

# Sourabh V. Apte

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## (a) Professional Preparation

University of Pune, India, Mechanical Engineering, B.E. July 1994  
Indian Institute of Science, Bangalore, India, Mechanical Engineering, M.E., January 1996  
Pennsylvania State University, Mechanical and Nuclear Engineering, Ph.D., December 2000  
Stanford University, Multiphase Turbulent Flow Simulations, Research Associate, 2000-2005

## (b) Appointments

Assistant Professor, Oregon State University, (October 2005-present)  
Air Force Summer Faculty Fellowship (Wright-Patterson, AFB) (July-August 2010)  
Editorial Board, International Journal of Rotating Machinery (2010-present)  
ORISE Faculty Research Participant, DoE's NETL, Albany, OR (November 2006-present)  
Engineering Research Associate, Stanford University (2000-2005)  
Graduate Research Assistant, Pennsylvania State University (1996-2000)  
Researcher at Tata Research Development and Design Center, Pune, India (1996)  
Research Assistant, Indian Institute of Science, Bangalore, India (1994-1996)

## (c) Publications

### (i) Five Related Publications

1. **Apte S.V.**, Martin, M. and Patankar N.A., "A Numerical Method for Fully Resolved Simulation (FRS) of Rigid Particle-Flow Interactions in Complex Flows," *Journal of Computational Physics*, Vol. 228 (8), pp. 2712-2738, 2009.
2. **Apte S.V.**, and Patankar N.A., "A Formulation for Fully Resolved Simulation (FRS) of Particle-Turbulence Interactions in Two-Phase Flows," *International Journal of Numerical Analysis and Modeling*, Vol. 5, Supp., pp. 1-16, 2008.
3. Moin, P., and **Apte S.V.**, "Large-eddy Simulation of Realistic Gas Turbine Combustors," *AIAA Journal*, Vol. 44 (4), 698-708, 2006. (Special issue on Combustion Modeling and LES: Development and Validation Needs for Gas Turbine Combustors).
4. **Apte, S.V.**, and Yang, V., "A Large-eddy Simulation Study of Transition and Flow Instability in a Porous-Walled Chamber with Mass Injection," *Journal of Fluid Mechanics*, Vol. 477, pp. 215-225, 2003.
5. **Apte, S.V.**, Mahesh, K., Moin, P., and Oefelein, J.C., "Large-eddy Simulation of Swirling Particle-Laden Flows in a Coaxial-Jet Combustor," *International Journal of Multiphase Flow*, Vol. 29 (8), pp. 1311-1331, 2003.

### (ii) Five Other Publications

1. **Apte, S.V.**, Mahesh, K., and Moin, P. "Large-eddy Simulation of Evaporating Spray in a Coaxial Combustor," *Proceedings of Combustion Institute*, Vol. 32 (2), 2009, pp. 2247-2256, 2009.
2. **Apte, S.V.**, Mahesh, K., Gorokhovski, M., and Moin, P. "Stochastic modeling of atomizing spray in a complex swirl injector using large eddy simulation," *Proceedings of Combustion Institute*, Vol. 32 (2), 2009, pp. 2257-2266, 2009.
3. **Apte S.V.**, Mahesh, K., and Lundgren, T. "Accounting for Finite-Size Effect in Disperse Two-Phase Flow," *International Journal of Multiphase Flow*, Vol. 34 (3), pp. 260-271, 2008.
4. Pozorski, J., and **Apte, S.V.**, "Filtered Particle Tracking in Isotropic Turbulence and Stochastic Modeling of Subgrid Scale Dispersion," *International Journal of Multiphase Flow*, Vol. 35 (2), pp. 118-128, 2009.
5. **Apte, S.V.**, and Yang, V., "Unsteady Flow Evolution and Combustion Dynamics of Homogeneous Solid Propellant in a Rocket Motor," *Combustion and Flame*, Vol. 131, pp. 110-131, 2002.

## Sourabh V. Apte

### (d) Synergistic Activities

- Participated in organization of 13<sup>th</sup> International Conference on Liquid Atomization and Spray Systems in Vail, Colorado (July 2009). Served as Paper's Chair which involved handling 250+ conference papers, arranging reviewers for papers.
- Participated in synergistic efforts to establish academic alliance between Oregon State University and Department of Energy's National Energy Technology Laboratory (Albany, OR) in the field of oxy-coal combustion. This has led to acquisition of a \$260K (80 node) parallel computer cluster.
- Implemented and developed a take-home experiment (based on APS-DFD Mini-Symposium (2007) on *Fluids Demonstrations and Instructional Laboratories* and presentation by John Cimbala, Pennsylvania State University) for hands-on experience with fluid flow problems in a junior-level class of 100 students on Introductory Fluid Mechanics at Oregon State University.
- Served as a mentor and thesis advisor for University Honors College thesis by Kevin Drost on CFD investigations of plunging and pitching effects on thin airfoils.
- Participated in the development of a massively parallel, multiphysics, unstructured grid solver for simulation of turbulent, multiphase, reacting flows in realistic gas-turbine configurations under the Department of Energy's Advanced Scientific Computing (ASC) program at Stanford University.
- Participated in collaboration with Pratt and Whitney, wherein the research tools developed under ASC project were transferred to industry and incorporated into their CFD-based design cycle for future generation gas-turbine combustion chambers.

### (e) Collaborators and Other Affiliations

- Collaborators: Diane Forster (University of New Hampshire); Mikhael Gorokhovski (University of Rouen, France); Roy Haggerty, James Liburdy (Oregon State); Thomas Lundgren (University of Minnesota); Parviz Moin (Stanford University); Vinod Narayanan (Oregon State); Tom Ochs, Cathy Summers (National Energy Technology Laboratory, OR); Neelesh Patankar (Northwestern); Jacek Pozorski (Polish Academy, Poland); John Schmitt, Brian Wood (Oregon State).
- Graduate Advisors and Postdoctoral Sponsors: Vigor Yang, Ph.D. advisor (Pennsylvania State University), Parviz Moin, post-doctoral advisor (Stanford University).
- Thesis Advisor (at Oregon State University):  
*Current:* Andrew Cihonski (MS expected 2010; Ph.D. expected 2011); Justin Finn (PhD expected 2011), Kevin Drost (MS 2012); Tracie Jackson (Ph.D., expected 2012)  
*Graduated:* Daniel Peterson (MS 2010), Benn Eilers (MS 2010); Kevin Drost (BS, Honors thesis, 2010); Ehsan Shams (**Ph.D.**, 2009); Justin Finn (MS, 2009); Mathieu Martin (M.S., 2009); Stephen Snider (M.S., 2008).

### (f) Honors and Awards

American Society for Engineering Education's Air Force Summer Faculty Fellowship (2010)  
Editorial Board (Associate Editor), International Journal of Rotating Machinery (2010-)  
Gift for Continuation of Spray Modeling Research (Honeywell Inc., Arizona) (2009)  
Research Equipment Reserve Award, Oregon State University (2006,2009)  
Jawaharlal Nehru Memorial Trust Outstanding Academics Award (1996)  
Open & National Merit Scholarship for Outstanding Academics (1988)

### (g) Memberships

American Physical Society (APS-DFD), Combustion Institute, Institute for Liquid Atomization and Spray Systems (ILASS).