



ADVANCED SCIENCE RESEARCH CENTER  
THE GRADUATE CENTER  
CITY UNIVERSITY OF NEW YORK



# IlluminationSpace Biennial Report, 2021-2023

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*Letter from the ASRC Interim Director*

# JOSHUA BRUMBERG

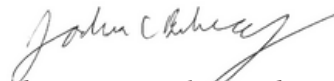
Dean for the Sciences, CUNY Graduate Center  
Interim Director, Advanced Science Research Center

No matter who we are or where we live, science shapes our daily lives. It enables and affects how we communicate, travel, eat and breathe. Despite this global impact, the practice of science and its implementation have been the purview of a largely homogeneous group. The historical exclusion of women and people of color from STEM education and, subsequently, employment opportunities hinder science in realizing its best discoveries and applications. These hinderances are especially problematic at a moment when the wellbeing of the planet and humans are at such critical turning points and reliant on broad access to scientific knowledge, discovery and application.

CUNY's historical mission is providing students a first-class higher education regardless of their means or background. Living out this mission has allowed the university to play a critical role in ensuring New York City and the businesses that thrive here have a diverse talented pool of employees that are more reflective of the city's population. STEM is an area where we've been more challenged in our work to ensure diversity. The CUNY ASRC IlluminationSpace Hub was designed to help address this challenge on a fundamental level by improving information and knowledge exchange between the CUNY STEM community and New York City's diverse communities. It also aims to stimulate young minds and create pathways to STEM higher education for groups that are underrepresented in STEM.

This first biennial report highlights the growing impact of the IlluminationSpace Hub's work to make science more accessible and partner CUNY STEM and New York City communities in using science for the public good. I hope you enjoy learning about this work and that you glean opportunities to participate in realizing this critical and timely mission.

Sincerely,



Joshua C. Brumberg, Ph.D.  
Dean for the Sciences  
The CUNY Graduate Center

Interim Director  
Advance Science Research Center at  
The CUNY Graduate Center

Professor of Psychology and Biology  
Queens College and The Graduate Center,  
CUNY



*Letter from the IS Hub Co-Directors*  
**KENDRA KRUEGER & SHAWN RHEA**



The past two years have confirmed that our vision for the IlluminationSpace (IS Hub) is needed and timely.

As a public institution serving a student body that is predominately people of color, CUNY is committed to seeing that our students have pathways to enter fields that address 21st century needs and removing barriers to careers that are historically challenging for individuals from some groups to pursue. The ASRC was created to elevate science across CUNY, and that includes ensuring that students with STEM interests and abilities aren't dissuaded by lack of pathways.

The IS Hub's mission is to foster deep and ongoing collaboration between CUNY STEM and NYC Black, Indigenous, and People of Color (BIPoC) communities, making science more accessible and responsive to local needs and providing individuals from underrepresented and underserved groups pathways to STEM education and careers. We do this through partnership building within the ASRC, across CUNY, and with local public schools, community groups, neighborhoods, and a dedicated community advisory group.

This first biennial report provides a glimpse into the IS Hub's four programs, which are designed to open STEM pathways and create a diverse scientific community that is connected across disciplines, beyond the lab and into local neighborhoods.

The Science Communication Academy engages grad-level STEM and science journalism students in an academic year-long fellowship that uses media technologies to communicate complex science to diverse audiences. The Community Sensor Lab is a youth and community-member training space for building low-cost environmental monitoring technology and data collection for community advocacy. The IS Hub Field Trip and Virtual Classroom Program brings communities into the ASRC to connect with the science performed here. And the IS Hub Digital Community will facilitate community use of open-source STEM technologies and research publications, and foster research collaboration, data-driven policy change, and engagement between STEM academics and BIPoC communities.

