



Membrane nanomaterials and nonconventional forces for water and air treatment

David Warsinger

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Wednesday, January 29th @ 11 AM in BRK 1001

Coffee and snacks served before seminar

also on [MS Teams](#)

Abstract:

Humanity is facing growing challenges from pollution, water scarcity, and climate change. Membrane separations are typically the most effective and energy efficient approaches, but membranes need new capabilities to address complex and challenging separations. To remediate pollutants, membranes with specialized selectivity between ions can enhance high-salinity desalination and catalytic membrane processes. Catalytic processes can also enable the first self-pumping membrane processes. Membranes can also be designed to be enhanced by acoustic fields, to tackle challenging separations like removing virus-containing bioaerosols. And crucially, membranes need incredible selectivity to replace inefficient thermal processes for separating dilute components, like removing water vapor from the air. This talk will explain mechanisms, materials, and innovations to transform selective processes key for sustainability and human health.

Bio:

David Warsinger is an Assistant Professor at Purdue University, where his research uses thermofluids and materials science for improving the performance and capabilities of sustainable membrane technologies. His applications include research for desalination, water treatment, water harvesting, contaminant destruction, and HVAC membranes. David completed his PhD and Masters in a combined 3 years, doing his PhD thesis at MIT with Prof. John Lienhard. He was a PostDoc at Yale University with Prof's Menachem Elimelech and Jaehong Kim. David is a coauthor of over 120 scientific contributions, comprising journal papers, conference papers, patents, and book chapters. He has won 7 international awards for young scientists and receives over 1300 citations per year. His lab members have been successful in securing academic jobs: so far 8 members have done so. He is also involved with commercializing his research through startup companies and industrial grants.