



Student Design Challenges in Capillary Flow

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In 2016, NASA Glenn hosted two major Student Design Challenges in Capillary Flow: CELERE and CFC.

Capillary Effects on Liquids Exploratory Research Experiments (CELERE)

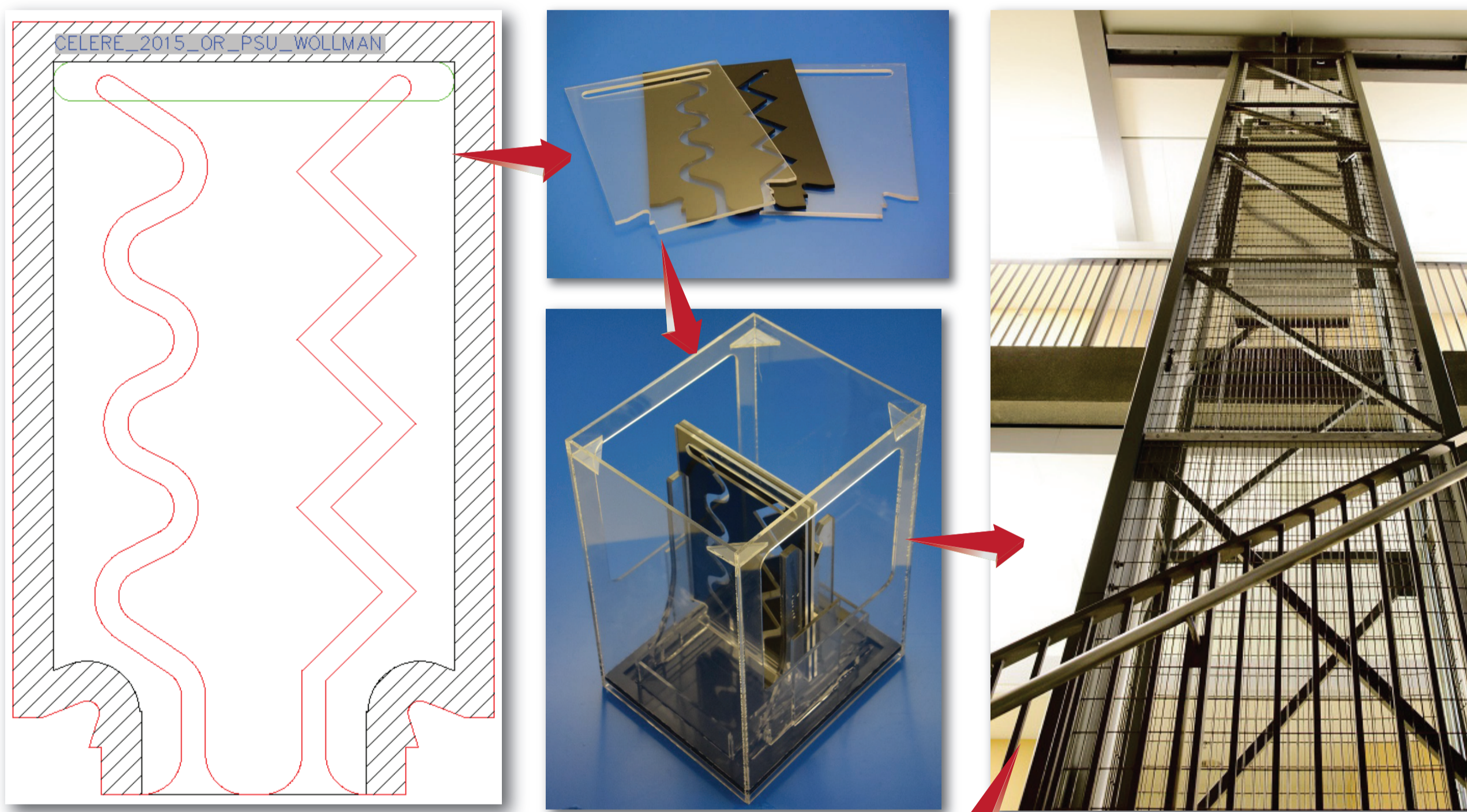
- An annual joint program of NASA and Portland State University (PSU) enabling youth to participate in microgravity research on capillary action like that conducted on the International Space Station (ISS).
- Youth design their own experiments using Computer-Aided Design (CAD) and submit them to NASA.
- Test cells are fabricated using the submitted drawing and a computer-controlled laser cutter.
- Experiments are conducted in microgravity via PSU's 2.1-Second Dryden Drop Tower.
- Results are provided online for student analysis and reporting, for example, as an extra credit or science fair project.



