

## DEVESH RANJAN

### ASSOCIATE PROFESSOR

#### J. ERSKINE LOVE JR. FACULTY FELLOW

#### GEORGE W. WOODRUFF SCHOOL OF MECHANICAL ENGINEERING

#### DANIEL GUGGENHEIM SCHOOL OF AEROSPACE ENGINEERING, GEORGIA INSTITUTE OF TECHNOLOGY

Tel: 979-676-3200, email: [devesh.ranjan@me.gatech.edu](mailto:devesh.ranjan@me.gatech.edu), Website: <http://staml.gatech.edu/>

### I. EARNED DEGREES

University of Wisconsin-Madison	Mechanical Engineering	Ph.D., 2007
University of Wisconsin-Madison	Mechanical Engineering	M.S., 2005
National Institute of Technology-Trichy	Mechanical Engineering	B. E., 2003

### II. EMPLOYMENT HISTORY

J. Erskine Love Jr. Faculty Fellow	Georgia Institute of Technology, GA	1/1/2016-Present
Associate Professor	Georgia Institute of Technology, GA	7/1/2014-Present
Morris E. Foster Faculty Fellow	Texas A&M University, TX	9/1/2013 – 6/30/2014
Assistant Professor	Texas A&M University, TX	1/7/2009 – 6/30/2014
Director's Research Fellow	Los Alamos National Laboratory, NM	08/2008 - 1/6/2009
Postdoctoral Research Associate	Los Alamos National Laboratory, NM	01/2008 - 07/2008
Instructor	University of Wisconsin-Madison, WI	06/2007 -08/2007
Graduate Research Assistant	University of Wisconsin-Madison, WI	06/2003 -12/2007
Research Fellow	JNCASR-Bangalore, India	01/2003 - 04/2003
Summer Intern	JNCASR-Bangalore, India	06/2002 - 08/2002
Summer Intern	National Chem. Lab. Pune, India	05/2001 - 06/2001

### III. HONORS AND AWARDS

#### A. International or National Awards

- Invited participant to National Academy of Engineering's **2016 US Frontiers of Engineering Symposium**
- **Department of Energy-Early Career Award, 2016**
- US Air Force Office of Scientific Research (**AFOSR**) **Young Investigator Award, 2013**
- National Science Foundation (**NSF**) **CAREER Award, 2013**
- Alexander von Humboldt Fellowship for Postdoctoral Research, August 2007
- Director's Research Fellow, Los Alamos National Laboratory, 2008
- Article selected as cover page in Journal of Fluid Mechanics-Vol. 594
- Best Poster (co-authored by Dr. Om Prakash Singh), International Conference on Advances in Fluid Mechanics, Bangalore, India, July 2003.
- Best Student Contribution (co-authored by John Niederhaus), 16th American Nuclear Society Topical Meeting on the Technology of Fusion Energy, September, 2004.

#### B. Institute or School Awards

- **J. Erskine Love Jr. Faculty Fellow, 2015**
- Georgia Tech nominee to attend 2016 NAE-Frontiers in Engineering Education

- Texas A&M University Nominee for 2014 Blavatnik Awards for Young Scientists (Category-Physical Sciences and Engineering)
- Morris E. Foster Faculty Fellow in Mechanical Engineering (Awarded by College of Engineering), 2013
- 2013 Texas A&M ASME Professor Mentorship Award
- Caterpillar Teaching Excellence Award 2012-2013 (Awarded by College of Engineering)
- TEES Select Young Faculty Award, 2012-2013
- Departmental Nominee for the 2012-2013 Montague Center for Teaching Excellence Scholar Award (University Level Award)
- Morris E. Foster Faculty Fellowship, Department of Mechanical Engineering, TAMU, 2010
- TAMU Student Led Award for Teaching Excellence (SLATE), 2009
- Rajiv Gandhi Research Scholar for year 2002 (Awarded to top 3 summer interns under JNCASR summer research program by Dept. of Science and Technology).
- Summer Research Fellowship by JNCASR (2002 and 2003).

