



# Semi-sesquicentennial of mecheng@IISc

## Distinguished Seminar Series



### Cavitation near boundaries, in boundaries and due to boundaries

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**November 24, 2021 at 1:30 PM**

Meeting link: <https://bit.ly/3oEJ17J> (MS Teams)

#### ABSTRACT

The phase change from liquid to vapour may or may not lead to fast fluid flows. In boiling, the bubbles - once formed - remain peaceful, yet when nucleated due to a transient pressure reduction they probe extreme conditions of matter during their collapse. While the spherical symmetry with its singular energy focusing ability has attracted a lot of attention, already slightest disturbances hampers the converging flow. What remains are non-spherical bubbles. In this talk I will provide some overview on these particular flows that remain to be very forceful. The range of scenarios I will discuss are the bubble collapse near a simple and some complex rigid boundaries, cavitation in elastic solids, and cavitation created by surface waves on boundaries. The emphasis is on experiments, yet some of the phenomena are so fast and occur on such small volumes that numerical simulations are the last hope to understand what really goes on.

#### ABOUT THE SPEAKER

Prof. Dr. Claus-Dieter Ohl is Professor and Head in the Department for Soft Matter, Institute for Physics at the University of Magdeburg, Germany. He received his undergraduate and graduate degrees from Technical University Darmstadt (1989-1995) and University of Göttingen (1995-1998). His research interests include thin film fluid mechanics, fundamentals of cavitation in liquids and solids, novel boiling regime from microheaters, linear time reversal acoustics, finite amplitude waves and shock waves and their interaction with liquids-solid-gas interfaces and in particular coalescence and rupture of thin films, surface and bulk nanobubbles in microfluidics, acoustic probing of nanobubbles and manipulation with optical tweezers, high-speed photography, nucleation of gas and vapor phase, and cavitation bubble dynamics in and at surfaces of elastic solids.

He is the recipient of the 2004 VIDJ research prize from the Dutch Science Foundation and has held visiting Professor positions at Sapienza University (Rome), Tokyo University Agriculture & Technology (Japan), Tsinghua University (China) and Nanyang Technological University (Singapore). He is the Founding Director of the educational Start-Up EDU2VR (<http://www.edu2vr.com/>) and has served as the Associate Chair of Academics, School of Physical and Mathematical Sciences, NTU (2012-2016).



Session chair: Prof. Jaywant H. Arakeri, Mecheng@IISc