Sunita Williams conducting the CFE on the ISS.

Capillary Flow Challenge (CFC)

- A one-time design challenge sponsored by the American Society for Gravitational and Space Research (ASGSR) and NASA Glenn.
- Teams of students from grades 9 to 12 design and build a simple device using capillary flow (only) to eject droplets as far as possible as the device falls down NASA's 2.2-Second Drop Tower.
- Results are provided online for student analysis and reporting.
- Student teams encouraged to present their results to microgravity researchers at the ASGSR conference in Cleveland, OH, on Saturday, October 29, 2016.

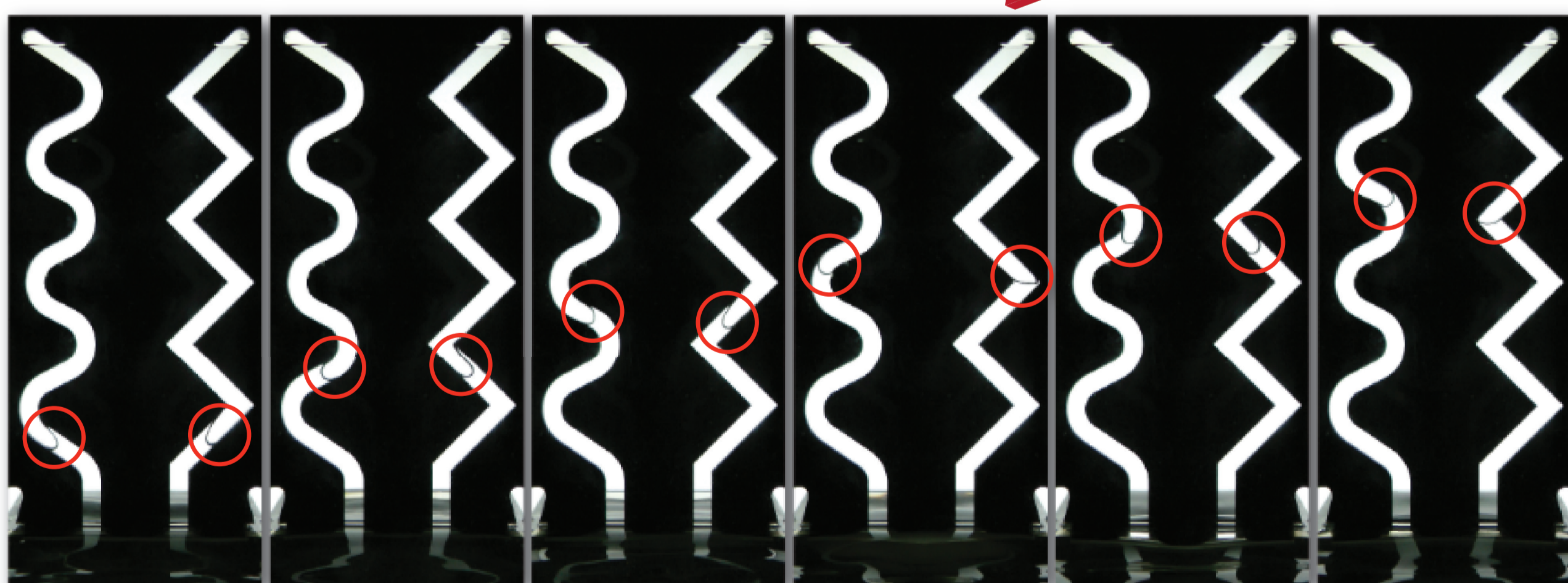


Overall Goals

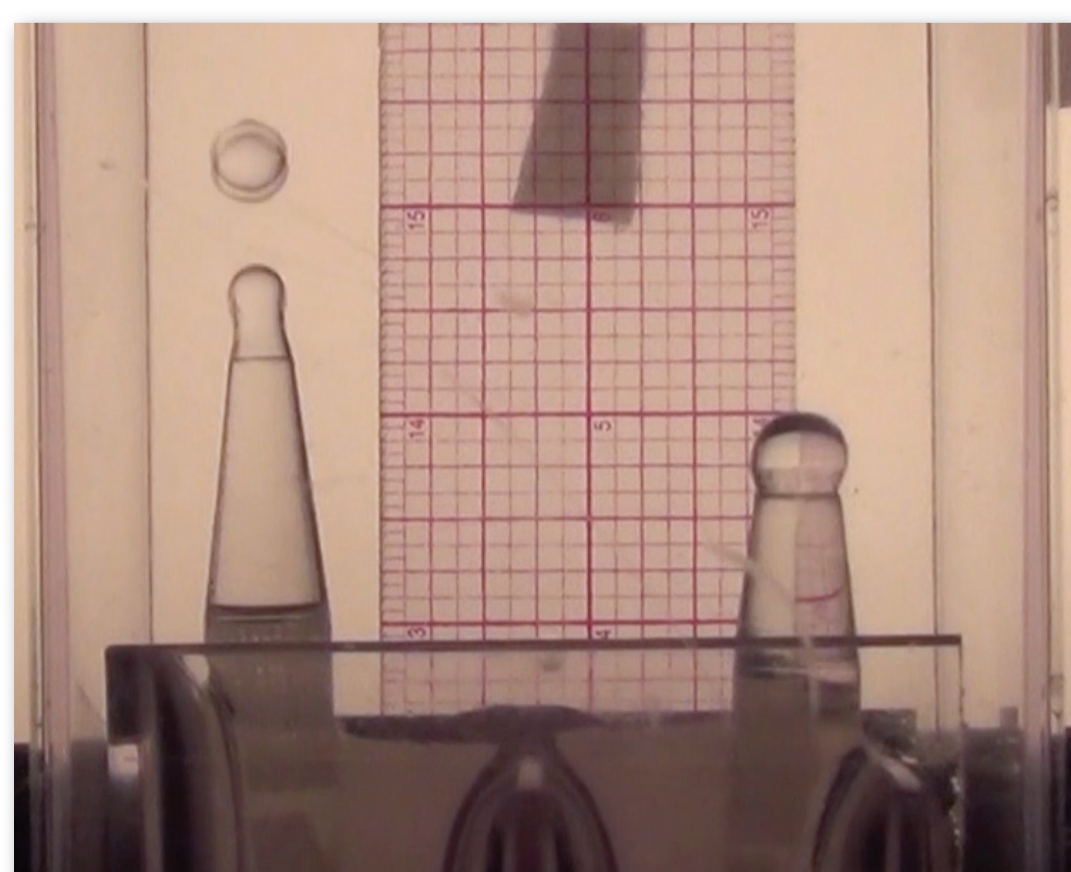
- To learn about CAD and space station science
- To learn about capillary flow
- To inspire careers in Science, Technology, Engineering, Arts, and Mathematics (STEAM)
- To enhance college applications

Learn More

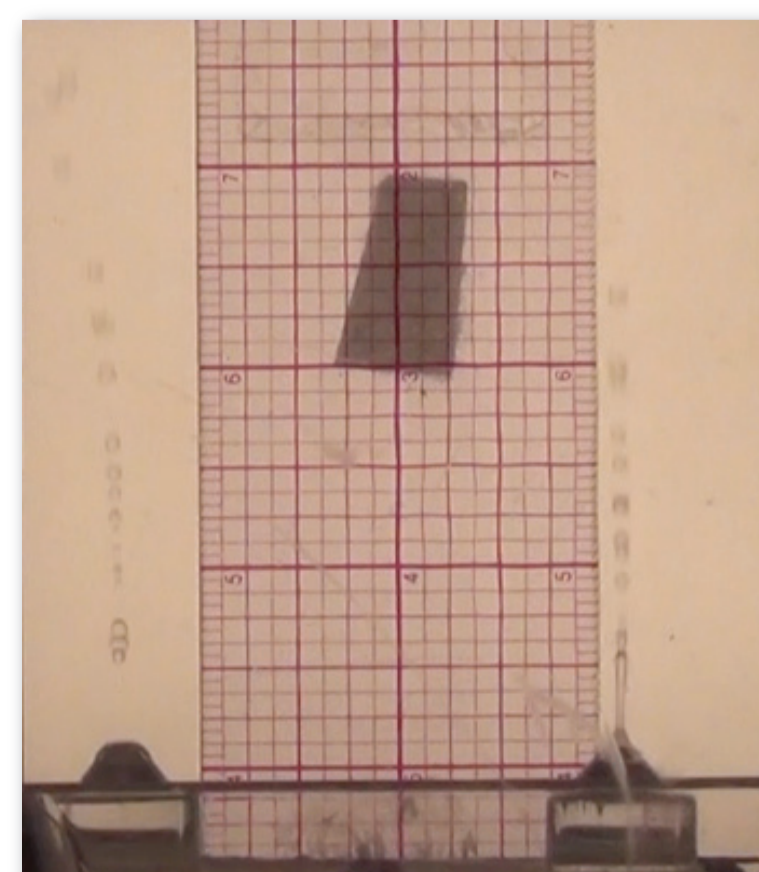
Visit <http://spaceflightsystems.grc.nasa.gov/CELERE> or e-mail celere@lists.nasa.gov.