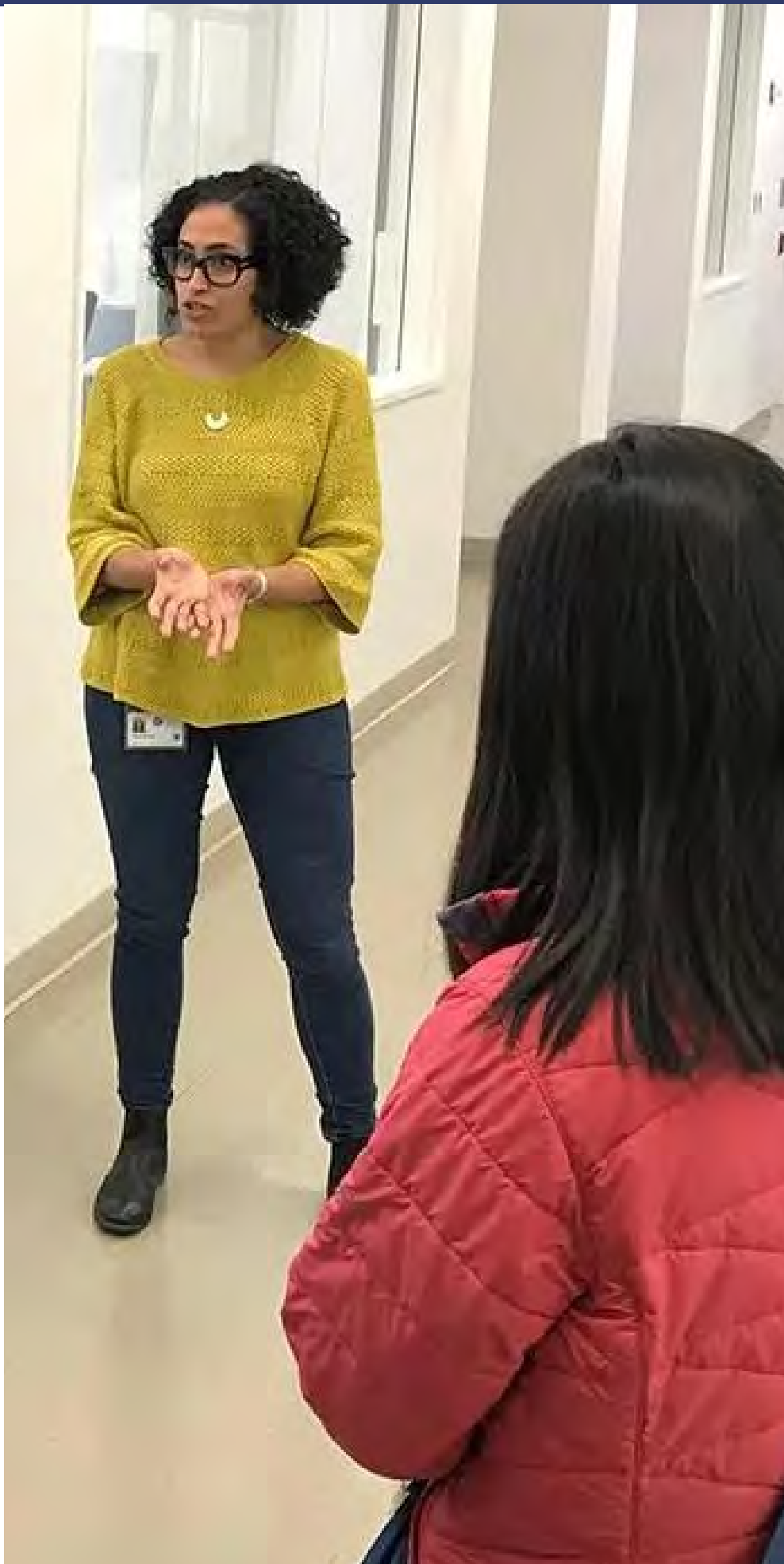
We would like to give a special thank you to GC Science Dean Josh Brumberg; former ASRC Executive Director Nina Gray, who championed our work to launch the IS Hub when it was just an idea and helped us secure our first funding; CUNY Craig Newmark School of Journalism's Health & Science Reporting Program Director Emily Laber-Warren, who partners with us on the Science Communication Fellowship Program; and Ricardo Toledo-Crow, director of the ASRC Next Gen Sensor lab, and co-director of the IS Hub's Community Sensor Lab.

Sincerely,

Shawn Rhea & Kendra Krueger,  
ASRC IlluminationSpace Hub Co-Directors

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*Executive Summary*

# COMMUNICATION. COLLABORATION. COMMUNITY.

Inequitable public-education, culturally exclusive pedagogy and educational spaces, and lack of entry points and pathways are major barriers to STEM equity and access that arise repeatedly over the course of BIPOC students' educational careers. For example, 65.5% of NYC public school students are Black and Latinx, but they are just 10.2% of students attending the city's specialized high schools. BIPOC students are 55.7% of CUNY's matriculating population, but only 49.4% of STEM students on the undergraduate level and 17% on the graduate level.

BIPOC students and communities are systemically excluded from opportunities to access, develop and shape the use of STEM to solve major challenges and improve the human condition.

The IlluminationSpace (IS) Hub creates spaces, programs and resources that foster collaboration between diverse and differently resourced stakeholders to address shared goals, such as healthier communities, workforce development and greater access to life-improving technologies.

The hub's areas of work -- K-16+ STEM education, science communication, community-based science, and workforce development -- address inequitable public education resources and the lack of entry points and pathways to STEM training and community employment.

