AIAA Fellow Selection Committee, periodically since 2005  
Member, AIAA Publications Awards Committee, 2002 – 2009  
Associate Editor, **AIAA Journal**, 2002-5  
Associate Editor, **Journal of Propulsion and Power**, 1996-98

## **External University Advisory/Review Committees**

Member, Advisory Board, **UK Fluids Network**, 2015 - present  
Chair, Review of University of Arizona Dept of Aerospace & Mechanical Engr., 2015  
Member, Princeton Univ. Mechanical & Aerospace Engr Advisory Council, 2014-present  
Member, Exec Bd, U. Michigan/AFRL Collab. Center in Control Science, 2012 – present  
Member, Caltech External Advisory Board, Mechanical & Civil Engr., 2007-present  
Member and Chair, Visiting Committee, University of Washington Department of Aeronautics and Astronautics, 1998-2002  
Member, Review Team, University of Colorado Dept of Mech Engr., 1996  
Member, Review Committee, UC Irvine Dept of Mech & Aero Engr., 1996

## **Department of Energy/Sandia National Laboratories**

Chair, External Advisory Board, Sandia National Laboratories' Grand Challenge Laboratory Director's R&D Project on Sensing for HDBT Defeat, 2003-5  
Member, DOE Basic Energy Sciences Review Team, Sandia Natl. Labs, 2002  
Chair, Review Team for Caltech DOE ASCI Center, 1999

## **Other Technical/Professional Activities**

Member, Mayor's Advisory Council on Aerospace, City of Los Angeles, 2014-16  
Member, NSF proposal and other review panels, periodically since 1991  
**Co-organizer**, 70<sup>th</sup> Birthday Symposium in honor of Prof. Robert Kelly, Nov., 2004  
**Co-Coordinator**, Advanced School on "Modeling, Manipulation, and Control of Transverse Jets", Centre International des Sciences Mecaniques, Italy, June, 2001  
Reviewer, **AIAA Journal**, **Journal of Fluid Mechanics**, **Physics of Fluids**, **Phys Rev Fluids**, **The Physical Review and Physical Review Letters**, **Combustion Symposia**, **ASME Journal of Heat Transfer**, **Journal of Propulsion and Power**, **Combustion and Flame**, **Combustion Science and Technology**, **Shock Waves Proc. of the Royal Society A**, **Experiments in Fluids**, **Theoretical & Computational Fluid Dynamics**, **Combustion Theory & Modeling**

## PRESENT/FORMER GRADUATE STUDENTS AND POST-DOCTORAL RESEARCHERS

### Doctoral Students

Bose V. S. Manda, Ph.D., 1987; currently MTS, Structural Research & Analysis Corp.  
Stephen D. Heister, Ph.D., 1988; currently Raisbeck Distinguished Professor, Purdue Univ.  
Trinh T. Nguyen, Ph.D., 1989; currently MTS, Aerospace Corporation  
Hsi-Shang Li, Ph.D., 1992; currently President, Contex Engineering Intl., Inc.  
Kevork Madooglu, Ph.D., 1992; currently Physics Instructor, Burbank USD  
Vinh Ton, Ph.D., 1993; currently MTS, Boeing Space and Communications  
Jeffrey Willis, Ph.D., 1994; currently Group lead, Turbopumps, SpaceX  
Christopher Cadou, Ph.D., 1996; currently Assoc. Prof., Dept. of Aero. Engr., Univ. of Maryland  
Yungmo Kang, Ph.D., 1997; currently MTS, Solar Turbines  
Thomas Selerland, Ph.D., 1997; currently faculty member, American University of Sharjah  
Ari Majamaki, Ph.D., 2001; currently MTS, Aerospace Corporation  
Xing He, Ph.D., 2004; currently Quantitative Analyst, Bloomberg, NYC  
Srinivasan Dattarajan, Ph.D., 2004; currently Manager, R&D, Forbes Marshall Pvt Ltd, India  
Leonardo Alves, Ph.D., 2006; currently Professor, Universidade Federal Fluminense, Brazil  
Juliett Davitian, Ph.D., 2008; currently Member of Technical Staff, Aerospace Corporation  
Juan Rodriguez, Ph.D., 2009; currently faculty member, CETYS Universidad Posgrado  
Christopher Zeineh, Ph.D., 2010; currently MTS, Aerospace Corporation  
Brian Boyce, Ph.D., 2010; currently MTS, Aerojet-Rocketdyne  
Sophonias Teshome, Ph.D., 2012; currently MTS, Aerospace Corporation  
Daniel Getsinger, Ph.D., 2012; currently Senior Associate, Thermal Sciences, Exponent  
Lord Cole, Ph.D., 2012; currently Trade Logic Developer, TransMarket Group, Chicago IL  
Jeffrey Wegener, Ph.D., 2014; currently Principal Scientist, Physical Sciences, Inc.  
Hai Le, Ph.D., 2014; currently Computational Physicist, Lawrence Livermore National Lab  
Levon Gevorkyan, Ph.D., 2015; currently MTS, Aerospace Corporation  
Ayaboe Edoh, Ph.D., 2017; currently Research Scientist, ERC, Inc./Air Force Research Lab  
Takeshi Shoji, Ph.D., 2017; currently Researcher, Japan Aerospace Exploration Agency (JAXA)  
Richard Abrantes, Ph.D., 2018; currently NRC Postdoctoral Researcher, Air Force Research Lab  
Andrea Besnard, Ph.D. in progress  
Elijah Harris, Ph.D. in progress  
Miguel Plascencia, Ph.D. in progress  
Salvador Badillo Rios, Ph.D. in progress  
Andres Vargas, Ph.D. in progress

