

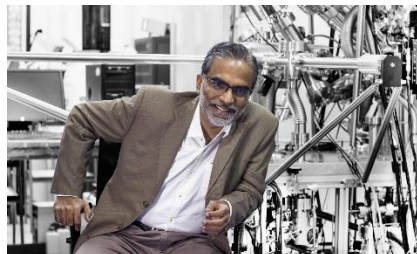
EEE Research Seminar

Date: February 2, 2024, at 1:30 PM

Location: POTR 234 (Fu Room)

Thalappil Pradeep, Ph.D.

**Institute Professor &
Deepak Parekh Institute Chair Professor**
Department of Chemistry
Indian Institute of Technology Madras



Affordable clean water using advanced materials

Abstract

Sustainable nanotechnology is important for providing contaminant-free water to humanity. In this talk, I will present the compelling need for providing access to clean water through nanotechnology-enabled solutions and the large disparities in ensuring their implementation. I will present the discovery of affordable and sustainable nanomaterials to selectively scavenge arsenate and arsenite ions (and others) in water to bring their concentrations below the drinking water limits and its development into a technology. The solution, popularly called AMRIT (meaning elixir in Sanskrit), is now delivering 80 million litres of arsenic-, iron- and uranium-free water, conforming to international standards every day to 1.3 million people at the cost of 2.1 paise (US\$0.00026) per litre, lowest in the world.

Bio

Thalappil Pradeep is an Institute Professor at the Indian Institute of Technology Madras (IITM), Chennai, India. He is the Deepak Parekh Institute Chair Professor and is also a Professor of Chemistry. He studied at the University of Calicut, Indian Institute of Science (IISc), UC Berkeley, and Purdue. His research interests are in molecular and nanoscale materials. He is an author of over 550 scientific papers in journals and is an inventor of over 120 patents or patent applications. He is involved in the development of affordable technologies for drinking water purification and some of them have been commercialized. His pesticide removal technology has reached about 10 million people. His arsenic removal technology, approved for national implementation, is delivering arsenic free water to about 1.3 million people every day. Along with his associates, he has incubated seven companies and three of them have production units. He is the recipient of several awards including the Shanti Swaroop Bhatnagar Prize, BM Birla Science Prize, National Award for Nanoscience and Nanotechnology, India Nanotech Innovation Award, JC Bose National Fellowship and National Water Award. He has won The World Academy of Sciences (TWAS) prize in Chemistry for the year 2018. Nation conferred the civilian award, Padma Shri on him in 2020. He is also a recipient of the Nikkei Asia Prize, Prince Sultan Bin Abdulaziz International Prize for Water, VinFuture Prize and ENI award. Recently, he has won the International Excellence Award of Karlsruhe Institute of Technology, Germany, and the Fellowship of SCHROFF Foundation. He is a Fellow of all the science and engineering academies of India, TWAS, American Association for the Advancement of Science and The African Academy of Sciences. He is the author of the introductory textbook, Nano: The Essentials (McGraw-Hill) and is an author of the monograph, Nanofluids (Wiley-Interscience) and an advanced textbook, A Textbook of Nanoscience and Nanotechnology (McGraw-Hill). He is on the editorial boards of journals such as ACS Nano, Chemistry of Materials, Analytical Chemistry, Chemical Communications, Nanoscale, Environmental Science & Technology, JPC Letters, etc., and is an associate editor of ACS Sustainable Chemistry & Engineering. He has authored popular science books in English and Malayalam and is a recipient of Kerala Sahitya Akademi Award for knowledge literature. He has received the Lifetime Achievement Research Award of IITM and Distinguished Alumnus Award of IISc. As part of philanthropy, he supports a school in his village where 500 students are on rolls.