



ME Seminar



Loop heat pipes for thermal management

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ABSTRACT

Loop Heat Pipes (LHP) and the closely related Capillary Pumped Loops (CPL) are two phase thermal transport devices that are used extensively for spacecraft thermal management. This lecture will introduce these two technologies. The talk will focus on the following topics:

- Development and in-orbit experience of the 500W Ammonia LHP flight experiment at ISRO
- Interesting new configurations. For space applications, the preferred configuration is the LHP (due to ease of startup and auto-regulation), however some terrestrial thermal management applications have used CPLs by suitable placement of the reservoir. Another interesting concept that is gaining interest is the pump augmented CPL/LHP.

ABOUT THE SPEAKER

Dr. Amrit Ambirajan completed his Btech and M.S. from IIT-Madras in 1988 and 1991 respectively and the PhD in Mechanical Engineering from the Missouri University of Science and Technology in 1997. He worked as a post doctoral fellow at Penn State University for one year. Subsequently, he joined the Thermal Systems Group at U. R. Rao Satellite Centre in 1998 where he worked till 2019, leaving as deputy division head of the thermal testing division. His work at URSC included the thermal design and analysis of INSAT-3A, LHP flight experiment on GSAT-19, mini-LHP flight experiment on GSAT-29, and Pulse Tube Cryocooler flight experiment on GSAT-29. His other major field of work at URSC was thermal property measurements. His research interests include two-phase heat transport devices, contact conductance, radiation heat transfer, thermoacoustic devices, spacecraft thermal management, refrigeration, solar thermal devices and air pollution monitoring. He is currently an independent consultant. He is a fellow of the Indian National Academy of Engineering.



October 21, 2020, 4:30 pm, Microsoft Teams