

# Parisa Sarmadi

Fluid Mechanics Lab|The University of British Columbia

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## Research Interests

- Complex fluid mechanics and visco-plastic fluids
- Computational fluid dynamics
- Mathematical modelling of industrial fluid mechanics and oilfield cementing dynamics
- Multi-phase flows and interfacial flows

## Education

- Ph.D. Mechanical Engineering, **University of British Columbia**, Vancouver, Canada 2015 – 2019  
Advisors: Prof. Ian Frigaard(Mathematics and Mechanical Engineering) and Prof. Sarah Hormozi (Chemical & Biomolecular Engineering, Cornell University)  
Thesis title: Visco-Plastically Lubricated Multi-Layer Flows with Application to Transport in Pipelines
- M.Sc. Mechanical Engineering, **University of Tehran**, Iran 2012 – 2014  
Advisors: Prof. Keyvan Sadeghy(Mechanical Engineering) and Prof. Mehrdad Raisee Dehkordi (Mechanical Engineering)  
Thesis title: Visco-Plastic Effects on Interfacial Dynamics Due to Density Stratification and its Application in Successive Oil Recovery
- B.Sc. Mechanical Engineering, **University of Tehran**, Iran 2008 – 2012  
Advisor: Prof. Mehrdad Raisee Dehkordi (Mechanical Engineering)

## Research Experiences

- Postdoctoral Fellow, **Fluid Mechanics Laboratory (FML)**, UBC, Vancouver 2020 – *present*
- Graduate Research Assistant, **FML**, Department of Mechanical Engineering, UBC, Vancouver 2015 – 2019
- Visitor Scholar, Department of Mathematics, **Technical University of Dortmund** 2018
- Graduate Research Assistant, Department of Mechanical Engineering, **University of Tehran** 2012 – 2014

## Teaching Experiences

- Instructor, **MECH 386, Industrial Fluid Mechnaics**, UBC Fall 2019
- Academic Graduate Assistant, **Department of Mechanical Engineering**, UBC Summer 2018
- Facilitator, **BC Science World**, Vancouver Spring 2018
- Guest Lecturer, **MECH 380, Fluid Dynamics**, UBC Spring 2018
- Guest Lecturer, **MECH 280, Introduction to Fluid Mechanics**, UBC Spring 2018
- Teaching Assistant**
- Engineering Analysis II**, APSC Department, UBC Spring 2019
- Fluid Dynamics**, MECH Department, UBC Spring 2018
- Introduction to Fluid Mechanics**, MECH Department, UBC Spring 2018
- Technical Communication**, APSC Department, UBC Fall 2017
- Engineering Analysis I**, APSC Department, UBC Fall 2017
- Data Analysis and Mechanical Engineering Laboratories**, MECH Department, UBC Spring 2017
- Fluid Dynamics**, MECH Department, UBC Spring 2017
- Data Analysis and Mechanical Engineering Laboratories**, MECH Department, UBC Spring 2016
- Mechanical Design I**, MECH Department, UBC Fall 2015
- Fluid Mechanics II**, MECH Department, University of Tehran Fall 2013
- Fluid Mechanics I**, MECH Department, University of Tehran Fall 2011
- Differential Equations**, APSC Department, University of Tehran Fall 2010

## Awards and Honours

<b>Academic Achievement Award</b> , MECH Department, UBC	2020
<b>Graduate Leadership Award</b> , MECH Department, UBC	2020
<b>The Department of Mechanical Engineering Teaching Fellowship</b> , UBC	2019
<b>GSI Department Continuing Merit Award</b> , MECH Department, UBC	2019
<b>Go Global Self-Directed Research Abroad</b> , UBC	2018
<b>MITACS Globalink Research Abroad</b> , Canada	2018
<b>Graduate Leadership Award</b> , MECH Department, UBC	2018
<b>Graduate Leadership Award</b> , MECH Department, UBC	2017
<b>International Tuition Award</b> , UBC	2015 – 2018
<b>Entrance Scholarship</b> , UBC	2015
<b>Full Scholarship</b> , University of Tehran	2012
<b>Elite Student</b> , University of Tehran	2008 – 2012
<b>Full Scholarship</b> , University of Tehran	2008

