Yumeng Yang

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EDUCATION

Ph.D., Electrical & Computer Engineering, National University of Singapore (NUS), Singapore, 2012 - 2017

B.S., Material Science, Sichuan University, China, 2007 - 2011

PROFESSIONAL EXPERIENCES

Assistant professor, ShanghaiTech University, China Jan 2020 – present

Research engineer & Research fellow, NUS, Singapore Mar 2016 – Dec 2019

Graduate assistant, NUS, Singapore Sep 2012 – May 2015

Research assistant, Tsinghua University, China Sep 2011 – Nov 2011

Internship, Wuxi Huiyuan Technology Ltd., China Aug 2011

TEACHING

- EE221 Solid State Physics (2019-2020 Spring, 2020-2021 Spring)
- EE227 Introduction to Nanoelectronics (2020-2021 Fall)

AWARDS

Aug 2014 – Jan 2016: President's Graduate Fellowship, NUS, Singapore

May 2015: Intermag Student Travel Grant, Beijing, China

Jan 2012 – July 2014: NUS Research Scholarship, Singapore

Oct 2010, 2009: Outstanding Student Scholarship, Sichuan University, China

May 2009: "Bosai" Student Scholarship, Sichuan University

LIST OF PUBLICATIONS

Journals:

1. Q. Liu#, Z. Mu#, C. Liua, L. Zhao, L. Chen, **Y. Yang**, X. Wei, W. Yu, *Gate-All-Around MOSFET Built on Void Embedded Silicon on Insulator Substrate*, IEEE Electron Device Letters (Accepted)
2. Y. H. Wu, Y. Xu, Z. Luo, **Y. Yang**, H. Xie, Q. Zhang, and X. Zhang, *Charge–spin interconversion and its applications in magnetic sensing*, Journal of Applied Physics 129, 060902 (2021)
3. Y. Zhang, F. Xue, C. Tang, J. Li, L. Liao, L. Li, X. Liu, **Y. Yang**, C. Song, and X. Kou, *Highly Efficient Electric-Field Control of Giant Rashba Spin–Orbit Coupling in Lattice-Matched InSb/CdTe Heterostructures*, ACS Nano 14, 17396 (2020)
4. S. Hu, H. Yang, M. Tang, H. Chen, **Y. Yang**, S. Zhou, and X. Qiu, *Current‐Induced Planar Resistive Switching Mediated by Oxygen Migration in NiO/Pt Bilayer*, Advanced Electronic Materials 6, 2000584 (2020)
5. Y. Xu, **Y. Yang**, and Y. H. Wu, *Eddy Current Testing of Metal Cracks Using Spin*

Hall Magnetoresistance Sensor and Machine Learning, IEEE Sensors Journal 20, 10502 (2020)

