ME Seminar

Efficient design of desalination and energy systems

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ABSTRACT

Removing dissolved impurities from aqueous streams is inherently energy intensive. We develop and apply a comprehensive thermodynamic framework based on entropy generation minimization to reduce the specific energy consumption of various desalination processes such as membrane distillation, reverse osmosis, and electrodialysis. A method to compare the state-of-the-art of disparate technologies with very different operating principles is then presented. These principles are then applied towards energy-efficient design of cooling processes, renewable energy production, and fuel cell systems.

ABOUT THE SPEAKER

Jaichander Swaminathan is an Assistant Professor in the Mechanical Engineering discipline at IIT Gandhinagar, where he heads the "Water Energetics Lab." He is the current occupant of the Kanchan and Harilal Doshi Chair for Water and Sanitation, and is an International Desalination Association fellow. He received his SM and PhD from MIT with a major in "Energy Science and Engineering" and BTech from IIT Madras, all in Mechanical Engineering.

August 12, 2022, 4:00 pm, Microsoft Teams (Online)