



## Mechanical Engineering Seminar Series

### Engineering Advanced Materials for Sustainable Energy and Water Devices

**Evelyn N. Wang**

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Department of Mechanical Engineering  
MIT*



Tuesday, April 5, 2022

4:00 p.m. - **Virtual Only**

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#### **Abstract**

Nanoengineered materials have exciting, untapped potential to improve energy and water technologies. In this talk, I'll provide a few examples of how we leverage nanoscale manipulation capabilities to develop advanced thermal management, solar thermal energy conversion, and water harvesting devices. First, I'll discuss our recent work which harnesses novel surface designs to control and manipulate wettability and liquid-vapor phase-change processes. We'll demonstrate its applications for enhanced condensation in power generation and thermal management. Next, I'll discuss how nanoengineered materials can also be used to increase the efficiency of solar thermal devices. Specifically, I'll share our work on optically transparent thermally insulating aerogel solar receivers for energy conversion and medical sterilization. Finally, I'll present a water harvesting device that leverages the unique properties of metal-organic frameworks and other adsorbents along with novel device architectures to address water scarcity challenges in arid climates.

#### **Bio**

Evelyn N. Wang is the Ford Professor of Engineering and Department Head in the Mechanical Engineering Department at MIT. She received her BS from MIT and MS and Ph.D. from Stanford University in Mechanical Engineering. From 2006-2007, she was a postdoctoral researcher at Bell Laboratories. Her research interests include fundamental studies of micro/nanoscale heat and mass transport and the development of efficient thermal management, solar thermal energy conversion, and water harvesting and desalination systems. Her work has been honored with awards including the 2008 DARPA Young Faculty Award, the 2011 Air Force Office of Scientific Research Young Investigator Award, the 2012 Office of Naval Research Young Investigator Award, the 2012 ASME Bergles-Rohsenow Young Investigator Award, the 2016 ASME EPPD Women Engineer Award, the 2017 ASME Gustus L. Larson Award, and the 2020 ICNMM Prominent Researcher Award. She was recognized as one of Foreign Policy's Global Re-Thinkers in 2017. She is an ASME and AAAS Fellow.

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