

# Special Lecture

Organizer: Institute of Fluid Science, Tohoku University

Sponsor: Tohoku Branch of the Institute of Electrostatics Japan

Date and time: March 27, 2024 (Wed.) 16:00 ~ 17:00

Venue: Meeting Room (2F, IFS bldg. 1) and Online (Google Meet) (Hybrid)

<https://meet.google.com/xnc-vhkr-qjr>

Lecturer: Mohamed Farhat (Professor, Senior Scientist, Head of Cavitation Research Group, Institute of Mechanical Engineering, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland)

Title: Review of recent research on cavitation

Abstract: In the present talk, I will present an overview of the past and ongoing research, performed at EPFL, on the cavitation bubble dynamics and how they may interact strongly with neighboring boundaries. I will first report about our recent experiments on the effect of gas content on the collapse of a cavitation bubble. We used aqueous ammonia to manipulate the gas content and could demonstrate that the vapor does not condense entirely but gets partially compressed during the final stage of the collapse. I will show how this result is of major importance in predicting the intensity of shockwaves and luminescence. I will also address the dynamics of a single cavitation bubble in the vicinity of a sand bed and a flexible surface. I will illustrate how in these occasions the speed of the microjet may significantly increase and become supersonic, compared to the case of a rigid surface. Finally, I will briefly describe our open-source numerical solver BIMBAMBUM, based on the Boundary Integral Method, to predict the bubble dynamics in various configurations.

\*This special lecture is organized as a part of the activities of collaborative research.

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