

Ben Martin '22

Research in Professor Ian Baker's Lab at Thayer

Winter 2020

During the 2020 winter term at Dartmouth, I worked as a research assistant in the materials science lab run by Dr. Ian Baker at Thayer. I mostly assisted with the research of two 4th year PhD candidates, but I also worked on a project assigned directly to me by Dr. Baker. Most of my time was spent in the Thayer Machine Shop, doing design and fabrication work for different kinds of metallurgy samples. A couple of the most exciting things I got to work on was upgrades for a cryogenic wear tester and a new method for creating very small diameter holes in hard materials using an electrical discharge machine. On the cryogenic wear tester, I improved the insulation of the experimental setup and collected and synthesized data in order to determine the design specifications for a new reserve liquid nitrogen reservoir. The electrical discharge machining project was difficult, as I didn't have a whole lot of expertise or guidance to rely upon from within the research group, but it gave me a chance to challenge myself by trying to characterize the machining process in terms of various parameters that affected the real-world electromagnetic behavior of the process.

Aside from machine shop work, I got to do a little bit of shadowing. I was taught how to use a huge variety of different machines and learned some new experimental techniques. Some of the most valuable experience I felt that I had was when I attended weekly research group meetings. On Wednesdays, everyone from the research group presented their progress for the week, plans on what they intended to do next, and so on. While it wasn't presented as any kind of education for my benefit, just being exposed to the data and hearing everyone discuss the patterns and models that they were working on either validating or creating helped me understand a small part of the kinds of mathematics used in materials science. I had a great experience overall, and I've been asked if I'd like to continue my work with the group in my free time, an offer I fully intend to take up.