### Masters Thesis/Research Students

Trinh T. Nguyen, M.S., 1986; currently MTS, Aerospace Corporation  
Yutaka Suganuma, M.S., 1987; currently MTS, Boeing Corp.  
Thomas G. Kalman, M.S., 1987; currently MTS, Raytheon Corp.  
Hsi-Shang Li, M.S., 1990; currently President, Contex Engineering Intl., Inc.  
Li-Ming Lee, M.S., 1990; currently Animator, SKG Dreamworks  
Anh-Tuan Le, M.S., 1991; currently Engr. Scientist, Advatech Pacific, Inc.  
Christopher Cadou, M.S., 1991; currently Assoc. Prof., Dept. of Aero. Engr., Univ. of Maryland  
Jeffrey Willis, M.S., 1991; currently Group lead, Turbopumps, SpaceX  
K. S. Charles Wang, M.S., 1993; currently Group Supervisor, NASA/Jet Propulsion Lab  
Annik Neill Majamaki, M.S., 1993; currently MTS, Northrop-Grumman Space Technology  
Silvia H. Karlsson, M.S., 1993; currently MTS, General Motors Research  
Brian J. Petersen, M.S., 1995; currently MTS, Boeing Phantom Works  
Timothy Gerk, M.S., 1996; currently MTS, HyperParallel, Inc.  
Mark Mitchell, M.S., 1996; currently Combustion Engineer, Capstone Turbine Corp.  
Ari Majamaki, M.S., 1996; currently MTS, Aerospace Corporation  
Guillermo Pont, M.S., 1996; currently MTS, Honeywell  
Ivan Lam, M.S., 1996; currently Senior Technical Staff, Oracle Computing Corp.

