

# Feng Yan, Ph.D.

Assistant Professor

Department of Metallurgical and Materials Engineering, The University of Alabama  
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## EDUCATION

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### National University of Singapore

Singapore, 2007 - 2011

- **Ph.D., Prof. Lu** Materials Science & Engineering,
- Dissertation: Fabrication and characterization of chemically modified BiFeO<sub>3</sub> multiferroic materials.

### Zhejiang University

Hangzhou, China, 2005 - 2007

- **M. S.** in Materials Science & Engineering
- Thesis: Growth and characterization of GeTe-based thermoelectric materials.

### Xi'an University of Technology

Xi'an, China, 2001 - 2005

- **B. S.** in Materials Science & Engineering

## WORKING AND PROFESSIONAL EXPERIENCE

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### The University of Alabama,

Tuscaloosa, AL, May 2017

- **Assistant Professor** in the Department of Metallurgical and Materials Engineering (MTE)
- Renewable Energy materials and devices
- Electronics and photonics materials and devices, i.e., thin film solar cells

### First Solar, Inc.

Perrysburg, OH, 2014-2017

- **Senior Development Engineer** in Advanced Research Department
- Develop the record conversion efficiency for cadmium-telluride (CdTe) photovoltaic (PV) research cell.
- The most recently achieved world record efficiency of CdTe cell was 22.1% certificated by the Newport Corporation's Technology and Applications center in February 2016. This achievement was *highlighted by various world renowned technology media including MIT Technology Review, Nature Energy*, and accepted by NREL Best Research-Cell Efficiencies Chart.
- Products: 2 US patents and 4 intellectual properties filed

### Harvard University

Cambridge, MA. 2013 - 2014

- **Postdoctoral Fellow.** Prof. Shriram Ramanathan, School of Engineering and Applied Sciences
- Nanoscale fabrication and characterization of the electronic behavior of correlated complex oxides using scanning probe microscopy.
- Products: 2 paper published, and 1 first author paper in J. Mater. Chem. C.

### Northwestern University

Evanston, IL 2012 - 2013

- **Postdoctoral Fellow.** Prof. T. O. Mason, Department of Materials Science and Engineering
- New materials discovery and laboratory realization for renewable energy application using high-throughput computational calculation.
- Products: 2 paper published, and 1 first author paper in Nature Communication

### Drexel University

Philadelphia, PA. 2011 - 2012

- **Research Associate.** Prof. J. E. Spanier, Department of Materials Science and Engineering
- Research focuses on complex oxide materials and devices, e.g., ferroelectric, multiferroic, and photovoltaic materials.
- Bulk targets fabrication using metallurgical engineering and thin film deposition using Physical Vapor deposition.
- Physical properties characterization at nanoscale using scanning probe microscopy, e.g., optical, magnetic, electronics behavior in complex oxide thin films.
- Products: 7 papers published, and 4 first and correspondence author in Appl. Phys. Lett. ACS Nano, etc.

### University of Freiburg

Freiburg, German, 2009

- **Visiting scholar.** Prof. Emre, Department of Chemistry.
- Research focuses on defects chemistry in complex oxides characterization using Electron Paramagnetic response (EPR).
- Products: 1 papers published as first authors and correspondence author in Scientific Report.

## RESEARCH INTEREST

- **Materials synthesis and characterization for renewable energy applications**
  - II-VI group alloy thin film growth and characterization, e.g., CdTe, CdS, ZnTe, ZnCdTe, and CdSe materials
  - Perovskite materials used for renewable energy, e.g., methylammonium lead trihalide ( $\text{CH}_3\text{NH}_3\text{PbX}_3$ ), BiFeO
  - Metallurgical engineering for new materials with variable bandgap used for renewable energy application, such as back contact materials, electron reflector materials, transparent conducting materials.
- **Devices fabrication and characterization for renewable energy application**
  - II-VI semiconductor solar cells, such as CdTe thin film solar.
  - Perovskite solar cell.
  - Ferroelectric and multiferroics solar cells
- **Next generation informative data storage technologies development**
  - Ferroelectric/multiferroics materials for multistate data storage
  - Devices fabrication and characterization for data storage behavior, e.g., ferroelectric, magnetic, resistivity, and photovoltaics.
  - Nanoscale characterization of the electronic behaviors in memory.

