Xiuling Li – University of Illinois

xiuling@Illinois.edu

POETS by the numbers:

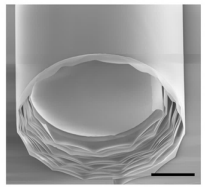
4 Universities - University of Illinois at Urbana-Champaign (lead), Howard University, Stanford University, University of Arkansas

- 31 Faculty
- 107 Student Researchers
- 38 Ph.D., 29 M.S., 9 B.S. Degrees Granted to date
- 35 Graduates working in industry to date
- 229 POETS publications
- 64 Technical Reports
- 3 Testbeds – Aerospace, Off-Highway, On-Highway
- 3 Full patents
- 3M+ in Associated Project Funding (2020-2021)

P/O/E/T/S

Recent POETS Projects

- Development of 3D Inductors using the Self-rolled-up Membrane (S-RuM) Nanotechnology Platform for Improved Power Density
- Circuit Integration of S-RuM Inductors

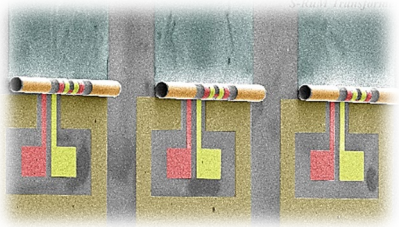


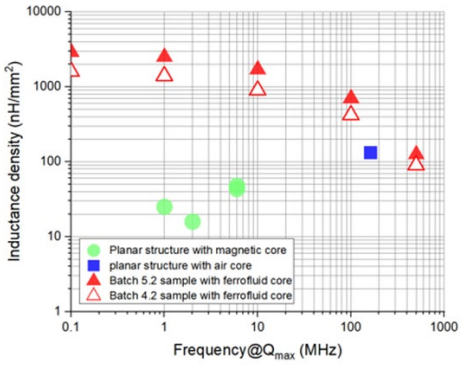
POETS & Related Research

- **Miniaturization and integration of passive electronic components using S-RuM**

  The overarching physical principle of S-RuM nanotech is strain-driven spontaneous deformation of 2D membranes into 3D architectures. Complex 3D structures enable advanced functionalities that are otherwise out of reach. Monolithic mTesla level magnetic induction was achieved at 10 MHz by geometric transformation of centimeter-long 2D nanomembranes into 140 µm diameter air-core microtubes, followed by post-rolling ferrofluid core-filling. Current efforts are dedicated to continued performance improvement and circuit integration.

  S-RuM inductor: *Sci. Adv. 6, eaay4508 (2020).*
  S-RuM transformer: *Nature Electron. 1, 305-313 (2018).*
  S-RuM L-C network: *Adv. Func. Mater. 2004034 (2020).*





- **Wide and ultrawide bandgap semiconductor materials, processing, and devices**
  - **Plasma-free anisotropic etching – MacEtch**

    SiC: Adv. Func. Mater. 31, 2103298 (2021).
    GaN: J. Vac. Sci. Technol. A 39, 053212 (2021).
    GOX: ACS Nano, 13,8784 (2019).
  - **MOCVD of III-N and Ga_2O_3 (at UT)**