Peter Hwang, M. S., 1998; currently Managing Director of Iron Mountain, Greater China  
Ryan Pfeiffer, M. S., 1999; currently MTS, Aerospace Corp.  
Indy Lee, M. S., 2001; currently MTS, Loral Space and Communications  
Jonathan King, M. S., 2002; currently MTS, Northrop-Grumman Corp.  
Stephen Shapiro, M. S., 2003; currently Post Production Film Editor, New Line Cinema  
Caesar Mak, M. S., 2004; currently MTS, Northrop-Grumman Corp.  
Tony Tang, M.S., 2004; currently MTS, Aerospace Corporation  
Sevan Megerian, M.S., 2005; currently MTS, Lockheed-Martin Skunk Works  
Mark Lee, M.S., 2005; currently Mechanical Engineer, Knolls Atomic Power Laboratory  
Marcus George, M.S., 2006; currently Member of Technical Staff, Aerospace Corporation  
Julieta Davitian, M.S., 2006; currently Member of Technical Staff, Aerospace Corporation  
Juan Rodriguez, M.S., 2006; currently faculty member, CETYS Universidad Posgrado  
Edson Rodriguez, M.S., 2007; currently MTS, Aerospace Corporation  
Timothy Roth, M.S., 2008; currently MTS, Northrop-Grumman Electronic Systems  
Reza Tavassoli, M.S., 2008; currently MTS, Northrop-Grumman Electronic Systems  
Daniel Getsinger, M.S., 2008; currently Senior Associate, Thermal Sciences, Exponent  
Cory Hendrickson, M.S., 2008; currently MTS, Ford Scientific Research Laboratory  
Sophonias Teshome, M.S., 2008; currently MTS, Aerospace Corporation  
Lord Cole, M.S., 2008; currently Trade Logic Developer, TransMarket Group, Chicago IL  
Haykaz Mkrtchyan, M.S., 2009; currently Manager, Energetech/Curtiss-Wright  
Kevin Canzonieri, M.S., 2009; currently Engineer, General Atomics  
Jeffrey Wegener, M.S., 2011; currently Principal Scientist, Physical Sciences, Inc.  
Levon Gevorkyan, M.S., 2011; currently MTS, Aerospace Corporation  
Hai Le, M.S., 2012; currently Computational Physicist, Lawrence Livermore National Lab  
Ayaboe Edoh, M.S., 2012; currently Ph.D. student, UCLA  
Cristhian Sevilla, M.S., 2013; currently MTS, Meggitt Safety Systems  
William Quan, M.S., 2013; currently MTS, Boeing  
Takeshi Shoji, M.S., 2013; currently Researcher, Japan Aerospace Exploration Agency (JAXA)  
Phuoc Hai Tran, M.S., 2014; currently Engineer, Air Force Research Laboratory  
Richard Abrantes, M.S., 2014; currently NRC Postdoctoral Researcher, Air Force Research Lab  
Jonathan Tovar, M.S., 2015; currently MTS, Aerospace Corporation  
Andrea Besnard, M.S., 2016; currently Ph.D. student, UCLA  
Elijah Harris, M.S., 2016; currently Ph.D. student, UCLA  
Miguel Plascencia, M. S., 2017; currently Ph.D. student, UCLA  
Salvador Badillo Rios, M.S., 2017; currently Ph.D. student, UCLA  
Jonathan Tran, M. S., 2017; currently, Technical Analyst, RAND Corporation  
Andres Vargas, M.S., 2018; currently Ph.D. student, UCLA  
Daniel Kerr, M. S., 2019; currently researcher, Air Force Research Lab  
David Ren, M.S., in progress

#### Postdoctoral and Visiting Scholars

Farrokh Issacci, Ph.D.; currently Group Manager, Amgen  
Pamela Logan, Ph.D.; currently Researcher, Department of Energy, Richland, WA  
James McDonough, Ph.D.; currently Professor, University of Kentucky  
Lance Smith, Ph.D.; currently Research Engineer, United Technologies Research Center  
Luca Cortelezzi, Ph.D.; currently Associate Professor, Politecnico di Milano  
Heon-Chang Kim, Ph.D.; currently Assistant Professor, Hoseo University, Korea  
Chaouki Ghenai, Ph.D.; currently Assistant Professor, Florida Atlantic University  
Daniel Getsinger, Ph.D.; currently Senior Associate, Thermal Sciences, Exponent  
Daniel Chalhub, Ph.D.; currently Professor, Universidade do Estado do Rio de Janeiro  
Mario Roa, Ph.D.; currently Technical Staff, Air Force Research Laboratory, Edwards AFB  
Dario Valentini, Ph.D.; currently an engineer at SITAEL, Pisa, Italy  
John Bennowitz, Ph.D.; currently Research Scientist, Air Force Research Lab, Edwards AFB  
Hyung Sub Sim, Ph.D.; currently postdoctoral researcher, Sandia National Labs, Livermore  
Rosa Padilla, Ph.D.; currently research scientist, NASA Glenn Research Center

## INSTRUCTIONAL ACTIVITIES

Courses regularly taught at UCLA, 1982 – present (100 level: undergraduate; 200 level: graduate)

- [MAE 103, Elementary Fluid Mechanics](#)
- [MAE 150A, Intermediate Fluid Mechanics](#) (co-instructor in charge)
- [MAE 150P/250P, Aircraft Propulsion Systems](#) (creator, instructor in charge)
- [MAE 150R/250R, Rocket Propulsion Systems](#) (creator, co-instructor in charge)
- [MAE 157, Basic Mechanical Engineering Laboratory](#)
- [MAE 250B, Viscous and Turbulent Flows](#) (co-instructor in charge)
- [MAE 250C, Compressible Flows](#) (co-instructor in charge)
- [MAE 252C, Fluid Mechanics of Combustion Systems](#) (creator, instructor in charge)

## PUBLICATIONS (\* = corresponding author)

### Air Force Scientific Advisory Board Publications (as lead author):

1. **Karagozian, A. R.**, Judd, O. P., Lacoss, R., et al., "Sensor Technologies for Difficult Targets: Chapters on Sensors for Hard and Deeply Buried Targets", AF SAB Technical Report, 2001.
2. **Karagozian, A. R.**, Glasgow, E., Kroo, I., et al., "Persistence at Near Space Altitudes", Air Force SAB-TR-05-06, August, 2005.
3. **Karagozian, A. R.**, Dahm, W., Kroo, I., Murray, R., et al., "Technology Options for Improved Air Vehicle Fuel Efficiency", Air Force SAB-TR-06-04, May, 2006.
4. **Karagozian, A. R.**, Yarymovych, M. I., Heister, S., Van Wie, D., et al., "The Future of Launch Vehicle Systems for the United States Air Force", Air Force SAB-TR-10-02, August, 2010.

