College Student of the Year Information

Basic Information

Name: Charlie Nitschelm

Hometown: Portsmouth, NH

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Age: 19

College: University of New Hampshire

Year: Sophomore

Major: Mechanical Engineering

Specific Information- Freshman Year

* Finished freshman year with a 3.92 GPA. Took the usual classes for M.E. but instead of Calculus 1 and 2, I took Differential Equations with Linear Algebra and Multidimensional Calculus.
* Certified in Solidworks and designed a tool cart to be used for UNH Precision Racing.
* Volunteered roughly once a month as a member of STEMbassadors to lead the robotics activity for New Hampshire elementary and middle school students.
* Secretary and member of the powertrain for UNH Precision Racing. Helped catch can design.
* Electrical member for UNH Lunacats. Designed the electrical box and built both the main box and back up box. Competed in Florida at the Nasa Robotics Mining Competition in May. Electrical performed. Many mechanical malfunctions.
* Bass singer and vocal percussionist in UNH’s all-male a Cappella group, Not Too Sharp.
* Competed in the NASA Space Apps Challenge in April. Designed a web application to bring the power of solar panels into the hands of consumers to further the progression of renewable energy usage.
* Intern at Shoal Interactive, an LLC currently in the process of releasing an app called Coupler. I help with business and marketing and assist with any projects needed to be done by the CEO. Coupler is a social platform where couples in your area can sign up and make a profile that include your interest as a couple. You can then see other couples in your area and find people who have similar interests as you. It is a social app designed to assist couples finding friends in the area.

My REAP Essays

REAP Student Applicant Essay 1

While in high school I read a total of six books.  These six books were all required reading.  This year, as a college freshman, in addition to my assigned schoolwork, I have already read 17 books.  I chose each of these books based on my desire to learn and grow as a person and as a student.  Some examples include *Death by Black Hole*by Neil DeGrasse Tyson and *A Brief History of Time*by Stephen Hawking.  
 Before attending university, I didn't push myself as a student--- I coasted by in high school with minimal effort, achieving what I thought was an acceptable level of performance.  During my fourth day as a student at the University of New Hampshire I had an epiphany that changed my approach to my education.  I decided that it is no longer acceptable for me to receive a B+ in a class I am passionate about.  I will not sit idly by as my dreams fall by the wayside, all due to a lack of motivation and effort.  I want to do everything I can to achieve my dream of being a mechanical engineer at SpaceX, the pioneering company founded by Elan Musk that designs, manufacturers and launches advanced rockets and spacecraft.   That's when I started reading.   
 Each night, when I am headed back to my dorm room, I find myself excited when I think about getting back to my books.  My anticipation regarding this new nightly ritual surprises me.  Reading is a solitary, reflective, personal experience.  In high school, I was an extrovert; I chose to spend my time socializing and interacting with friends rather than spend time alone. Here at UNH, I have discovered the more introverted side of my personality.   Reading a book allows me to peak into an author's inner life and experience his/her thoughts. It is an absolute honor to be able to have access to some of the smartest people’s minds whenever I want--just by picking up a book.  This year, I primarily chose to read books that regarding astronomy and astrodynamics and they have provided me with a strong background within these fields.   
 Dr.  Mark McConnell has given me the opportunity to research with him over the summer, searching for gamma-ray polarization in solar flares.  By participating in Dr. McConnell's research, I will have my first opportunity to be part of the daily activities of a research group while learning about gamma-ray and neutron radiation detectors, unix-based computer systems, instrument design, analysis of satellite data and the science of solar flares.  This experience is undoubtedly essential to building my experience and expanding my exposure in the professional world.  In order to become a successful engineer who must design some of the most sophisticated and innovative mechanical parts, I understand that it is never too early to start the learning process--my books have taught me that.  UNH is a university with numerous opportunities for everyone, as long as you keep your eyes and ears open and have an open mind to pursue new experiences.  The experience and knowledge I would gain from this research opportunity will bring me one step closer to my long-term engineering goals.   
 My interest in astronomy, combined with my mechanical design background, will make me a desirable member of Dr. McConnell's team. I am also aware of how an engineering team is run.  As secretary of UNH Precision Racing, I shadow many seniors’ senior projects, peppering them with constant questions to learn about frame, suspension and the power train of a single seated race car.  I am also an electrical member on the UNH Lunacats.  I chose these activities because I wanted to understand the many different aspects of a complete engineering project.  These experiences with university level organizations have helped me understand how important it is to work as a team when designing parts that can be so complex.  This has prepared me to take the next step to a more professional and advanced atmosphere of physics research.