#### IV. RESEARCH, SCHOLARSHIP, AND CREATIVE ACTIVITIES

##### Selected Recent Journal Publications:

1. Akula, B., P. Suchandra, M. Mikhaeil, and **Ranjan, D.**, "Dynamics of unstably stratified free shear flows: an experimental investigation of coupled Kelvin–Helmholtz and Rayleigh–Taylor instability", *Journal of Fluid Mechanics*, Vol. 816, pp. 619-660 (2017)
2. **Ranjan, D.**, Oakley, J., and Bonazza, R., "Shock-Bubble Interactions," *Annual Rev. Fluid Mech.*, 43, pp117-140 (2011) [**Review article on Shock-accelerated inhomogeneous flows**]
3. Akula, B., and **Ranjan, D.**, "Dynamics of buoyancy driven flows at moderately high Atwood numbers", *Journal of Fluid Mechanics*, Vol. 795, pp. 313-355 (2016)
4. Sekhran, A., Morrison, G., and **Ranjan, D.**, "An enquiry of the friction factor 'jump' phenomenon in hole-pattern seals," *Journal of Fluids Engineering*, vol. 138, Issue 8, pp. 081102 (2016)
5. McFarland, J. A., Reilly, D., Black, W., Greenough, J. A., and **Ranjan, D.**, "Modal interactions between a large-wavelength inclined interface and small wave-length multimode perturbations in a Richtmyer-Meshkov Instability," *Physical Review E*, Vol. 92, 013023 (2015)
6. Reilly, D., McFarland, J. A., Mohaghar, M., and **Ranjan, D.**, "The effect of initial conditions and circulation deposition on the inclined-interface reshocked Richtmyer-Meshkov instability," *Experiments in Fluids*, 56 (8), 1-16, (2015)
7. McFarland, J. A., Greenough, J. A., and **Ranjan, D.**, "Simulations and Analysis of the Reshocked Inclined Interface Richtmyer-Meshkov Instability for Linear and Non-linear Interface Perturbations," *Journal of Fluids Engineering*, Vol. 136 (7), 071203, 2014
8. McFarland, J. A., Reilly, D., Creel, S., McDonald, C., Finn, T., and **Ranjan, D.**, "Experimental Investigation of Inclined Interface Richtmyer-Meshkov Instability Before and After Reshock," *Experiments in Fluids*, Vol. 55, Issue 1, pp 1640 (2014)

9. Akula, B., Andrews, M. J., and **Ranjan, D.**, "Effect of shear on Rayleigh-Taylor mixing at low Atwood number", *Physical Review E*, Vol. 87, 033013 (2013)
10. McFarland, J. A., Greenough, J. A., and **Ranjan, D.**, "Computational parametric study of a Richtmyer-Meshkov instability for an inclined interface," *Physical Review E*, Vol. 84, 026303 (2011)

### Refereed Book Chapters

- **Thanapal, S., Eseltine, D., Annamalai, K., and Ranjan, D.**, "Biomass Fuel Quality Enhancement and Respiratory Quotient (RQ) for Ranking Fossil and Biomass Fuels Based on CO<sub>2</sub> Emissions," *Novel Combustion Concepts for Sustainable Energy Development*, Springer India, 2014 pp 45-73
- Ranjan, D., Niederhaus, J.H.J., Oakley, J.G., Anderson, M.H., and Bonazza, R., "Experimental investigation of shock-induced distortion of a light spherical gas inhomogeneity," *Shock Waves, Part XV111- Richtmyer-Meshkov*, Springer Berlin Heidelberg, 2009. (DOI - 10.1007/978-3-540-85181-3\_61)
- Niederhaus, J.H.J., Ranjan, D., Oakley, J.G., Anderson, M.H., ., Greenough, J. A., and Bonazza, R., "Computations in 3D for shock-induced distortion of a light spherical gas inhomogeneity," *Shock Waves Part XV111- Richtmyer-Meshkov*, Springer Berlin Heidelberg, 2009. (DOI - 10.1007/978-3-540-85181-3\_60)

### Edited Volumes

Bonazza, R. and Ranjan D., "29<sup>th</sup> International Symposium on Shock Waves Vol. I and II" Springer International Publishing Switzerland, (2015) [DOI: Vol I- 10.1007/978-3-319-16835-7 and Vol II-- 10.1007/978-3-319-16838-78]

### V. SYNERGISTIC ACTIVITIES

- Editorial Board, Shock Wave Journal (Springer)-2016-Present
- Plenary Speaker at 14th International Workshop on Physics of Compressible Turbulent Mixing (IWPCTM) Meeting at San Francisco, 2014, titled "Progress with Experiments on Understanding the Rayleigh-Taylor and Richtmyer-Meshkov Driven Flows for Complex Environments"
- Invited Talk "Fluid Instabilities and Mixing in Variable Density Flows at Extreme Conditions," at Fluids Days 2013, IISc Bangalore, India, July 19th 2013. (Special Conference in honor of 80th birthday of Prof. Roddam Narasimha)
- Invited Panelist – Workshop: "Research Needs for Material Mixing at Extremes" at LANL, 2011
- Invited Panelist – Workshop: "Thermal Energy Storage Workshop" organized by DOE ARPA-E, 2011
- Invited Panelist – Workshop: "Supercritical CO<sub>2</sub> Power Cycle" organized by DOE Sun Shot, 2014
- Conference Co-Organizer of 29th International Shock Wave Symposium (ISSW) held at Madison, Wisconsin from July 14th –July 19, 2013