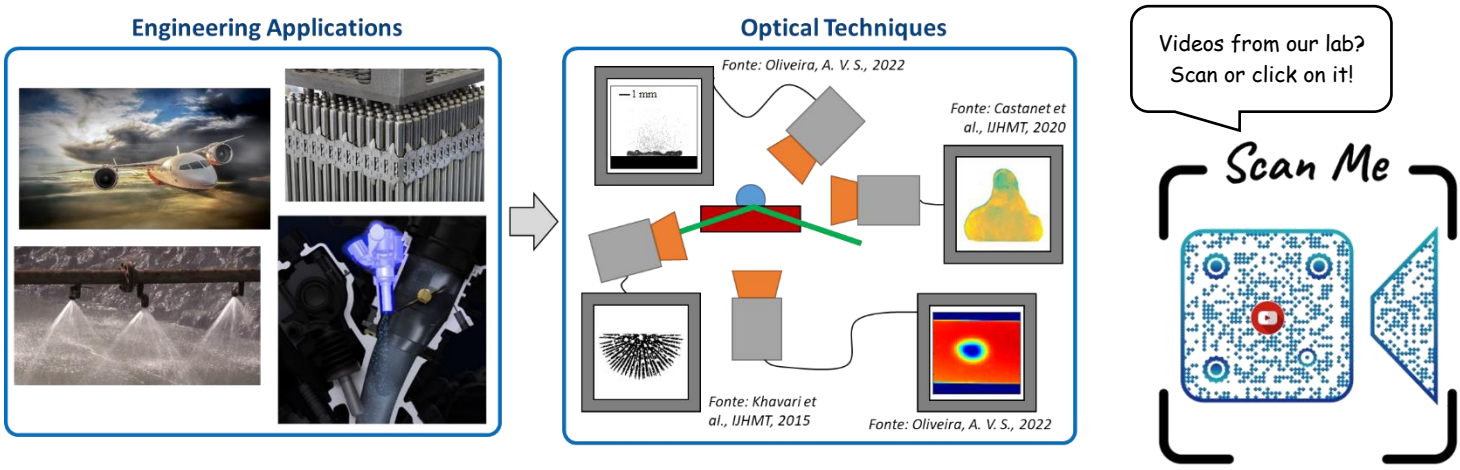
CALL FOR DIRECT DOCTORATE DEGREE WITH FAPESP FUNDING

THERMAL-HYDRAULICS OF MULTIPLE DROPLET IMPACT AND SPRAYS ON A HEATED WALL USING COMBINED HIGH-SPEED OPTICAL TECHNIQUES



INFORMATION

Professor: Arthur V. S. Oliveira

Time dedication: Full time

Domain: Thermal and fluids engineering

Requirement: Good scholar history

FAPESP project: Experimental study of droplets impact onto heated walls using combined optical techniques: single droplets, multiple droplets and sprays (Process 2021/01897-0)

Applications: combustion engines, aeronautics, nuclear reactors, metallurgy, solar energy, …

OBJECTIVES

Although many researchers have studied droplet impact on heated walls and spray cooling, most of them used limited instrumentation to characterize the **fluid dynamics and heat transfer processes before, during and after the droplet impact**. These limited measurements impede characterizing completely the heat transfer phenomena involved in this process. Moreover, more understanding is necessary on multiple droplet impact and the effect of droplet interactions during wall cooling processes. We built a new experimental bench at EESC/USP to characterize **multiple droplet impact on heated walls** and **spray cooling** using four different high-speed imaging techniques combined (few thousands fps): **infrared thermography** to measure the wall temperature; **2cPLIF** to measure the liquid temperature; **shadowgraphy** to measure the droplet size, shape and velocity; and **TIR** to measure the solid-liquid contact area (check out some of these techniques in YouTube! Link: https://tinyurl.com/DropsSprays).

A **FAPESP scholarship is ensured for direct doctorate** (for those without a master degree), including **financial support to move to São Carlos**. The main FAPESP project is in collaboration with the **Université de Lorraine, in France**, where the student may spend part of the project – a double diploma USP-UL is expected.

Application: e-mail your CV and scholar history to avs.oliveira@usp.br