

Resume of Dr. V.V. Ranade

Name : Vivek Vinayak Ranade
Address: Industrial Flow Modeling Group
National Chemical Laboratory
Pune 411 008, India
Tel: +91 20 25893400 Fax: +91 20 25893260
Email: yvranade@ifmg.ncl.res.in

Date of Birth: October 15, 1963

Academic Qualifications:

B. Chem. Engg.	University of Bombay	1984 (Rank 3)
Ph.D.(Tech.)	University of Bombay	1988

Professional Experience:

Since April 1990: **Scientist E II**
Industrial Flow Modeling Group
National Chemical Laboratory
Pune 411 008, India

From Oct. 1997 to Sept. 1998: Faculty of Chemical Technology
University of Twente, Post Box 217
7500 AE Enschede, The Netherlands

From May 1993 to January 1994: Faculty of Applied Physics
Delft University of Technology
Delft, The Netherlands

From Oct. 1988 to March 1990: Technische-Chemisches Laboratorium
ETH-Zentrum, 8096, Zurich
Switzerland

Awards:

- **CHEMTECH “Outstanding Contribution” Award (Chemical Engineering), 2005**
- **Fellow of Indian National Academy of Engineering, 2005**
- **S.S. Bhatnagar Award for Engineering Sciences, 2004**
- **Herdillia Award for Excellence in Basic Research in Chemical Engineering, 2004**
- **AVRA Young Scientist Award, 2003**
- **Fellow of Maharashtra Academy of Sciences, 2001**
- **DST Swarnajayanti Fellowship, 1999**
- **Young Engineer Award of Indian National Academy of Engineering, 1996**
- **Young Associate of Indian Academy of Sciences, 1994**
- **CSIR Young Scientist Award for engineering sciences, 1992**

Publications:

Book: Computational Flow Modeling for Chemical Reactor Engineering
Academic Press, 2002.

Journals: > 60

Conferences: > 70

Some Recent Publications:

- Harshe, Y. M., Utikar, R. P. and Ranade, V. V., Dynamic model for polypropylene fluidized bed reactor: PoRE, *Chem. Eng. Sci.*, **59**, 5145-5156, 2004.
- Khopkar, A.R., P. Mavros, V.V. Ranade and J. Bertrand, Simulation of Flow Generated by an Axial-Flow Impeller: Batch and Continuous Operation, *Chem. Eng. Res. Des.*, **82**, 737-751 (2004).
- Khopkar, A.R., Aubin, J., Rubio-Atoche, C., Xuereb, C., Le Sauze, N., Bertrand, J. and Ranade, V. V., Flow generated by radial flow impellers: PIV measurements and CFD simulations, *Int. J. Chem. Reactor Engineering*, 2004.
- Dakshinamurthy, D., Khopkar, A.R., Louvar, J.F. and Ranade, V.V., CFD simulations to study early shortstop of runaway reaction in stirred vessel, *J. Loss Prevention*, 2004
- Buwa V.V. and V.V. Ranade, Characterization of dynamics of gas-liquid flows in rectangular bubble columns using wall pressure and voidage fluctuations, *AIChE Journal*, December 2004
- Gunjal, P.R., V.V. Ranade and R.V. Chaudhari, Spreading/recoiling of liquid droplet after collision with flat surface: Experimental and VOF simulations, *AIChE Journal*, January 2005.
- Gunjal P. R., V. V. Ranade and R. V. Chaudhari, Computational study of single-phase flow in packed bed of spheres, accepted for publication *AIChE Journal*, February 2005.
- Buwa V. V. and Ranade, V. V., Characterization of gas-liquid flows in rectangular bubble columns using conductivity probes, *Chem. Eng. Commun.*, accepted for publication, 2005.
- Khopkar, A.R., Rammohan, A., Ranade, V.V. and Dudukovic, M.P., Gas-liquid flow generated by a Rushton turbine in a stirred vessel: CARPT/CT measurements and CFD simulations, *Chem. Eng. Sci.*, accepted for publication, 2005.

Research Interests:

Turbulent Multiphase Flows, Chemical Reactor Engineering, Industrial Flow Modeling, CFD

Research Contributions:

We develop and harness computational fluid dynamics (CFD) and other modeling tools to understand, to optimize and to develop complex industrial processes and products. We have developed hierarchy of modeling (computational/ experimental) tools to address reactor and product engineering issues and have applied these tools creatively to realize performance enhancements in reactors/ processes and products. We recognize that first-rate work on modeling of industrial flow processes can be sustained only if it is backed up by basic research in complex flows. We have initiated comprehensive research programs on turbulent multiphase flows. Through such programs, *iFMg* has developed new approaches and CFD based models to simulate fluid dynamics of variety of process equipment. We have developed multi-scale modeling capabilities from micro-scale simulations of dynamics of single drop or bubble to macro-scale simulations of industrial scale multiphase reactors. We have made significant contributions in modeling of mechanically stirred reactors, bubble column (slurry) reactors, fluidized bed reactors, trickle/ fixed bed reactors and rotary kilns. Some efforts were made or being made to develop better products using computational models (for example, spacers for membrane modules, nozzles for FCC riser reactors and so on).