6. Q. Zhang, **Y. Yang**, Z. Luo, Y. Xu, R. Nie, X. Zhang, and Y. H. Wu, *Terahertz Emission From an Exchange-Coupled Synthetic Antiferromagnet*, Physical Review Applied 13, 054016 (2020)
7. H. Xie, Z. Luo, **Y. Yang**, and Y. H. Wu, *In situ study of oxygen and Mg effects on current-induced magnetization switching in Pt/Co bilayers in ultrahigh vacuum*, Applied Physics Letters 116, 122404 (2020).
8. **Y. Yang**, H. Xie, Y. Xu, Z. Luo, and Y. H. Wu, *Multi-state magnetization switching driven by spin current from a ferromagnetic layer*, Physical Review Applied 13, 034072 (2020).
9. J. Yuan#, **Y. Yang#**, Y. Cai, Y. H. Wu, Y. Chen, X. Yan, and L. Shen, *Intrinsic skyrmions in monolayer Janus magnets*, Physical Review B 101, 094420 (2020).
10. Y. Wang#, D. Zhu#, **Y. Yang**, K. Lee, R. Mishra, G. Go, S.-H. Oh, D.-H. Kim, K. Cai, E. Liu, S. D. Pollard, S. Shi, J. Lee, K. L. Teo, Y. H. Wu, K.-J. Lee, and H. Yang, *Magnetization switching by magnon-mediated spin torque through an antiferromagnetic insulator*, Science 366, 1125 (2019).
11. H. Xie, J. Yuan, Z. Luo, **Y. Yang**, and Y. H. Wu, *In-situ study of oxygen exposure effect on spin-orbit torque in Pt/Co bilayers in ultrahigh vacuum*, Scientific Reports 9, 17254 (2019).
12. Q. Zhang, Z. Luo, H. Li, **Y. Yang**, X. Zhang, and Y. H. Wu, *Terahertz emission from anomalous Hall effect in a single-layer ferromagnet*, Physical Review Applied 12, 054027 (2019).
13. Y. Xu, **Y. Yang**, H. Xie, and Y. H. Wu, *Spin Hall magnetoresistance sensor using Au_xPt_{1-x} as the spin-orbit torque biasing layer*, Applied Physics Letters 115, 182406 (2019).
14. Y. Xu, **Y. Yang**, Z. Luo, and Y. H. Wu, *Disentangling magnon magnetoresistance from anisotropic and spin Hall magnetoresistance in NiFe/Pt bilayers*, Physical Review B 100, 094413 (2019).
15. Z. Luo, Q. Zhang, Y. Xu, **Y. Yang**, X. Zhang, and Y. H. Wu, *Spin-Orbit Torque in a Single Ferromagnetic Layer Induced by Surface Spin Rotation*, Physical Review Applied 11, 064021 (2019).
16. Y. Xu, **Y. Yang**, M. Zhang, Z. Luo, and Y. H. Wu, *Ultrathin All-in-one Spin Hall Magnetic Sensor with Built-in AC Excitation Enabled by Spin Current*, Advanced Materials Technologies 3, 1800073 (2018).
17. Z. Luo, Y. Xu, **Y. Yang**, and Y. H. Wu, *Magnetic angular position sensor enabled by spin-orbit torque*, Applied Physics Letters 112, 262405 (2018).
18. **Y. Yang**, Z. Luo, H. Wu, Y. Xu, R.-W. Li, S. J. Pennycook, S. Zhang, and Y. H. Wu, *Anomalous Hall magnetoresistance in a ferromagnet*, Nature Communications 9, 2255 (2018).
19. Y. Xu, **Y. Yang**, Z. Luo, B. Xu, and Y. H. Wu, *Macro-spin modeling and experimental study of spin-orbit torque biased magnetic sensors*, Journal of Applied Physics 122, 193904 (2018).
20. Z. Luo, W. Liao, **Y. Yang**, C. Zhu, and Y. H. Wu, *Selective multiple domain wall injection using spin-orbit torque*, Applied Physics Letters 111, 162404 (2017).
21. Y. Wang#, D. Zhu#, Y. Wu, **Y. Yang**, J. Yu, R. Ramaswamy, R. Mishra, S. Shi, M. Elyasi, K. L. Teo, Y. H. Wu, and H. Yang, *Room temperature magnetization switching in topological insulator-ferromagnet heterostructures by spin-orbit torques*, Nature Communications 8, 1364 (2017).
22. X. Wang, **Y. Yang**, Y. Wang, Z. Luo, H. Xie, and Y. H. Wu, *Spin accumulation in permalloy-ZnO heterostructures from both electrical injection and spin pumping*, Journal of Physics D: Applied Physics 50, 455004 (2017).
23. **Y. Yang**, Y. Xu, H. Xie, B. Xu, and Y. H. Wu, *Semitransparent anisotropic magnetoresistance sensors enabled by spin-orbit toque biasing*, Applied Physics Letters 111, 032402 (2017).
24. Z. Luo, **Y. Yang**, Y. Xu, M. Zhang, B. Xu, J. Chen, and Y. H. Wu, *Static and dynamic magnetic properties of FeMn/Pt multilayers*, Journal of Applied Physics 121, 223901 (2017).
25. **Y. Yang**, J. Yuan, L. Qi, Y. Wang, Y. Xu, X. Wang, Y.P. Feng, B. Xu, L. Shen and