## Publications

1. **P. Sarmadi**, O. Mierka, S. Turek, S. Hormozi, and I.A. Frigaard, Three dimensional simulation of flow development of triple-layer lubricated pipeline transport. *J. Non-Newton. Fluid Mech.*, 274:104201, 2019.
2. **P. Sarmadi** and I.A. Frigaard. Inertial effects in triple-layer core-annular pipeline flow. *Phys. Fluids*, 31:103102, 2019.
3. **P. Sarmadi** and I.A. Frigaard. Stable core-annular horizontal flows in inaccessible domains via a triple-layer configuration. *Chem. Eng. Sci.*: X, 3:100028, 2019.
4. B. Taghiloo, P. Sadeghi, **P. Sarmadi**, M. Saffaripour, and K. Sadeghy. Buoyancy-driven exchange flow of immiscible yield-stress fluids in a vertical closed-ended container. *J. Non-Newton. Fluid Mech.*, 265:79-91, 2019.
5. **P. Sarmadi**, S. Hormozi, and I.A. Frigaard. Flow development and interface sculpting in stable lubricated pipeline transport. *J. Non-Newton. Fluid Mech.*, 261:6080, 2018.
6. **P. Sarmadi**, S. Hormozi, and I.A. Frigaard. Triple-layer configuration for stable high-speed lubricated pipeline transport. *Phys. Rev. Fluids*, 2:044302, 2017.
7. H. Alimohammadi, V. Dehghanniri, **P. Sarmadi**, and M. Ashjaee. Improvement of heat transfer performances of bio-magnetic flow in a rectangular duct under different types of magnetic fields, *Int. J. Technol. Enhanc. Eng. Res.*, 2(8):44-48, 2014.

## Under Review

1. **P. Sarmadi**, A. Renteria, and I.A. Frigaard, Primary cementing of horizontal wells. Displacement flows in eccentric horizontal annuli part 2: computations. *J. Fluid Mech.*, 2020.

## Contribution to Refereed Conference Proceedings

1. **P. Sarmadi**, S. Hormozi, I.A. Frigaard. Stable triple-layer lubricated pipeline flow. 39th International Conference on Ocean, Offshore and Arctic Engineering, International conference proceeding, 2020.
2. B. Taghilou, **P. Sarmadi**, and K. Sadeghy. Rayleigh-Taylor instability of Bingham fluids, 16th Iranian National Congress of Chemical Engineering, National conference proceeding, 2019.
3. **P. Sarmadi**, I.A. Frigaard, S. Hormozi. A novel visco-plastically lubricated method for pipeline flow, International Conference of Multi-Phase Flow (ICMF), International conference proceeding, 2016.

