

## Electrochemical STM Investigations of Strong Intermolecular Electronic Coupling within a TTF Island

Speaker: **Dr. Yasuyuki Yokota,**  
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Venue: Blk S13, #M01-11, Department of Physics Conference Room, Faculty of Science, NUS  
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Time: 4.00pm – 5.00pm

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### Abstract:

From the viewpoint of molecular electronics, we have studied the structural and electronic properties of TTF derivatives on gold substrate. In this seminar, I report the electrochemical STM (EC-STM) studies of tetrathiafulvalene (TTF) islands embedded in *n*-decanethiol SAMs on Au(111). EC-STM measurements of TTF islands of varied sizes at various potentials were performed in 0.05 M HClO<sub>4</sub> solution. From the cyclic voltammetry of self-assembled monolayers, the electronic states of TTF moieties in each STM images were characterized. It was found that the larger the size of the large islands, the higher the apparent height in the STM images, although the physical height of the islands can be assumed to be same. We think that the effective electron transfer between TTF moieties leads to increase of electron-transfer passes due to the strong intermolecular electronic coupling. The results of ferrocene islands will be also reported to discuss the case of weak intermolecular interactions.

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### About speaker:

Dr. Yasuyuki Yokota received his Ph.D. in chemistry from the Tokyo Institute of Technology (TIT) in 2007. He was a Ph.D. candidate working under the direction of Prof. Toshiaki Enoki and Prof. Ken-ichi Fukui at TIT, and a junior research associate working under the direction of Prof. Masahiko Hara at RIKEN. His thesis focuses on electrochemically-controlled molecular devices. His research interests involve the study of surface electrochemistry and electrochemical nanotechnology.