#WHYSPACEMATTERS

MICRO GRAVITY RESEARCH

Running experiments in weightlessness or microgravity allows to study phenomena which are usually masked on Earth due to gravity causing buoyancy, convection, sedimentation, drainage… On Earth, microgravity environments are only achieved temporary, e.g. with drop towers, sounding rockets and parabolic flights. On the contrary, a spacecraft in orbit, such as the International Space Station (ISS), is constantly in freefall and allows long duration experiments.

Studied phenomena include flame burning, crystal grow, chemical process, foam coarsening,… Just as liquid boiling studied by the Multiscale Boiling experiment RUBI hosted in Columbus' Fluid Science Laboratory (FSL). In microgravity, the vapor bubble does not detach, allowing a better observation of the bubble shape and heat flux distribution.

Credit: ESA

As ESA Facility Responsible Centre for FSL since 2015, the B.USOC team is in charge of all the operational phases of the hosted experiments, from the reference runs on ground to the execution in space, as well as the coordination with the payload developers, the scientists, and the ISS ecosystem.

In addition to the RUBI experiment, B.USOC manages the Soft Matter Dynamics experiment container which hosts sample cells allowing several investigations on granular matter, foam, emulsions, and regolith dust. However, some unexpected but stimulating results with the foam forced the team to adapt the operation concept while already in flight.