

## Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Sreeta Basu

### APPLICANT PROFILE

#### General Applicant Information

First Name: Sreeta

Middle Name:

Last Name: Basu

Previous Last Name(s):

Primary Email Address: sreeta@princeton.edu

Alternate Email Address 1:

Alternate Email Address 2:

ORCID: [0000-0001-5269-8955](https://orcid.org/0000-0001-5269-8955)

#### Current Address

Primary Phone Number: 404-664-1967

Alternate Phone Number:

#### Citizenship/Languages/Eligibility Information

I will be 18 years of age or older by the time the internship begins: Yes

Are you a U.S. Citizen? Yes

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### EDUCATIONAL BACKGROUND

#### Academic Information

Are you currently attending a community college or 2-year college?	No
Current academic status:	Sophomore
If you are selected as a participant in this DOE program, will you receive academic credit from your university/college for participating?	No

#### Undergraduate Institution Information

College/University Country:	United States and U.S. Territories
College/University State/Province/Territory:	New Jersey
College/University Name:	Princeton University
College/University Address:	90 Charlton Street
College/University City:	Princeton
College/University Zip Code:	08544-1098
Expected/Declared Major:	Mathematics
Minor and/or Concentration Expected/Declared:	<ul style="list-style-type: none"> <li>• Business, Finance, Management, Marketing, and Related</li> <li>• Mathematics - Statistics</li> </ul>
Expected Degree From This College/University:	Bachelor's
Expected/Completed Graduation Date:	May / 2024
Transcript:	Transcript.pdf
Does this institution provide grades?	Yes
GPA Scale:	4.0
Total Attempted Credits:	17.00
Total Earned Credits:	17.00
Total Quality Points:	61.54
GPA:	3.62

## Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Sreetta Basu

### Science, Technology, Engineering and Mathematics (STEM) Courses

**Course Title:** Analysis I: PDE and Fourier Analysis

**Course Number:** MAT325

**Enrollment Status:** Planning to Enroll

**Course Title:** Computer Science: An Interdisciplinary Approach

**Course Number:** COS126

**Enrollment Status:** Recently Completed

**Course Title:** Intro to Differential Geometry

**Course Number:** MAT355

**Enrollment Status:** Planning to Enroll

**Course Title:** Intro to Real Analysis

**Course Number:** MAT215

**Enrollment Status:** Recently Completed

**Course Title:** Linear Algebra

**Course Number:** MAT217

**Enrollment Status:** Recently Completed

**Course Title:** Multivariable Calculus

**Course Number:** MAT300

**Enrollment Status:** Recently Completed

**Course Title:** Probability and Stochastic Systems

**Course Number:** ORF309

**Enrollment Status:** Recently Completed

**Course Title:** The Quantum World

**Course Number:** CHM305

**Enrollment Status:** Recently Completed

### High School Graduation or GED

**Date of High School Graduation or GED:** June / 2020

**Country:** United States

**City:** Sewell

**State/Province/Territory:** NJ

## Science Undergraduate Laboratory Internships (SULI)

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### WORK EXPERIENCE & SKILLS

#### Work Experience

<b>Name of Place of Employment or Activity:</b>	Kumon Math and Reading Center
<b>Dates of Employment or Activity:</b>	From 9/10/2018 To 3/12/2020
<b>Hours Per Week:</b>	8.0
<b>Primary Duties:</b>	Instruct middle and high schoolers on how to use the Kumon method to solve math problems and develop reading comprehension skills
<b>Tasks Performed:</b>	Work individually with students, grade and assign homework

#### Professional Associations

<b>Are you a member of any professional organizations?</b>	No
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#### Computer Skills

<b>Computer related skills:</b>	I am able to program in the following languages: R, Stata, Python, Visual Basic, Java, HTML, Mathematica and Matlab. I also have lots of experience working with all applications in the Microsoft suite.
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## Science Undergraduate Laboratory Internships (SULI)

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### PROGRAM INFORMATION

#### Eligibility

Have you previously participated in 2  
SULI appointments? No

#### Previous DOE Internship/Fellowship Experience

Have you ever had an  
internship/fellowship with the  
Department of Energy or any of its  
National Laboratories? No

