



**Summer Undergraduate Research Fellowship (SURF)  
National Institute of Standards and Technology**

**STUDENT APPLICATION FORM**

(To be completed by the student applicant and included with the completed institutional application package. DO NOT SEND Separately.)

*Application Deadline: February 12, 2018*

**APPLICANT INFORMATION**

<b>Name:</b>	<input type="text" value="Nitschelm"/>	<input type="text" value="Charlie"/>	<input type="text" value="James"/>
	<small>Last</small>	<small>First</small>	<small>Middle Name</small>
<b>Permanent Address:</b>	<input type="text" value="384 Peverly Hill Road"/>		
	<small>Street Address or PO Box, Apartment #, etc.</small>		
	<input type="text" value="Portsmouth"/>	<input type="text" value="NH"/>	<input type="text" value="03801"/>
	<small>City</small>	<small>State (Abbreviation)</small>	<small>Zip Code</small>
<b>Telephone:</b>	<input type="text" value="(603) 923-9079"/>	<b>Email:</b>	<input type="text" value="cjn1012@wildcats.unh.edu"/>
	<small>Quickest Contact Number (xxx-xxx-xxxx)</small>	<small>Primary email address</small>	
<b>Citizenship:</b>	<input checked="" type="radio"/> U.S. Citizen <input type="radio"/> Permanent U.S. Resident (with a valid Green Card)		
<b>NOTE: SURF participants MUST be U.S. citizens or Permanent Residents</b>			

**ACADEMIC INFORMATION**

**\*Please submit unofficial transcripts only.**

**Name of College/University:**

**Current Class Standing** (check only one): ☐ Freshman ☒ Sophomore ☐ Junior ☐ Senior

**Major/Minor:**  **Overall GPA:**

**Do you have experience with computer languages?** ☒ Yes ☐ No

If so, please describe *briefly* in the provided space. Please include specific details in your resume.

**Python - Summer 2017 Research**

**Matlab - Introduction to Engineering Computing Course (Spring 2018)**

**SURF PROGRAM LOCATION**

**Which location(s) are you applying to for SURF 2018?** (Note, the SURF Program accepts ~20 applicants at Boulder and ~120 applicants at Gaithersburg annually)

☐ Boulder      ☒ Gaithersburg      ☐ Both

**\*\*Complete research preference based on previously selected NIST location ONLY.**

**HOUSING**

**If accepted, will you require housing?**

☐ Yes for Boulder    ☒ Yes for Gaithersburg    ☐ No

**Gender** (for housing purposes only)

☐ Female      ☒ Male

**\*\*Note: Participants should expect to share a bedroom with one other student.**

*Local students will **ONLY** receive housing under special circumstances.*

Name: Nitschelm Charlie University of New Hampshire  
 Last First University Name

