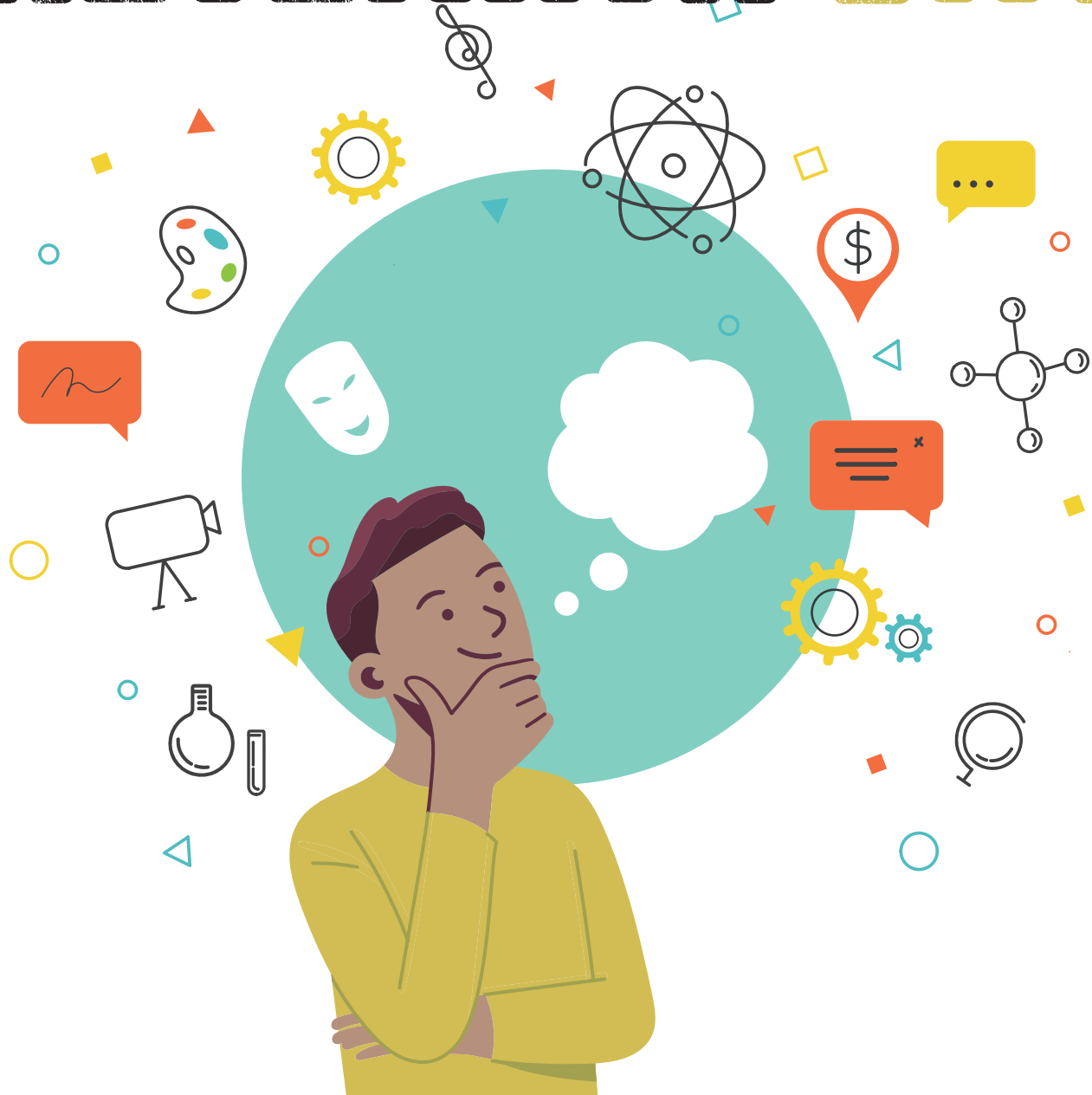# 2022 UNDERGRADUATE RESEARCH DAY

FRIDAY, DECEMBER 2, 2022

The 7th Annual Undergraduate Research Day: Showcasing UR Across the Disciplines

QUEENSBOROUGH COMMUNITY COLLEGE | CUNY

Acknowledgments

Queensborough Community College's
UR Day Committee
Office of Academic Affairs
Center for Excellence in Teaching & Learning (CETL)
& Research Committee

December 2, 2022

Welcome to Queensborough Community College's 7th Annual Undergraduate Research Day! UR Day is organized by the UR Day Planning Committee, the Office of Academic Affairs, the Research Committee and the Center for Excellence in Teaching and Learning (CETL). This event is a showcase of *faculty-mentored undergraduate research efforts across the disciplines* at the college. The conference gives undergraduate students an opportunity to present and showcase the results of his or her research in various fields.

