Edward P. DeMauro

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Assistant Professor
Rutgers University
Department of Mechanical and Aerospace Engineering

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EDUCATION

Rensselaer Polytechnic Institute — Troy, NY
Ph.D. in Mechanical Engineering — August 2008 – December 2012
Dissertation: Active flow control of cantilevered cylinders of low-aspect ratio
Advisor: Professor Michael Amitay
GPA: 3.92/4.0

SUNY University at Buffalo — Buffalo, NY
M.S. in Aerospace Engineering — August 2006 – September 2008
Thesis: Design and testing of a rechargeable, pressure-compensated, lithium-ion battery module for underwater use
Advisor: Professor Joseph C. Mollendorf
GPA: 3.56/4.0

SUNY University at Buffalo — Buffalo, NY
B.S. in Aerospace and Mechanical Engineering — August 2002 – September 2006
GPA: 3.56/4.0

RESEARCH EXPERIENCE

1. **Assistant Professor**, Rutgers University, January 2017 – Present: Experimental aerodynamics with a focus on three-dimensional flow physics and active control.
2. **Postdoctoral Research**, Sandia National Labs, January 2015 – December 2016: Designed and conducted experiments for purposes of studying transonic and supersonic flows under Steven J. Beresh and Justin L. Wagner. Experience using tools such as time-resolved PIV with a pulse-burst laser, Schlieren, and stereoscopic PIV.
3. **Postdoctoral Research**, Rensselaer Polytechnic Institute, March – June 2013: Designed wind tunnel models and conducted wind tunnel research on control of Tollmein-Schlichting waves using Electroactive polymers under Michael Amitay. Supervised graduate student projects.
4. **Ph.D. Research**, Rensselaer Polytechnic Institute, August 2008 – December 2012: Gained detailed experience designing and conducting wind tunnel tests in order to understand complex flow phenomena along with theoretical analysis in hydrodynamic stability theory under Michael Amitay. Experienced using a variety of advanced measurement techniques including stereoscopic particle image velocimetry, constant-temperature hot-wire anemometry, surface pressure, temperature, and flow

measurements.

5. **M.S. Research**, SUNY University at Buffalo, August 2006 – July 2008: Explored the safety limits of power supply for active heating/cooling wetsuit for ONR. Used one-dimensional lumped-capacitance model to predict unsteady temperature growth in lithium-ion battery compartment under Joseph C. Mollendorf.

PUBLICATIONS

1. Wagner, J.L., Kearney, S.P., Beresh, S.J., **DeMauro, E.P.**, and Pruett, B.O., "Flash X-Ray measurements on the shock-induced dispersal of a dense particle curtain," ***Experiments in Fluids***, Vol. 56, No. 213, 2015, pp. 1-12.
2. **DeMauro, E.P.**, Dell'Orso, H., Zaremski, S., Leong, C.M., and Amitay, M., "Control of a laminar separation bubble on a NACA 0009 airfoil using electro-active polymers," ***AIAA Journal***, Vol. 53, No. 8, 2015, pp. 2270-2279.
3. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Interaction of a synthetic jet with the flow over a low aspect ratio cylinder," ***Physics of Fluids***, Vol. 25, No. 6, 2013, pp. 1-18.
4. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Modification of the near wake behind a finite-span cylinder by a single synthetic jet," ***Experiments in Fluids***, Vol. 53, No. 6, 2012, pp. 1963-1978.
5. Menicovich, D., Vollen, J., Amitay, M., Letchford, C., **DeMauro, E.P.**, Rao, A., and Dyson, A., "A new approach to the aerodynamic performance of tall buildings," ***CTBUH Journal***, http://www.ctbuh.org, 2012.
6. Pendergast, D.R., **DeMauro, E.P.**, Fletcher, M., Stimson, E., and Mollendorf, J.C., "A rechargeable lithium-ion battery module for underwater use," ***Journal of Power Sources***, Vol. 196, No. 2, 2011, pp. 793-800.

BOOK CHAPTER

1. Wagner, J.L., Beresh, S.J., **DeMauro, E.P**., Pruett, B.O., and Farias, P.A., "Towards particle image velocimetry measurements during shock-particle curtain interactions," ***Proceedings of the 30th International Symposium on Shock Waves***, 1st ed., Springer, New York, 2015.
2. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Stability and control of a low aspect ratio cantilevered circular cylinder," ***Instability and control of massively separated flows***, 1st ed., Vol. 107, Springer, New York, 2015, pp. 151-156.