BOULDER SURF RESEARCH PREFERENCE					
<p>List (by reference number) the 6 research opportunities which you are most interested in order of preference. Include opportunities from at least two different divisions. (Go to <a href="https://www.nist.gov/surf/surf-boulder/research-opportunities">https://www.nist.gov/surf/surf-boulder/research-opportunities</a> for the current list of research opportunities.)</p>					
1	2	3	4	5	6
<p>Are you available for the entire 11-week SURF Program in Boulder, CO on May 21, 2018-August 3, 2018?  <input type="radio"/> Yes <input type="radio"/> No            If no, give availability dates. <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1.2em; vertical-align: middle;"></span> **Total amount of time must span 11 weeks.  <b>NOTE: All students must attend through August 3, 2018.</b></p>					
GAITHERSBURG SURF RESEARCH PREFERENCE					
<p>Select from the dropdown menu, the 2 research opportunities (by laboratory name) in which you are most interested in order of preference. Try to include opportunities from at least two different laboratories. (Go to <a href="https://www.nist.gov/surf/surf-gaithersburg/research-programs">https://www.nist.gov/surf/surf-gaithersburg/research-programs</a> for a description of each laboratory.)</p>					
1 MML/NCNR Materials Science			2 PML-Electrical Engineering		
<p>Are you available for the for the entire 11-week SURF program in Gaithersburg, MD?            (May 29, 2018 – August 10, 2018)  <input checked="" type="radio"/> Yes <input type="radio"/> No            If no, give availability dates. <span style="border: 1px solid black; display: inline-block; width: 150px; height: 1.2em; vertical-align: middle;"></span>  <b>**Limited number of 9-week fellowships available (June 11, 2018 – August 10, 2018).</b>  <b>NOTE: All students must attend through August 10, 2018.</b></p>					
PREVIOUS SURF EXPERIENCE					
<p>Have you participated in the SURF program at NIST previously? <input type="radio"/> Yes <input checked="" type="radio"/> No            If yes, please indicate: Year (s): <span style="border: 1px solid black; display: inline-block; width: 100px; height: 1.2em; vertical-align: middle;"></span> Location: <input type="radio"/> Boulder <input type="radio"/> Gaithersburg            Mentor's Name: <span style="border: 1px solid black; display: inline-block; width: 200px; height: 1.2em; vertical-align: middle;"></span>            If you were to return, would you prefer to work with the same mentor?  <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> No Preference</p>					
SPECIAL SKILLS					
<p>Do you have experience working in a laboratory? <input checked="" type="radio"/> Yes <input type="radio"/> No            If so, please describe <i>briefly</i> in the provided space. Please include specific details in your resume.            Will begin working on the Mechanics, Materials, and Manufacturing Research Group - February 2018</p>					
<p>List any other special skills not included above (e.g., tutoring, extracurricular activities, leadership positions):            Founder of UNH SEDS - Rocketry Organization            Bass and Beatbox in an all-male a Cappella group, Not Too Sharp</p>					

Name: **Nitschelm**  
Last

**Charlie**  
First

**University of New Hampshire**  
University Name

#### TERMS & Conditions

*Please provide your initials by each statement below to acknowledge that you have read the statements below and plan to abide by the conditions.*

**CS** If invited to participate in the NIST SURF Program, I acknowledge that I must indicate in this application if I require housing. I will not have the opportunity to request housing once my application is submitted.

**CS** If invited to participate in the NIST SURF Program, I acknowledge that I am required to undergo a background check which includes fingerprinting.

**CS** If invited to participate in the NIST SURF Program, I acknowledge that I will provide the required federal identification for entry to NIST on the first day of the program established under the REALID Act of 2005. Drivers' licenses from the following states and territories will NOT be accepted for entry to NIST: American Samoa, Arizona, and Louisiana. In addition, only enhanced drivers' licenses (identified by the American flag on the face of the card) will be accepted from the following three states: Minnesota, New Hampshire, and New York state. Individuals without licenses from compliant jurisdictions may present alternative forms of identification such as an unexpired U.S. Passport.

**Application Deadline: February 12, 2018**

#### Checklist:

- ☒ Resume (Important: be sure to include any laboratory skills or computer languages, etc.)
- ☒ Personal Statement of Commitment to participate (includes research interest)
- ☒ Two letters of recommendation
- ☒ Transcripts (unofficial acceptable)
- ☒ Verification of US citizenship or permanent legal residence (e.g. legible copy of birth certificate, passport, or green card)

**Please submit this application and the items listed in the checklist above to your University Contact for inclusion with institutional application—DO NOT SEND SEPARATELY.**

SURF Program Contact: Dr. Brandi Toliver, Email: [brandi.toliver@nist.gov](mailto:brandi.toliver@nist.gov)