In addition to providing the experience of presenting research posters and performances, the conference is an opportunity to learn about research carried out by other students and faculty across the difference disciplines on our QCC campus. It also aims to provide information on the various programs and opportunities on campus that provide funding and support for students and faculty to engage in undergraduate research. We are delighted to share sixty-four presentations, showcasing the work of *one hundred and forty-four students mentored by fifty faculty members* over the past year. It has been a challenging year where many have struggled to restart in-person research activities after the pandemic shutdown while continuing to juggle teaching classes in various modalities. We gratefully acknowledge the efforts of faculty mentors, who have prioritized engaging students in research activities during this time, and the student researchers, who despite many obstacles, persevered to bring us this exciting event.

The college is proud of the hard work and dedication of our faculty mentors and students participating in undergraduate research activities, and we are pleased to offer each of you the opportunity to participate in this excellent learning experience. Students, we hope that you enjoy sharing the results of your hard work with the campus community. We also hope that your accomplishments will serve as an inspiration to other students seeking out similar opportunities and experiences on campus. To every student, congratulations on your achievements!

Sincerely,

Dr. Sharon Lall-Ramnarine, Faculty Fellow for Research Activities, Office of Academic Affairs
Director of the CUNY Research Scholars Program / Professor, Chemistry Department

Dr. Sarbani Ghoshal,
Assistant Professor, Biological Sciences and Geology Department

Dr. Urszula Golebiewska,
Professor, Biological Sciences and Geology Department / STEM Coordinator for UR as a High Impact Practice

Dr. Meg Tarafdar,
Interim Director, Center for Excellence in Teaching & Learning (CETL) / Asst. Professor, English Department

Dr. Zhou Zhou, Assistant Professor, Chemistry Department

Dr. James Nichols, Associate Professor, History Department

Dr. Andrew Bulawa, Associate Professor, Mathematics & Computer Science

Dr. Rommel Robertson, Assistant Professor, Social Sciences

Undergraduate Research Day

Queensborough Community College
Bayside, NY

Friday, December 2, 2022

10:00	**Registration and Poster set-up**	**Student Union Lobby**
12:00	**Welcoming Remarks**	**Student Union Lobby**

Dr. Sharon Lall-Ramnarine   **Faculty Fellow for Research Activities**

Dr. Christine Mangino   **President, Queensborough Community College**

Dr. Sandra Palmer   **Provost & Vice President, Academic Affairs**

Dr. Urszula Golebiewska   **Co-Coordinator, UR as a High Impact Practice**

Dr. Ron Nerio   **Research Programs Director
CUNY Office of Research**

12:30	**Group Photo**	**Stairs between Library & Admin. Buildings**

12:45 – 1:45   **Poster Session I**
Student Union Lobby

2:00 - 3:00   **Networking Social**   **Student Union Lobby**
&
Poster Session II
(Same posters as in Poster Session I)

2:00	**Student Government Association Welcome**	**Silvia Quinonez-Lee,
Programming Vice President, SGA**
3:00	**Undergraduate Researchers LinkedIn group**	**Dr. Regina Sullivan**
**3:00
– 4:30**	**Theatre, Dance, Music Presentations**	**RFK Building, Room 214 (Dance Studio)**

Undergraduate Research Day Planning Committee

Sharon Lall-Ramnarine
Academic Affairs

Sarbani Ghoshal
Biological Sciences &
Geology

Urszula Golebiewska
Biological Sciences
and Geology

Meg Tarafdar
Center for Excellence
in Teaching &
Learning
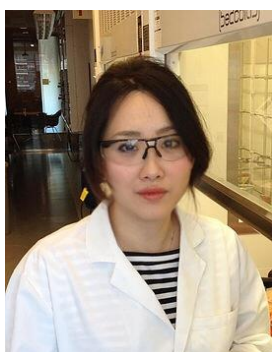
Zhou Zhou
Chemistry