### Archival (Peer-Reviewed) Journal Papers:

1. **Karagozian, A. R.** and Marble, F. E.\*, "Study of a diffusion flame in a stretched vortex", *Combustion Science and Technology*, Vol. 45, Issue 1-2, pp. 65-84, 1986
2. **Karagozian, A. R.\***, "An analytical model for the vorticity associated with a transverse jet", *AIAA Journal*, Vol. 24, No. 3, pp. 429-436, March, 1986
3. **Karagozian, A. R.\***, "The flame structure and vorticity generated by a chemically reacting transverse jet", *AIAA Journal*, Vol. 24, No. 9, pp. 1502-1507, September, 1986
4. **Karagozian, A. R.\*** and Manda, B. V. S., "Flame structure and fuel consumption in the field of a vortex pair", *Combustion Science and Technology*, Vol. 49, pp. 185-200, 1986
5. **Karagozian, A. R.\***, Nguyen, T. T., and Kim, C. N., "Vortex modeling of single and multiple dilution jet mixing in a crossflow", *Journal of Propulsion and Power*, Vol. 2, No. 4, pp. 354-360, July, 1986
6. **Karagozian, A. R.\*** and Nguyen, T. T., "Effects of heat release and flame distortion in the transverse fuel jet", *Proceedings of the Combustion Institute*, Vol. 21, pp. 1271-1279, 1986
7. **Karagozian, A. R.\***, Sukanuma, Y., and Strom, B. D., "Experimental Studies in Vortex Pair Motion Coincident with a Liquid Reaction", *The Physics of Fluids*, Vol. 31, pp. 1862-1871, 1988; also in *Turbulent Reactive Flows*, Lecture Notes in Engineering, Vol. 40, Springer-Verlag, 1989
8. Manda, B. V. S. and **Karagozian, A. R.\***, "Effects of Heat Release on Diffusion Flame-Vortex Pair Interactions", *Combustion Science and Technology*, Vol. 61, pp. 101-119, 1988
9. Heister, S. D., Nguyen, T. T., and **Karagozian, A. R.\***, "Modeling of Liquid Jets Injected Transversely into a Supersonic Crossflow", *AIAA Journal*, Vol. 27, No. 12, pp. 1727-1734, 1989
10. Heister, S. D. and **Karagozian, A. R.\***, "Vortex Modeling of Gaseous Jets in a Compressible Cross Flow", *Journal of Propulsion and Power*, Vol. 6, No. 1, pp. 85-92, 1990. Translated into Russian and published in *Aerokosmicheskaya Tekhnika*, Vol. 8, pp. 76-86, August, 1990.