CONFERENCE PAPERS

1. **DeMauro, E.P.**, Casper, K.M., Beresh, S.J., Wagner, J.L., Henfling, J.F., and Spillers, R.W., "Study of the flow within finite-span complex cavities using particle image velocimetry and pressure sensitive paint," ***AIAA Paper No. 2017-1474***, Jan. 2017.
2. **DeMauro, E.P.**, Wagner, J.L., DeChant, L.J., Beresh, S.J., Farias, P.A., Turpin, A.M., Sealy, W., Albert, S.W., and Sanderson, P.D., "Measurements of the initial transient of a dense particle curtain following shock wave impingement," ***AIAA Paper No. 2017-1466***, Jan. 2017.
3. Wagner, J.L., Beresh, S.J., Casper, K.M., **DeMauro, E.P.**, and Arunajatesan, S.,

"Resonance dynamics in compressible cavity flows using time-resolved particle image velocimetry and pressure sensitive paint," ***AIAA Paper No. 2017-0475***, Jan. 2017.

4. Chen, Y., **DeMauro, E.P.**, Wagner, J.L., Arienti, M., Guildenbecher, D.R., Farias, P.A., Grasser, T.W., Sanderson, P.D., Albert, S.W., Turpin, A.M., Sealy, W., and Ketchum, R.S., "Aerodynamic breakup and secondary drop formation for a liquid metal column in a shock-induced cross-flow," ***AIAA Paper No. 2017-1892***, Jan. 2017.
5. **DeMauro, E.P.**, Beresh, S.J., Wagner, J.L., Henfling, J.F., and Spillers, R.W., "Three-dimensional measurement of edge effects in open cavities of finite-span," ***AIAA Paper No. 2016-3314***, June 2016.
6. Beresh, S.J., Wagner, J.L., **DeMauro, E.P.**, Henfling, J.F., and Spillers, R.W., "Applications of temporal supersampling in pulse-burst PIV," ***AIAA Paper No. 2016-3400***, June 2016.
7. **DeMauro, E.P.**, Wagner, J.L., Beresh, S.J., Farias, P.A., "Measurements of gas-phase velocity during shock-particle interactions using pulse-burst PIV," ***AIAA Paper No. 2016-0793***, Jan. 2016.
8. **DeMauro, E.P.**, Beresh, S.J., Wagner, J.L., Henfling, J.F., and Spillers, R.W., "Volumetric measurement of transonic cavity flow using stereoscopic particle image velocimetry," ***AIAA Paper No. 2016-2076***, Jan. 2016.
9. Wagner, J.L., Beresh, S.J., Casper, K.M., **DeMauro, E.P.**, Arunajatesan, S., Henfling, J.F., and Spillers, R.W., "Relationship between transonic cavity tones and flowfield dynamics using pulse-burst PIV," ***AIAA Paper No. 2016-1345***, Jan. 2016.
10. Wagner, J.L., Beresh, S.J., **DeMauro, E.P.**, Casper, K.M., Guildenbecher, D.R., Pruett, B.O., and Farias, P.A., "Pulse-burst PIV measurements of transient phenomena in a shock tube," ***AIAA Paper No. 2016-0791***, Jan. 2016.
11. Beresh, S.J., Wagner, J.L., **DeMauro, E.P.**, Henfling, J.F., and Spillers, R.W., "Resonance characteristics of transonic flow over a rectangular cavity using pulse-burst PIV," ***AIAA Paper No. 2016-1344***, Jan. 2016.
12. Guildenbecher, D.R., Wagner, J.L., Olles, J.D., **DeMauro, E.P.**, Farias, P.A., Grasser, T.W., and Sojka, P.E., "kHz rate digital in-line holography applied to quantify secondary droplets from aerodynamic breakup of a liquid column in a shock tube," ***AIAA Paper No. 2016-1044***, Jan. 2016.
13. **DeMauro, E.P.**, Dell'Orso, H., Sivaneri, V., Tuna, B.A., and Amitay, M., "Measurements of 3-D stall cells on 2-D airfoil," ***AIAA Paper No. 2015-2633***, June 2015.
14. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Interaction of a single synthetic jet with a finite aspect ratio circular cylinder," ***AIAA Paper No. 2012-3043***, June 2012.

PRESENTATIONS

1. Wagner, J.L., Beresh, S.J., **DeMauro, E.P.**, Pruett, B.O., and Farias, P.A., "Measurements of transient phenomena in a shock tube using pulse-burst PIV," Presented at ***APS Division of Fluid Dynamics Conference***, 22-24 November 2015.
2. Olles, J., Guildenbecher, D.R., Wagner, J.L., **DeMauro, E.P.**, Farias, P.A., Grasser, T.W., and Sojka, P., "Experimental investigation of the breakup of a round liquid jet in a shock-induced crossflow," Presented at ***APS Division of Fluid Dynamics Conference***, 22-24 November 2015.

