

# Research Techniques Seminar

## **Two-Phase Cooling of Targets and Electronics for Particle Physics Experiments**

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**Wednesday, January 20, 2010  
10:30 am**

**Curia II**

An overview of the LTCM lab's decade of experience with two-phase cooling research for computer chips and power electronics will be described with its possible beneficial application to high-energy physics experiments. Flow boiling in multi-microchannel cooling elements in silicon (or Al) have the potential to provide high cooling rates (up to as high as  $350 \text{ W/cm}^2$ ), stable and uniform temperatures of targets and electronics, and lightweight construction while also minimizing the fluid inventory. An overview of two-phase flow and boiling research in single microchannels and multi-microchannels test elements will be presented together with video images of these flows. The objective is to stimulate discussion on the use of two-phase cooling in these demanding applications, including the possible use of  $\text{CO}_2$ .

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