Website: <http://www.nist.gov/surf>

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# Charlie Nitschelm

384 Peverly Hill Road, Portsmouth, NH 03801 • (603) 923-9079 • Charlie6055@gmail.com

<b>Objective:</b>	Find an internship or research position pertaining to materials science or aerospace engineering	
<b>Education:</b>	<b>University of New Hampshire – College of Engineering and Physical Sciences</b> GPA: <b>3.84/4.0</b>   Honors Program   B.S, Mechanical Engineering   Physics Minor	<b>Aug. 2016 – May 2020, anticipated</b>
<b>Tech Skills:</b>	Microsoft Suite   Solidworks   Python   MATLAB   Lean & VSM   GD&T   Machining	
<b>Experience:</b>	<b>UNH Institute for the Study of Earth, Oceans, and Space</b> <i>Researcher</i>	<b>May 2017 – August 2017</b>
	<ul style="list-style-type: none"><li>Used Python to conduct a systematic search of the COMPTEL data for evidence of polarization from solar flares</li><li>Organized necessary data sets and developed tools that will be needed for analysis</li><li>Using the COMPTEL field-of-view, determined the number of source and background counts for that event, and then used simulations to estimate the polarization sensitivity for that event</li><li>Created a systematic analysis of all gamma ray bursts that took place within the COMPTEL field-of-view</li></ul>	
	<b>Shoal Interactive, LLC</b> <i>Business and Marketing Intern</i>	<b>January 2017 – present</b>
	<ul style="list-style-type: none"><li>Attend weekly meetings to decide business and product decisions with the team</li><li>Assist with the applications user interface and administrative writing</li><li>Lead major marketing campaigns to neighboring towns for the release of our Coupler's alpha</li></ul>	
<b>Relevant Orgs:</b>	<b>UNH Students for the Exploration and Development of Space</b> <i>Co-Founder, CTO, Head of Rocket Propulsion</i>	<b>Mar. 2017 – present</b>
	<ul style="list-style-type: none"><li>Lead overall managerial duties of the organization including running all meetings and overseeing the goals of the organization</li><li>Foster a learning environment for all and manage all outreach and networking events</li><li>Head the design and manufacturing for the rocket propulsion team, which includes a two-stage solid rocket booster</li><li>Manage all tech leads to create a high-altitude rocket to participate in the University Student Rocketry Competition in September. 2018</li></ul>	
	<b>UNH LunaCats</b> <i>Electrical Team Member</i>	<b>Sept. 2016 – May 2017</b>
	<ul style="list-style-type: none"><li>Designed, fabricated and coded a robotic excavator to compete in NASA's Robotics Mining Competition</li><li>Assembled and tested the electronics box so the rover can successfully compete at Kennedy Space Center for the 2017 NASA sponsored Robotics Mining Competition</li></ul>	
	<b>UNH Precision Racing</b> Secretary, Powertrain Engineer	<b>Sept. 2016 – May 2017</b>
	<ul style="list-style-type: none"><li>Maintained all relations to the college and the surrounding community by providing outreach and an end-of-year banquet to all our supporters</li><li>Assisted the design of the intake system and catch cans</li></ul>	
	<b>STEMbassadors</b> <i>Member Lead in the Robotics Activity</i>	<b>Sept. 2016 – present</b>
	<ul style="list-style-type: none"><li>Volunteer in the New Hampshire area to inspire the next generation of engineers and problem solvers</li><li>Run the World of Robotics activity where students can experiment with gear ratios and different wheel choices</li></ul>	
<b>Other Skills:</b>	Project Management   Organizational Leadership   Creativity and Problem-Solving   Communication	

Charlie Nitschelm  
384 Peverly Hill Road  
Portsmouth, NH 03801  
603-923-9079

# Personal Statement

October 22, 2017

100 Bureau Drive  
Gaithersburg, MD 20899

Dear NIST SURF team,

I fell in love with engineering when I became a founding member of a FIRST robotics team that was started during my senior year of high school. When the FIRST season was over, I felt the need to continue building on my engineering skills. I began to experiment with model rocketry, which is still my hobby. I converted my longboard to be electric. I welded the motor mount onto the back truck and hooked a Turnigy electric motor to it. I used an electronic speed controller paired with a transmitter and receiver to control the acceleration and breaking of the board. I learned how lithium polymer batteries worked and hooked two 5000 mAh batteries in parallel to power it. I began to realize that I naturally gravitated to math and science in high school and constantly surrounded myself with various engineering projects. I knew I wanted to continue my education in mechanical engineering, but I did not know what I wanted to do with a mechanical engineering degree. I began to explore my options for a career when I picked up an unexpected past-time, reading.