3. Wagner, J.L., Beresh, S.J., **DeMauro, E.P.**, Pruett, B.O., and Farias, P.A., "Towards particle image velocimetry measurements during shock-particle curtain interactions," Presented at ***30th International Symposium on Shock Waves***, 19-24 July 2015.
4. Sivaneri, V., Tuna, B., **DeMauro, E.P.**, and Amitay, M., "Formation of three-dimensional stall cells on two-dimensional airfoils," Presented at ***APS Division of Fluid Dynamics Conference***, 23-25 November 2014.
5. Dell'Orso, H., Tuna, B., **DeMauro, E.P.**, and Amitay, M., "Control of Tollmien-Schlichting waves on a flat plate using piezoelectric-driven oscillating surface," Presented at ***APS Division of Fluid Dynamics Conference***, 23-25 November 2014.
6. Bogardus, T., **DeMauro, E.P.**, and Amitay, M., "Quantification of a new type of oscillating surface-mounted element for flow control applications," Presented at ***AIAA Region I Student Conference***, 25-26 April 2014.
7. Menicovich, D., Vollen, J., Amitay, M., Letchford, C., **DeMauro, E.P.**, and Dyson, A., "Enhancing wind energy generation in tall buildings using fluid based aerodynamic modification," Presented at ***International Sustainable Built Environment Conference***, 28-30 January 2014.
8. Dell'Orso, H., Chang, L., Zaremski, S., **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Control of a separation bubble at low Reynolds numbers using electro-active polymers," Presented at ***APS Division of Fluid Dynamics Conference***, 24-26 November 2013.
9. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Stability and control on a low aspect ratio cantilevered circular cylinder," Presented at ***International Conference on Instability and Control of Massively Separated Flows – ICOMASEF***, 5-6 September 2013.
10. **DeMauro, E.P.**, Leong, C.M., and Amitay, M., "Active flow control of a circular cylinder of a low aspect ratio," Presented at ***APS Division of Fluid Dynamics Conference***, 20-22 November 2011.
11. **DeMauro, E.P.** and Amitay, M., "Active flow control of low aspect ratio cylinders," Presented at ***1000 Islands Fluid Mechanics Meeting***, 15-17 April 2011.

TEACHING AND ADVISING

Rutgers University, *Piscataway, NJ*
Lesson planning, holding regular office hours

1. **Instructor** in MAE 14:650:471 Aircraft Flight Dynamics (1 section) — Spring 2017

Rensselaer Polytechnic Institute, *Troy, NY*
Lesson planning, holding regular office hours

1. **Lecturer** in MANE-4090 Flight Mechanics (1 section) — Fall 2014
2. **Lecturer** in MANE-4020 Thermal and Fluids Engineering II (3 sections) — Fall 2013, Spring 2014
3. **Lecturer** in MANE-4010 Thermal and Fluids Engineering Lab (10 sections) — Fall 2013, Spring 2014, Fall 2014
4. **Undergraduate Advisor** in Aeronautical Engineering — Fall 2014

***Rensselaer Polytechnic Institute**, Troy, NY*

1. **Teacher's Assistant** in MANE-4090 Flight Mechanics (1 section) — Fall 2012
2. **Teacher's Assistant** in MANE-2060 Fundamentals of Flight (1 section) — Spring 2012
3. **NSF GK-12 Fellow** at Albany High School (Albany, NY) and Mohanasen High School (Rotterdam, NY) — Fall 2008, Spring 2009, Fall 2009, Spring 2010

***SUNY University at Buffalo**, Buffalo, NY*

1. **Teacher's Assistant** in MAE-336 Heat Transfer (1 section) — Spring 2007
2. **Teacher's Assistant** in MAE-451 Design and Optimization (1 section) — Fall 2006

CORE COMPETENCIES

1. Proficiency in Italian and Spanish
2. Expertise in Matlab, LabVIEW, Tecplot, NX, Solidworks
3. Expertise in stereoscopic particle image velocimetry (*SPIV*), time-resolved particle image velocimetry (*TR-PIV*), hot-wire anemometry, shadowgraph and Schlieren imaging, linear hydrodynamic stability theory, pressure/temperature measurement, wind tunnel testing (low-speed subsonic and transonic), shock tube testing

HONORS

1. **Office of Minority Student Affairs Academic Achievement (OMSA) Award**, *Rensselaer Polytechnic Institute* — 2009
2. **NSF GK-12 Fellowship**, *Rensselaer Polytechnic Institute* — 2008
3. **Tau Beta Pi Engineering Honor Society**, *SUNY University at Buffalo* — 2006
4. **Sigma Gamma Tau Aerospace Engineering Honor Society**, *SUNY University at Buffalo* — 2004
5. **Phi Eta Sigma National Honor Society**, *SUNY University at Buffalo* — 2003

ACADEMIC/PROFESSIONAL ACTIVITIES

1. American Institute of Aeronautics and Astronautics (*AIAA*), Member and Reviewer
2. Journal of Fluid Mechanics (*JFM*), Reviewer