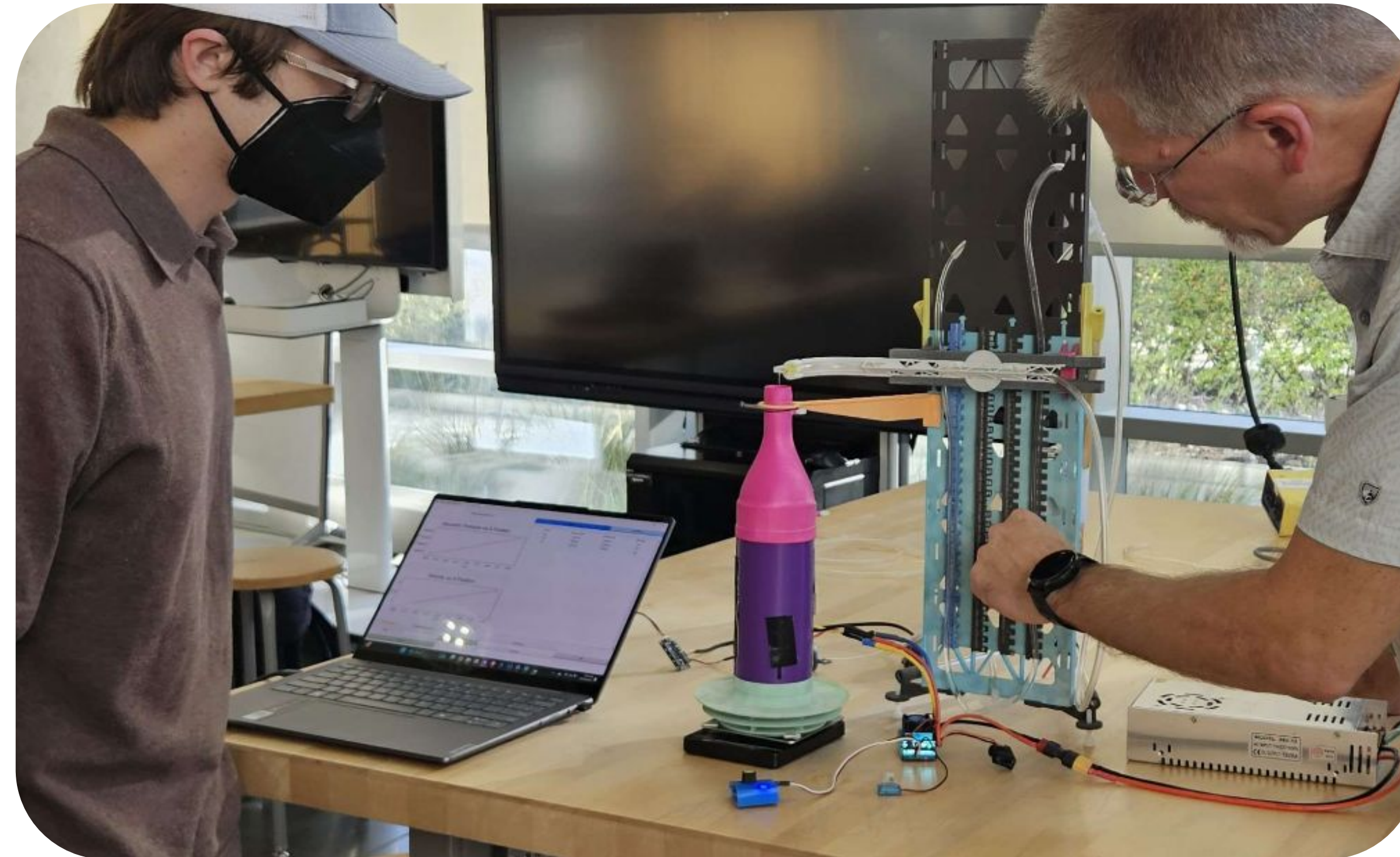
