CURRICULUM VITAE

Satyajit Pramanik
Doctoral Student
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Research interests:

I am an applied mathematician with strong interests both in fundamental and application oriented fluid dynamics. I am a Ph.D. student in the Department of Mathematics, Indian Institute of Technology Ropar. I received my M.Sc. degree in Mathematics from the Department of Mathematics, Indian Institute of Technology Kharagpur. My research interests include fundamental fluid dynamics, hydrodynamic instabilities, biofluids, complex fluids, multiphase flows, partial differential equations, reaction-diffusion processes, and pattern formation.

Educational Qualifications:

Doctor of Philosophy (Ph.D.)	Mathematics (Cumulative Grade Point Average: 9.21/10) (Pursuing from January 2012) Indian Institute of Technology Ropar, Rupnagar, Punjab, India
Master of Science (M.Sc.)	2011, Mathematics (Cumulative Grade Point Average: 9.16/10) Indian Institute of Technology Kharagpur
Bachelor of Science (B.Sc.)	2009, Mathematics Honours (Honours papers 86.12%) University of Kalyani

Research Experiences:

- January, 2012 - Till date: Graduate student in the Department of Mathematics, Indian Institute of Technology Ropar.
- October, 2014 - March, 2015, Visiting researcher at the Institute of Fluid Mechanics and Heat Transfer, TU Wien, Vienna, Austria.
- May, 2014 - June, 2014, Visiting researcher at Nonlinear Physical Chemistry Unit, University Libre de Bruxelles, Brussels, Belgium.
- July, 2011 - December, 2011: Junior Research Fellow of Department of Science and Technology project in the Department of Mathematics, Indian Institute of Technology Ropar.

Publications:

Journals articles

1. Hota, T. K., **Pramanik, S.**, Mishra, M. (2015), Non-modal linear stability analysis of miscible viscous fingering in porous media, *Phys. Rev. E* **92**, 053007.
2. **Pramanik, S.,** De Wit, A., Mishra, M. (2015), Viscous fingering and deformation of a miscible circular blob in a rectilinear displacement in porous media, *J. Fluid Mech.* (Rapids) **782**, R2.
3. **Pramanik, S.**, Hota, T. K., Mishra, M. (2015), Influence of viscosity contrast on buoyantly unstable miscible fluids in porous media, *J. Fluid Mech* **780**, 388-406.

4. Hota, T. K., **Pramanik, S.**, Mishra, M. (2015), Onset of fingering instability in a finite slice of adsorbed solute, *Phys. Rev. E* **92**, 023013.

5. **Pramanik, S.,** Mishra, M. (2015), Viscosity scaling of fingering instability in finite slices with Korteweg stress, *Europhys. Lett.* **109**, 64001.

6. **Pramanik, S.,** Mishra, M. (2015), Effect of Péclet number on miscible rectilinear displacement in a Hele-Shaw cell, *Phys. Rev. E* **91**, 033006.

7. **Pramanik, S.,** Mishra, M. (2015), Nonlinear simulation of miscible viscous fingering with gradient stresses, *Chem. Eng. Sci.* **122**, 523-532.

8. **Pramanik, S.,** Mishra, M. (2014), Comparison of Korteweg stresses effect on the fingering instability of higher or less viscous miscible slices: Linear stability analysis, *Chem. Eng. Sci.* **110**, 144-152.

9. **Pramanik, S.,** Mishra, M. (2013), Linear stability analysis of Korteweg stresses effect on miscible viscous fingering in porous media, *Phys. Fluids* **25**, 074104.

Conference Proceedings/Abstracts

1. Mishra, M., De Wit, A., **Pramanik, S.** (2015), Comet-shape deformation and transition to viscous fingering of a miscible circular blob in a rectilinear displacement in porous media, 68th Annual Meeting of APS Division of Fluid Dynamics (DFD15), Boston, Massachusetts, USA, November 22 - 24, 2015.

2. **Pramanik, S.** (2015), Viscosity scaling in hydrodynamic instabilities in porous media, *Springer Proceedings in Complexity Series* (accepted).

3. Hota, T. K., **Pramanik, S.,** Mishra, M. (2015), A general approach to the linear stability analysis of miscible viscous fingering in porous media, *Springer Proceedings in Complexity Series* (accepted).

4. **Pramanik, S.**, Kuhlmann, H. C., Mishra, M. (2015), Influence of Korteweg stress on the miscible viscous fingering instability including double diffusive effects, Twelfth International Conference on Flow Dynamics, Sendai International Center, Sendai, Japan, October 27 - 29, 2015.

