NUS National University of Singapore | Department of Materials Science & Engineering
College of Design and Engineering

Materials Science For Sustainability

18th Feb, Friday
2:30 - 3:30pm
Singapore Time Via Zoom

Click here to register

https://nus-sg.zoom.us/webinar/register/WN_d-V4qCwOTG-5bNWF3UmvNA

ABSTRACT

The earth's atmosphere houses an enormous amount of water, which could be effectively exploited for many applications. In this talk, we would like to share a series of specially fabricated water-harvesting materials which plays a significant role in freshwater production, agriculture, and dehumidification. A sponge-like porous material has been designed to extract water from the air. An atmospheric water generator built with this material is able to produce drinking water continuously without electrical energy consumption. To mitigate food and water shortage simultaneously, a water-harvesting copper-based material is integrated into a fully automated SmartFarm device that utilizes the harvested water for plant irrigation without manual intervention. With this new material and SmartFarm device, the demand for freshwater for irrigation is substantially reduced and self-sustaining urban farming can be achieved. Another sustainability challenge is to reduce the use of air-conditioner which emits greenhouse gases to our environment. Through the humidity control achieved by the moisture-absorbing materials, the "perceived temperature" can be drastically reduced, providing a more sustainable and energy-saving solution for maintaining thermal comforts.



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Dr Tan Swee Ching received his Bachelor in Physics from the National University of Singapore and PhD from the University of Cambridge. After his PhD, Dr Tan worked as a postdoctoral associate in the Department of Materials Science and Engineering at MIT. He is currently an Assistant Professor at the Department of Materials Science and Engineering at National University of Singapore. He is also the founder of Ultra Dry Pte. Ltd. a spin-off company from NUS based on the invention of a superhygroscopic material.



Benjamin Greaves
Closed Environment Agricultural Engineer at Starlab Oasis

Ben Greaves attended the University of Michigan where he received a bachelor's degree in Mechanical Engineering, a minor in Astrophysics and a master's degree in Space Engineering. As a graduate student, Ben interned at NASA Kennedy Space Center and NASA Langley Research Center where he developed projects for extraterrestrial food production as well as Martian habitat designs. After returning, he attended the International Space University's Interactive Space Program and conducted plant growth research as a HI-SEAS analog astronaut. Now with StarLab Oasis, Ben is utilizing space systems to improve global food security and nutrition.
https://starlaboasis.com/our-team/benjamin-greaves/