The IS Hub's space born out of the idea that STEM is for everyone and that our understanding and communication of science can drive solutions to the major issues of our time.





## OUR WHY

### *Why are we doing this?*

- From climate change to global pandemics, science is essential to understanding and addressing the challenges of this moment.
- CUNY is highly diverse, serving a student body that is nearly 56% BIPOC, but only 49.4% of STEM students on the undergraduate level and just 17% on the graduate level.
- The IS Hub team understands that communication, collaboration, and community are essential to meeting these challenges.

### *Why is CUNY well-positioned to do this work?*

- CUNY is a public institution with a clear directive to provide scholarship to New Yorkers and to serve the public good.
- The ASRC is an R1 research institution, and was established to elevate science across all of CUNY by fostering interdisciplinary research.
- The ASRC is located in the predominantly Black and Latinx Harlem community.

### *Why does this matter?*

- The work of the IS Hub has and will continue to create partnerships across communities while addressing local needs.
- The IS Hub creates pathways for collaboration, cross-learning, and career development through its programming.

The IS Hub team understands that communication, collaboration, and community are essential to meeting these challenges.

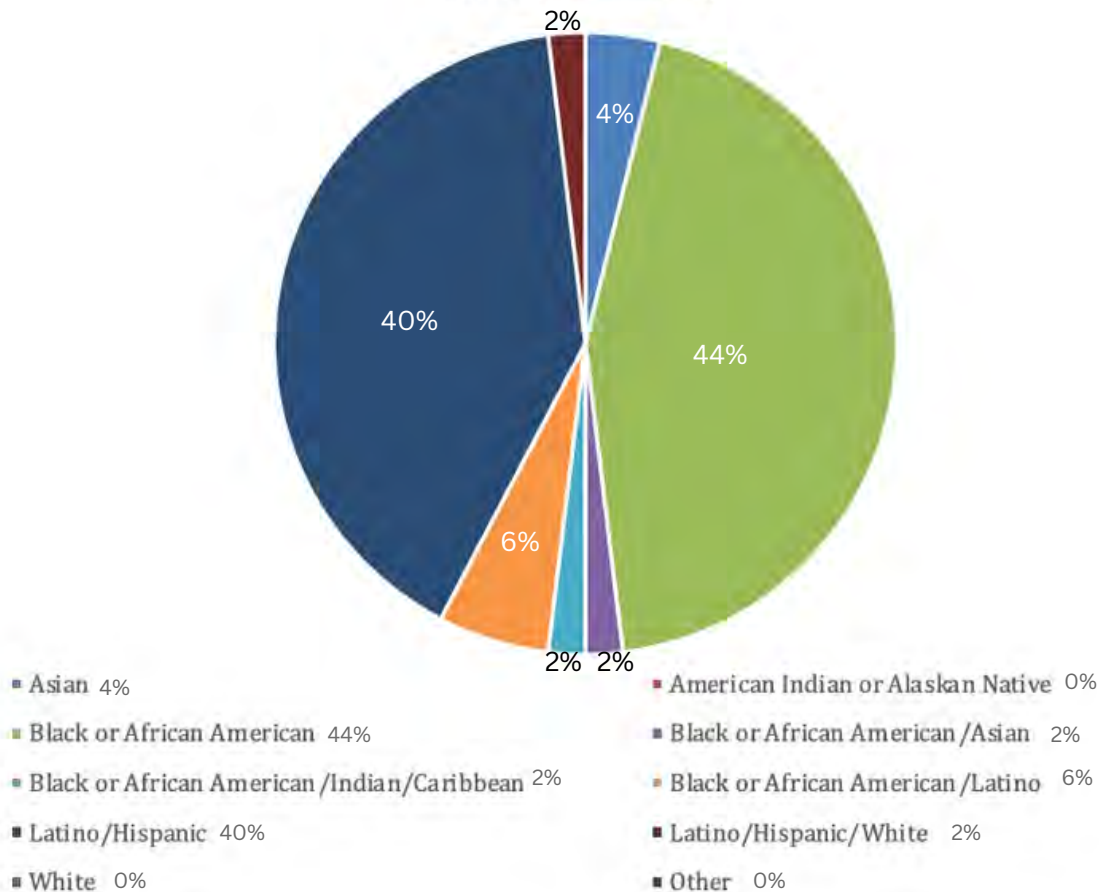


Our partners are vital to the success of the IS Hub. We are grateful to collaborate with a diverse and committed group of researchers, educators, journalists, activists, and community-based organizations. We are working to expand our reach into all five boroughs.