## Presentations and Posters

- P. Sarmadi\***, S. Hormozi, and I.A. Frigaard. Stable triple-layer core-annular flow. 18th International Congress on Rheology 2020
- P. Sarmadi\***, A. Renteria, and I.A. Frigaard. Three dimensional numerical study of laminar displacement flows in horizontal eccentric irregular annuli. Canadian Symposium in Fluid Dynamics 2020
- P. Sarmadi\***, O. Mierka, S. Turek, S. Hormozi, and I.A. Frigaard. Three dimensional simulation of triple-layer core-annular flow. International Workshop on Numerical Methods for Non-Newtonian Flows, Peso da Regua, Portugal 2019
- P. Sarmadi**, S. Hormozi, and I.A. Frigaard\*. Progress with triple-layer core-annular flow. Institute of Non-Newtonian Fluid Mechanics, The Lake Vyrnwy Spring Rheology Meeting, UK 2019
- P. Sarmadi\***, O. Mierka, S. Turek, S. Hormozi, and I.A. Frigaard. Development of triple layer lubricated pipeline flow with viscoplastic sculpting, Canadian Applied and Industrial Mathematics Society, Whistler, Canada 2019
- P. Sarmadi**, S. Hormozi\*, and I.A. Frigaard. A novel method for heavy oil transport, Annual European Rheology Conference, Sorrento, Italy (poster) 2018
- P. Sarmadi**, S. Hormozi, and I.A. Frigaard\*. A new method for stable core-annular flow of heavy oils. Pacific Rim Conference on Rheology, Jeju, Korea 2018
- P. Sarmadi\***, S. Hormozi, and I.A. Frigaard. Viscoplastic sculpting in stable triple layer heavy oil transport flow. APS Annual Meeting, Division of Fluid Dynamics, Denver, USA 2017
- P. Sarmadi**, S. Hormozi, and I.A. Frigaard\*. Flow development and interface sculpting in stable lubricated pipeline transport. Viscoplastic Fluid from Theory to Application 7, Rotorua, New Zealand 2017
- P. Sarmadi**, S. Hormozi, and I.A. Frigaard\*. Stable triple layer heavy oil transport flow. Society of Rheology Annual Meeting, Denver, USA 2017
- P. Sarmadi\***, I.A. Frigaard, and S. Hormozi. A novel visco-plastically lubricated method for pipeline flow, International Conference of Multi-Phase Flow, Florence, Italy (poster) 2016
- H. Alimohammadi, **P. Sarmadi\***, V. Dehghanniri, and M. Raisee. Pressure distribution during various movements of human knee joint with non-Newtonian fluid. Iranian Conference on Electrical and Electronics Engineering, Gonabad, Iran 2013
- P. Sarmadi\***, H. Alimohammadi, and M. Raisee. Computation and analysis of pressure and temperature contours of synovial fluid as a non-Newtonian fluid in the knee joint, Iranian Society of Mechanical Engineering Annual Meeting, Tehran, Iran (poster) 2013

## Service

### Organizing Committee

**Conference secretary**, 8th Pacific Rim Conference on Rheology (PRCR2022), UBC 2020 – *present*

### Peer Review

Applied Mathematical Modelling Journal  
 European Journal of Mechanics-B/Fluids  
 International Conference on Ocean, Offshore, and Arctic Engineering

## Mentoring

Ethan Rajkumar	Undergraduate Student, Multidisciplinary Undergraduate Research Program, UBC
Ruizi Zhang	Ph.D. Student in Mechanical Engineering, Computational analysis, UBC
Alondra Renteria	Ph.D. Student in Mechanical Engineering, Computational analysis, UBC

## Services to UBC

Mentor, Multidisciplinary Undergraduate Research Program	2019
Event Coordinator, Fluid Mechanics Laboratory	2018 – 2019
Adjudicator, Multidisciplinary Undergraduate Research Program	2018
President, Mechanical Engineering Graduate Association	2017
Soccer Team Captain, Mechanical Engineering Graduate Association (MEGA)	2017
Vice President of Communication, MEGA	2016

## References

- Ian A. Frigaard      Professor, Department of Mathematics and Department of Mechanical Engineering, University of British Columbia, Canada  
Email: [frigaard@math.ubc.ca](mailto:frigaard@math.ubc.ca)
- Sarah Hormozi      Associate Professor, Department of Chemical & Biomolecular Engineering, Cornell University, USA  
Email: [hormozi@cornell.edu](mailto:hormozi@cornell.edu)
- Dana Grecov      Associate Professor, Department of Mechanical Engineering, University of British Columbia, Canada  
Email: [dgrecov@mech.ubc.ca](mailto:dgrecov@mech.ubc.ca)
- Keyvan Sadeghy      Professor, Department of Mechanical Engineering, University of Tehran, Iran  
Email: [sadeghy@ut.ac.ir](mailto:sadeghy@ut.ac.ir)
- Stefan Turek      Professor, Department of Mathematics, Technical University of Dortmund, Germany  
Email: [stefan.turek@mathematik.tu-dortmund.de](mailto:stefan.turek@mathematik.tu-dortmund.de)