



Dr. Saw Wai Hla
Group Leader
Electronic & Magnetic Materials &
Devices (EMMD) Group
Phone: 630-252-2743
Fax: 630-252-4646
E-mail: shla@anl.gov
Argonne National Laboratory
Center for Nanoscale Materials
9700 S Cass Ave., Building 440
Argonne, IL 60439-4806
Ph.D., University of Ljubljana

Dr. Saw Wai Hla received a PhD in physics from the University of Ljubljana in 1997. After postdoctoral appointments at the TASC-INFM laboratory in Trieste, Italy, and Freie Universitaet Berlin in Germany, Dr. Hla joined Ohio University as a faculty member in the Physics and Astronomy Department in 2001. In 2005, Dr. Hla was promoted to associate professor with tenure and recently to full professor, a position he still holds.

Dr. Hla also served as an executive committee member of the American Vacuum Society's Magnetic Interfaces and Nanostructures Division (2006-2008); as a conference or session organizer of the American Physical Society's March Meetings (2005 and 2006), International Workshop on Nanoscale Spectroscopy and Nanotechnology (2008), and Materials Research Society's Spring Meeting (2009); as a proposal reviewer for NSF, DOE, NIH, and European funding agencies; and as an associate editor of *Journal of Advanced Microscopy Research*.

Dr. Hla's research is focused on low-temperature scanning tunneling microscopy, tunneling spectroscopy, spin-polarized scanning tunneling microscopy, and manipulation of single atoms and molecules as well as single-molecule studies of molecular spintronics, molecular magnetism, molecular electronics, molecular machines, and molecular switches and devices.

Selected Publications

1. K. Clark, A. Hassanien, S. Khan, K.-F. Braun, H. Tanaka, and S.-W. Hla. "Superconductivity in Just Four Pairs of (BETS)₂-GaCl₄ Molecules," *Nature Nanotechnology* **5**, 261-265 (2010).
2. D. Serrate, P. Ferriani, Y. Yoshida, S.-W. Hla, M. Menzel, K. von Bergmann, S. Heinze, A. Kubetzka, and R. Wiesendanger. "Imaging and Manipulating the Spin Direction of Individual Atoms," *Nature Nanotechnology* **5**, 350-354 (2010).
3. U.G.E. Perera, H.J. Kulik, V. Iancu, L.G.G.V. Dias da. Silva, S.E. Ulloa, N. Marzari, and S.-W. Hla. "Spatially Extended Kondo State in Magnetic Molecules Induced by Interfacial Charge Transfer," *Phys. Rev. Lett.* **105**, 106601 (2010).
4. F. Jäckel, F., U.G.E. Perera, V. Iancu, K.-F. Braun, N. Koch, J.P. Rabe, and S.-W. Hla. "Investigating Molecular Charge Transfer Complexes with a Low Temperature Scanning Tunneling Microscope," *Phys. Rev. Lett.* **100**, 126102 (2008).
5. A. Deshpande, H. Yildirim, A. Kara, D. P. Acharya, J. Vaughn, T. S. Rahman, and S.-W. Hla. "Atom-by-Atom Extraction using the Scanning Tunneling Microscope Tip-Cluster Interaction," *Phys. Rev. Lett.* **98**, 028304 (2007).
6. S.-W. Hla. "Molecular Machines: Reinventing the Wheel," *Nature Nanotechnology* **2**, 82-84 (2007).

7. G. Newkome, P. Wang, C.N. Moorefield, T.J. Cho, P. Mohapatra, S. Li, S.-H Hwang, O. Lukoyanova, L. Echegoyen, J.A. Palagallo, V. Iancu, and S.-W. Hla. "Nano assembly of a Fractal Polymer: A Molecular 'Sierpinski Hexagonal Gasket,'" *Science* **312**, 1782-1785 (2006).
8. V. Iancu, A. Deshpande, and S.-W. Hla. "Manipulation of Kondo Effect via Two Dimensional Molecular Assembly," *Phys. Rev. Lett.* **97**, 266603 (2006).
9. K.-F. Braun, V. Iancu, N. Pertaya, K.-H. Rieder, and S.-W. Hla. "Decompositional, Incommensurate Growth of Ferrocene Molecules on a Au(111) Substrate," *Phys. Rev. Lett.* **96**, 246102 (2006).
10. V. Iancu, and S.-W. Hla. "Realizing of a Four-Step Molecular Switch in Scanning Tunneling Microscope Manipulation of Single Chlorophyll-a Molecules," *Proc. Nat. Acad. Sci.* **103**, 13718-13721 (2006).
11. V. Iancu, A. Deshpande, and S.-W. Hla. "Manipulating Kondo Temperature via Single Molecule Switching," *Nano Lett.* **6**, 820-823 (2006).
12. K.-F. Braun and S.-W. Hla. "Probing the Conformation of Physisorbed Molecules at the Atomic-Scale using STM Manipulation," *Nano Lett.* **5**, 73-76 (2005).
13. S.-W. Hla, K.-F. Braun, B. Wassermann, and K.-H. Rieder. "Controlled Low-Temperature Molecular Manipulation of Sexiphenyl Molecules on Ag(111) using Scanning Tunneling Microscopy," *Phys. Rev. Lett.* **93**, 208302 (2004).
14. S.-W. Hla, K.-F. Braun, V. Iancu, A. Deshpande. "Single Atom Extraction by Scanning Tunneling Microscope Tip-Crash and Nanoscale Surface Engineering," *Nano Lett.* **4**, 1997-2001 (2004).
15. S.-W. Hla, and K.-H. Rieder. "STM Control of Chemical Reactions: Single-Molecule Synthesis," *Ann. Rev. Phys. Chem.* **54**, 307 (2003).
16. S.-W. Hla, A. Prodan, and H.J.P. van Midden. "Atomistic Stress Fluctuation at Surfaces and Edges of Epitaxially Grown Silver Nanorods," *Nano Lett.* **4** (2004) 1221-1224.
17. C. C. Cudia, S.-W. Hla, G. Comelli, Z. Sljivančanin, B. Hammer, A. Barldi, K. C. Prince, and R. Rosei. "Distinct Reaction Mechanisms in the Catalytic Oxidation of Carbon Monoxide on Rh(110): Scanning Tunneling Microscopy and Density Functional Theory Studies," *Phys. Rev. Lett.* **87**, 137-140 (2001).
18. S.-W. Hla, L. Bartels, G. Meyer, and K.-H. Rieder. "Inducing All Steps of a Chemical Reaction with the Scanning Tunneling Microscope Tip: Towards Single Molecule Engineering," *Phys. Rev. Lett.* **85**, 2777-2780 (2000).