# COMMUNITY IS OUR STRENGTH

1. CUNY ASRC
2. WE ACT for Environmental Justice
3. Craig Newman School of Journalism
4. CUNY Graduate Center
5. Sixth Street Community Center (SSCC)
6. Red Hook Initiative

## Race &amp; Ethnicity



Race & ethnicity of respondents to in-person field trip surveys: Spring thru fall 2022 (n = 52)

# DIVERSITY IS OUR SUPERPOWER

- All of the IS Hub staff are BIPOC, and a majority are women.
- All of our CSL interns were BIPOC students
- 50% of our Science Communications Fellows were BIPOC
- 50% of our Science Communications Fellows were female
- 94% of our field trip participants were BIPOC
- 66% of our field trip participants were female
- Nearly 6% of our field trip participants were gender non-binary



*IlluminationSpace Hub*

# PROGRAMS

The four programs of the IS Hub ensure that the sciences are accessible - fostering communication, collaboration, and community - throughout.

Between 2021 and 2023, each program component used a variety of technological tools to share information and teach STEM skills that can address community needs, connect scientists and communities around shared interests, and provide on-ramps to STEM careers.

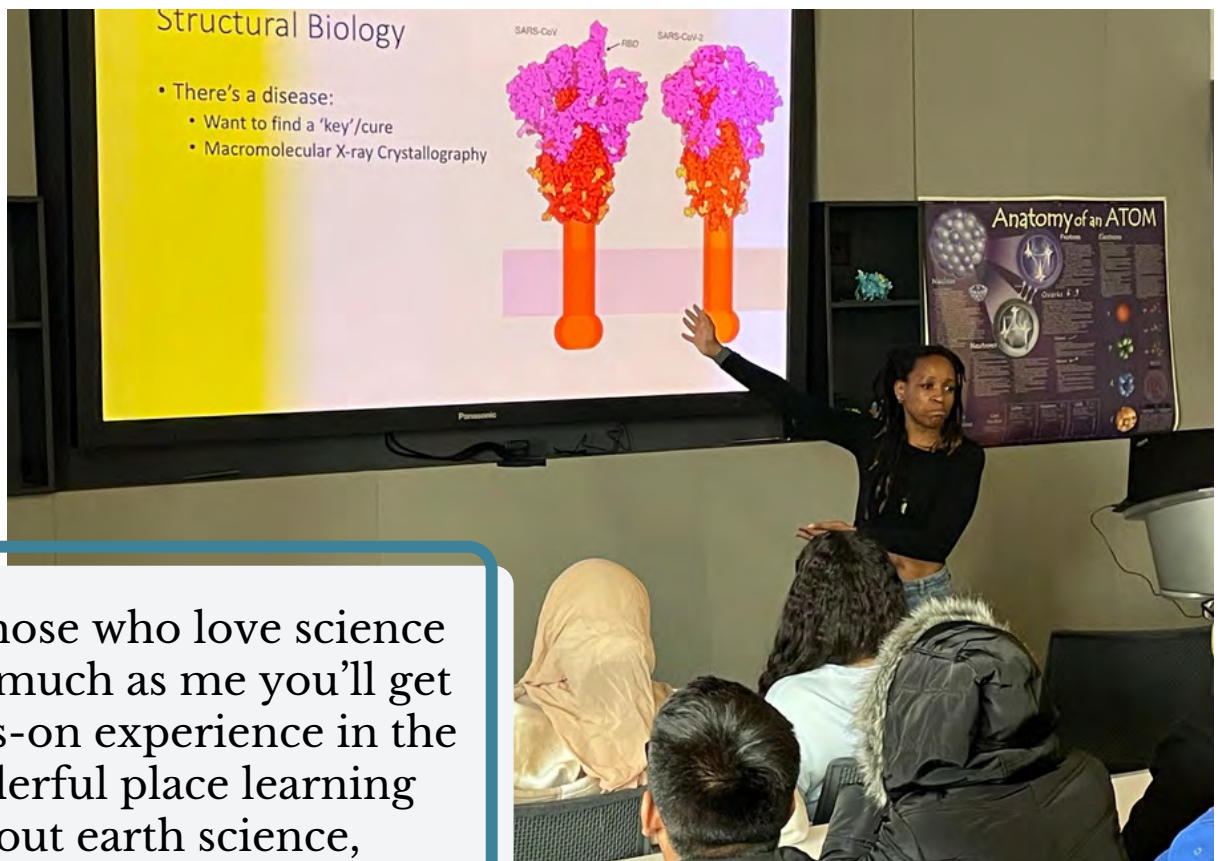


I would tell teachers interested in bringing to students to the ASRC to prepare their students for a breathtaking experience right here in NYC!



