# THE EFFECT OF RELATIVE HUMIDITY ON DROPWISE CONDENSATION DYNAMICS

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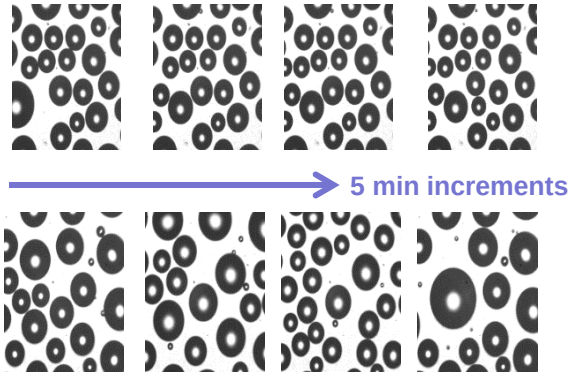
## OBJECTIVE

Provide an adequate framework for assessing the dynamics of dropwise condensation from humid air in order to understand what the effect of relative humidity on the dynamic formation of droplet structures.

## APPROACH

- Perform dropwise condensation experiments at different subcooling temperatures and different relative humidity conditions
- Modeling temporal evolution of single droplet and droplet distribution and compare it with experimental results
- Compare water yield at different relative humidity and for different surface morphologies

## RESULTS




**Top and bottom row show droplet growth at 60% and 70% relative humidity, respectively.**

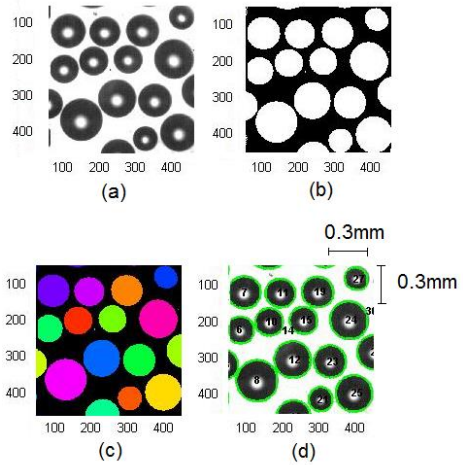
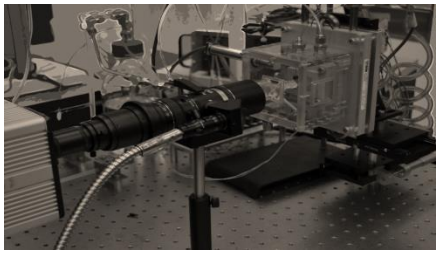
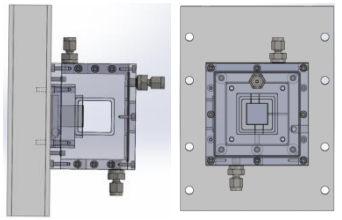



**Image segmentation process : (a) original image (b) binary image (c) single droplet identification (d) shape recognition.**





**(top) Test facility (far left) lateral and (close left) front view of main test section**

## IMPACT

A better understanding of the time evolution of dropwise condensation, in conjunction with surface engineering, has the potential to lead to the improvement of current industrial applications such as:

- Dehumidification
- Atmospheric Water Generation (dew water harvesting)
- Anti-icing surfaces

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