Y. H. Wu, *Unveiling the role of Co-O-Mg bond in magnetic anisotropy of Pt/Co/MgO using atomically controlled deposition and in-situ electrical measurement*, Physical Review B 95, 094417 (2017).

26. **Y. Yang**, Y. Xu, X. Zhang, Y. Wang, S. Zhang, R.-W. Li, M. S. Mirshekarloo, K. Yao, and Y. H. Wu, *Fieldlike spin-orbit torque in ultrathin polycrystalline FeMn films*, Physical Review B 93, 094402 (2016).
27. Y. Xu, **Y. Yang**, K. Yao, B. Xu, and Y. H. Wu, *Self-current induced spin-orbit torque in FeMn/Pt multilayers*, Scientific Reports 6, 26180 (2016)
28. **Y. Yang**, Y. Xu, K. Yao, and Y. H. Wu, *Thickness dependence of spin Hall magnetoresistance in FeMn/Pt bilayers*, AIP Advances 6, 065203 (2016);
29. Y. Wang, J. Chai, S. Wang, L. Qi, **Y. Yang**, Y. Xu, H. Tanaka, and Y. H. Wu, *Electrical oscillation in Pt/VO_2 bilayer strips*, Journal of Applied Physics 117, 064502 (2015).
30. **Y. Yang**, B. L. Wu, K. Yao, S. Shannigrahi, B. Zong, and Y. H. Wu, *Investigation of magnetic proximity effect in Ta/YIG bilayer Hall bar structure*, Journal of Applied Physics 115, 17C509 (2014).
31. Z. X. Chen, Z. Fang, Y. Wang, **Y. Yang**, A. Kamath, X. P. Wang, N. Singh, G. -Q. Lo, D. -L. Kwong, and Y. H. Wu, *Impact of Ni Concentration on the Performance of Ni Silicide/HfO2/TiN Resistive RAM (RRAM) Cells*, Journal of Electronic Materials 43, 4193 (2014).
32. Y. Wang, **Y. Yang**, and Y. H. Wu, *Dynamic control of local field emission current from carbon nanowalls*, Journal of Vacuum Science & Technology B 32, 051803 (2014).
33. Y. Wang, **Y. Yang**, Z. Zhao, C. Zhang, and Y. H. Wu, *Local electron field emission study of two-dimensional carbon*, Applied Physics Letters 103, 033115 (2013).
34. B. L. Wu, **Y. Yang**, Z. B. Guo, Y. H. Wu, and J. J. Qiu, *Suppression of superconductivity in Nb by IrMn in IrMn/Nb bilayers*, Applied Physics Letters 103, 152602 (2013).
35. C. Sun, H. Hu, L. Yi, X. Bai, **Y. Yang**, H. Feng, J. Xu, Y. Chen, Y. Jin, Z. Jiao, and X. Sun, *Photoluminescence of silicon nanostructures prepared via hydrothermal growth progress*, Applied Surface Science 258, 8078 (2012).
36. Y. Liang, X. Bai, **Y. Yang**, E. Nie, D. Liu, C. Sun, H. Feng, J. Xu, Y. Chen, Y. Jin, Z. Jiao, and X. Sun, *Preparation of silica nanowires using porous silicon as Si source*, Applied Surface Science 258, 1470 (2011).