## IS IMMERSIVE CLASSROOM

- Field trips engage NYC high school and middle school students and educators
- Immersive and interactive technologies used as entry points to understand and explore the ASRC's five interdisciplinary research areas and labs



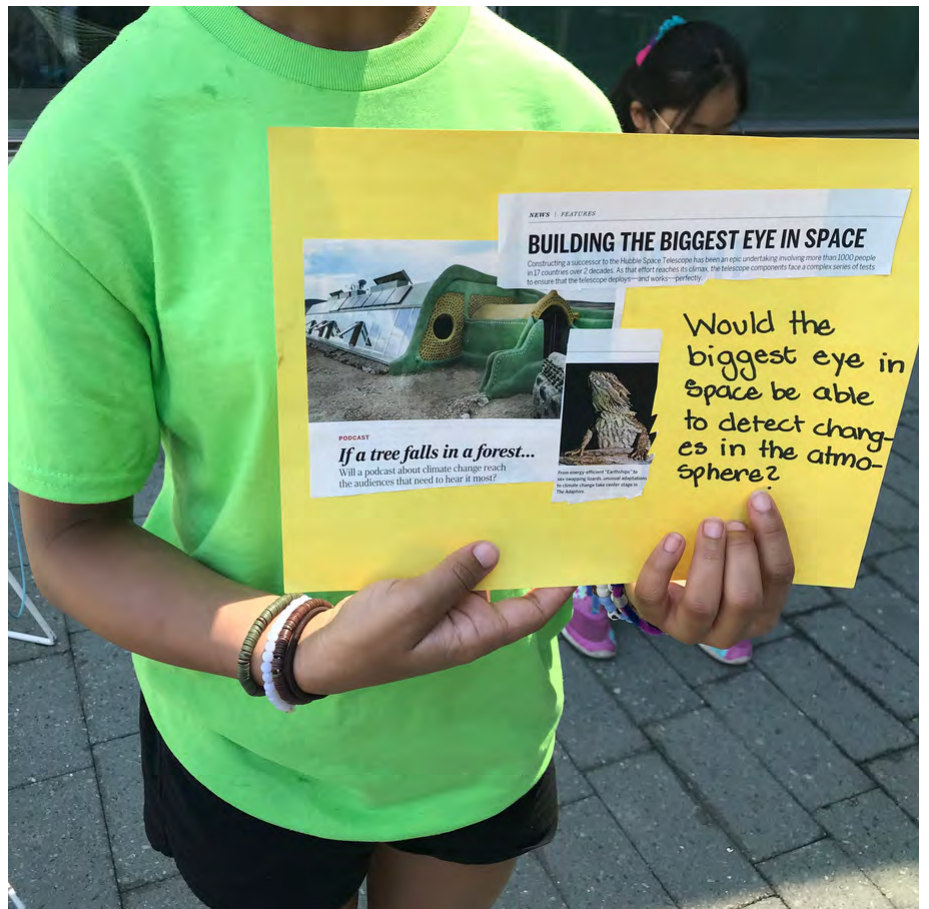
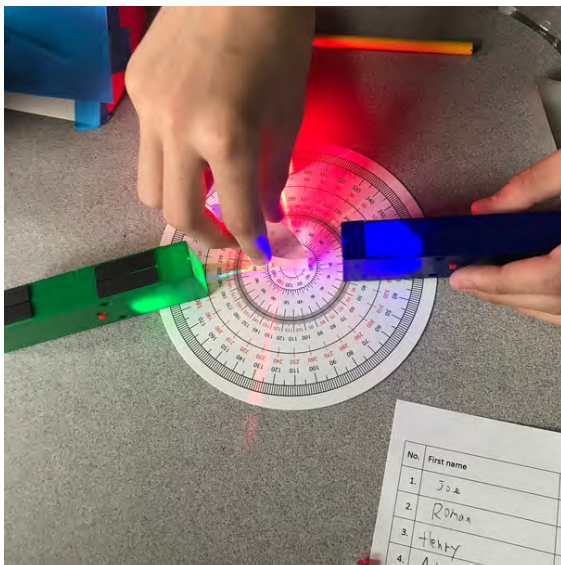
“...for those who love science just as much as me you'll get a hands-on experience in the wonderful place learning about earth science, computer science...”