#### Availability

What is the earliest date you can  
begin your internship? 5/16/2022

When do you need to complete your  
internship? 9/2/2022

#### First Choice Host DOE Laboratory

**DOE Laboratory:** Princeton Plasma Physics Laboratory (PPPL)

**First Choice Research Area:** Computational Sciences

**Second Choice Research Area:** Plasma and Fusion Sciences

**Third Choice Research Area:** Astronomy/Astrophysics

#### Second Choice Host DOE Laboratory

**DOE Laboratory:** Thomas Jefferson National Accelerator Facility (TJNAF)

**First Choice Research Area:** Mathematics

**Second Choice Research Area:** Accelerator Physics/Science

**Third Choice Research Area:** Computer Science and Technologies

#### Relatives Employed at DOE Laboratories

Are you a relative of an employee at  
the proposed host DOE laboratories? No

## Science Undergraduate Laboratory Internships (SULI)

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### ESSAYS

#### Research Experience:

I have been fortunate to participate in several ambitious research projects. As a New Jersey Governor's STEM Scholar during my high-school sophomore year, I worked with a lab at Monmouth University to develop new RNA therapies for glioblastoma. Initially, each team member did independent research on RNA mutations to propose effective targeted therapies; then, we constructed the candidate therapies in the lab and tested their efficiency. Through this experience, I learned to work well in group settings, while taking the initiative to create understandable presentations of our results, which was the final requirement of the program. The experience taught me how to convey complex information through diagrams and examples in ways that would be accessible to a lay audience.

During the summer of my high-school junior year, I studied distracted driving in autonomous vehicles at the NJ Governor's School of Engineering and Technology at Rutgers University. My research was centered around drivers who depend too much on a car that still requires human intervention; these drivers often fall asleep or otherwise engage in other tasks while behind the wheel that leave them less able to concentrate on the road, creating a significant danger to themselves and others on the road. Part of my team's research goal was to identify the best way to alert distracted drivers without causing further distraction. While reading the existing literature, I found that the best notification systems utilized different sensory approaches; thus, I took the lead on creating a multi-level sensory notification system that optimized user interaction.

This last summer, I worked virtually as an intern for the Deike Lab Group at the Princeton Environmental Institute. I was asked to use Python and Matlab to process visual data previously collected in the lab into more usable formats. I was given full responsibility for the image processing and independently optimized the code to generate more accurate results. Towards the end of the summer, I used the numpy library to create graphs using all of the data I had extracted to illustrate the conclusions I had drawn. All of these research projects were demanding and required me to learn and assimilate a lot of new ideas.

#### Research Interests:

Since high school, I have looked for ways to apply my mathematical background in new contexts. At the end of my junior year, my physics teacher gave me a copy of *Flatland*. Perhaps one of the best gifts I've ever received, I finished the book in a matter of days, despite pausing after every chapter to fully comprehend each idea.

*Flatland* describes the world from the point of view of a square who can only see in two dimensions using only geometric shapes. From the way shapes discern one another to the way their houses do not need roofs, *Flatland* forces us to think in different dimensions. This book completely transformed my understanding of geometry in higher dimensions, and with it, came the realization that mathematics is essential to understanding the world.

As a math major, I am constantly learning about different tools to fit the world and its most unpredictable phenomena into equations we can manipulate. My first and second choice laboratories share an emphasis on computational physics that would let me gain more practical experience and connect classroom material to real-world situations.

During the fall semester of my sophomore year of college, I took an introductory course in quantum mechanics; for my final project, I presented a research paper on the power of quantum computing. I was fascinated by the problem of understanding how and why particles act the way they do as well as the applications of this research. I would love to continue participating in this research at Princeton Plasma Physics Laboratory.

I also hope to learn more about the methods used by scientists to convert experimental data into trends and information. This last summer, I worked virtually as an intern for the Deike Lab Group at the Princeton Environmental Institute. I was asked to use Python and Matlab to process visual data previously collected in the lab into usable formats. I was given full responsibility for the image processing and independently optimized the code to generate more accurate results. Towards the end of the summer, I used the numpy library to create graphs using all of the data I had extracted to illustrate the conclusions I had drawn. I would like to

