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IMPact@SUTD is a regular update featuring works by SUTD Faculty, Researchers, Students and Research Centres/Labs. We hope to create awareness of the Research by SUTD within the SUTD community and beyond. Share with us your SUTD works today so that we can include it in our next update.



**High-fidelity imaging of amyloid-beta deposits with an ultrasensitive fluorescent probe facilitates the early diagnosis and treatment of Alzheimer's Disease Theranostics**

SUTD Author: Tianruo Shen, Davin Tan and Xiaogang Liu

"Aided via computational modeling, we developed an ultrasensitive probe to detect A $\beta$  deposition in live animals. This probe could facilitate the study of the A $\beta$ -related pathology of Alzheimer's Disease."

--- Tianruo Shen



**Multi-stage anisotropic etching of two-dimensional heterostructures**  
*Nano Research*

SUTD Author: Dechao Geng and Hui Ying Yang

"In this work, interface-driven anisotropic etching mode is demonstrated for the first time to be generally applied to 2D heterostructures. It is shown that the typical in-plane graphene and hexagonal boron nitride (h-BN) heterostructures follow a multi-stage etching behavior initiated first along the interfacial region between the two materials and then along edges of neighboring h-BN flakes and finally along central edges of h-BN."

--- Hui Ying Yang



**Superior Volumetric Capability Dual-Ion Batteries Enabled by A Microsize Niobium Tungsten Oxide Anode**  
*Advanced Functional Materials*

SUTD Author: Jiaojiao Zhu

"We propose a novel strategy to use Wadsley-Roth phase niobium tungsten oxide to achieve dual-ion batteries (DIBs) with superior volumetric performance. The excellent practicality of this DIB is demonstrated by assembling a flexible pouch battery. Meanwhile, the energy storage mechanism of the full battery was investigated by operando XRD characterization and operando Raman spectroscopy."

--- Jiaojiao Zhu

**A part-scale, feature-based surrogate model for residual stresses in the laser powder bed fusion process**  
*Journal of Materials Processing Technology*

SUTD Author: Guoying Dong, Umesh Kizhakkian and David William Rosen

**Alternating lysis and lysogeny is a winning strategy in bacteriophages due to Parrondo's paradox**  
*Proceedings of the National Academy of Sciences of the United States of America*

SUTD Author: Kang Hao Cheong, Tao Wen, and Jin Ming Koh

**Enhanced photonics devices based on low temperature plasma-deposited dichlorosilane-based ultra-silicon-rich nitride (Si8N)**  
*Scientific Reports*

SUTD Author: Hongwei Gao, Hongwei Gao, Peng Xing, George F. R. Chen, Xavier X. Chia, Yanmei Cao, Kenny Y. K. Ong and Dawn T. H. Tan

**Evaluation of Fiber-Reinforced Modular Soft Actuators for Individualized Soft Rehabilitation Gloves**  
*Actuators*

SUTD Author: Shaoying Huang

**Flexible Fiber Inductive Coils for Soft Robots and Wearable Devices**  
*IEEE Robotics and Automation Letters*

SUTD Author: Aby Raj P. M., Thillepan Stalin, and Pablo Valdivia y Alvarado

**Hydrated Eutectic Electrolyte with Ligand-Oriented Solvation Shell to Boost the Stability of Zinc Battery**  
*Advanced Functional Materials*

SUTD Author: Tian Chen Li

**Nanowatt Receiver for High-Data-Rate Advanced Internet of Things and Microwave Applications**  
*IEEE Nanotechnology Magazine*

SUTD Author: Aasish Boora, Bharatha Kumar Thangarasu and Kiat Seng Yeo

**Solvent-Free Upcycling Vitrimers through Digital Light Processing-Based 3D Printing and Bond Exchange Reaction**  
*Advanced Functional Materials*

SUTD Author: Yuan-Fang Zhang

**Nowhere to Hide: Online Rumor Detection Based on Retweeting Graph Neural Networks**  
*IEEE Transactions on Neural Networks and Learning Systems*

SUTD Author: Roy Ka-Wei Lee

**Ultra-efficient highly-selective MFC-7 cancer cell therapy enabled by combined electric-pulse carbon 1D-nanomaterials platforms**  
*Materials Advances*

SUTD Author: Sophia S. Y. Chan, Shao Xiang Go, Maria Prisca Meivita, Denise Lee, Natasa Bajalovic and Desmond K. Loke

**Unity Assumption in Audiovisual Emotion Perception**  
*Frontiers in Neuroscience*

SUTD Author: Ka Lon Sou

**Everything is theoretically impossible, until it is done.**  
— Robert A. Heinlein

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