5. **Pramanik, S.** (2014), Transient interfacial tension in miscible viscous fingering, School on hands-on research in complex systems, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, June 30 - July 11, 2014.

6. **Pramanik, S.**, Mishra, M., (2014), Dispersion effect on miscible viscous fingering in microfluidic Hele-Shaw cell, 1st International conference on micro and nanofluidics fundamentals and applications, University of Twente, The Netherlands, May 18 - 21, 2014.

7. **Pramanik, S.** (2013), Influence of Péclet number on miscible viscous fingering instability: Linear stability theory, 58th congress of Indian Society of Theoretical and Applied Mechanics (ISTAM 2013), Kolkata, India, December 18 - 21, 2013.

8. Mishra, M., **Pramanik, S.** (2013), Effect of transient interfacial tension on miscible viscous fingering, 66th Annual Meeting of APS Division of Fluid Dynamics (DFD13), Pittsburg, Pennsylvania USA.

9. **Pramanik, S.,** Mishra, M. (2013), Miscible viscous fingering of pushed versus pulled interface, COMSOL conference, Bangalore, India, October 17-18, 2013.

10. Mishra, M., **Pramanik, S.** (2013), Self-similar linear stability analysis for miscible viscous fingering instability, International Conference on Mathematical Modeling and Numerical Simulations (ICMMANS - 2013), Lucknow, India, July 1 - 3, 2013.

11. **Pramanik, S.,** Mishra, M. (2013), Viscous fingering of a miscible slice with Korteweg stresses: A linear stability theory, Mathematics and Chemical Kinetics in Engineering (MaCKiE - 2013), An International Conference, Chennai, India, February 4 - 6, 2013.

12. **Pramanik, S.,** Mishra, M. (2012), Effects of Korteweg stresses on the viscous fingering of a miscible slice in porous media, 57th congress of Indian Society of Theoretical and Applied Mechanics (ISTAM 2012), Pune, India, December 17 - 20, 2012.

13. **Pramanik, S.,** Kulukuru, G. L., Mishra, M. (2012), Miscible Viscous Fingering: Application in Chromatographic Columns and Aquifers, COMSOL conference, Bangalore, India, November 1 - 2, 2012.

14. **Pramanik, S.,** Mishra, M. (2012), Stability of miscible displacement in porous media: Effect of Korteweg stress, EUROMECH Fluid Mechanics Conference 9 (EFMC9), Rome, Italy, September 9 - 13, 2012.

Poster Presentations:

1. **Pramanik, S.** (2015), Miscible blobs in Hele-Shaw flows, Cynosure - 2015, Annual Research Day, November 07, 2015, Department of Mathematics, Indian Institute of Technology Ropar, India. (**Best poster award**)

2. **Pramanik, S.** (2014), Transient interfacial tension in miscible viscous fingering, School on hands-on research in complex systems, June 30 - July 11, 2014, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy. (**Outstanding poster award**)

3. **Pramanik, S.,** Mishra, M. (2014), Dispersion effect on miscible viscous fingering in microfluidic Hele-Shaw cell, 1st International conference on micro and nanofluidics fundamentals and applications, University of Twente, The Netherlands, May 18 - 21, 2014.

4. **Pramanik, S.,** Mishra, M. (2013), Viscous fingering of a miscible slice with Korteweg stresses: A linear stability theory, Mathematics and Chemical Kinetics in Engineering (MaCKiE - 2013), An International Conference, Chennai, India, February 4 - 6, 2013.

Awards and Fellowships:

1. **International Travel Grants** (sponsored by the **Department of Science and Technology** and the **National Board for Higher Mathematics, Government of India**) to attend the international conference Twelfth International Conference on Flow Dynamics, Sendai, Japan, October 27-29, 2015.

2. **Ernst Mach scholarship** by the Austrian Exchange Service (OeAD-GmbH) financed by the Austrian Federal Ministry of Science, Research and Economy (BMWFW) to perform research work at the Institut für Strömungsmechanik und Wärmeübertragung, TU Wien, Vienna, October, 2014 - March, 2015.

3. **Outstanding poster award** at the School on hands-on research in complex systems at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, June 30 - July 11, 2014.

4. **Partial travel support** from ICTP for participating in the School on Hands-on Research on Complex Systems at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, June 30 - July 11, 2014.

5. **Partial travel support** from the organizers to attend the 1st International Conference on Micro and Nanofluidics Fundamentals and Applications (FLOW14), University of Twente, The Netherlands, May 18-21, 2014.

6. **NBHM travel support** for attending international conference 9th European Fluid Mechanics Conference (EFMC9), Rome, Italy, September 9-13, 2012.

