

**Dr. Saw Wai Hla***Group Leader*Electronic & Magnetic Materials & Devices
(EMMD)

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

Dr. Saw Wai Hla received a PhD in physics from the University of Ljubljana in 1997. After postdoctoral appointments at the TASC-INF/M/ELETTRA synchrotron lab in Trieste, Italy, and Freie University/Paul Drude Institute for Solid State Electronics, Berlin in Germany, Dr. Hla joined to Ohio University (OU) as a faculty of physics in 2001. In 2005, Dr. Hla was promoted to associate professor with tenure and in 2011 to full professor. Dr. Hla also was a visiting professor in University of Hamburg, Germany from 2008 to 2009, and in Universite Paul Sabatier in Toulouse, France in 2010 during his sabbatical periods. Since September 2011, Dr. Hla joined to Center for Nanoscale Materials (CNM) at Argonne National Laboratory as a joint appointment with OU. Dr. Hla has also served in numerous national/international boards such as an executive committee member of the American Vacuum Society's Magnetic Interfaces and Nanostructures Division (2006-2008); as a conference/session organizer of various international conferences held in US and Europe as well as the American Physical Society, and Material Research Society, and as a proposal reviewer/panelist for NSF, DOE, NIH, and European funding agencies. In CNM, Dr. Hla leads the Electronic and Magnetic Materials and Devices group. Dr. Hla's research is focused on atom and molecule based nanoscience using low-temperature scanning tunneling microscopy (STM), spin-polarized STM, and atomic/molecular manipulation. He is a leading researcher in the areas of STM single molecule manipulations, single molecule spintronics/electronics, molecular switches and machines on surfaces.

URL: <http://www.phy.ohiou.edu/~hla>**Positions and Employments:****Research Group Leader**, CNM, Argonne National Laboratory, **USA**, 2011 – present**Professor**, Physics & Astronomy Dept., Ohio University, **USA**, 2011 – present**Visiting Professor**, Universite Paul Sabatier, Toulouse, **France**, 2010 (sabbatical with *G. Rapenne*)**Visiting Professor**, University of Hamburg, **Germany**, 2008-2009 (sabbatical with *R. Wiesendanger*)**Associate Professor (tenured)**, Physics & Astronomy Dept., Ohio University, **USA**, 2005 – 2011**Assistant Professor**, Physics & Astronomy Department Ohio University, **USA**, 2001 – 2005**Postdoc**: Freie Universität, and Paul-Drude Institute, Berlin, **Germany**. 1998-2001 (with *K.-H. Rieder*)**Postdoc**: ELECTTRA Synchrotron/TASC-INF/M Lab, Trieste, **Italy**, 1997-1998 (with *R. Rosei*, *G. Comelli*)**Selected Publications:**

1. V. Rose, K. Wang, T.U. Chien, J. Hiller, D. Rosenmann, J.W. Freeland, C. Preissner, and S.-W. Hla. *Synchrotron X-Ray Scanning Tunneling Microscopy: Fingerprinting Near to Far Field Transitions on Cu(111) Induced by Synchrotron Radiation*. **Adv. Funct. Mater.** DOI: 10.1002/adfm.201203431 (2013).
2. U.G.E. Perera, F. Ample, H. Kersell, Y. Zhang, G. Vives, J. Echeverria, M. Grisolia, G. Rapenne, C. Joachim, and S.-W. Hla. *Controlled Clockwise and Anticlockwise Rotational Switching of a Molecular Motor*. **Nature Nanotechnology** **8**, 46-51 (2013).
3. S.-W. Hla. *Graphene: Conductivity Measurement Picks Up*. **Nature Nanotechnology** **7**, 693-694 (2012).
4. B. Wolter, Y. Yoshida, A. Kubetzka, S.-W. Hla, K. von Bergmann and R. Wiesendanger. *Spin Friction Observed on the Atomic Scale*. **Phys. Rev. Lett.** **109**, 116102 (2012).

5. A. DiLullo, S.-H. Chang, N. Baadji, K. Clark, J.-P. Klockner, M.-H. Prosenc, S. Sanvito, R. Wiesendanger, G. Hoffmann, and S.-W. Hla. *Molecular Kondo Chain*. **Nano Lett.** **12**, 3174-3179 (2012).
6. Y.-S. Fu, J. Schwöbel, S.-W. Hla, A. Dilullo, G. Hoffmann, S. Klyatskaya, M. Ruben, and R. Wiesendanger. *Reversible Chiral Switching of Bis(phthalocyaninato) Terbium III on a Metal Surface*. **Nano Lett.** **12**, 3391-3395 (2012).
7. 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).
8. 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).
9. 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).
10. 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).
11. 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).
12. S.-W. Hla. *Molecular Machines: Reinventing the Wheel*. **Nature Nanotechnology** **2**, 82-84 (2007).
13. G. Newkome, P. Wang, C.N. Moorefield, T.J. Cho, P. Mohapatra, S. Li, S.-H Hwang, O. Lukyanova, 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).
14. V. Iancu, A. Deshpande, and S.-W. Hla. *Manipulation of Kondo Effect via Two Dimensional Molecular Assembly*. **Phys. Rev. Lett.** **97**, 266603 (2006).
15. 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).
16. 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).
17. V. Iancu, A. Deshpande, and S.-W. Hla. *Manipulating Kondo Temperature via Single Molecule Switching*. **Nano Lett.** **6**, 820-823 (2006).
18. 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).
19. 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).
20. 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).
21. 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**, 1221-1224 (2004).
22. S.-W. Hla, and K.-H. Rieder. *STM Control of Chemical Reactions: Single-Molecule Synthesis*. **Ann. Rev. Phys. Chem.** **54**, 307-330 (2003).
23. C. C. Cudia, S.-W. Hla, G. Comelli, Z. Slijvancanin, 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).
24. 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).