## RESEARCH EXPERIENCE

**First Solar, Inc.**, (2 US patents and 4 intellectual properties filed)

**Perrysburg, OH**

• **High-Efficiency CdTe Thin Film Solar Cells.** I invented a method to involving oxides into the CdTe thin film solar cells to increase the cell efficiency. Such coupling between oxides and CdTe has plenty of benefits to optimize the grain size in the cells and manipulate the grain boundaries in order to reduce the stack faults in the devices. The tailoring of the grain and grain boundaries during the CdCl<sub>2</sub> treatment significantly improves the cell performance and achieves new efficiency.

• **Metallurgical Engineering of Bandgap in II-VI semiconductor.** I developed a new method to synthesize II-VI alloy semiconductor with introducing either intrinsic or extrinsic dopants in order to engineer the bandgap in II-VI semiconductor and further tuning the bandgap gradient to apply into the thin film solar cells. I also invented two-step synthesis of pseudo-binary solid state solution in order to control the bandgap via stabilizing the various phase structures.

**Harvard University** (2 papers published)

**Cambridge, MA**

• **Correlated oxides growth and characterization at the nanoscale.** I fabricated phase pure SmNiO<sub>3</sub> thin films using physical vapor deposition. I also nanofabricated the electronic devices in clean room for physical properties characterization, such as temperature dependence IV test. I also performed nanoscale characterization of the work function of SmNiO<sub>3</sub> using scanning force microscopy (SPM), including atomic force microscopy, (AFM), Kelvin probe force microscopy (KPFM) and electrostatic force microscopy (EFM). The nanoscale transition between metallic and insulating phase as a function of temperature was recorded using the conductive atomic force microscopy (c-AFM). Meanwhile, the metal-insulator transition mechanisms at nanoscale by precisely tuning external thermal and electrical fields in two-terminal electrode devices was systematically investigated. (1 first authorship paper published at J. Mater. Chem. C.)

**Northwestern University** (2 papers published)

**Evanston, IL**

• **Computationally driven novel p-type transparent conductors, leveraged by “inverse design”** (1 paper published in [Nature Communication](#)). I successfully fabricated a first p-type transparent conductor with three metal elements. Such transparent conductor was not known previously and was successfully synthesized based on the thermodynamics calculation. The stability was confirmed at room temperature and was experimentally fabricated into an ingot and then deposited into thin films. The optical characterization was conducted and the transparent behavior is demonstrated in the visible spectra range. The unique bandgap was extracted through the diffusion reflectance and was in agreement with the calculated electronic structure using first principle calculation.

• **New oxides used for renewable energy based high throughput computational design.** I experimentally fabricated quaternary oxides. The designed, fabricated and characterization for a series of novel oxide and oxide sulfide electroceramics in the spirit of “[inverse design](#)” for energy applications such as transparent absorbers for inorganic photovoltaics and as photocatalysts for solar water splitting was conducted and promising results were achieved.

**Drexel University** (7 papers published)

Philadelphia, PA

- **Complex oxide thin film synthesis and characterization.** I assembled a pulsed laser deposition (PLD) system in Prof. Spanier's group. I fabricated and characterized the multifunctional complex oxides materials, e.g., KNbO<sub>3</sub>, BaTiO<sub>3</sub>, and BiFeO<sub>3</sub>. The microstructure and the physical properties were successfully characterized, i.e., ferroelectric, photovoltaic, and resistive switching, of complex oxides at the nanoscale using TEM, AFM, etc.
- **Multiferroics devices fabrication.** The multiferroics coupling between electronics and spins were characterized in the BiFeO<sub>3</sub> thin films devices. The nano-devices were fabricated and the magnetic field impact on the polarization was successfully identified at local scale using the scanning probe microscopy with magnetic accessories. The ferroelectric polarization as a functional of the in-plane magnetic field was investigated and the improved ferroelectrics behavior was demonstrated with the presence of magnetic field. I revealed and realized a new method to investigate the coupling between electrical and magnetic ordering in multiferroics.
- Prepared nanoscale multiferroic devices for data storage via electron beam lithography (EBL), a thermal evaporator, wire bonder and wetting etch.
- Identified photovoltaic effect in multiferroics/ferroelectric materials via a developed unique approach by combining Piezoresponse Force Microscopy (PFM) and Kelvin Probe Force Microscopy (KPFM).
- Precisely measured the magnetoelectric coefficient via a highly efficient local technique for multiferroic BiFeO<sub>3</sub>-CoFe<sub>2</sub>O<sub>4</sub> composites.