## IS IMMERSIVE CLASSROOM HIGHLIGHTS

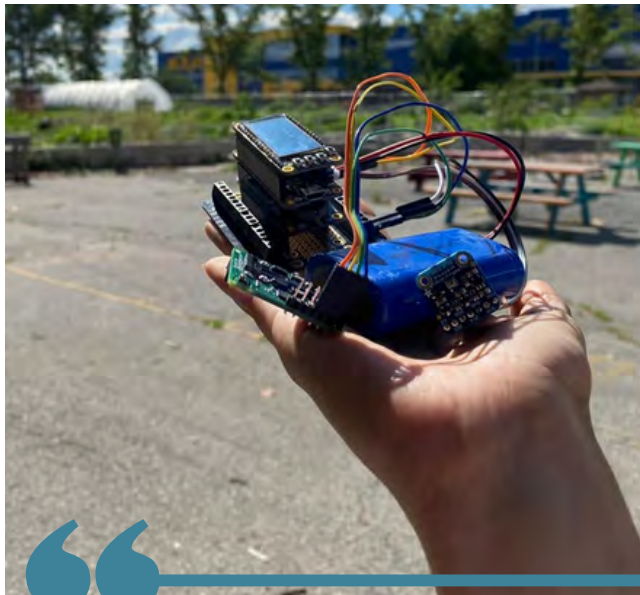
- Launched our immersive 360-virtual tour platform for remote field trips and VR experiences
- Raised funds to re-develop our neuroscience exhibit to focus on the brain and mental health
- Hosted community pop-ups, tabling events and in-school programs





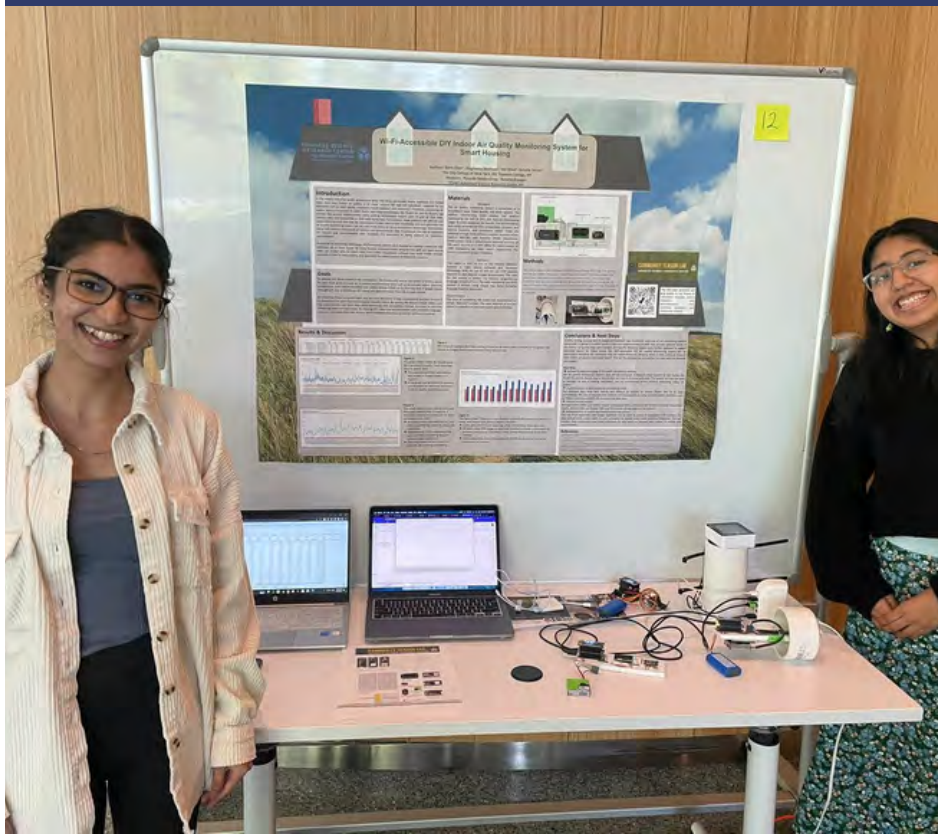
## COMMUNITY SENSOR LAB (CSL)

- Youth and community-member training space for building low-cost environmental monitoring technology and data collection for community use and education
- Engages CUNY STEM faculty and students, tech companies and CBOs to partner and collaborate



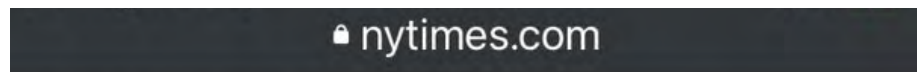
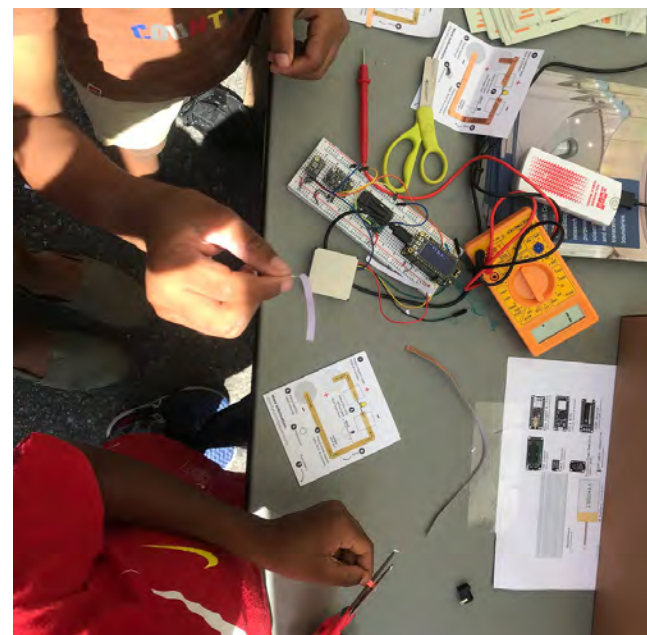
“...the Community Sensor Lab is particularly important as it forces people to confront the fact that global warming is slowly affecting our daily lives, propelling them to make movements to prevent it from spreading further...”





