

# UNDERGRADUATE SUMMER RESEARCH PROGRAM PROPOSAL

- Project title

**Interactive Hele-Shaw Cell Development**

- Faculty advisor

**Stephen Solovitz**

- Project description

The Hele-Shaw cell is a remarkable device that displays two-dimensional flow behavior with great accuracy. Using two closely-spaced, transparent plates, the planar flow is identical to potential flow, even with viscosity. We plan to develop a novel Hele-Shaw cell that includes a grid of inlet and outlet ports. Each port can be activated as a source or a sink, generating an arbitrary flow. Ideally, this can generate flow around many different shapes, including airfoils. This device will be used for research, such as study of porous materials, instability, and chaos.

- Deliverables

**The student will produce:**

- **Baseline Hele-Shaw cell**
- **Modified cell including inlet/outlet ports**
- **Successful demonstration of device functionality**

- Time requirements

- 1) **Total of 240 hours of research time**
- 2) **Flexible dates/times from Monday through Friday, 8 a.m. to 5 p.m., between May 16 and July 15**

- Constraints

**None**

- Required skills and knowledge

**The student must have completed the undergraduate course in fluid mechanics.**

- Preferred qualifications

**Laboratory and machining experience are preferred, but not required.**