**National University of Singapore** (15 papers published)

Singapore

- **Complex multiferroic oxides design, fabrication, and characterization.** I conducted physical vapor deposition of the multiferroics oxides, which is owning electric and magnetic ordering in a single phase oxide. The ferroelectric polarization and magnetic variation could be used as next generation data storage technologies. The perovskite structure was successfully grown on varieties of semiconducting/dielectric substrates, including Si, Al<sub>2</sub>O<sub>3</sub>, SrTeO<sub>3</sub>, and Sapphire.
- **Novel multiferroics nanoarchitectures.** With PLD technique, I developed a 3D nanodot-based Multiferroics devices was demonstrated to be excellent data storage applications. By manipulating the growth conditions, 3D CoFe<sub>2</sub>O<sub>4</sub> nanostructures with magnetic was successfully embedded into BiFeO<sub>3</sub> matrix. The multiferroics properties for these 3D nano dots can improve the magnetic behavior.
- **Magnetoelectronic behavior at local scale.** I established methods to determine the magnetoelectronic behavior of thin film multiferroics oxides using the probed ferroelectric domain structure for epitaxial and polycrystalline composite. I successfully realized ferroelectric domain-switching behavior for deposited multiferroic oxide composites at nanoscale using the piezoelectric force microscopy (PFM) and magnetic domain structure using the magnetic force microscopy (MFM).
- **Spintronics devices based on multiferroic oxides.** The spintronics devices were fabricated in the clean room, and the spintronics behavior was characterized using the physical properties measurement system (PPMS). The electrical and magnetic properties were investigated systematically.

**University of Freiburg** (1 paper published)

Freiburg, Germany

- Defect Chemistry in multiferroic complex oxide materials. The defects in the BiFeO<sub>3</sub> was investigated using the Electron Paramagnetic Resonance (EPR) technique. The intrinsic and extrinsic defects were characterized, and the surface magnetic phase transition and defect chemistry behaviors of multiferroic materials were systematically investigated. The coupling between the spins and the electrons was modeled.

**Zhejiang University** (6 paper published)

Hangzhou, China

- High-performance thermoelectric materials design, process, and characterization. I successfully developed high-performance thermoelectric nanomaterials in a unique amorphous-crystalline system, i.e., GeTe, PbTe, and Bi<sub>2</sub>Te<sub>3</sub>. The nanostructure interaction between the amorphous and crystalline was systematically investigated, and the thermoelectric properties were demonstrated in this novel system. This research was reported by several journals and websites.

**TEACHING AND MENTORING EXPERIENCE****Harvard University, Graduate Student Research Mentor**

Cambridge, MA

- Instructed the graduate student for the characterization of the work function of correlated oxides.
- Trained the graduate students for the scanning probe microscopy operation.

2013

**Northwestern University, Graduate student Research Mentor,**

Evanston, IL

- Trained and project supervisor for one graduate student using vacuum metallurgy
- Mentored and advised for one graduate student for analyzing the new ABX compounds.

2012 - 2013

**Drexel University, Graduate Student Research Mentor,**

- Trained and supervised two graduate students on using PLD system to deposit high-quality complex oxide thin films.
- Conducted experiments on local probing of magnetoelectric coupling and magnetoelastic control of switching in BiFeO<sub>3</sub>-CoFe<sub>2</sub>O<sub>4</sub> composite, which led to a publication in *Appl. Phys. Lett.*
- Investigated on temperature-dependent ferroelectric resistive switching in BiFeO<sub>3</sub> films, and the results have been submitted to *Appl. Phys. Lett.*

Philadelphia, PA

2011 - 2012

**National University of Singapore, Teaching Assistant,**

- TA of Materials Science and Engineering: An Introduction

Singapore

Aug. 2009 - Nov. 2010

**National University of Singapore, Graduate Student Research Mentor,**

- Supervised 4 undergraduate students on a one-year material research project for 3½ years

Singapore

Aug. 2008 - Apr. 2011

**National University of Singapore, Lab Assistant,**

Materials Science Lab,

Singapore

Aug. 2008 - Apr. 2011

- Trained and consulted both undergraduate and graduate students on material research techniques, i.e., XRD, SEM, AFM, MMR probe station, ferroelectric tester, etc.

**Zhejiang University, Lab Assistant,**

Energy Lab,

Hangzhou, China

Sept. 2005 - Jun. 2007

- Designed and maintained a rapid-quenching thermal treatment system and a thermoelectric tester.