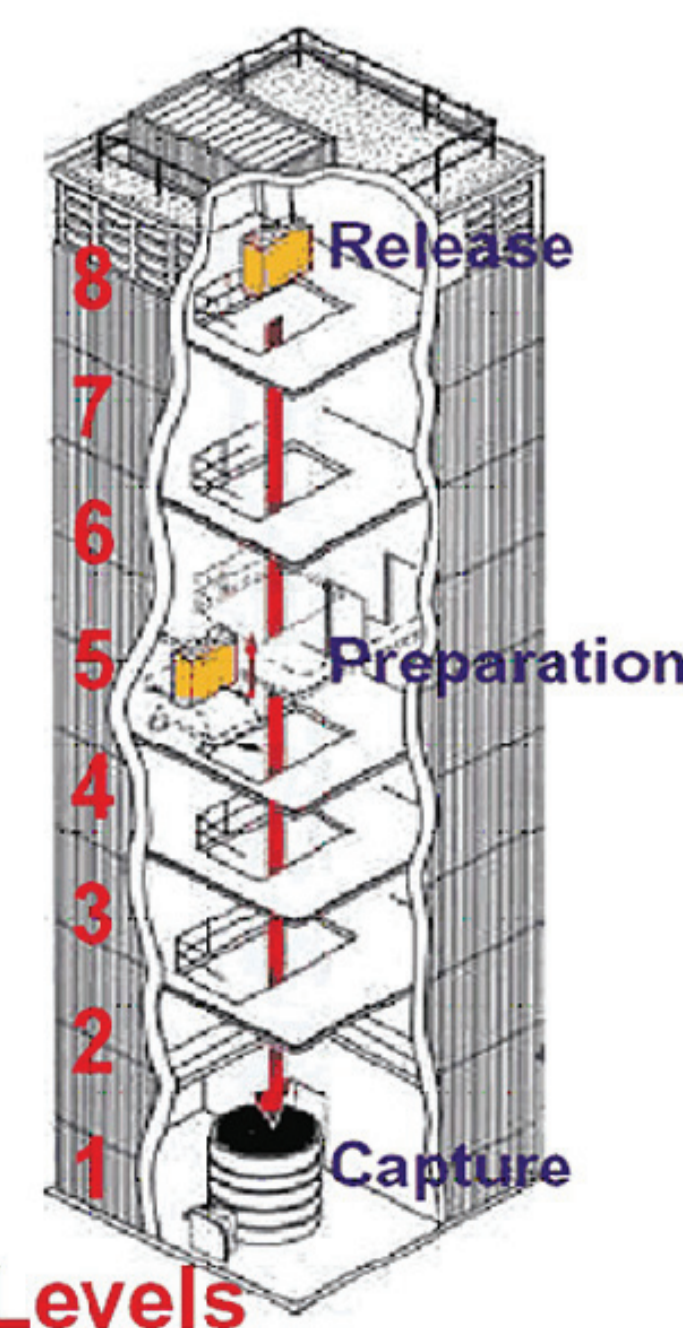
Staff preparing an experiment in view looking down the shaft of the drop tower.



Droplet ejected by capillary flow from the left-hand tube in microgravity.



Multiple droplets ejected by capillary flow in microgravity.



Floor layout of NASA Glenn's 2.2-Second Drop Tower.

The authors would like to acknowledge John McQuillen and the 2.2-Second Drop Tower Staff at NASA Glenn for their support during the CFC drop tower activities.