Reading became a big part of my life in university. I started to replace all my time wasters including scrolling through Facebook and TV shows with reading. The first book I read, *Space Chronicles* by Neil deGrasse Tyson, sparked a huge transformation of the interests in my life. For most, it is scary to think of something so huge and complex. I see opportunity. I see an adventure waiting to happen. It empowers me to join the force for space exploration and be at the forefront of human adventure. Reading books that let me explore the universe continues to inspire and invigorate me. It fills me with hope for the future. It is what made me fall in love with astronomy, physics and, ultimately, aerospace engineering.

I have nearly 3 years of experience leading organizations, with my current one being an aerospace engineering organization. As co-founder and Chief Technical Officer of UNH Students for the Exploration and Development of Space (SEDS), I have developed a skill set that allows me to understand my organization members' personalities and commitments to better manage the team. Teamwork is a skill that can only be learned in practice and having experience in engineering projects has helped me be a better communicator and team player. As head of propulsion at UNH SEDS, I gained experience in running design meetings and detailing expectations for each member in my group. In my research position this past summer through a research award, I was able to gain experience in data analysis using Python and the experience has given me a better understanding of the process of research and working under deadlines.

# Official Academic Transcript from University of New Hampshire

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University of New Hampshire

Elizabeth Smith

Stoke Hall

11 Garrison Avenue

Durham, NH 03824

Telephone: 603-862-1593

School Web Page: <http://unh.edu/>

Accreditation: New England Association of Schools and Colleges, Comm on Institutions of Higher Ed (NEASC-CIHE)

## Student Information

Student Name: Charlie James Nitschelm

Numeric Identifier: 936785333

Birth Date: Not Provided By the Sending School

Student Email: [cjn1012@wildcats.unh.edu](mailto:cjn1012@wildcats.unh.edu)

## Receiver Information

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## UNIVERSITY OF NEW HAMPSHIRE

SSN: \*\*\*-\*\*-6736

ID: 936785333

Date of Birth: 30-APR

Date Issued: 19-JAN-2018

Record of: Charlie James Nitschelm  
 Current Name: Charlie James Nitschelm  
 384 Peverly Hill Road  
 Portsmouth, NH 03801

Page: 1

Issued To: Charlie James Nitschelm  
 cjn1012@wildcats.unh.edu  
 Student email:  
 cjn1012@wildcats.unh.edu