11. Heister, S. D. and **Karagozian, A. R.\***, "Gaseous Jet in Supersonic Crossflow", *AIAA Journal*, Vol. 28, No. 5, pp. 819-827, 1990
12. Logan, P., Lee, J. W., Lee, L. M., **Karagozian, A. R.\***, and Smith, O. I., "Acoustics of a Low Speed Dump Combustor", *Combustion and Flame*, Vol. 84, pp. 93-109, 1991
13. Smith, O. I.\*, Marchant, R., Willis, J., Lee, L. M., Logan, P., and **Karagozian, A. R.**, "Incineration of Surrogate Wastes in a Low Speed Dump Combustor", *Combustion Science and Technology*, Vol. 74, 1-6, pp. 199-210, 1990
14. Heister, S. D., McDonough, J. M., **Karagozian, A. R.\***, and Jenkins, D. W., "The Compressible Vortex Pair", *Journal of Fluid Mechanics*, 220, pp. 339-354, 1990
15. Nguyen, T. T. and **Karagozian, A. R.\***, "A Liquid Fuel Jet in Subsonic Crossflow", *Journal of Propulsion and Power*, Vol. 8, No. 1, pp. 21-29, 1992
16. Marchant, R., Hepler, W., Smith, O. I., Willis, J., Cadou, C., Logan, P., and **Karagozian, A. R.\***, "Development of a Two-Dimensional Dump Combustor for the Incineration of Hazardous Wastes", *Combustion Science and Technology*, 82, pp. 1-12, 1992
17. Li, H. S. and **Karagozian, A. R.\***, "Breakup of a Liquid Jet in Supersonic Crossflow", *AIAA Journal*, Vol. 30, No. 7, pp. 1919-1921, 1992
18. Cadou, C., Logan, P., **Karagozian, A. R.**, Marchant, R., and Smith, O. I.\*, "Laser Diagnostic Techniques in a Resonant Incinerator", *Environmental Sensing and Combustion Diagnostics*, SPIE, Vol. 1434, pp. 67-77, 1991.
19. Willis, J. W., Lee, L-M, **Karagozian, A. R.\***, and Smith, O. I., "Acoustic Mode Alteration in a Dump Combustor Arising from Halon Addition", *Combustion Science and Technology*, 94, 1-6, pp.469-481, 1993.
20. Madooglu, K. and **Karagozian, A. R.\***, "Burning of a Spherical Fuel Droplet in a Uniform Flowfield with Exact Property Variation", *Combustion and Flame*, 94, pp. 321-329, 1993.
21. Ton, V. T., **Karagozian, A. R.\***, Marble, F. E., Osher, S. J., and Engquist, B. E., "Numerical Simulations of High Speed Chemically Reacting Flow", *Theoretical and Computational Fluid Dynamics*, 6, pp. 161-179, 1994 (invited).
22. Madooglu, K. and **Karagozian, A. R.\***, "A Simplified Approach to Transient Convective Droplet Evaporation and Burning", *Combustion and Flame*, 98, pp. 170-174, 1994.
23. Willis, J., Cadou, C., Mitchell, M., **Karagozian, A. R.\***, and Smith, O. I., "Destruction of Liquid and Gaseous Waste Surrogates in an Acoustically Excited Dump Combustor", *Combustion and Flame*, 99, pp. 280-287, 1994.
24. Wang, K. S. C., Smith, O. I., and **Karagozian, A. R.\***, "In-Flight Imaging of Gas Jets Injected into Subsonic and Supersonic Crossflows", *AIAA Journal*, 33(12), pp. 2259-2263, 1995.
25. **Karagozian, A. R.\***, Wang, K. C., Le, A.-T., and Smith, O. I., "Transverse Gas Jet Injection Behind a Rearward-Facing Step", *Journal of Propulsion and Power*, 12(6), pp. 1129-1136, 1996.