James Nichols
History
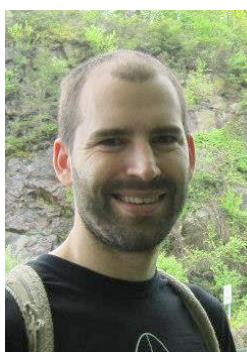
Andrew Bulawa
Mathematics &
Computer Science

Rommel Robertson
Social Sciences

Queensborough's Research Committee

Faculty Representatives by Department

Professor Sharon Lall-Ramnarine, Academic Affairs

Professor Hayes (Pete) Mauro, Art and Design Department

Professor Sarbani Ghoshal, Biological Sciences and Geology Department

Professor Roumen Vragov, Business Department

Professor Paul Sideris, Chemistry Department

Professor Heather Huggins, Communication, Theatre, & Media Production Department/ UR-HIP Coordinator

Professor Guozhen An, Engineering Technology Department

Professor Melissa Dennihy, English Department

Professor Carolina Chaves-O'Flynn, Foreign Language & Literature Department

Professor Rezan Akpinar, Health, Physical Education and Dance Department

Professor James Nichols, History Department

Ms. Marisa Hollywood, Kupferberg Holocaust Center

Professor John Schriner, Library Department

Professor Andrew Bulawa, Mathematics and Computer Science Department

Professor Svjetlana Bukvich-Nichols, Music Department

Professor Georgina Colalillo, Nursing Department

Professor Jillian Bellovary, Physics Department

Professor Jody Resko, Social Sciences Department

Ms. Christine Spicknell, Office of Grants/Sponsored Programs

Professor Anissa Moody, Human Research Protection Program Coordinator

Professor Jennifer Chabra, Research Compliance Specialist

Professor Urszula Golebiewska, Undergraduate Research, High Impact Practice Coordinator

2022 Research Committee Members

Hayes (Pete) Mauro
ART & DESIGN

Sarbani Ghoshal
BIOLOGICAL SCIENCES
& GEOLOGY

Roumen Vragov
BUSINESS

Paul Sideris
CHEMISTRY

Heather Huggins
COMMUNICATION,
THEATRE, & MEDIA
PRODUCTION/ UR-HIP

Guozhen An
ENGINEERING
TECHNOLOGY

Melissa Dennihy
ENGLISH

Carolina Chaves
O'Flynn
FOREIGN LANGUAGE
& LITERATURE

Rezan Akpinar
HEALTH, PHYSICAL
EDUCATION, & DANCE

James Nichols
HISTORY
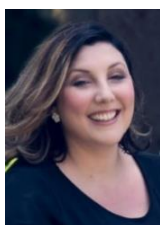
Marisa Hollywood
KUPFERBERG
HOLOCAUST CTR.

John Schriner
LIBRARY

Andrew Bulawa
MATH & COMPUTER
SCIENCE

Svjetlana Bukvich-
Nichols
MUSIC

Georgina Colalillo
NURSING

Jillian Bellovary
PHYSICS

Jody Resko
SOCIAL SCIENCES

Sharon Lall-Ramnarine
RC CHAIR
OFFICE OF ACADEMIC
AFFAIR

Christine Spicknell
GRANTS/ SPONSORED
PROGRAMS

Anissa Moody
HUMAN RESEARCH
PROTECTION
PROGRA

Jennifer Chabra
RESEARCH
COMPLIANCE
SPECIALIST

Urszula Golebiewska
UNDERGRADUATE
RESEARCH, HIP
COORDINATOR

High-Impact Practices at Queensborough

Center for Excellence in Teaching and Learning (CETL)

Dr. Meg Tarafdar, Interim Director, Center of Excellence in Teaching & Learning

Undergraduate Research is one of the six high-impact practices (HIPs) offered at Queensborough. The HIPs are teaching strategies that promote deeper learning and greater persistence. The Association of American Colleges and Universities (AAC&U) has identified 11 distinct HIPs and has published extensively on the HIPs and their documented benefits with regard to student retention, academic performance, and students' self-reported deeper learning. The HIPs have been instituted as a key component of *Queensborough Academies* Model. The integration of high impact practices into the curriculum promotes integrative learning and supports the achievement of the General Education Outcomes. Each of the following HIPs are supported by one or more Faculty Coordinators, all of whom work with the Center for Excellence in Teaching & Learning to oversee the HIPs at Queensborough. The College formally offers six HIPs: Academic Service-Learning (ASL), Common Intellectual Experience/Common Read (CIE), Global and Diversity Learning (GDL), Students Working in Interdisciplinary Groups (SWIG), Undergraduate Research (UR), and Writing Intensive Courses (WI).

