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## 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 a High Performance  $\mu$ -cooler ( $0.01 \text{ cm}^2 \text{ }^\circ\text{C/W}$  at  $1 \text{ kW/cm}^2$ ) with Minimal Packaging Process Overhead
- Capillary-Driven Boiling Heat Transfer on Hybrid Copper Wiremesh and “Graded”  $\mu$ -porous Copper Inverse Opals (CIOs) Wicks

## POETS & Related Research

**Development of Nanomaterials for high performance  $\mu$ -coolers using silicon pin fins and copper inverse Opals (CIOs).** Ph.D. students: **Qianying Wu and Sougata Hazra, Dr. Chi Zhang (postdoc) and Adjunct Prof. Mehdi Asheghi (Stanford University) and Prof. Paul Braun (UIUC).**

**Spreading by Etched Diamond Channels**

**Nanomaterials for phase change heat transfer**

Boiling Curve for CIO on diamond channels with 3D manufacturing

$\Delta T [T_{\text{reservoir}} - T_{\text{sat}}]$ [K]	$q''$ [W/cm <sup>2</sup> ]	Phase
0 - 50	0 - 250	Single phase
50 - 100	250 - 800	Nucleate
100 - 150	800 - 1400	Unstable
150 - 180	1400 - 1600	Full film

**Capillary-Driven Boiling Heat Transfer on Hybrid Copper Wiremesh and  $\mu$ -porous (CIOs) Wicks.** Student: **Farid Soroush, Adjunct Prof. Mehdi Asheghi (Stanford University), Prof. Nenad Miljkovic (UIUC) & Prof. Paul Braun (UIUC).**