26. Pont, G., Willis, J. W., **Karagozian, A. R.\***, and Smith, O. I., "Effects of External Acoustic Excitation on Waste Surrogate Destruction in an Resonant Incinerator", *Proceedings of the Combustion Institute*, Vol. 26, pp. 2463-2470, 1996
27. Gerk, T. J. and **Karagozian, A. R.\***, "Ignition Delay Associated with a Strained Fuel Strip", *Proceedings of the Combustion Institute*, Vol. 26, pp. 1095-1102, 1996.
28. Smith, L. L., Majamaki, A. J., Lam, I. T., Delabroy, O., **Karagozian, A. R.\***, Marble, F. E., and Smith, O. I., "Mixing Enhancement in a Lobed Injector", *The Physics of Fluids*, 9, pp. 667-678, 1997.
29. Pont, G., Cadou, C. P., **Karagozian, A. R.\***, and Smith, O. I., "Emissions Reduction and Pyrolysis Gas Destruction in an Acoustically Driven Dump Combustor", *Combustion and Flame*, 113, pp. 249-257, 1998.
30. Selerland, T. and **Karagozian, A. R.\***, "Ignition, Burning, and Extinction of a Strained Fuel Strip with Complex Kinetics", *Combustion Science and Technology*, 131, No. 1-6, pp. 251-276, 1998.
31. Kang, Y., **Karagozian, A. R.\***, and Smith, O. I., "Transport Enhancement in Acoustically Excited Cavity Flows, Part I: Non-Reactive Flow Diagnostics", *AIAA Journal*, Vol. 36, No. 9, pp. 1562-1567, 1998.
32. Cadou, C., Smith, O. I., and **Karagozian, A. R.\***, "Transport Enhancement in Acoustically Excited Cavity Flows, Part II: Reactive Flow Diagnostics", *AIAA Journal*, Vol. 36, No. 9, pp. 1568-1574, 1998.
33. Strickland, J. H., Selerland, T., and **Karagozian, A. R.\***, "Numerical Simulations of a Lobed Fuel Injector", *The Physics of Fluids*, Vol. 10, No. 11, pp. 2950-2964, 1998.
34. Mitchell, M. G., Smith, L. L., **Karagozian, A. R.\***, and Smith, O. I., "Burner Emissions Associated with Lobed and Non-Lobed Fuel Injectors", *Proceedings of the Combustion Institute*, Vol. 27, pp. 1825-1831, 1998.
35. Hwang, P., Fedkiw, R. P., Merriman, B., Aslam, T. D., **Karagozian, A. R.\***, and Osher, S. J., "Numerical Resolution of Pulsating Detonation Waves", *Combustion Theory and Modelling*, Vol. 4, No. 3, pp. 217-240, September, 2000.
36. Cortelezzi, L. and **Karagozian, A. R.\***, "On the Formation of the Counter-Rotating Vortex Pair in Transverse Jets", *Journal of Fluid Mechanics*, Vol. 446, pp. 347-373, November, 2001.
37. M'Closkey, R. T., King, J. M., Cortelezzi, L., and **Karagozian, A. R.\***, "The actively controlled jet in crossflow", *Journal of Fluid Mechanics*, Vol. 452, pp. 325-335, February, 2002.
38. Lee, I., Smith, O. I., and **Karagozian, A. R.\***, "Hydrogen-Helium Leak Rates from Micromachined Orifices", *AIAA Journal*, Vol. 41, No. 3, pp. 457-464, March, 2003.
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78. Edoh, A.\*, **Karagozian, A. R.**, Sankaran, V., and Merkle, C., “[Comparison of Artificial Dissipation and Filtering Schemes for Time-Accurate Simulations](#)”, Paper AIAA-2015-0284, 53rd AIAA Aerospace Sciences Meeting/Science and Technology Forum and Exposition, Kissimmee, Florida, January, 2015.
79. Edoh, A.\*, Mundis, N. L., **Karagozian, A. R.**, and Sankaran, V., “[The Role of Dispersion and Dissipation on Stabilization Strategies for Time-Accurate Simulations](#)”, Paper AIAA-2016-0071, 54th AIAA Aerospace Sciences Meeting/Science and Technology Forum and Exposition, San Diego, CA, January, 2016.
80. Edoh, A.\*, Mundis, N. L., **Karagozian, A. R.**, and Sankaran, V., “[Efficient Filtering Formulations for Large-Eddy Simulation](#)”, Paper AIAA-2016-3794, 46th AIAA Fluid Dynamics Conference, AIAA Aviation and Aeronautics Forum and Exposition, June 2016.
81. Bennewitz, J.\*, Plascencia, M., Vargas, A., Valentini, D., Smith, O. I., and **Karagozian, A. R.**, “Periodic Partial Extinction in Acoustically Coupled Fuel Droplet Combustion”, 24th International Congress of Theoretical and Applied Mechanics, Montreal, Canada, August, 2016.
82. Shoji, T.\*, Besnard, A., Harris, E., M’Closkey, R. T., and **Karagozian, A. R.**, “Effects of external forcing on transverse jet structure and mixing”, 24th International Congress of Theoretical and Applied Mechanics, Montreal, Canada, August, 2016.
83. Edoh, A.\* and **Karagozian, A. R.**, “A Stabilized Scale-Similarity Model Formulation for Large-Eddy Simulations”, Paper AIAA-2017-1227, 55th AIAA Aerospace Sciences Meeting/Science and Technology Forum and Exposition, Grapevine, Texas, January, 2017.
84. Sim, H. S.\*, Plascencia, M., Vargas, A., Bennewitz, J., Smith, O. I., and **Karagozian, A. R.**, “Effects of Aluminum Nanoparticle Additives on Liquid Fuel Droplet Combustion with and without Acoustic Excitation”, Paper 3C09, 10th U.S. National Combustion Meeting, Univ. of Maryland, April, 2017.
85. Edoh, A.\* and **Karagozian, A. R.**, “[Inspecting Interactions of Discretization, Filter Formulation, and Stabilization in LES: Lessons from the Taylor-Green Vortex](#)”, Paper AIAA 2017-3952, 23rd AIAA Computational Fluid Dynamics Conference, AIAA AVIATION Forum, Denver, CO, June, 2017.
86. Besnard, A.\*, Shoji, T., Schein, S., Harris, E. W., and **Karagozian, A. R.**, “[Exploration of Asymmetric Forcing on Mixing and Structural Characteristics for Transverse Jets](#)”, AIAA 2019-032, 57th AIAA Aerospace Sciences Meeting/Science and Technology Forum and Exposition, January 2019.
87. Badillo-Rios, S.\* and **Karagozian, A. R.**, “Effect of turbulence on chemistry in single element shear coaxial rocket injector”, Paper 1C01, 11th U.S. National Combustion Meeting, Pasadena, California, March, 2019.
88. Vargas, A.\*, Sim, H. S., Plascencia, M., and **Karagozian, A. R.**, “Effect of aluminum nanoparticle additives on sooting hydrocarbon fuel droplet combustion”, Paper 3G04, 11th U.S. National Combustion Meeting, Pasadena, California, March, 2019.