REAP Student Applicant Essay 2

I experienced a rude awakening during my first week of classes at the University of New Hampshire.  In high school, I was grouped in classes with other high-achieving students who were motivated by a love of learning.  We were physics and math "geeks" who were interested in the subject matter, not just in achieving a certain grade.   Inspired by each other and our own creativity and love of learning, we questioned everything and considered how we might apply what we were learning in our classes to our lives outside the classroom.

When I arrived here at the university, I struggled to find other students who were as passionate as I am about mathematical and physics concepts.   I am surprised that many of my fellow engineering students are not excited by Bernoulli’s Equation, or how they appear disinterested in how to find a cross product to find a vector perpendicular to the vectors being crossed.   I understand that we are studying the work of physicists and mathematicians who spent their entire lives studying physics and mathematics, and I am grateful for the opportunity to learn from the work of such great minds.  I wondered why others who chose to pursue the same degree as I were not as grateful.  
 Recently, while studying chemistry with one of my new university friends for the first time, this friend became annoyed with me.  He complained that I was going over material that would not be on our test and so studying it was a "waste of time."  I had expressed an interest in determining why the information we were studying was important and how it had been discovered.   Personally, I was there to learn, but I could see he had a different motivation.   We spent the next hour in a dialogue about the meaning of education to each of us.  He explained to me that he had attended a high school where there was a tremendous amount of competition for high grades.   In fact, he had been so motivated by his need to achieve high grades that he had lost sight of the importance of learning and understanding the material.  At this point in his education, he could no longer recognize that the material he was now being taught had once been the discoveries of great minds such as Newton, or Leibnitz, or Bernoulli, and that those discoveries were a result of persistent and creative scientific inquiry.

After this discussion, I more clearly recognize that there are many different types of students here at the university.  There are those who seem to be here simply as a means to an end-- obtaining a degree so they can get a job and make a living.  And there are others who, while they want to have a career someday, of course, also understand the value of learning for its own sake and have a passion for their chosen subject.  I intend to surround myself with other students who love to learn, and who can inspire me to continue learning here at UNH.

**CLUBS**

**UNIVERSITY OF NEW HAMPSHIRE**

2017- current, University of New Hampshire SEDS, Co-Founder.

2016-2017, University of New Hampshire Precision Racing, Secretary. UNH Precision Racing designs, tests and builds a single-seat race car for the Formula SAE competition that takes place in Michigan. It is a senior design project with 3 underclassmen assisting. I am part of the Powertrain, where I create Solidworks models and help solve problems with the intake system. I also work directly under the Managerial Captain, assisting him with administrative and technical tasks.

2016-curr, STEMbassadors, World of Robotics Member. STEMbassadors travels to nearby schools to encourage students to pursue STEM subjects in the future. I am part of the robotics team, where the students get hands-on experience with gear ratios and wheel radius.

2016-2017, University of New Hampshire Lunacats, Electrical Member. The UNH Lunacats create a robot to compete in a NASA-sponsored event in Florida every May. I am part of the electrical team, where I am responsible for soldering and assisting with electrical design and installation of electrical components.

2016-curr, Not Too Sharp, Member. Not Too Sharp is an all-male a cappella group that performs for the community weekly. Not Too Sharp recently opened a rally for President Barack Obama singing the National Anthem.

**PORTSMOUTH HIGH SCHOOL**

2015-2016, FIRST Robotics Team 5902, Team Captain. I started this organization during my senior year and fell in love with the world of robotics. I worked with a team to accomplish things very few rookie teams could do, placing in the upper 50th percentile of teams during the final competition.

2015-2016, Clipper Chicken Club, Founder and President. This was a social club committed to bringing together all classes with the shared interest of chicken. We would travel once a month to a restaurant around our city to eat dinner together. Participation rose to over 100 within a year.

2015-2016, Portsmouth High School Varsity Tennis, Most Improved Player. During my Junior year, I decided I wanted to learn how to play tennis. I joined the JV team and quickly rose to number one over the season. I became #7 on the Varsity team by the end of my senior year.

2012-2016, Portsmouth High School Musicals, Leads and ensemble. Participated in 2 musicals and 1 play every school year including: The Who's Tommy, Hansel and Gretel, The Laramie Project, In the Heights, Chicago and The Other Room.

2014, Trigonometry Club, Founder. Met at lunch to practice high-level trigonometry. We also filmed and produced an educational music video for the freshman geometry classes to watch to get them interested in STEM.

