



LEI SHEN

Lecturer :: Department of Engineering Science Programme
Block EA, #05-09, 9 Engineering Drive 1, NUS, Singapore, 117575
Tel: (+65) 6601 3813; Email: espshen@nus.edu.sg
Webpage: http://www.esp.nus.edu.sg/people/people_index.html

Research **Research interests**

- Computational design of advanced materials for energy and spintronics
- Topological phases of matter
- Materials Genome
- PhD thesis "*Materials for Spintronics: from bulk to nano*" 2011
- Post-doc research topics "*Spintronics with low-dimensional materials*" 2011-2014
- Industry-related research "*Theoretical prediction of new materials and new approach to low power perpendicular magnetic random access memory*" (NUS-GlobalFoundries) 2016

Awards & Certificates

- Offer of Lee Kuan Yew Postdoctoral Fellowship ([Lee Kuan Yew Endowment Fund, 2014](#)) (declined)
- Kawazoe Young Researcher Presentation Award (ACCMS-7, 2013)
- MRS-S Medal for "*the best PhD thesis in Physics*" (Materials Research Society of Singapore, 2011)

Membership

- Singapore Spintronics Consortium (SG-SPIN) Member (since 2014)
- American Physical Society Member (since 2011)
- IEEE Society Member (2010 - 2011)

Publications

Summary

About 50 journal papers, 3 book chapters; 1,500 citations (*h*-index 18)

Full publications: refer to [Annex A](#) or <http://www.researcherid.com/rid/G-1077-2012>

Selected papers

- "*Chemisorption-induced n-doping of MoS₂ by oxygen*" **Applied Physics Letters**, 108, 063103 (2016) [[link](#)]
- "*Electrically tunable in-plane anisotropic magnetoresistance in topological insulator BiSbTeSe₂ nanodevices*" **Nano Letters**, 15, 2061 (2015) [[link](#)]
- "*Topological properties determined by atomic buckling in self-assembled ultra-thin Bi (110)*" **Nano Letters**, 15, 80 (2015) [[link](#)]

- "Efficient Spin Injection into Graphene through a Tunnel Barrier: Overcoming the Spin-Conductance Mismatch" **Physical Review Applied**, 2, 044008 (2014) [[link](#)]
- "Simultaneous magnetic and charge doping of topological insulators with carbon" **Physical Review Letters**, 111, 236803 (2013) [[link](#)]
- "Room-Temperature Ferromagnetism in ZnO-Encapsulated 1.9 nm FePt₃ Nanoparticle-Composite Thin Films with Giant Interfacial Anisotropy" **Advanced Materials**, 25, 1639 (2013) [[link](#)]
- "Origin of Long-Range Ferromagnetic Ordering in MOF with AFM Dimeric-Cu(II) Building Units" **J. Am. Chem. Soc.** 134, 17286 (2012) [[link](#)]
- "Graphene-based spin logic gates" **Applied Physics Letters**, 98, 092110 (2011) [[link](#)]
- "Electron Transport Properties of Atomic Carbon Nanowires between Graphene Electrodes" **J. Am. Chem. Soc.** 132, 11481 (2010) [[link](#)]
- "Charge-transfer-based mechanism for half-metallicity and ferromagnetism in one-dimensional organometallic sandwich molecular wires" **J. Am. Chem. Soc.** 130, 13956 (2008) [[link](#)]
- "Room-temperature ferromagnetism in carbon-doped ZnO" **Physical Review Letters**, 99, 127201 (2007) [[link](#)]

Teaching **Modules**

- PC1433 – Mechanics and Waves (4.70/5 AY2015/2016)
- PC2130B – Applied Quantum Physics (4.56/5 AY2015/2016)
- ESP2109 – Design Project 1 (4.33/5 AY2015/2016)
- ESP3902 – Major Design Project 2 (4.15/5 AY2015/2016)
- FMS1211P – Understanding the Materials Genome (4.59/5 AY2012/2013)

Awards

Teaching Commendation Award (ESP, AY2015/2016)

Service **Journal editorship**

Assistant editor of "International Journal of Computational Materials Science and Engineering" (2012 - present)

Local conference organization

- "Accelerating the Discovery of Advanced Materials Using the Materials Genome Approach" The 9th International Conference on Computational Physics (ICCP9), 7-11 January 2015, Singapore
- "Materials by Theoretical/Computational Design" International Union of Materials Research Societies – International Conference on Electronic Materials (IUMRS-ICEM), 4-8 July 2016, Singapore