Ken Goodson: Getting the Heat Out - Electronics Cooling from Smartphones to Data Centers

Wednesday, June 3
10:00am-11:30am EDT
(14:00-15:30 GMT)
23:00-24:30 JST

Join Professor Ken Goodson for a webinar on the electronics cooling.

- Ken Goodson, Professor and Senior Associate Engineering Dean, Stanford University
- Dereje Agonafer (Moderator), Professor, University of Texas at Arlington

If you want to join the seminar, please tell your affiliation to GMSI Office <office[at]gmsi.t.u-tokyo.ac.jp> by June 2, 5 pm (JST). We will let you know Zoom Webinar Link.

About Ken Goodson:
Ken Goodson is the Davies Family Provostial Professor and Senior Associate Engineering Dean at Stanford, where he holds appointments in Mechanical Engineering and (by courtesy) Materials Science. His 45 PhD graduates are distributed evenly IC companies and professorships at top schools including MIT, Stanford, and UC Berkeley. Goodson is a member of the National Academy of Engineering and a Fellow with ASME, IEEE, APS, AAAS, and the National Academy of Inventors (NAI). Awards include the ASME Kraus Medal, the inaugural IEEE Richard Chu Award, the AIChE Kern Award, and the SRC Technical Excellence and University Researcher Awards. Goodson has 35 patents and co-founded Cooligy, which built heat sinks for Apple desktops. He recently served as Stanford Mechanical Engineering Chair and recruited 15 faculty who transformed the department's scholarship and diversity.

Abstract:
Heat removal poses design limits and adds parasitic power loads for electronics at all scales, from servers and laptops to electric vehicles. As information technology ramps up as a contributor to global energy consumption, electronics cooling is scaling up in environmental relevance and impact. This talk describes cooling innovations including fluidic heat sinks and spreaders containing thermal metamaterials, which combine thermal, mechanical, and fluidic properties not found in nature. These novel devices approach "thermal ground plane" performance for multi-kW converters and 3D logic. We've also recently made progress on thermal switch/regulator technologies, which promise better heat routing in power electronics and ASICs, using chalcogenide films, ion infusion within crystalline monolayer stacks, and capillary-driven fluidics. This talk will highlight extensive design and prototyping with IC companies in Silicon Valley and beyond.