2014-2016, Recreation Basketball, Player. I created a team comprised of the fellow students in my physics class, most of whom had never touched a basketball.

2012-2016, Portsmouth High School Concert Choir, Lead Tenor and 2014 American Choral Directors Association Singer. Concert Choir is a non-audition-based choir performing at multiple venues every semester.

2012-2016, Portsmouth High School Madrigal Singers, Lead Tenor. Madrigal Singers is a select choir that is audition-based. They perform at select venues performing high-complexity music.

2012-2016, Portsmouth High School Concert and Marching Band, Trombone and Bass Clarinet. During the fall, I was part of the Marching band, performing at competitions and football games. During the winter and spring, I was in the concert band performing at venues within the community.

Charlie Nitschelm

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**Education****: University of New** **Hampshire** – *College of Engineering and Physical Sciences* **Aug. 2016 – Curr.**

B.S, Mechanical Engineering | Minor, Physics

Relevant Course Work: *Differential Equations with Linear Algebra | Multidimensional Calculus | Physics 1- Mechanics* GPA: **3.92/4.0**  *Physics 2- Electricity and Magnetism | Chemical Principals for Engineers | Solidworks*

**Portsmouth High School** –**Aug. 2012 – June 2016**

GPA: **3.91/4.0**

**Tech. Skills:** Microsoft Suite | Solidworks | Python

**Experience****: UNH Institute for the Study of Earth, Oceans, and Space May 2017 – Curr.**

*Researcher*

* Use Python to conduct a systematic search of the COMPTEL data for evidence of polarization from solar flares.
* Organizing necessary data sets and developing tools that will be needed for the analysis.
* Using the COMPTEL field-of-view, determine the number of source and background counts for that

event, and then use simulations to estimate the polarization sensitivity for that event.

* Create a systematic analysis of all gamma ray bursts that took place within the COMPTEL field-of-view.

**Shoal Interactive LLC January 2017 – Curr.**

*Business and Marketing Intern*

* Attending weekly meetings to decide business and product decisions with the team.
* Assisting with design look and administrative paperwork.
* Leading major marketing campaigns to neighboring towns for the release of our alpha in August of 2017.

**Orgs:** **UNH Students for the Exploration and Development of Space Mar. 2017 – Curr.**

*Co-Founder, CTO*

* As Co-Founder, I share overall managerial duties of the organization including running all meetings and overseeing the goals of the organization.
* As CTO, I foster a learning environment for all members to excel in their interests as well as oversee and direct all engineering projects with a timeline achievable by all members.

**UNH LunaCats Sept. 2016 – May 2017**

*Electrical Team*

* To design, fabricate and code a robotic excavator to compete in NASA’s Robotics Mining Competition.
* Designed, assembled and tested the electronics box so the rover can successfully compete at Kennedy Space Center for the 2017 NASA sponsored Robotics Mining Competition.

**UNH Precision Racing Sept. 2016 – May 2017**

Secretary, Powertrain

* Maintained all relations to the college and the surrounding community by providing outreach and an end-of-year banquet to all our supporters.
* Part of the Powertrain

**PHS FIRST Robotics- The Wire Clippers Sept. 2015 – June 2016**

*Team Captain, Mechanical Lead*

* Designed, manufactured and tested a robot to compete in the FIRST robotics competition.
* Led team to score an autonomous goal during the first 15 seconds of each match.
* Mechanical lead in charge of overall design and shooting performance.

**Other Skills:** Project Management | Organizational Leadership | Creativity and Problem-Solving Skills | Community Service

**Charlie Nitschelm: Short answers and Essay questions**

**What do you think makes you unique?**

I believe I am unique because I consistently am working towards my long-term goal of becoming an essential part of humanity's work toward the exploration of and eventual colonization of Mars. I intend to work for Elon Musk at SpaceX as an engineer, and I am working hard to do what I need to do, even in this early stage of my career, to achieve that goal. Many people are either unable or unwilling to recognize that they cannot reach lofty goals without first achieving smaller ones. I am unique in that I see life as a series of small steps all leading to the same place-- Mars.

**How do you think your friends would describe you?**

My friends humorously describe me as a "Queen Ant." Although most men would take that as an insult, I love this characterization. A queen ant oversees a highly efficient team made up of specialized workers who use their individual abilities for the good of the whole colony. When I work in a group setting, I always look for the strengths of each individual in the group and figure out how that person can help the group project.