## CSL HIGHLIGHTS

- Our Red Hook cohort launched their satellite program, Red Hook Community Sensor Lab, hosting 9 workshops and tabling events
- CSL CUNY students won best poster at Bio-Inspired Technology Conference
- All CUNY students obtained REU or industry internships for summer 2023
- Publication of our open-source, collaborative Data & Sensing Curriculum



**Hurricane Sandy, 10 Years Later**

Photos

Timeline

5 Ways to Prevent

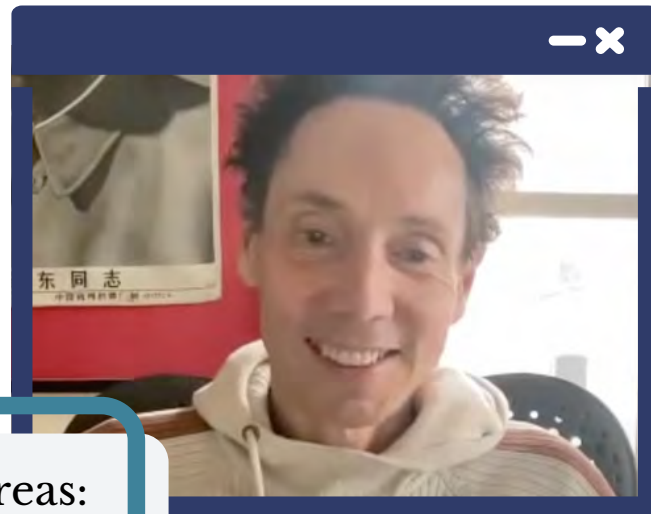






## GC SCIENCE COMMUNICATION ACADEMY

- Engages grad-level STEM and science journalism students in an academic year-long fellowship that uses media technologies to communicate complex science to diverse audiences.
- Provides community-based STEM advocacy workshops, and science communication, advocacy, and outreach skills training to CUNY STEM students.



I improved in the following critical areas: (1) the ability to summarize my own research in a short, concise and easy-to-understand level; (2) ability to read into other relevant research work and write short and public-facing summary about it; (3) media management skill (making videos, posters, fliers, etc.) and; (4) social media management skills.

# IS DIGITAL COMMUNITY

Plans are underway for the design and development of a digital platform for the IS Hub community.

The IS Digital Community will:

- facilitate community use of open-source STEM technologies and research publications
- foster research collaboration, data-driven policy change, and engagement between STEM academics and BIPoC communities.



“ ...a digital community where the floor is kind of like level, then everyone can kind of see everyone's issues and the things that everyone else think are important...”







## OUR IMPACT



**85%**

of Field trip participants said they learned something new that they would share with someone and that the science they encountered was easy to understand



**100%**

Community Sensor Lab Interns and teachers identified as Black, Indigenous or People of Color



**185**

Community members engaged through community science public programs



**21**

Number of  
Communicating Your  
Science (CYS) Webinars  
between September  
2020 and January 2023

**100%**

CYS participants who were "likely"  
or "extremely likely" to  
recommend the session to a  
friend

**100%**

SciCom Fellows who feel  
competent in  
communicating science  
concepts to the members  
of the local community  
(2022-2023 Cohort)

**100%**

SciCom Fellows who found the key  
features of the fellowship experience -  
such as an understanding of science  
communications writing for the  
public, media engagement and  
interview skills - valuable or  
"extremely valuable" (2020-2022  
Cohorts)



*What's next?*

# PATHWAYS TO COMMUNICATION, COLLABORATION, AND COMMUNITY

Since its inception in 2014, the ASRC has been committed to community STEM education through the development of the IlluminationSpace as an interactive STEM education center. Our outreach efforts have expanded beyond the initial vision with the creation of community-based science, science communication, and immersive experiential programs.

