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### Academic Qualification

Ph.D. in Chemistry Materials, Department of Chemistry, **Tsinghua University**, Beijing, China  
Bachelor in Qingdao University of Science and Technology, Qingdao, China

### Teaching Area

Inorganic chemistry  
Semiconductor physics  
New energy and materials  
Selected topics in electrical materials

### Research Area

Energy materials and their related device, silicon solar cell, light converting materials.  
Morphology and phase control of polymer/inorganic materials.  
Flexible electronics, Self-powered Sensor, conducting ink.  
Charge separation and transport in organic/inorganic hybrid composites.  
Fabrication and characterization of solution-processed light-emitting diodes and solar cells, thin film transistor.  
Optoelectronic properties of organic/nanostructured semiconductor devices.  
Interface/surface chemistry and physics of organic/inorganic semiconductor.

### Professional Services

2015-present, Advisory Editorial Board, Physica Status Solidi A, B,C&RRL (IF:1.349-2.815) Publisher:  
WILEY-VCH Verlag GmbH & Co. KGaA, Germany  
2020 present, Editorial Board Members, Frontiers in Electronics, Switzerland

### Working Experience

2002.8-2007.4 Research Associate in Optoelectronics, **Cavendish Laboratory (Physics), Cambridge University** (Advisor Sir Richard Friend), Cambridge, United Kingdom  
2007.5-2009.01 Research Scientist in C-PCS, **Los Alamos National Laboratory** (Hosted by Dr. Victor Klimov), NM, USA  
2009.01-Present **Professor in Institute of Functional Nano & Soft Materials (FUNSOM)**, Soochow University, Suzhou, China  
2021.01-Present **Professor in Institute of Materials Science and Engineering**, Macau University of Science and Technology, Macau, China

### Academic Publication

**200 “SCI” indexed articles with more than 22,000 citations, H-index=78**

#### (Selected 2023-2025)

1. Shao B, Wu T-C, Yan Z-X, Ko T-Y, Peng W-C, Jhan D-J, Chang Y-H, Fong J-W, Lu M-H, Yang W-C, Chen J-Y, Lu M-Y, Sun B, Liu H-J, Liu R, Lai Y-C. Deep learning–empowered triboelectric acoustic textile for voice perception and intuitive generative AI-voice access on clothing. *Science Advances*. **2025**, 11(41):eadx3348.
2. Li Y, Yu J, Li J, Wang Y, Sun B. Critical Factors and Equilibrium Analysis of Luminescent Down-Shifting Process for Silicon Heterojunction Solar Cells. *Adv Energy Mater*. **2025**, 15(24):2405918.
3. Lan T, Zhao T, Liu Y, Cao J, Li W, Yang J, Zhang X, Wang Y, Sun B. Correlative Raman–Voltage Microscopy Revealing the Localized Structure–Stress Relationship in Silicon Solar Cells. *ACS Nano*. **2025**, 19(4):4473-83.
4. Gao P, Luo C, Sung HHY, Zheng G, Yang S, Gao X, Zhao Y, Sun B, Zhao Q. Visible-to-infrared

photoabsorption in supermolecule-induced Turing-structured perovskite hybrid semiconductors. *Science Advances*. **2025**, 11(24):eadu0298.

5. Bai G, Li J, Lan T, Gao T, El-Shaer A, Shao B, Sun B. Faradaic Reversible Electrodes Enable Programmable High-Power Hydrovoltaic Energy Harvesting Across Broad Ionic Environments. *Advanced Materials*. **2025**, n/a(n/a):e18509.

6. Zhang J, Wang J, Cai L, Wang S, Wu K, Sun B, Zheng W, Kershaw SV, Jia G, Zhang X, Rogach AL, Yang X. Fine-Tuning Crystal Structures of Lead Bromide Perovskite Nanocrystals through Trace Cadmium(II) Doping for Efficient Color-Saturated Green LEDs. *Angewandte Chemie International Edition*. **2024**, 63(26):e202403996.

7. Zeng X, Ding Y, Yuan X, Jiang C, Wang Y, Song Y, Li Y, Shao B, Wang Y, Sun B. Photo-Mediated Cascade Growth of Ag Nanocrystals in Flow Reactors for High-Performance Flexible Transparent Electrodes. *Advanced Functional Materials*. **2024**, 34(8):2309730.

8. Wang Y, Yuan X, Ni K, Song Y, Li X, Zeng X, Shao B, Sun B. 3D dendritic hierarchically gradient nanoflowers in situ grown on conductive substrates for efficient hydrovoltaic power generation. *Energy & Environmental Science*. **2024**, 17(13):4780-93.

9. Shao B, Lu T-C, Lu M-H, Chen Y-T, Wu T-C, Peng W-C, Ko T-Y, Chen J-Y, Sun B, Chen C-Y, Liu R, Hsu F-C, Lai Y-C. Efficient Permeable Monolithic Hybrid Tribo-Piezo-Electromagnetic Nanogenerator Based on Topological-Insulator-Composite. *Advanced Materials*. **2024**, 36(41):2408936.

10. Shao B, Lu M-H, Wu T-C, Peng W-C, Ko T-Y, Hsiao Y-C, Chen J-Y, Sun B, Liu R, Lai Y-C. Large-area, untethered, metamorphic, and omnidirectionally stretchable multiplexing self-powered triboelectric skins. *Nature Communications*. **2024**, 15(1):1238.

11. Duan W, Shao B, Wang Z, Ni K, Liu S, Yuan X, Wang Y, Sun B, Zhang X, Liu R. Silicon nanowire/ionic hydrogel-based hybrid moist-electric generators with enhanced voltage output and operational stability. *Energy & Environmental Science*. **2024**, 17(11):3788-96.

12. Song Y, Song Z, Jiang C, Xing C, Zeng X, Zhang Z, Chen Z, Song T, Shao B, Wang Y, Sun B. Ferroelectric Layer-Assisted Asymmetric Heterojunction Boosts Power Output in Silicon Hydrovoltaic Device. *Adv Energy Mater*. **2023**, 13(48):2302765.

13. Shao B, Song Y, Song Z, Wang Y, Wang Y, Liu R, Sun B. Electricity Generation from Phase Transitions between Liquid and Gaseous Water. *Adv Energy Mater*. **2023**, 13(16):2204091.

## Research Grants

2021.10 -- 2024.11 Unveiling the Degradation Mechanism of Perovskite Light-Emitting Diodes From Molecular Insight and Development of Efficient and Stable Devices (FDCT, 0044/2021/A)

2022.10 -- 2025.10 Highly stable blue quantum dots with narrow emission width and their electroluminescence devices (FDCT, 0017/2022/AGJ)

2023.10 -- 2026.11 Highly stable quantum dots for high resolution display application and their demonstrations in Microdisplays (FDCT, (0005/2022/AKP)