Conferences:

1. Y. H. Wu, **Y. Yang**, Z. Luo, Q. Zhang, and X. Zhang, Spin-charge interconversion based on anomalous Hall effect, Spintronics XII 11090, 110902L (invited).
2. **Y. Yang**, J. Yuan, L. Qi, Y. Wang, Y. Xu, X. Wang, Y.P. Feng, B. Xu, L. Shen, and Y. H. Wu, *In-situ study of the role of Co-O-Mg bond in magnetic anisotropy of Pt/Co/MgO*, IEEE International Magnetics Conference, Dublin, Ireland, 22 – 28 April, 2017 (Oral).
3. **Y. Yang**, Z. Luo, Y. Xu, B. Xu, and Y. H. Wu, *Spin Hall magnetoresistance in FeMn/Pt bilayers and multilayers*, IEEE International Magnetics Conference, Dublin, Ireland, 22 – 28 April, 2017 (Oral).
4. **Y. Yang**, Y. Xu, S. Zhang, R. -W. Li, K. Yao, and Y. H. Wu, *Field-like spin orbit torque in ultra-thin polycrystalline FeMn films*, International Union of Materials Research Societies- International Conference on Electronic Materials, Singapore, 4 – 8 July, 2016 (Oral).
5. **Y. Yang**, X. Zhang, Y. Xu, S. Zhang, R. -W. Li, K. Yao and Y. H. Wu, *Spin orbit torque effect in Pt/FeMn bilayers*, IEEE International Magnetics Conference, Beijing, China, 11 – 15 May, 2015 (Oral).
6. **Y. Yang**, X. Zhang, Y. Wang, K. Yao, Y. H. Wu, *Investigation of Spin-orbit Effect in Pt/NiFe/Ta, Pt/NiFe/Pt and Ta/NiFe/Ta Trilayers*, 59th Annual Conference on Magnetism and Magnetic Materials, Honolulu, Hawaii, 3 – 7 Nov, 2014 (Poster).
7. **Y. Yang**, B. L. Wu, K. Yao, S. Shannigrahi, B. Zong, Y. H. Wu, *Investigation of magnetic proximity effect in Ta/YIG bilayer Hall bar structure*, 58th Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, 4 – 8 Nov, 2013 (Poster).

PATENTS FILED

1. Y. H. Wu, Y. Xu, **Y. Yang**, “Magnetoresistance sensor with AC biasing and rectification detection”. PCT Patent, WO 2019/093964 A9.
2. Y. H. Wu, Y. Xu, Z. Luo, **Y. Yang**, “Method for providing a magnetic sensor with a biasing spin-orbit effective field”, US Patent, US 2018/0106873 A1.
3. Y. H. Wu, Y. Xu, **Y. Yang**, “Antiferromagnet and heavy metal multilayer magnetic systems for switching magnetization using spin-orbit torque”, US Patent, US 2017/0279038 A1.

FUNDING

1. “*Study of all electrical magnetization switching through spin anomalous Hall effect*”. National Science Foundation China (NSFC), 590k RMB, PI, 2021-2024.
2. “*Study of spin orbit torque biased magnetoresistance sensors*”. Shanghai Pujiang Program, 300 k RMB, PI, 2020-2022
3. “*Electrical characterization of spin orbit torques in magnetic heterostructures*”, Open Project of Shanghai Key Laboratory of Special Artificial Microstructure Materials and Technology, Tongji University, 20k RMB, PI, 2020-2021.
4. “*Study on the memory bit cell of SOT-MRAM*”. Open Project of State Key Laboratory of Functional Materials for Informatics, Shanghai Institute of Microsystem and Information Technology, 80k RMB, PI, 2020-2021.
5. ShanghaiTech University Starup Funding, PI, 2020-2023.

PROFESSIONAL SERVICE

Conference session chair:

- Session Chair, AR: “Magneto-electronic Devices”, IEEE International Magnetics Conference, Singapore, 23 – 27 April, 2018.

Journal paper reviewer:

- Japanese Journal of Applied Physics
- IEEE Transactions on Magnetics
- Applied Physics A
- IEEE Transactions on Circuits and Systems II