7. National Board for Higher Mathematics, Department of Atomic Energy, Govt. of India Ph.D. Scholarship - 2011.

8. **Institute silver medal** for the academic year 2010 - 2011 on being adjudged to be the best student in order of merit among the students graduating with M.Sc. degree in Mathematics from Indian Institute of Technology Kharagpur.

9. **Post graduate merit scholarship for the university rank holders 2009 - 2011** funded by University Grant Commission, India.
10. Indian Academy of Sciences **Summer research fellowship - 2010**.
11. **Merit-Cum-Means (MCM) fellowship** in M.Sc. in Mathematics, Indian Institute of Technology Kharagpur.

Academic Achievements:

1. Department of Science and Technology - Innovation in Science Pursuit for Inspired Research (INSPIRE) Ph.D. fellowship - 2012 for being 1st in M.Sc. in Mathematics.
2. Council of Scientific and Industrial Research National Eligibility Test for Junior Research Fellowship in Mathematical Sciences in June, 2011.
3. National Board for Higher Mathematics (NBHM), Department of Atomic Energy, Govt. of India Ph.D. Scholarship - 2011.
4. Secured 1st position in M.Sc. in Mathematics from the Indian Institute of Technology Kharagpur.
5. Qualified Graduate Aptitude Test in Engineering - 2011 in Mathematics.
6. Secured an all india rank - 29 in Joint Admission Test for M.Sc. (JAM) in Indian Institute of Technology in 2009.
7. Secured 1st position in B.Sc. in Mathematics Honours from the University of Kalyani.

Teaching Assistance:

I have worked as teaching assistant in the following undergraduate courses at IIT Ropar:

1. MAL111: Mathematics Laboratory (Summer '12, '14)
2. MAL112: Advanced Calculus (Summer '13)
3. MAL114: Linear Algebra (Winter '12, '14)
4. MAL116: Introduction of Ordinary Differential Equations (Winter '13)

Seminar Talks:

1. Self-similar linear stability analysis for miscible displacement in homogeneous porous media, October 27, 2014, Institute of Fluid Mechanics and Heat Transfer, Vienna University of Technology, Vienna, Austria.
2. Transient interfacial tension in miscible viscous fingering, July 8, 2014, the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.
3. Influence of Péclet number on miscible rectilinear displacement in a Hele-Shaw cell, June 10, 2014, Université Libre de Bruxelles, Brussels, Belgium.
4. Hydrodynamic instability in a miscible fluid system, October 9, 2013, Indian Institute of Technology Ropar, India.
5. Numerical approximation of population balance equations and their mathematical analysis, February 21, 2012, Indian Institute of Technology Ropar, India.

Workshops and Summer Schools Attended:

1. Cynosure - 2015, Annual Research Day November 7, 2015, organized by Department of Mathematics, Indian Institute of Technology Ropar, India.
2. School on hands-on research in complex systems, June 30 - July 11, 2014, organized by The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.
3. DAAD sponsored Advances in PDE Modeling and Computation, October 21-25, 2013, organized by Department of Mathematics, IIT Madras, Chennai, India.
4. Instructional Workshop on FEM, 2nd July - 13th July, 2012, organized by TIFR Centre for Applicable Mathematics, Bangalore, India.
5. National Program on Differential Equations: Theory, Computation & Applications (NPDE-TCA), Advanced level, organized by the Department of Mathematics, IIT Bombay, 10th June - 30th June, 2012.
6. Workshop on Adaptive Finite Element - 2012, organized by the Department of Mathematics, Indian Institute of Science and Technology, Trivandrum, Kerala, India.
7. National workshop on Linear and Non-linear systems - 2011 organized by Centre for Mathematical Sciences, Banasthali Vidyapith, Rajasthan, India.
8. Selected as Indian Academy of Sciences Summer Research Fellow - 2010 and worked on "Peristaltic transport of Newtonian Fluids" under the guidance of Prof. A. Ramachandra Roa, Department of Mathematics, Indian Institute of Science, Bangalore.

Computer Skills:

- Programming skills in **Matlab, C, Python**.
- Text processing using **Latex, MS-Word**.
- Operating systems **Windows, Linux**.

Ph.D. Thesis

Analysis of hydrodynamic instabilities in miscible displacement flows in porous media
(October 2015)
Supervisor: Dr. Manoranjan Mishra
Institute: Department of Mathematics, Indian Institute of Technology Ropar

References:

1. Dr. Manoranjan Mishra (Ph.D. Supervisor)
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   Department of Mathematics
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3. Prof. A. De Wit
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Rupnagar, Punjab, November 18, 2015