**PUBLICATIONS (\* indicates as the corresponding author) [Google Scholar Link \(>700 citations\)](#)****First Authorship (23 scientific journals)**

1. **F. Yan**, X.Zhang, Y. G. Yu, L. Yu, A. Nagaraja, T. O. Mason, A. Zunger Design and discovery of a novel half-Heusler transparent hole conductor made of all-metallic heavy elements, *Nature Communications* (2015, 6, 7308)
2. **F. Yan**, G. Z. Xing, S. Li, L.Li. Magnetic phase transition of Mn-doped BiFeO<sub>3</sub>. *Scientific Reports*. 2015, 5, 9128.
3. **F. Yan\***, F. Schoofs, J. Shi, S. D. Ha, R. Jaramillo, S. Ramanathan, *Local charge writing in epitaxial SmNiO<sub>3</sub> thin films*, *J. Mater. Chem. C* 2, 3805, (2014).
4. **F. Yan**, G. Chen, L. Lu, and J. E. Spanier, *Dynamics of photo-generated surface charge on BiFeO<sub>3</sub> films*. *ACS Nano*, 6, 2353, (2012)
5. **F. Yan**, M. O Lai, L. Lu and T. J. Zhu. *Enhanced multiferroic properties and valence effect of Ru-doped BiFeO<sub>3</sub> thin films*. *J. Phys. Chem. C*, 114, 6994 (2010).
6. **F. Yan\***, G. Z.Xing, L. Li, *Low temperature dependent ferroelectric resistive switching in epitaxial BiFeO<sub>3</sub> films*. *Appl. Phys. Lett.* 104, 132904, (2014)
7. **F. Yan**, G. Chen, L. Lu, P. Finkel, and J. E. Spanier. *Local probing of magnetoelectric coupling and magnetoelastic control of switching in BiFeO<sub>3</sub>-CoFe<sub>2</sub>O<sub>4</sub> thin-film nanocomposite*. *Appl. Phys. Lett.* 103, 042906, (2013).
8. **F. Yan\***, G. Z. Xing, M. Islam, S. Li, and L. Lu. *Orientation-dependent surface potential behavior in Nb-doped BiFeO<sub>3</sub>*. *Appl. Phys. Lett.*, 100, 172901, (2012).
9. **F. Yan\***, M. Shu, T. J. Zhu, M. O Lai, and L. Lu. *Strain effect on the surface potential and nanoscale switching characteristics of multiferroic BiFeO<sub>3</sub> thin films*. *Appl. Phys. Lett.* 100, 132907, (2012).
10. **F. Yan\***, M. O Lai, and L. Lu. *Domain structure and piezoelectric response in rare earth-substituted multiferroic BiFeO<sub>3</sub> thin films*. *J. Phys. D: Appl. Phys.*, 45, 325001, (2012)
11. **F. Yan\***, T. J. Zhu, M. O Lai, and L. Lu. *Influence of La and Ru dopants on multiferroic properties of polycrystalline BiFeO<sub>3</sub> thin films*, *Appl. Phys. Express.*, 4, 111502 (2011)
12. **F. Yan\***, M. O Lai, L. Lu and T. J. Zhu. *Role of Pb(Zr<sub>0.52</sub>Ti<sub>0.48</sub>)O<sub>3</sub> substitution in multiferroic properties of polycrystalline BiFeO<sub>3</sub> thin films*. *J. Appl. Phys.*, 110, 114116, (2011)
13. **F. Yan\***, M. O Lai, L. Lu and T. J. Zhu. *Variation of leakage mechanism and potential barrier in La and Ru co-doped BiFeO<sub>3</sub> thin films*. *J. Phys. D: Appl. Phys.*, 44, 435302 (2011)
14. **F. Yan\***, T. J. Zhu, M. O Lai, and L. Lu. *Effect of bottom electrodes on nanoscale switching characteristics and piezoelectric response in polycrystalline BiFeO<sub>3</sub> thin films*. *J. Appl. Phys.*, 110, 084102 (2011)
15. **F. Yan**, S. Miao, I. Sterianou, I. M. Reaney, M. O. Lai, L. Lu, and W. D. Song. *Multiferroic properties and temperature-dependent leakage mechanism of Sc-substituted bismuth ferrite-lead titanate thin films*. *Scr. Mater.*, 64, 458 (2011).
16. **F. Yan**, M. O Lai, L. Lu, and T. J. Zhu. *Enhanced multiferroic properties and domain structure of La doped BiFeO<sub>3</sub> thin films*. *Scr. Mater.*, 63, 780 (2010).
17. **F. Yan**, T. J. Zhu, M. O. Lai, L. Lu. *Influence of oxygen pressure on the ferroelectric properties of BiFeO<sub>3</sub> thin films on LaNiO<sub>3</sub>/Si substrates via laser ablation*. *Appl. Phys. A.*, 101, 651 (2010).
18. **F. Yan**, I. Sterianou, S. Miao, I. M. Reaney, M. O. Lai, and L. Lu. *Multiferroic properties of Bi(Fe<sub>0.5</sub>Sc<sub>0.5</sub>)O<sub>3</sub>-PbTiO<sub>3</sub> thin films*. *Phys. Scr.*, T139. 014003, (2010).

