



Calendar details

Date:	Wednesday, 8 December 2021
Time:	9.00 am – 10.30 am (Melbourne Time)
Event registration link:	https://www.eventbrite.com.au/e/australian-society-of-rheology-seminar-8-december-2021-registration-218909463097

Invited lecture

Speaker: Prof. Arezoo Ardekani (School of Mechanical Engineering, Purdue University, West Lafayette, Indiana)

Presentation Title: Viscoelastic fluids through porous media: flow instability and particle transport

Abstract

Viscoelastic fluid flows through porous media are common in industrial and biological applications ranging from oil recovery and groundwater remediation to drug transport in tissue. Polymeric stresses affect the topology and stability of these flows, and thus, their macroscopic transport properties. We numerically study the flow topology, instability, and dispersion of viscoelastic flow through porous media. Inertial stresses here are negligible, and instead, the flow is dominated by elasticity and viscosity; their relative effects are characterized by the Weissenberger number. At small Weissenberg numbers, stable eddies appear, whereas at large Weissenberg numbers, strong flow fluctuations due to high polymeric stresses lead to the formation of highly unstable eddies in different regions of the pores and multiple distinct unstable flow structures occur. The stretched polymeric chains inside the pore facilitate eddy formation, whereas relaxed chains lead to eddy free regions. We also discuss the dispersion of particles in these flows.

Speaker's biography



Dr. Ardekani is a Professor of Mechanical Engineering at Purdue University. Her research focuses on complex fluids, biofluids, and suspensions of particles and cells. Honored with the Presidential Early Career Award for Scientists and Engineers (PECASE) from president Obama, Arezoo has also received an NSF CAREER Award, the Arthur B. Metzner Early Career Award from the Society of Rheology, the Society of Engineering Science Young Investigator Medal, the Sigma Xi Mid-career Research Award, and is named a Purdue University Faculty Scholar. A Fellow of American Society of Mechanical Engineers, Arezoo has also received the College of Engineering

Faculty Excellence Awards for Graduate Student Mentorship and Early Career Research, the Amelia Earhart Award and the Society of Women Engineers Award. She received her PhD from University of California Irvine in 2009 and was a Shapiro Postdoctoral Fellow at MIT. Arezoo has published 100 articles (including five invited articles) in leading journals including Proceedings of the National



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Academy of Sciences, Physical Review Letters, Journal of Fluid Mechanics, Physical Review Fluids and presented more than 70 invited/keynote talks. Arezoo is an Associate Editor of ASME Applied Mechanics Review, an Editorial Advisory Board Member of International Journal of Multiphase Flow, Journal of Non-Newtonian Fluid Mechanics, Physics of Fluids and Physical Review Fluids and a member of the American Physical Society-Division of Fluid Dynamics Executive Committee.

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