Course Level: Undergrad degree

Term Information continued:  
 Mechanical Engineering

Current Program

College : Engineering&Physical Sciences  
 Major : Mechanical Engineering

College : Engineering&Physical Sciences Major : Mechanical Engineering					SUBJ NO.	COURSE TITLE	CRED GRD	PTS R
SUBJ NO.	COURSE TITLE		CRED GRD	PTS R	HIST 444J	Honors/Global Citizenship	4.00 A	16.00
TRANSFER CREDIT ACCEPTED BY THE INSTITUTION:					ME 503	Thermodynamics	3.00 A	12.00
					ME 525	Statics	3.00 A	12.00
					ME 561	Intro to Materials Science	4.00 B	12.00
					PHYS 405	Intro to Modern Astronomy	4.00 A-	14.68
					Ehrs: 18.00 GPA-Hrs: 18.00 QPts: 66.68 GPA: 3.70			
201610 College Board Examinations					January 2018			
					IN PROGRESS WORK			
MATH 425	Calculus I AP		4.00 TCR		ME 795	Top/Industrial Skills & Eng	3.00 IN PROGRESS	
MATH 426	Calculus II AP		4.00 TCR		In Progress Credits 3.00			
PHYS 401	Introduction to Physics I AP		4.00 TCR		Spring 2018			
Ehrs: 12.00 GPA-Hrs: 0.00 QPts: 0.00 GPA: 0.00					IN PROGRESS WORK			
INSTITUTION CREDIT:					BIOL 444B Honors/Current Issues in Biol 4.00 IN PROGRESS			
Fall 2016					HUMA 440B Honors/That Belongs in aMuseum 4.00 IN PROGRESS			
Engineering&Physical Sciences					IAM 550 Intro to Engineering Computing 4.00 IN PROGRESS			
Mechanical Engineering					ME 526 Mechanics of Materials 3.00 IN PROGRESS			
ENGL 401	First-Year Writing		4.00 A	16.00	PHYS 615 Mechanics/Mathematical Phys I 4.00 IN PROGRESS			
EREC 411	Envrnmntl&Res Econ Perspectives		4.00 A	16.00	TECH 602 Machine Shop Training 1.00 IN PROGRESS			
MATH 527	Diff Equation w/Linear Algebra		4.00 A	16.00	In Progress Credits 20.00			
PHYS 407S	General Physics I Studio		4.00 A	16.00	***** TRANSCRIPT TOTALS *****			
Ehrs: 16.00 GPA-Hrs: 16.00 QPts: 64.00 GPA: 4.00					Earned Hrs GPA Hrs Points GPA			
					TOTAL INSTITUTION 51.00 51.00 196.04 3.84			
Spring 2017					TOTAL TRANSFER 12.00 0.00 0.00 0.00			
Engineering&Physical Sciences					OVERALL 63.00 51.00 196.04 3.84			
Mechanical Engineering					***** END OF TRANSCRIPT *****			
CHEM 405	Chem Principles for Engineers		4.00 A-	14.68				
MATH 528	Multidimensional Calculus		4.00 A	16.00				
ME 477	Introduction to Solid Modeling		1.00 A	4.00				
PHYS 408	General Physics II		4.00 A	16.00				
THDA 440A	Honors/Theatre &Social Justice		4.00 A-	14.68				
Ehrs: 17.00 GPA-Hrs: 17.00 QPts: 65.36 GPA: 3.84								
Fall 2017								
Engineering&Physical Sciences								
***** CONTINUED ON NEXT COLUMN *****								



Andrew Colby, University Registrar

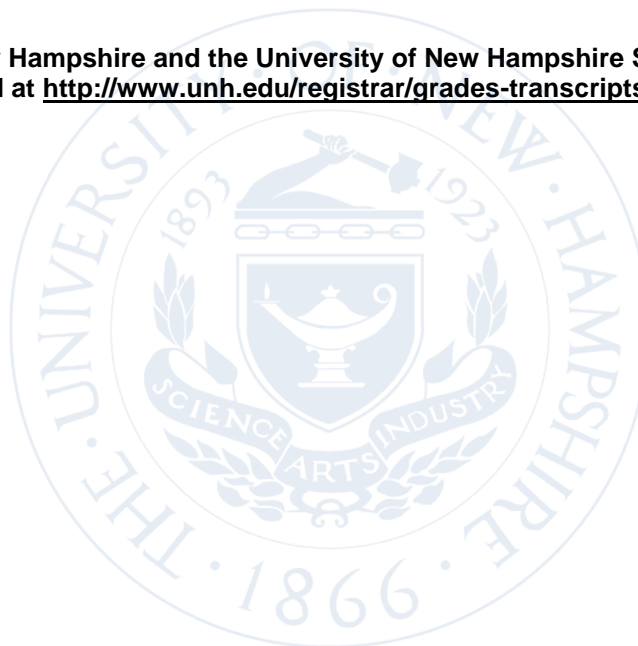


Office of the Registrar  
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Durham, NH 03824-3511  
(603) 862-1587

