

My objective is for each graduate student advisee to experience a welcoming and collaborative group environment in which each individual is able to achieve their personal academic and research goals. My research is in **computational science and engineering**, currently with an emphasis on higher-order adaptive finite element methods. While my main application focus has been aerospace engineering and in particular aerodynamics, I will be increasingly pursuing environmental simulation applications to model, for example: weather, groundwater, tsunamis, climate, etc. Regardless of the specific application, the research we pursue in the group is very much algorithmic in nature and involves a combination of numerical analysis, applied mathematics, computer science, computational geometry, and usually (though not always) fluid dynamics.

When considering adding new people to the group, I look for a demonstrated interest in computational science and engineering. This could be through taking relevant coursework, previous research experiences, or both. The specific application (e.g. aerodynamics, weather, structural dynamics, porous media flows, etc) is not a critical factor. My research interests align best with students that plan to pursue doctorates (either after receiving an undergraduate or masters degree). While I very much enjoy my academic position, I realize that most doctoral students will not pursue academic careers. I fully support my advisee's career decisions no matter where that may lead them. While some of **my former graduate students** have gone on to academia, most are pursuing careers in a wide range of industry and government positions.

I schedule regular weekly meetings with each advisee, usually about 45 minutes in length, and often attended by other senior researchers. The main focus of these meetings will be research. The advisee is the main driver of these meetings, meaning that they almost always decide what to talk about, what questions they could use advice on, what barriers they need help to overcome, etc. This includes the option of canceling a meeting if research is proceeding but without a significant development or questions/barriers that could use advice. While these research meetings are not meant to be formal in nature with polished presentations, students usually prepare an informal, not-polished presentation or notes (in the form of an electronic document) to guide the meeting. We have found these informal presentations/notes are excellent records of past work and often are the basis for formal presentations, papers, and theses.

We also have weekly group meetings. Depending on the specific needs of the overall group and our sponsors, the exact purpose and format of the meetings can change. Recently, we have tended to alternate each week between a meeting with a research sponsor and a meeting without a sponsor. The non-sponsor group meetings vary in purpose including (1) discussion of on-going development of our main group software **SANS**, (2) research presentations by an individual student, or (3) review of a paper in the field.

Over the 20+ years that I've been a faculty member, my group has tended to have about 6-8 graduate students. However, in the last couple of years, I am purposefully reducing that to a target of about 3-5 graduate students. My intention is to be able to spend more time advising fewer students. During a doctoral program of study, I intend that advisees will:

- Complete their doctorate in about 5 years (starting from an undergraduate degree).
- Be lead author on at least two journal articles.

- Attend a conference about once per year, frequently including presenting at the conference.
- Be involved in the preparation of at least one research proposal.
- Be teaching assistants for about two semesters. I believe teaching is an excellent way to strengthen understanding, and thus regardless of whether or not an academic path is of interest, I expect advisees to have a couple of significant teaching experiences.
- Mentor at least one undergraduate researcher.
- Have one internship experience, typically 2-3 months in length. These internships could be at a government, industry, or other academic institution. Internships usually involve some significant planning to balance a student's goals and constraints, with a sponsor's needs, and (to a lesser extent) my own interests in making a timely impact through research. However, my intention is to work through all of these factors such that most (hopefully all) advisees will have an internship experience while they are graduate students.

I do not have specific work hours for advisees (either in amount or time of day). However, I do think that learning and research progress is significantly enhanced by interactions with the entire group and the lab more broadly. Thus, I would suggest that some amount of time is spent in lab during the day to encourage those interactions. I had a great advisor as a doctoral student, but there is no doubt that I learned significantly from my labmates.

Finally, we also have a nearly every week gathering as a group at the **Muddy**, or a local pub/restaurant. Given that there are a lot of constraints on everyone's time, there is no pressure to attend this.