

Tuesday, 23 July 2024, 4 p.m.
Callinstr. 30, room 001 "Musiksaal"

Rheological response of Magnetorheological Cementitious Inks tuned for active control in digital construction

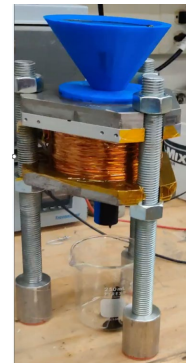
Guest lecture by

Konstantin Sobolev

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This presentation will report on Magnetorheological Cementitious Inks (MRCI) incorporating various proportions of portland cement, high-ferrous Class-F Fly Ash (FA), nanosilica, and nanoalumina (NA), which were blended and characterized for rheological response under magnetic field. This research was designed to understand better the effects of doping cement with magnetic material for application in '4D-printing' of cementitious 'smart materials'. The research results suggest that the principle of utilizing an applied magnetic field for active control of flow and slump of cementitious materials extruded through 3D printing apparatus is worthy of further pursuit and development.



Konstantin Sobolev is Professor at the Department of Civil and Environmental Engineering, University of Wisconsin-Milwaukee, and director of the Concrete Sustainability and Resilience Center. He developed innovative and effective technologies for advanced materials, including pigments and coatings, high-performance cement, chemical admixtures, and concrete. His current research interests are in the application of bottom-up engineering in nano-admixtures and nanotechnology for cement and concrete; particle packing models; application of evolutionary algorithms; design, modeling, and application of high-strength and high-performance materials; materials with photocatalytic properties; superhydrophobic materials; 3D printing of concrete, auxetic and smart stress-sensing materials.