## MAJOR AIR FORCE BRIEFINGS

- A. **Karagozian, A. R., “Persistence at Near Space Altitudes”**, briefing based on findings and recommendations of the Air Force Scientific Advisory Board study on the subject chaired by Prof. Karagozian; presented during **2005-2007** to:
1. Vice Chief of Staff Gen. John Corley and the Air Force Scientific Advisory Board, June 30, 2005
  2. Chief of Staff of the U.S. Air Force, General John Jumper and the Acting Secretary of the Air Force, Michael Dominguez, July 6, 2005
  3. Deputy Asst. Under Sec. of Defense Dr. Charles Perkins, Mr. Charles Riechers and Dr. Hriar Cabayan, Office of the Secretary of Defense, July 6, 2005
  4. Naval Research Advisory Committee, July 7, 2005
  5. Army Science Board, July 18, 2005
  6. Gen. Lance Lord, Commander of the AF Space Command, August 8, 2005
  7. Mrs. Natalie Crawford, Vice President of RAND Corp. and RAND staff, August 22, 2005
  8. Dr. William Ballhaus, President and CEO of Aerospace Corp. and staff, August 23, 2005
  9. Dr. Pedro (Pete) Rustan, Director of advanced systems and technology, National Reconnaissance Office, October 5, 2005
  10. BGen Ellen Pawlikowski, Director, Military Satellite Communications Joint Program Office, Space and Missile Systems Center, LA Air Force Base, November 9, 2005
  11. Dr. Gary Graham and DARPA staff members in Special Projects Office and Tactical Technology Office, January 27, 2006
  12. Air Force Air Combat Command Maxflyer Concept Assessment Team, April 20, 2007
  13. Staff, AF Air Combat Command, Langley AFB, July 30, 2007
- B. **Karagozian, A. R., “Technology Options for Improved Air Vehicle Fuel Efficiency”**, briefing based on findings and recommendations of the Air Force Scientific Advisory Board study on the subject chaired by Prof. Karagozian; presented during **2006-2007** to:
1. Dr. Ron Sega, Under Secretary of the Air Force, and staff, January 26, 2006
  2. Dr. Andre van Tilborg, Acting Deputy Undersecretary of Defense for Science and Technology, and staff, March 9, 2006
  3. Lt. Gen. Donald Hoffman, SAF/AQ, and Air Force Scientific Advisory Board, April 10, 2006
  4. Dr. Michael McGrath, Dep. Asst. Sec. of the Navy, Chris DiPetto, Dep. Director of SE DT&E, Office of the Sec. of Defense, and other staff, April 26, 2006
  5. Mr. Terry Jagers, Dep. Asst. Secretary of the Air Force for Science, Technology and Engr., May 9, 2006
  6. National Academies’ Air Force Studies Board panel on fuel efficiency for large transport aircraft, May 23, 2006.
  7. JASONS Fuel Efficiency study, June 28, 2006.
  8. Gen. John Corley, Vice Chief of Staff, US Air Force; Lt. Gen. Christopher Kelly, AF Air Mobility Command, Lt. Gen. Michael Hamel, AF Space & Missile Systems Command, Lt. Gen. Frank Klotz, AF Space Command, and the AF Scientific Advisory Board, June 30, 2006.
  9. Defense Studies Board Task Force on DOD Energy Strategy, July 18, 2006.
  10. Mr. Michael Wynne, Secretary of the Air Force, and staff, August 2, 2006.
  11. Dr. Lisa Porter, NASA Assoc. Administrator for Aeronautics, and staff, August 2, 2006.
  12. Gen. Duncan McNabb, Commander, AF Air Mobility Command, Scott AFB, May, 2007
  13. Staff, AF Air Combat Command, July 30, 2007
- C. **Karagozian, A. R., “The Future of Launch Vehicle Systems for the U.S. Air Force”**, briefing based on findings and recommendations of the Air Force Scientific Advisory Board study on the subject chaired by Prof. Karagozian; presented during **2010-2013** to:

