ZHEWEN YIN

PhD in Mechanical Engineering — Specializing in Semiconductor Process & 2D Materials.

@ yzw994@gmail.com Google Scholar LinkedIn Personal Website

EXPERIENCE

Postdoctoral Fellow & Graduate Research Assistant

NM3L Laboratory, University of South Florida

Aug 2018 – Ongoing Tampa, U.S.

- Primary research areas include the manufacturing, engineering, and optic/electronic applications of two-dimensional materials.
- **Collaboration:** Collaborated with groups from the University of Toronto, University of Illinois Urbana-Champaign, and Clemson University, completing projects including microplastics tracking in water systems, self-assembly of gold nanoparticles, etc.
- **Leadership:** Mentored six undergraduate and graduate students in cleanroom protocols and technical report writing, with the output of oral/poster presentations and publications.

Chief Technology Consultant

Lingjing Haptics (Beijing) Technology Co., Ltd.

Sep 2021 – Aug 2022 Remote

- **RD Leadership:** Directed a team in optimizing haptic gloves based on liquid-crystalline elastomer; published four related patents.
- **Customer Technical Support:** Served as the primary technical lead, delivering presentations to investors and partners, resulting in over 2,000,000 RMB funding.

PROJECTS

Scalable Nanomanufacturing of 2D Nanoribbons

Oct 2023 - Ongoing

- Pioneered a mechanical fracture method to achieve the scalable assembly of nanoribbons from diverse 2D materials with uniform width and spacing under ambient conditions (International Patent #WO2025015336A1). This technique provides a pathway for mass-producing next-generation nano-electronics.

Strain engineering of two dimensional materials

Aug 2019 - Dec 2023

- Revealed directionally resolved strain-coupled phononic properties of monolayer $MoTe_2$ via in situ Raman spectroscopy, estimated the corresponding Grüneisen parameters.
- Developed a self-assembly method to align Au nanoparticles of various sizes with templates designed from instability-driven, deformed 2D nanomaterials.
- Implemented vibration and ultrasonication methods to improve homogeneity of nanoparticle deposition, utilizing DOE to find optimal process windows.

Haptic gloves based on liquid-crystalline elastomer

Sep 2021 - Aug 2022

- Optimized the synthesis of liquid-crystalline elastomer films and fibers, realizing a reversible deformation of 50% within 2s.
- Designed and built a driving mode to achieve fast heating and cooling of the LCE films under low voltage (~7V).

EDUCATION

Ph.D. in Mechanical Engineering

University of South Florida

Aug 2018 – May 2025 Tampa, U.S.

M.S. in Materials Science and Engineering

University of South Florida

Aug 2016 – Jun 2018 Tampa, U.S.

B.S. in Nuclear Science and Technology

University of Science and Technology of China

Aug 2012 – Jun 2016 Hefei, China

PUBLICATIONS

- Directionally-Resolved Phononic Properties of Monolayer 2D Molybdenum Ditelluride($MoTe_2$) under Uniaxial Elastic Strain
  Zhewen Yin, Michael Cai Wang, et al.
  Nano Letters 2023
- Large Scale Self-assembly of Plasmonic Nanoparticles on Deformed Graphene Templates
  Matthew T. Gole*, **Zhewen Yin***, Michael Cai Wang*, et al.
  Scientific Reports 2021

PATENTS

- Scalable nanomanufacturing of atomically-thin, highly aligned, high-aspect-ratio, Homochiral nanoribbons, nanowires, and quantum wires with angstrom-precise morphology
  Zhewen Yin, Michael Cai Wang, Huijuan Zhao.
  International patent, #WO2025015336A1
- Method for heat exchange/pumping using elastocaloric/mechanocaloric/thermoelastic nanoscale two-dimensional (2D) materials
  Zhewen Yin, Michael Cai Wang.
  U.S. provisional patent, #63/500,898.

SKILLS

Process Development: CVD/PVD | Photolitho | E-beam litho | RIE | MBE | Thermal Evaporation

Characterization: SEM/TEM | EDS | AFM | Raman Spectroscopy | Photo Luminescence | FTIR | UV-Vis | XRD | Profilometer

Data Analysis: Origin | ImageJ | Gwyddion | Python | MATLAB | MDI Jade | KnowItAll

Softwares: SolidWorks | AutoCAD | ANSYS | Klayout