19. **F. Yan**, I. Sterianou, S. Miao, I. M. Reaney, M. O. Lai, and L. Lu. *Magnetic, ferroelectric, and dielectric properties of Bi(Sc<sub>0.5</sub>Fe<sub>0.5</sub>)O<sub>3</sub>-PbTiO<sub>3</sub> thin films.* **J. Appl. Phys.**, 105, 074101 (2009).
20. **F. Yan**, T. J. Zhu, X. B. Zhao, and S. R. Dong. *Microstructures and thermoelectric properties of GeSbTe based layered compounds.* **Appl. Phys. A.**, 88, 425 (2007).
21. **F. Yan**, T. J. Zhu, S. N. Zhang, and X. B. Zhao, *Microstructure and thermoelectric properties of cubic AgPb<sub>18</sub>Sb<sub>1-x</sub>Te<sub>20</sub> (x = 0.1, 0.3, 0.5) compounds,* **Phys. Scr.**, T129 116 (2007).
22. **F. Yan**, T. J. Zhu, X. B. Zhao, and S. R. Dong, *A study of the crystallization kinetics of Ge-Te amorphous system,* **J. Univ. Sci. Techn. Beijing**, S1, 64, (2007).
23. **F. Yan**, T. J. Zhu, and X. B. Zhao, *Progress in study on phase-change-materials,* **J. Funct. Mater.**, 37, 329, (2006).

#### Other authorship

24. G. Z. Xing, J. B. Yi, **F. Yan**, T. Wu and S. Li, Positive magnetoresistance in ferromagnetic Nd doped In<sub>2</sub>O<sub>3</sub> thin films grown by pulse laser deposition. **Appl. Phys. Lett.** 104, 202411, (2014).
25. D.D. Wang, G. Z. Xing, **F. Yan**, Y.S. Yan, S. Li, Ferromagnetic (Mn, N)-codoped ZnO nanopillars array Experimental and computational insights. **Appl. Phys. Lett.** 104, 022412, (2014)
26. L. Li, N. Wang, **F. Yan**, Transient response in metallic glass deformation: A study based on shear transformation zone dynamics simulations. *Scripta Mater.* 80, 25, 2014.
27. H. Xia, Y. Wan, **F. Yan**, L. Lu, *Manganese oxide thin films prepared by pulsed laser deposition for thin film microbatteries,* **Materials Chemistry and Physics**, in press (2013).
28. A. Kumar, **F. Yan**, K. Y. Zeng, and L. Lu. *Electric, magnetic and mechanical coupling effects on ferroelectric properties and surface potential of BiFeO<sub>3</sub> thin film.* **Funct. Mater. Lett.**, 4, 91 (2011)
29. H. Xia, **F. Yan**, M. O. Lai and L. Lu. *Electrochemical properties of BiFeO<sub>3</sub> thin films prepared by pulsed laser deposition.* **Funct. Mater. Lett.**, 2, 163 (2009).
30. T. J. Zhu, **F. Yan**, X. B. Zhao, *Preparation and thermoelectric properties of bulk nanocomposite with amorphous/nanocrystal in-situ hybrid structure,* **J. Phys. D: Appl. Phys.**, 40 6094 (2007).
31. T. J. Zhu, **F. Yan**, S. N. Zhang, and X. B. Zhao, *Microstructure and electrical properties of quenched AgPb<sub>18</sub>Sb<sub>1-x</sub>Te<sub>20</sub> thermoelectric materials,* **J. Phys. D: Appl. Phys.**, 40, 3537 (2007).
32. D. D. Wang, G. Z. Xing, **F. Yan**, Y. F. Li, B. Yao, Y. S. Yan, and S. Li. Ferromagnetic (Mn, N) codoped ZnO nanopillars array: experimental and computational insights. (*Appl. Phys. Lett.* 2013)
33. T. J. Zhu, Y. Q. Cao, **F. Yan**, and X. B. Zhao, *Nanostructuring and thermoelectric properties of semiconductor tellurides,* Conference Proceedings ICT 07: 26<sup>th</sup> International Conference on Thermoelectrics 2007, Jeju, Korea.