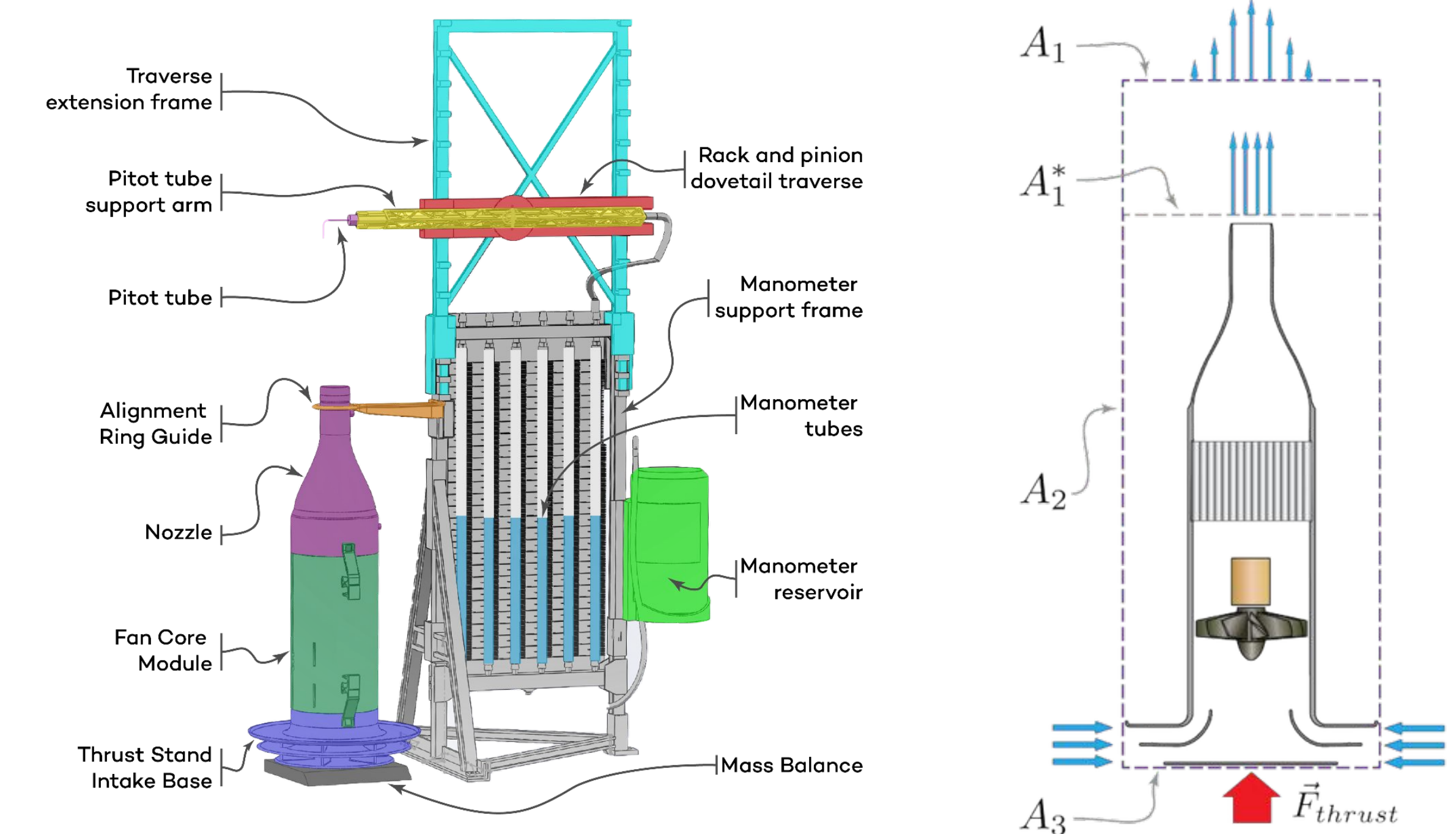


