fluid dynamics research group

Curtin University

FDRG Seminar

Jet Impingement Heat Transfer for High Heat Flux Applications

presented by

Abishek Sridhar

Fluid Dynamics Research Group &
Department of Mechanical Engineering,
Curtin University

Heat transfer techniques involving phase-change have been employed widely for cooling of components dissipating very large heat fluxes (over 100 W/sq-cm), primarily due to the inadequacy of standard (steady) single-phase cooling techniques. Jet impingement boiling has been found to be a potential technique for applications involving cooling of such large heat fluxes concentrated at discrete locations, particularly in power electronics, synchrotron X-ray, fusion, and semiconductor laser systems. Literature also suggests that the introduction of jet pulsations in the form of self-oscillating jets, pulsating jets and synthetic jets provide substantial enhancement over traditional steady jet impingement; however, the studies are mostly limited to air impingement cooling applications. The present research aims to investigate the flow and heat transfer characteristics of steady-state and pulsed, single-phase and boiling heat transfer, under a liquid jet impinging on a heated surface. Both, computational and experimental approaches are employed for the study.

The first part of the presentation will discuss the present computational technique employed for the simulation of boiling heat transfer under a submerged impinging jet. Some recent developments in the modeling of flow boiling would also be elucidated with the results obtained from the implementation of these models into the present computational framework in FLUENT for submerged jet impingement boiling.

The second part of the presentation will give a brief of the experimental setup developed to study the heat transfer characteristics of single-phase and boiling heat transfer under a pulsed impinging liquid jet. Some preliminary results obtained so far will also be discussed.

Date:	Friday 26th April
Time:	4pm – 5pm
Location:	216:207
	Curtin University, Bentley Campus

No RSVP required. For queries please email:
fdrg@curtin.edu.au