#### Submitted and in preparation:

34. **F. Yan**, etc. *Temperature-dependent localized resistivity switching in BiFeO<sub>3</sub> films* (Submitted to *Appl. Phys. Lett.*).

### CONFERENCE PRESENTATIONS

1. **F. Yan**, G. Chen, L. Lu, J. E. Spanier. *Dynamics of photo-generated surface charge on BiFeO<sub>3</sub> films.* **Materials Research Society (MRS) fall meeting**, Boston, USA, Nov. 2011
2. **F. Yan**, T. J. Zhu, M. O. Lai, and L. Lu, *Influence of oxygen pressure on the ferroelectric properties of BiFeO<sub>3</sub> thin films on LaNiO<sub>3</sub>/Si substrates via laser ablation.* **The 10<sup>th</sup> Conference of Laser Ablation**, Singapore, Nov. 2009.
3. **F. Yan**, I. Sterianou, S. Miao, I. M. Reaney, M. O. Lai, and L. Lu. *Multiferroic properties of Bi(Fe<sub>0.5</sub>Sc<sub>0.5</sub>)O<sub>3</sub>-PbTiO<sub>3</sub> thin films.* **The 3<sup>rd</sup> international Symposium on Functional Materials (ISFM)**. Jinju, Korea, Jun. 2009.
4. **F. Yan**, T. J. Zhu, S. N. Zhang, and X. B. Zhao, *Microstructure and thermoelectric properties of cubic AgPb<sub>18</sub>Sb<sub>1-x</sub>Te<sub>20</sub> (x = 0.1, 0.3, 0.5) compounds.* **The 2<sup>nd</sup> international Symposium on Functional Materials (ISFM)**. Hangzhou, China, May 2007.
5. X. Zhang, L. Yu, A. Zunger, **F. Yan**, Arpun R. Nagaraja, R. Gautier, T. O. Mason, K. R. Poeppelmeier, A. Zakutayev, D. Ginley, *Discovery of missing functional ABX compounds.* **Materials Research Society (MRS) fall meeting**, Boston, USA, Dec. 2013
6. R. Gautier, X. Zhang, A. Zakutayev, A. R. Nagaraja, **F. Yan**, L. Yu, S. Lany, D. S. Ginley, T. O. Mason, K. R. Poeppelmeier, A. Zunger, *Inverse design of ternary ABX inorganic materials.* **Energy Frontier Research Center Meeting**. 2013.

### PATENTS

- **F. Yan**, etc. A process for making powder alloys containing cadmium and selenium, **US, filed 2014**
- **F. Yan**, etc. Devices and methods for making polycrystalline alloys, **US, filed 2015**
- **F. Yan**, etc. *A novel thermoelectric nanocomposites with amorphous/nanocrystals in-situ hybrid structure*, China patent, CN 1937272A.

## SERVICES and MEMBERSHIPS

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- **Invited as a referee for more than 30 journals:**

*Journal of Materials Chemistry, Applied Physics Letters, Physical Chemistry Chemical Physics, Journal of Applied Physics, Journal of Physics: D, Applied Physics A, Materials Letters, Journal of Electronic Materials, Functional Materials Letters, Thin solid films, Nanoscale Research Letters, Journal of Magnetism and Magnetic materials, Ferroelectrics, Superlattice and Microstructures, Journal of Sol-gel science and Technology, Journal of Physics, Chemistry of solids, Nanotechnology, Composites Science and Technology, Ceramic international, Materials Science and Engineering B.,*

- **Membership:** Materials Research Society (MRS), American Physical Society (APS), American Chemical Society (ACS).

## AWARDS

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|---|------------------|
| • Research Scholarship, National University of Singapore, Singapore                 | <b>2007-2011</b> |
| • Research Fellowship, Freiburg University, Freiburg, Germany                       | <b>2009</b>      |
| • Excellent All-round Graduate, Zhejiang University, Hangzhou, China                | <b>2007</b>      |
| • First Class, National Scholarship of China, Xi'an, China                          | <b>2004</b>      |
| • First Class, University Scholarship, Xi'an University of Technology, Xi'an, China | <b>2002-2005</b> |

## EMPLOYMENT STATUS

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- US Lawful Permanent Resident (Green Card Holder).