Purpose

To reduce the high costs of traditional fluid mechanics equipment and encourage testing with smaller groups of students, take-home electronics kits are introduced for portability and to encourage more interactive collaboration.



Thrust Stand and Manometer



- A primary goal was to focus on student interaction with the setup and how to make it more intuitive.
- We have integrated our prototype with the fluid mechanics classes, where students can opt to perform their lab on our setup in place of their traditional lab.
- This semester, we had 27 students participate.

Concepts:

- Measuring pressure with liquid
- Energy conservation
- Fluids flowing through an area & Force production by a fluid

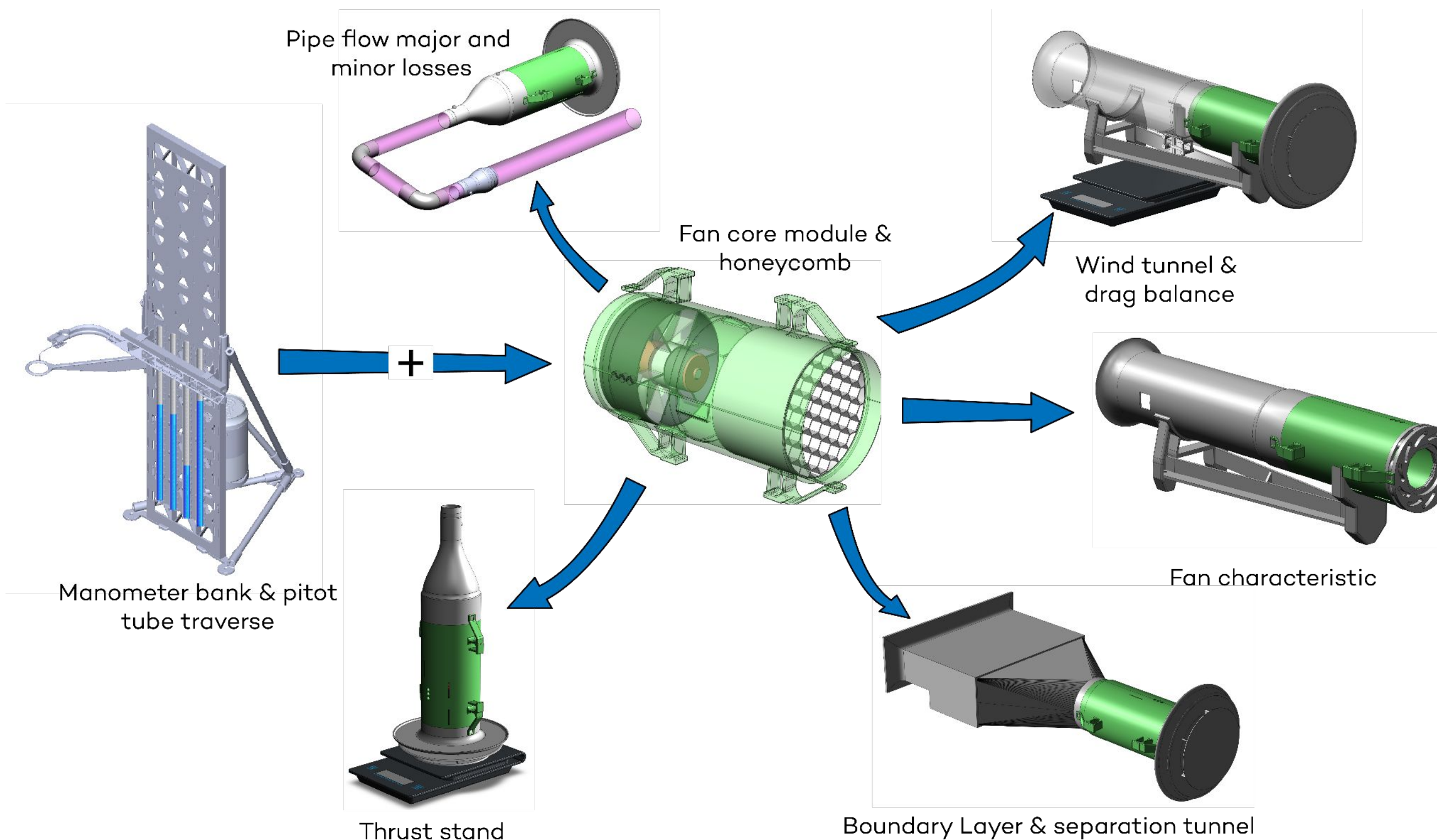
The Big Idea

Inexpensive, modular kits to enable at-home labs?

- Providing students with “take-home” lab kits has been shown to impact a greater understanding of the fundamental concepts in practical applications, bridging the gap between theory and practice.
- Our kit is designed with a modular approach to permit six different experiments with a common primary driver section, and multiple attachments.

Planned outcome:

- Students develop an ownership of material when given the ability to assemble, calibrate, and conduct their own experiments, with an at-home kit.



Testing & Results



Common Feedback from Students:

- Real-world application significantly improved students’ understanding of key concepts
- Live data collection using the GUI allowed students to verify the accuracy of their results
- Greater availability of video tutorials to support independent learning
- Need for greater clarity and more detailed guidance in post-lab report

References & Future Work



- Increase Student Testing
- Different labs for the 6 experiments
- Prototyping and development
- More efficacy testing
- Preparation for larger production