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	continue to develop this analytical skillset by working with the large amount of data collected by the accelerator at the Thomas Jefferson National Accelerator Facility.
<b>Personal Experience:</b>	<p>I believe that my strong communication skills will be valuable to the SULI program. As a Princeton debate team member, I am required to become and remain an expert on a large number of issues, from current policy debates to the newest movie releases. Part of this task involves synthesizing research into link-chains - a series of causal steps that explains why one simple change often cascades into a multitude of others. Delivering this information in an understandable manner requires translating the ideas into numbers and statistics a judge can relate to.</p> <p>I use these skills as a staff writer of the <i>Insight Spark Magazine</i>, an undergraduate literature review journal. Each of my articles aims to deliver current cutting-edge research to my fellow undergraduates in a manner that lets them appreciate the subject at hand. My ability to successfully communicate with multiple audiences should be helpful in translating lab results to lay audiences.</p>
<b>Professional Goals:</b>	<p>I aspire to become a research professor, combining my love of research and teaching to act as a mentor for future students while contributing to research myself. To reach this goal, I must enroll in a Ph.D. program to gain the skills and credentials needed to fulfill my career aspirations.</p> <p>Participation in the SULI program would help me develop the research skills necessary to thrive in a Ph.D. program. Working with top researchers will help me learn more about the tools computational researchers use to model particles and provide me with hands-on experience that will complement my coursework to date.</p>

### RECOMMENDATIONS

<b>Recommendation 1:</b>	<p><b>First Name:</b> Nicholas  <b>Last Name:</b> Risteen  <b>Email:</b> nristeen@princeton.edu  <b>Status:</b> Received 1/6/2022</p>
<b>Recommendation 2:</b>	<p><b>First Name:</b> Renee  <b>Last Name:</b> Altergott  <b>Email:</b> reneea@princeton.edu  <b>Status:</b> Received 1/8/2022</p>

# Undergraduate Internal Transcript (not for External Use)

Name: Basu, Sreeta  
ID: 920245285

Program: AB  
Plan:

## 2020-2021 Fall

<u>Course</u>		<u>Grade Basis</u>	<u>Title</u>	<u>Grade</u>	<u>Distrib Area</u>
COS	126	GRD	Computer Science: An Interdisciplinary A	A	QCR
ECO	310	GRD	Microeconomic Theory:A Math Approach	A	SA
FRE	103	GRD	Intensive Beginner's&Intermediate French	A	NONE
MAT	215	GRD	Single Variable Analysis with an Intro	B	QCR

## 2020-2021 Spring

<u>Course</u>		<u>Grade Basis</u>	<u>Title</u>	<u>Grade</u>	<u>Distrib Area</u>
ECO	312	GRD	Econometrics: A Mathematical Approach	A	QCR
FRE	107	GRD	Intermediate/Advanced French	B+	NONE
MAT	217	GRD	Honors Linear Algebra	B+	QCR
MUS	210	GRD	Beginning Workshop/Musical Composition	A	LA
WRI	198	GRD	Writing Seminar	B+	Writing

## 2021-2022 Fall

<u>Course</u>		<u>Grade Basis</u>	<u>Title</u>	<u>Grade</u>	<u>Distrib Area</u>
AMS	399	GRD	In the Groove:Technology and Music	A-	HA
CHM	305	GRD	The Quantum World	A-	SEN
MAT	300	GRD	Multivariable Analysis I	B	QCR
ORF	309	GRD	Probability and Stochastic Systems	A-	NONE

## 2021-2022 Spring

<u>Course</u>		<u>Grade Basis</u>	<u>Title</u>	<u>Grade</u>	<u>Distrib Area</u>
ECO	363	GRD	Corporate Finance and Financial Institut		SA
MAT	325	GRD	Analysis I: Fourier Series and PDE		QCR
MAT	355	GRD	Introduction to Differential Geometry		QCR
PHI	201	GRD	Introductory Logic		EC

Number of Elected PDFs: 0  
Number of Audits: 0  
Total Advanced Standing Credits: 0  
Total Course Credits: 17  
Unofficial GPA: 3.615



# SULI PROGRAM APPLICATION RECOMMENDATION FOR SREETA BASU

## Recommender Contact Information

- **First Name:** Nicholas
- **Last Name:** Risteen
- **Title:** Lecturer
- **Department:** Princeton Writing Program
- **Institution/Organization:** Princeton University
- **Telephone:** 603-465-1081
- **Email:** nristeen@princeton.edu

## Applicant Information

### Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

I have known Sreeta Basu for two years; she was a student in my First-year Writing seminar at Princeton in the Spring of 2021.

### Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

Dear SULI Program Selection Committee,

It is my sincere pleasure to endorse Sreeta Basu for a summer internship in the Department of Energy's Science Undergraduate Laboratory Internship Program. I had the pleasure of teaching Sreeta in Spring 2021 in my writing seminar *Apocalypse How?*, where she was an exemplary student and contributor to our class. Distinguishing herself as a dedicated writer and reviser, Sreeta was eager throughout the semester to receive feedback on her work and paid detailed attention to improving her essays. Of all my students last Spring, Sreeta showed an impressive ability to provide constructive and attentive feedback to her peers. With a keen eye for detail in analyzing her own work as well as that of her peers, Sreeta's writing and analytical skills improved markedly over the course of the semester and culminated in a well-researched final essay on volcanic warning systems and moral questions about the "right to safety." Given the unique learning environment of the 2020-21 school year—where Princeton's coursework was conducted entirely online—Sreeta's continued attention and dedication to the class despite the unsettled circumstances showed a deep resolve to overcome and thrive under difficult conditions.

Beyond her dedication to her own work, Sreeta was an active and engaged member of the seminar, paying close and thoughtful attention to the work of her peers in our writing workshops. Deftly melding criticism and encouragement, Sreeta's interactions with her classmates enlivened discussion and deepened the collegial atmosphere of peer review. The Writing Seminars at Princeton

encourage intense collaboration both inside and outside of the seminar. Outside of class, students meet individually and in small groups with the us to strategize the revision process; they also convene in writing groups to exchange drafts and offer each other suggestions. In class, students frequently do group work and have their writing or sections of their writing work-shopped by the class or in small groups. In these settings, I found Sreeta to be a wonderful addition to our class—a generous listener and thoughtful respondent I could count on to keep our conversations rigorous and lively. Skilled at both giving and receiving thoughtful feedback, Sreeta’s attention to detail and analytical approach marked her as a keen mind eager to engage with new ideas and actively learn from her experiences.

This engagement stems in part from Sreeta’s penetrating curiosity and willingness to take intellectual risks both in my class as well as in her other university coursework. As a concentrator in Mathematics here at Princeton, Sreeta brought her interests in natural science and vulcanology into the writing program context with considered attention on how to translate scientific ideas into clear arguments for a general audience. The skills she’s developed in writing seminar—of deeply engaging with primary sources to develop critical and original questions, and then to effectively argue and communicate her findings to a non-expert audience—has already served her well in her time as a staff writer for Princeton’s *Insight Spark Magazine*.

I am very happy to endorse Sreeta Basu’s application for an internship in the DOE’s SULI Program. Please don’t hesitate to contact me if you’d like more information about her as a student in my class.

Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical	X				
Experimental Research	X				
Overall Academic					X
Initiative and Self Reliance					X
Motivation toward Scientific Career					X
Originality of Thought				X	
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership					X
Oral Communication Skills					X
Written Communication Skills				X	

# SULI PROGRAM APPLICATION RECOMMENDATION FOR SREETA BASU

## Recommender Contact Information

- **First Name:** Renee
- **Last Name:** Altergott
- **Title:** Ms.
- **Department:** French and Italian
- **Institution/Organization:** Princeton University
- **Telephone:**
- **Email:** reneea@princeton.edu

## Applicant Information

### Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

I had the pleasure of getting to know Sreeta Basu this past fall semester (2021) at Princeton University. I am a doctoral candidate, and she was a student in my discussion section for Dr. Emily Thompson's course in the History Department, "In the Groove: The History of Sound Recording from Edison to the iPod." This course combined primary materials with cultural history, music, and the basic scientific and mechanical aspects of sound recording. Students participated in weekly discussion sections, and wrote four essays over the course of the semester. I graded her essays and provided detailed feedback on her research.

### Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

I can mainly speak to Sreeta's academic curiosity and character. She was consistently one of the top two participants in the weekly discussions, and always found thoughtful ways to engage in debates with her colleagues and push their ideas further. I think this would make her a strong asset in the laboratory setting of the SULI program, as she elevates the level of dialogue and enables her colleagues to approach problems from multiple angles. I could easily see these qualities enabling Sreeta to work well on a team, and to be a leader among her peers. I have read four research essays on the history of sound recording technology, music, and American culture that she wrote for my course, which also consistently received the highest marks in her section. These essays demonstrated her strengths in conducting research and presenting her findings in compelling ways, which I also feel would strengthen her candidacy for the SULI program.

# Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical	X				
Experimental Research	X				
Overall Academic					X
Initiative and Self Reliance					X
Motivation toward Scientific Career					X
Originality of Thought					X
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership					X
Oral Communication Skills					X
Written Communication Skills					X