

November 10,
16:00-17:00
Online

Computational
Materials
Science

Seminar

Computational Materials Science and Engineering of Concrete: Computational rheology and pumping of concrete



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Speaker Introduction

Dr. Yanwei Wang is an Associate Professor of Chemical and Materials Engineering at the School of Engineering and Digital Sciences (SEDS) of Nazarbayev University in Kazakhstan. He also holds the position of “head of laboratory” of the Computational Materials Science Lab under the Center for Energy and Advanced Materials Science, National Laboratory Astana (NLA). He obtained his M.Sc. (2005) and Ph.D. (2009) from the Chemical and Biochemical Engineering department of the Technical University of Denmark with specializations in polymer science and numerical modeling. His work and interests focus on computational molecular & materials science, transport processes, and macromolecular theory and simulations. He has published more than 60 research articles in peer-reviewed journals and H-index of 21.

Seminar abstract

Yield-stress fluids are encountered in a wide range of applications: pumping of concrete and mortar, 3D concrete printing, the handling of drilling fluids, sludge treatment and disposal, oil-well cementing, paste backfill, filling slurry, toothpaste, foam, mud, mayonnaise, etc. Among them, concrete is used more than any other man-made materials and is irreplaceable in most construction and building projects. Pumping of concrete is one of the most common practices in the field of construction and is a common step in digital fabrication techniques with concrete and other cement-based materials. To date, a fundamental understanding of the interrelations of non-Newtonian fluid dynamics, rheology, and the processing of concrete and other similar fluids remains an active area of research. This talk focuses on theoretical and computational studies on the rheology and pumping of fresh concrete. It covers an overview of recent studies and some progress made by the speaker’s research team [1,2].

References

- [1] Zhaidarbek, B., Tleubek, A., Berdibek, G., & Wang, Y. Elsevier 2022
- [2] Y. Wang Journal of Non-Newtonian Fluid Mechanics (2022)