My friends have also stated that I am "an extremely passionate worker." During my senior year of high school, FIRST Robotics came to the school. As a rookie team, we were disorganized and confused. When the season began and the rule book was released, I read the entire handbook the first day. When we gathered the next day, I led the team in going over all of the rules and making sure everyone understood. Also during that first meeting, I formed committees with group leaders to work on different elements of the robotics mission. My friend Matthew, the other senior on the team, noticed how my organization of the team showed leadership skill and a knack for efficiency. That is when my team started calling me "Queen Ant."

**Write briefly about a time you had a disagreement with a peer and how you worked through it.**

During the summer of 2015, I worked as a counselor at the camp I had attended for the previous ten summers. Near the end of the summer, the counselors have a night off where they are encouraged to compete in a scavenger hunt. I created a crew committed to winning first place. One of the objectives sent us on a car trip to Boston. On our way back, we needed to complete one more task to win the Scavenger Hunt. As we pulled into Walmart to complete the last task, my friend told us that he needed to get back to the camp immediately. He explained how he had forgotten that he had been late coming back to camp on his last day off and that he would be penalized if he didn't get back to camp one hour early this time. At first my friends and I were angry. After all, we had spent the past nine hours trying to win this competition, and now Eliot was preventing us from completing our final task. However, it soon became clear that Eliot was very upset by the situation - perhaps far more upset than we would be by losing the competition. In the end, we decided not to complete the competition and go back to the camp early so that Eliot would not be penalized. I believe we made the right decision, because sometimes helping another person is the right thing to do, despite the consequences.

**What qualities or skills would you have to offer your host institution and community?**

During my middle and high school years, my mother and I faithfully watched repeats of the NBC Situation Comedy "Seinfeld" each day at 5 pm. And as we lived our lives, we inevitably found ourselves exclaiming - "It's just like that time in 'Seinfeld' when..." In one episode, the character of Jerry Seinfeld's mother says to Jerry, "How can anybody not like you?" After that, my Mom would often say to me: "How can anybody not like you?" Of course, this was all in good fun, but we both know what she meant. In "Seinfeld," the main character, Jerry Seinfeld, is rather unassuming and generally inoffensive. People tend to like him. And this has been true in my life as well. I am easy-going, not overly opinionated, accepting of people's differences and mindful of their talents and proclivities. I feel that my amiable nature and my ability to get along and work with everybody will make me an asset to the host community and institution. After all, viewers wanted to have Jerry around in their living rooms for nine years. Why not me?

**Describe a situation in which you have had a significant responsibility and what you learnt from it.**

No one was there for Danny, a friend of mine from high school, after he graduated. His family has little money and provides no guidance, as his mother is a disabled hoarder too distracted to pay attention to Danny's problems, and his older brothers are criminals. In high school, Danny thrived because the school community embraced him and Danny embraced that same community back. With a ready smile and a quick wit, Danny learned to ingratiate himself with others by always being kind, respectful and helpful. In turn, he was admitted into the "club" of more privileged children. I never thought of it that way at the time - but I've since learned this to be true. When Danny graduated and went off to a distant college paid for by aid and money he made from working, I learned that the high school, our friends, and our community had been Danny's family, and that without our continued support, he was slowly falling apart. He started using drugs, drinking each night, and, sadly, crying into his pillow as he fell asleep. I didn't know this at first, but I found out when he came home over Christmas break. Danny confessed to me that he was "always sad" and planning to drop out of college. He had no plan. He had little hope. Taken aback by this transformation of my normally jocular buddy, I decided I needed to take responsibility for helping my friend. The first thing I did was reach out to other friends and one of our teachers from high school who had shown particular interest in Danny. I arranged for that teacher to contact Danny and spend some time with him. I also gathered together our close friends, and we each told Danny how much we had admired him in high school and how we will stand by him when he needs us. I contacted the local university, where I attend school, and found out how Danny could transfer, should he choose to do so. I brought Danny into my university to see if he could apply to be a Residential Assistant in one of the dormitories in order to receive free room and board. Most of all, I reassured him that he could reach out to me anytime and that I would do all I can to help him. Only time will tell how Danny will whether this crisis in his life. He decided to return to his university after break to finish the academic year with the intention of transferring to the local university that I attend next September. Maybe he will. Maybe he won't. Regardless, I will keep in touch with him throughout the semester and do what I can to help him. I feel good that I acted as best I could to help my friend. I have been relatively fortunate in life. Some others, like Danny, have it harder. By learning of Danny's struggles, which had been rather hidden from me during high school, I recognized that life is not always easy. There are always people who struggle and who have less than I do, whether it's monetarily, emotionally, or otherwise. When opportunities arise again for me to take responsibility for something important, like the struggles of another human being, I will take this role again.