1. Lt.Gen. Mark Shackelford, SAF/AQ, Lt. Gen. Thomas Sheridan, AF/SMC commander, and the Air Force Scientific Advisory Board, June 24, 2010
2. Vice Chief of Staff Gen. C. H. Chandler, Deputy Under Secretary Gary Payton, BGen Ed Bolton and staff, AF Pentagon, July 7, 2010
3. Gen. Robert Kehler, Commander, AF Space Command and staff, August 23, 2010
4. NASA Associate Administrator Chris Scolese and staff, NASA HQ, August 26, 2010
5. Secretary of the Air Force, Michael Donley, Chief of Staff of the AF, Gen. Norton Schwartz, SAF/US(D) Richard McKinney, and staff, AF Pentagon, August 27, 2010
6. MGen Ellen Pawlikowski, Commander, Air Force Research Lab, Wright-Patterson AFB, Sept 1, 2010
7. Director of National Reconnaissance Office, Gen (r) Bruce Carlson, Sept 14, 2010
8. NASA launch and propulsion leads, NASA HQ, October 6, 2010
9. LtGen Larry James, Commander, 14<sup>th</sup> AF, Vandenberg AFB, December 1, 2010
10. Propulsion Directorate, Air Force Research Lab, Edwards AFB, February 1, 2011
11. DOD/NASA IHRPT Steering Committee, March 16, 2011
12. National Academies' Space Studies Board Executive Committee, August 18, 2011
13. National Academies' Aeronautics and Space Engineering Board, October 18, 2011
14. Air Force Space Command Independent Strategic Assessment Group (SC-ISAG) Launch Strategy Review, August 1, 2013

## INTERVIEWS IN THE NEWS MEDIA AND OTHER TESTIMONY

**July, 2000:** Television interviews on the Air France Concorde accident (local channels KTLA and UPN)

**June, 2004:** BBC interview on SpaceShipOne and the Ansari X-prize (<http://news.bbc.co.uk/1/hi/sci/tech/3746313.stm>); picked up by other news agencies

**October, 2004:** Wisconsin Public Radio's "Here on Earth" interview on the Ansari X-Prize with Jean Fereca

**July and Aug., 2005:** Radio interviews on Space Shuttle with Metro networks

**January, 2006:** Interview on AF SAB Study on "Persistence at Near Space Altitudes", *Defense Daily* (<http://aimpoints.hq.af.mil/display.cfm?id=9427&printer=no>)

**March, 2006:** Interview on AF SAB Study on Improved Air Vehicle Fuel Efficiency, *Inside the Air Force*, Vol. 17, No. 12, March 24, 2006.

**September, 2006:** Testimony to Calif. Assembly Select Committee on Aerospace, "UCLA's Contributions to California's Aerospace Workforce for the 21<sup>st</sup> Century, Sept. 13, 2006

**June, 2008:** Trends in the Aerospace Engineering Job Market, *Los Angeles Times*, June 29, 2008.

**June, 2009:** "The Future of Aircraft Turbine Engine Technology", *Engine Air Magazine*, Summer, 2009 issue

**January, 2012:** "Military Goes Green", KCET SoCal Connected public television.

**August, 2012:** "X-51 Hypersonic Waverider failure", KPCC-89.3 FM, Aug. 16, 2012

**January, 2013:** "[Alternative Fuels for Friendlier Skies](#)", *EETimes*, Drive for Innovation, Chapter 228, posted January, 2013

**November, 2014:** "[Virgin Galactic and Antares crashes: What now for commercial space efforts?](#)", *Christian Science Monitor*, posted November 1, 2014. "[Spaceflight's no good, very bad week](#)", *The Verge*, posted November 4, 2014. Happenings Q&A: space launch failures and systems, **WLIP AM 1050 Radio**, November 13, 2014.

**April, 2016:** "[The final frontier: cheap space travel](#)", *Los Angeles Times*

**July, 2017:** "[A new generation of giant rockets is about to blast off](#)", *Los Angeles Times*

**February, 2019:** "[SpaceX test-fire of Mars spaceship's flight engine is milestone for its engine development](#)", *Los Angeles Times*

Ann Karagozian. The dynamics of oscillatory flames is relevant to acoustically coupled combustion instabilities arising in many practical engineering systems. This paper reviews fundamental studies that pertain to the combustion of single liquid fuel droplets in an acoustically resonant environment. Semantic Scholar profile for Ann R. Karagozian, with fewer than 50 highly influential citations. Among the important physical phenomena associated with the jet in crossflow is the formation and evolution of vortical structures in the flow field, in particular the counter-rotating vortex pair (CVP)