

## Implementation of a microscale soap bubble generator

Flow visualization technique usually requires seeding particles that can faithfully follow the flow. Microscale soap bubble has been developed and shows high potential for airflow visualization and measurement. This project requires students to design, implement, and verify a microscale soap bubble generator with the following requirements:

- Generate air-filled or Helium Filled soap bubbles at the controllable diameter, ranging from 15 microns to 150 microns.
- High output of more than  $10^7$  bubbles/s and high concentration of 20,000 bubbles/cm<sup>3</sup> with easy-to-adjust settings.
- Long residence time of more than 30 min.
- The required material is safe for the environment and easy to obtain.

Knowledge, skills, and expertise required for this project:

- Strong interests in engineering design, CAD, and problem-solving.
- Great teamwork capability and writing skills.
- Familiarity with the basics of the machine shop and 3D printing.
- Knowledge of microcontroller kits, e.g., Arduino and Raspberry Pi.

\*Students who have hands-on experience and/or planning to pursue a graduate degree at NAU ME are especially encouraged.

Budget: \$500

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