

February 2019

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.

## CONGRATULATIONS!

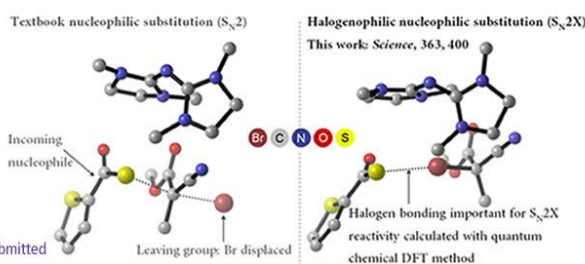
**Dr. Richmond Lee and Dr. Siu Min Tan**

for publishing their paper **An enantioconvergent halogenophilic nucleophilic substitution (SN2X) reaction\*** in *Science*\*\*.

\* One of the common textbook principles about substitution reaction requires a leaving group on molecule be expelled by an electron rich nucleophile from behind. This view is however radically challenged with recent discovery that the leaving group could leave with the nucleophile interacting from the front

via halogen-bonding. This work done in SUTD and NTU is an important first in establishing an intriguing reaction pathway for asymmetric reaction, and for its novelty it has been published in a top-tier multi-disciplinary and highly selective journal *Science*.

\*\* Accepts less than 7% research articles submitted



**Effect of multilayer interface through in situ fracture of Cu/Nb and Al/Nb metallic multilayers**  
*Journal of Materials Research*

SUTD Author: Hashina Parveen Anwar Ali, Ihor Radchenko, and Arief Budiman

"In situ microfracture bending experiments were performed between multilayered nanocomposites of two different combinations (Cu/Nb and Al/Nb) with the same FCC/BCC crystallography interface. The difference in the resulting fracture behaviour revealed the influence of their composition and presence of grain boundaries on the plasticity and fracture behaviour of these composites."

--- Hashina Parveen Anwar Ali



**Ultrafast Nanoscale Phase-Change Memory Enabled By Single-Pulse Conditioning**  
*ACS Applied Materials Interfaces*

SUTD Author: Desmond K. Loke, Rong Zhao, and Tow-Chong Chong

"For the first time, researchers from Singapore University of Technology and Design (SUTD) and the University of Cambridge, have successfully developed a new type of phase-change memory that reduces the switching time and shows excellent stability."

--- Desmond K. Loke



**"Small places" of ageing in a high-rise housing neighbourhood**  
*Journal of Aging Studies*

SUTD Author: Mihye Cho, Tshui Mum Ha, Zhao Ming Tony Lim, and Keng Hua Chong

"This research examines the 'small' places where older residents in a Singaporean public housing estate develop their own rhythm of life, and experience urban sensoriality and community life. It adopts insights from the slow city to contemplate diverse temporalities and routinized social interactions for the creation of an age-friendly place. It also queries the feasibility of the slow city for large-scale, high-rise, and high-density cities."

--- Mihye Cho

**3D printed fittings and fluidic modules for customizable droplet generators**  
*RSC Advances*

SUTD Author: Sindhu Vijayan and Michinao Hashimoto

**Axonopus compressus (Sw.) Beauv.: A potential biomonitor for molybdenum in soil pollution**  
*International Journal of Phytoremediation*

SUTD Author: Jean Wan Hong Yong

**Design Optimization of Sparse Sensing Array for Extended Aerial Robot Navigation in Deep Hazardous Tunnels**  
*IEEE Robotics and Automation Letters*

SUTD Author: Chee How Tan, Danial Sufiyan bin Shaiful, Wei Jun Ang, Shane Kyi Hla Win, and Shaohui Foong

**Design principle-based stimuli for improving creativity during ideation**  
*Proceedings of the Institution of Mechanical Engineers Part C-Journal of Mechanical Engineering Science*

SUTD Author: Blake Perez and Kristin L Wood

**Effect of Statistically Iterative Image Reconstruction on Vertebral Bone Strength Prediction Using Bone Mineral Density and Finite Element Modeling: A Preliminary Study**  
*Journal of Computer Assisted Tomography*

SUTD Author: Anitha D and Karupppasamy Subburaj

**Micro-tags for art: covert visible and infrared images using gap plasmons in native aluminum oxide**  
*Optical Materials Express*

SUTD Author: Ray Jia Hong Ng, Ravikumar Venkat Krishnan, Hailong Liu, Qifeng Ruan, Kin Leong Pey, and Joel K. W. Yang

**Multi-qubit Quantum Rabi Model and Multi-partite Entangled States in a Circuit QED System**  
*Scientific Reports*

SUTD Author: Chunfeng Wu

**Pressure-Driven Modeling of Cyber-Physical Attacks on Water Distribution Systems**  
*Journal of Water Resources Planning and Management*

SUTD Author: Hunter C. Douglas, Riccardo Taormina, and Stefano Galelli

**Quantitative Identification of Technological Discontinuities**  
*IEEE Access*

SUTD Author: Christopher L. Magee

**Selective Decoupling and Hamiltonian Engineering in Dipolar Spin Networks**  
*Physical Review Letters*

SUTD Author: Ulf Bissbort and Dario Poletti

**Trajectory tracking of piezoelectric-driven stage via a hybrid controller for both periodic and non-periodic motion**  
*Smart Materials and Structures*

SUTD Author: Yunfeng Fan and U-Xuan Tan

**Ultra-silicon-rich nitride devices for high nonlinear figure of merit optical signal processing**  
*Conference on Smart Photonic and Optoelectronic Integrated Circuits XX*

SUTD Author: Dawn Tan, Ezgi Şahin, Kelvin J. A. Ooi, Ju Won Choi and Peng Xing