Microchannel Flow Boiling of CO2
Applications to 2D and 3D Detector Cooling

GUEST SPEAKER -
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Flow boiling of CO2 is a very promising cooling process for future high energy physics particle detectors, including future 3D stacks. In the lecture, the highlights of my ongoing two-phase flow boiling research in microchannels will presented, illustrated by two-phase flow videos in single channels and multi-microchannel evaporators, including some CO2 videos. In particular, the important aspects of microchannel flow boiling in microchannels will be discussed and also the "weak points" of our current prediction methods (and what we are doing to improve them). A brief overview of our CMOSAIC project on two-phase cooling of future 3-dimensional computer chips in collaboration with IBM (stacks of processors cooled internally by interlayer microchannels) will be presented and used as an example of possible future directions/discussion of 2D and 3D detectors.

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