

Charlie Nitschelm

30 Coe Drive, Durham NH 03824 • (603) 923-9079 • Charlie.Nitschelm@seds.org

Dear Rocket Lab,

During the winter break of my freshman year, I witnessed SpaceX land a Falcon 9 on 'Of Course I Still Love You.' All my worries and problems disappeared for that moment, stunned with the significance of what I just saw. This moment showed me my passion: space exploration. I wanted to learn as much as I could about rocketry and bring together like minded individuals, but there were no space or rocket organizations on campus. From that revelation, I immediately founded a rocket club under SEDS, the world's largest student-run space organization.

First, we worked with off-the-shelf engines and used in-depth MATLAB simulations for trajectory and dimension optimization. Then quickly moved into the development of Runaway, our hybrid rocket engine. We are currently working towards qualifying Runaway so that we can integrate it into a rocket for the Spaceport America Cup in June 2020. The biggest unexpected challenge I have faced managing UNH SEDS was the reality that teams are comprised of individuals, and everyone has their own imperatives. At first, I assumed every team member had the same imperatives as me, which led to over-expectation and frustration. As my leadership skills developed, I came to understand these priorities and manage accordingly based on the individual. This mindset has brought the team closer together and has been the biggest impactor to our technical progress. This coupled with transparency and the implementation of clear goals has grown the club to the largest, most interdisciplinary engineering organization on campus.

In May of 2019, I was elected as the 'Member at Large' for SEDS USA, the presiding organization for all SEDS chapters nationwide. I have taken on the development of a SEDS Wiki which will be a repository of knowledge between the chapters. The goal is to create a more intimate community with chapters helping each other grow and prosper. Directing the development of this tool has taught me the struggles with motivating people indirectly, but also the importance of knowledge transfer. All of us have information that is a commodity to others and sharing allows the entire SEDS community, present and future, to grow our base knowledge further and further. Once released, it will have a significant impact on the growth of our younger chapters.

For the summer of 2019, I was awarded with the Matthew Isakowitz Fellowship, a program started to honor an extraordinary individual whose passion for aerospace inspired all who knew him. Instead of direct commercial space internships weighing so heavily on the university an applicant attends, this program weighs on the passion they have for the industry. The program paired me with Rocket Lab in California as a propulsion manufacturing engineer. Being the only engineering intern during the summer, I gained experience throughout the entire production process of the Rutherford engine for the Electron launch vehicle. I primarily focused on creating tooling to improve the quality and runtime of the engine's thrust chamber. This position taught me the importance of pushing forward and doing everything possible to progress together as a team. We were also invited to a fellowship summit in LA to meet the fellows, tour various commercial space companies, and meet notable leaders in each of the companies. I was fortunate enough to connect with Elon Musk during my visit and talk with him about the future of commercial space and the challenges he sees in manufacturing in the coming years. This last summer was my first exposure to working in the industry, and it has only solidified my future career goals. Rocket Lab was and is an amazing work environment, and I treasured my time working with the engineers and the technicians on the floor.

Developing manufacturing processes to accelerate the production rate of Electron will have a huge impact on the space market. It will allow for cheaper, more frequent flights to customers, enabling more people to have a role in the space industry. I would love to play a role in making this goal a reality. Thank you for considering me for the Manufacturing Engineer - Propulsion position. I look forward to hearing from you all.

Ad Astra,

Charlie Nitschelm