We are poised to build on this foundation and provide a state-of-the-art STEM education and communication program focused on making STEM more equitable and accessible to students and communities that are from underrepresented in STEM.

Our partnerships with local institutions that are embedded in BIPoC communities coupled with CUNY's positioning as a public university that serves a predominantly BIPoC student body and its recognition as an engine of social mobility will enable us to create pathways for further collaboration and community-building.

During our next phase, we intend to grow our programming and deepen our collaboration with BIPoC communities.

Planned projects include:

- The Community Sensor Lab (CSL) will expand the community training program and share our Data and Sensing curriculum more broadly and collect feedback on its use.
- The Field Trip program will explore more immersive technology such as augmented reality.
- The SciCom Academy will connect parts of the fellowship experience to the CSL's work to create more opportunities for the fellows to practice their science communications throughout the fellowship. The CYS Webinar series will aim to increase virtual participation in a post-COVID climate. It will also work with partners to launch community-based STEM advocacy workshops.
- We will craft a well-defined identity for our digital community, including audience, content, activities and service mission. We will determine where the community will interact, design and beta test a digital space.



## *Work at a Glance*

# MEDIA ASSETTS

### COMMUNITY SENSOR LAB SOCIAL MEDIA & CURRICULUM RESOURCES



- [Community Sensor Lab Public Assets Document](#)
- [Linktree](#)
- [Github](#)
- [TikTok](#)
- [YouTube Channel](#)
- [Website](#)
- [Data and Sensing Curriculum](#)

### GENERAL

- [New Website](#)

### VIRTUAL CLASSROOM

- [Self-Guided Virtual Field Trip](#)

### NEWS AND MEDIA

- [Five Ways to Prevent the Next Sandy, Ann Brenadrd for The New York Times](#) - featuring Caroyln Ferguson, our community intern holding one of our DIY air quality sensors
- [CUNYTV](#) - A Segment in CUNYTV's Simply science featuring the work at The Community Sensor Lab. Aired Oct 17 2022
- [Community Dinner Press Release](#)

### SCIENCE COMMUNICATION ACADEMY

- [Communicating Your Science \(CYS\) Assets](#)
  - [Tools for visualizing research](#)
  - [Tips for giving remote on-camera interviews](#)

- [CYS Webinar Recordings](#)
  - April 21, 2023 - [Meet the Reporter: Shaping STEM Research for the General Media](#)
  - March 31, 2023 - [Communicating Your Science: Turn Your Complex Science Into Compelling Soundbites](#)
  - January 27, 2023 - [Visualizing Science Workshop: How to Turn Research Into Compelling Media](#)
  - December 2, 2022 - [Applied Science: A Conversation about STEM Higher Education & Science Communication With Malcolm Gladwell](#)
  - November 4, 2022- [CUNY AcademicWorks: A Tool for Sharing Your Open-Access Research With the General Public](#)
  - September 30, 2022- [Meet the Librarian: An Introduction to The Graduate Center Library's Science Resources](#)
  - June 10, 2022 - [CUNY Student SciComs Symposium: Communicating Your Science Competition](#)
  - April 29, 2022 - [Meet the Reporter: Shaping STEM Research for the General Media](#)
  - March 25, 2022 - [Meet the Editor: CUNY Faculty STEM Journal Editors](#)
  - February 25, 2022 - [CUNY STEM Opportunities for Mastering Science Outreach](#)
  - January 28, 2022 - [Easy Science Videos With Lumen5 & iPhones](#)

## *Connect with us*

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[Join our mailing list](#)

### Donate to IlluminationSpace Hub Programming

While funding for construction of the ASRC IlluminationSpace was generously provided by the State of New York, there remains a financial need for its ongoing operation. Donations to the ASRC IlluminationSpace will help us to:

- Keep our field trips and community hours free to all visitors
- Increase our hours of operation
- Obtain supplies for supplemental hands-on activities and demonstrations
- Create new educational programs such as paid summer research internships and special community engagement events;
- Purchase essential equipment upgrades and maintenance contracts
- Support our science communication fellows
- Continue our Communicating Your Science workshops and webinars.

### Donate to Community Sensor Lab:

<https://www.givegab.com/campaigns/asrc-community-sensor-lab>

**Our crowdfunding goal is to raise \$5,000, with 100% of funds going toward operating the 2022 Community Sensor Lab summer research program.**

**The Community Sensor Lab is an education outreach program, part of the Advanced Science Research Center at the Graduate Center CUNY.**

**Environmental sensing is crucial for communities that have been historically marginalized and which typically bear the brunt of climate change. The Community Sensor Lab places the power of Do-It-Yourself (DIY) environmental sensing technology in the hands of youth and community members to collect data for local environmental advocacy, while learning STEM skills in the process.**