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University of New Hampshire  
Thompson Hall  
105 Main Street  
Durham, NH 03824-2512  
(603) 862-3000

University of New Hampshire  
School of Law  
2 White Street  
Concord, NH 03301-4115  
(603) 228-1541

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Dear NIST Program Committee:

I have known Charlie Nitschelm since August 2017. I am the instructor for his Thermodynamics class at the University of New Hampshire (UNH) and my impression is that he is in the top 5% of his class. Charlie excels in and outside of class and has a warm, friendly personality, and has exceptional scientific curiosity.

Charlie is easily one of the top students in the class that I am teaching. He grasps all the concepts which many other students struggle with. He often asks questions that reveal his profound understanding of the material and genuine scientific and engineering curiosity. Although he is a sophomore, we have had class-related conversations which many juniors and seniors would struggle to follow.

Charlie is a good team player who cares about his fellow students. I vividly remember how once during office hours he quickly grasped a concept that another student struggled with. Charlie helped the other student understand the concept and offered to help the student further after the office hours. Charlie is considerate – he stays far ahead of schedule in the class but is also humble and gives the opportunity to other students to participate in class. Charlie is not shy though – he asks questions when he occasionally does not understand something – I find this very helpful as often times the rest of the class would have the same question.

Charlie is the founder and president of a university organization called UNH Students for the Exploration and Development of Space. I was recently made aware of the club at an event at our college and was very intrigued by the high-altitude multi-stage rocket project that the club members are working on. Charlie has managed to recruit undergraduates from multiple majors and I am confident in the success of the project.

I believe that with his academic potential, leadership skills, and kind personality, Charlie will be an excellent fit for the NIST program, and I highly recommend him.

Please do not hesitate to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ivaylo'.

Ivaylo Nedyalkov (Ivo)



University of  
New Hampshire

College of Engineering  
and Physical Sciences  
Department of Mechanical  
Engineering

Kingsbury Hall, W101  
33 Academic Way  
Durham, NH 03824

V: 603.862.1352

F: 603.862.1865

TTY: 7.1.1 (Relay NH)

February 8, 2018

Reference for Charlie Nitschelm

Charlie was a student in a class I just finished teaching to 26 students entitled ME 561 – Introduction to Materials Science. He sits in the front row, comes to most classes, and asks pertinent and thoughtful questions. He received a B in my class, his first grade that was not an A or A- (I guess I'm a hardass). He is a confident and thoughtful student who takes responsibility for his learning successes and failures. ME 561 is a required class for mechanical engineers and many of them view it as an undesirable class similar to chemistry.

He is also a sophomore team member of a team competing in a rocket building competition. He has exhibited strong drive in helping the team achieve their goals. When we have met, Charlie is engaged, listens well, and thinks well on his feet. He is more mature in his thought processes than most of his peers but has not yet gone through the transition in academic performance strategies I see for most students after their Sophomore year (which he has not yet completed).

Charlie is one of those highly motivated and confident people who I believe are capable of achieving excellence in the areas they consider to be important. He attaches significant importance to schoolwork but it does not always appear to be his highest priority. He is highly focused on the rocket team and, while he does not ignore his studies, I think his participation on the team may displace some of his focus on schoolwork. That being said, his high academic achievement, a GPA of 3.84/4 so far, indicates he is highly intelligent and capable of multi-tasking with a great degree of success.

So far, Charlie is a top student who exhibits the ability to focus on multiple areas with creativity and excellence. He has an entrepreneurial flair. I view Charlie as a highly desirable candidate for the NIST program.

Regards,

Todd S. Gross  
Professor of Mechanical Engineering  
[todd.gross@unh.edu](mailto:todd.gross@unh.edu)

