Join the Zhao Nano Lab at UGA – Shape the Future of Science and Technology!

Are you ready to embark on groundbreaking research at the intersection of nanotechnology, sensors, artificial intelligence, and advanced materials? The **Zhao Nano Lab** (https://www.zhao-nano-lab.com/) at the University of Georgia invites passionate graduate and undergraduate students to join our dynamic, multidisciplinary team, engaging in experimental, theoretical, and data science-driven projects. Discover opportunities to contribute to cutting-edge research that fuses creativity, innovation, and real-world impact.

Research Opportunities

1. SERS-Based Biosensor Development (with UGA Vet Diagnostics Labs and other UGA infectious disease/enviromental experts)

- *Pioneering detection technologies:* Develop state-of-the-art methods for detecting viruses, bacteria, PFAS, and microplastics.
- *Integrated solutions:* Combine SERS with other advanced techniques to invent novel biosensing approaches.
- *Single-cell analysis:* Create a platform for SERS-based single-cell analysis.
- *Fundamental studies:* Use modeling and numerical calculations to deepen our understanding of the SERS mechanism.

2. Hydrogen Sensor Development (with Prof. Tho Nguyen, SRNL and industry)

- *Nanostructured sensors:* Design and characterize cutting-edge hydrogen sensors.
- *Mechanistic insights:* Investigate hydrogen sensing mechanisms and mass transport effects.

3. Artificial Intelligence in Sensors (with multiple groups in UGA AI Institute)

- *AI integration:* Combine machine learning with SERS-based sensors to revolutionize detection capabilities.
- *Optimization and design:* Use AI to enhance the design and optimization of SERS and hydrogen sensors.
- *Advanced algorithms:* Integrate diverse AI methods to push sensor performance to new heights.

4. CHIP-Based Research (with Prf. Kenan Song, Marshall Shepherd, Tina Salguero, Georgia Tech, multiple companies)

- *Innovative materials:* Fabricate and characterize package materials for advanced electronics.
- *Thermal solutions:* Design heat dissipation materials and devices.
- *Fundamental exploration:* Study air dynamics and thermal transport in micro/nanostructures.

5. LLMs and Open-Access Ecosystems (with multiple groups in UGA AI Institute)

- *Research & education tools:* Develop large language models (LLMs) tailored for research and education.

- *SpectraGuru ecosystem:* Expand the open-source platform SpectraGuru.org for spectroscopy, integrating cutting-edge databases and tools.

6. Nanofabrication

- *Novel structures:* Explore glancing angle deposition (GLAD) for creating nanostructures used in sensors, energy, and drug delivery.
- *Hybrid methods:* Innovate with nanosphere lithography combined with GLAD and AI.

7. Metamaterials

- *Chiral breakthroughs:* Fabricate and characterize chiral metamaterials for biosensing applications.
- *Fundamental physics:* Investigate the design of chiral materials, their interaction with electromagnetic waves, and AI-powered applications.

Why Join the Zhao Nano Lab?

- *Innovative Projects:* Work on projects that address real-world challenges in biosensing, energy, and AI-driven sensor technology.
- *State-of-the-Art Facilities:* Access world-class tools and expertise in nanofabrication and advanced characterization.
- *Interdisciplinary Collaboration:* Be part of a team that combines physics, engineering, AI, and chemistry for groundbreaking discoveries.
- *Career Growth:* Gain hands-on experience and mentorship to excel in academia, industry, or entrepreneurship.

Who Should Apply?

We welcome **motivated students** from diverse backgrounds in **physics, engineering, materials science, computer science, and related fields**. If you're passionate about innovation, curious about cutting-edge research, and eager to make an impact, we want to hear from you!