Academic Service-Learning (ASL) involves class assignments that take students' work out into the community, encouraging civic engagement and reflective practices that promote learning. Faculty development in design and implementation occurs throughout the semester. ASL Coordinator: Dr. Jennifer Maloy, Associate Professor, English.

The Common Read (CIE) is a common intellectual experience that promotes integrative learning across the curriculum through multi-disciplinary approaches to a common text. Participating faculty members are able to incorporate the text in a way that aligns with their individual interests and disciplines. Students have the opportunity to participate in cross- disciplinary events that encourage increased social and academic engagement while supporting the learning that takes place in the classroom. CIE Coordinator: Dr. Angela Ridinger-Dotterman, Associate Professor, English.

Global & Diversity Learning (GDL) provides a framework for exploring multiple perspectives on viewing the interdependent world. Students participate in experiences that promote an awareness of global issues, engagement with diverse perspectives, and transformative approaches towards learning. Queensborough's cultural resources provide opportunities for students to interact with the Kupferberg Holocaust Resource Center and Archives, QCC Performing Arts Center, and the Art Gallery. GDL Coordinator: Dr. Meg Tarafdar, Assistant Professor, English.

Students Working in Interdisciplinary Groups (SWIG): The SWIG project is, in effect, a virtual learning community. A SWIG experience is a Collaborative Assignments or Projects that allows students from two or more courses to create a shared student-centered online space, in which they can share their work with others, offer audience response and constructive feedback. SWIG Faculty Coordinator: Ms. Brigitte Tilley, Lecturer, English.

Undergraduate Research (UR) involves opportunities in which students learn about the scientific method by carrying out actual research embedded into their course, as part of their program or in an independent study research course. UR Coordinator: Urszula Golebiewska, Professor, Biological Sciences & Geology and Heather Huggins, Assistant Professor, Department of Communication, Theatre, & Media Production.

Writing Intensive Courses (WI) courses are designed to improve students' critical thinking, engagement with and mastery of course content, and writing ability through all academic disciplines. Two writing-intensive courses are required to graduate. Specific Writing Intensive Certification training is needed. WI Coordinators: Dr. Melissa Dennihy, Associate Professor, English; Ms. Monica Rossi-Miller, Lecturer, Foreign Languages.

The Office of Grants/Sponsored Programs at QCC

Development Grants Director: Christine Spicknell
Administrative Coordinator: SueAne Solares-Loza
Compliance Specialist: Jacinta Patrice-George

Location: Humanities, Room 336
Telephone: (718) 631-6357

The Office of Grants/Sponsored Programs (OGSP) provides grant development services and training and grant management support to faculty and staff to promote the successful acquisition and oversight of research and institutional sponsored awards. The OGSP develops and implements pre- and post-award grant training for new and existing principal investigators/project directors. Development is provided through workshops, trainings, dissemination of materials, a website, and via one-on-one interactions.

The OGSP supports grant directors in managing awards by providing assistance with human resources, purchasing, contract development, sub-awards, financial forecasting, reporting, monitoring and award close-out. The OGSP coordinates with OAA in promoting research integrity and compliance.

The OGSP is responsible for Sponsored Programs Administration and is accessible to assist faculty, principal investigators or project directors with any sponsored research or administrative program requirements.

The OGSP reports to the President, Provost or their designee; at QCC, the designee is the Dean for Faculty, Dean Sandra Palmer. The OGSP is available for:

- Reviewing proposals submitted to assure compliance with University policy. The Grants Office also reviews budgets to verify that all appropriate charges are included in the cost calculations.
- In cooperation with The Research Foundation, assisting the PI with the negotiation and acceptance of grant awards;
- Assisting the PI with the administration of research and sponsored programs from inception through close-out;
- In cooperation with the University, assuring compliance with sponsor's policies, e.g., fiscal, property, intellectual property, human and animal subjects;
- In cooperation with the University, assuring compliance with the policies and procedures of the Research Foundation;
- In cooperation with the University and The Research Foundation, maintaining official records concerning sponsored projects including official grant and contract files;
- Assisting faculty and department/school staff in the preparation of proposals and other administrative aspects of sponsored projects as needed; and
- Training of faculty and administrative staff in the policies, procedures and practices of the University, College or School and sponsors.

Some of QCC's Grant Funded Programs Providing Undergraduate Research Experiences:
- Research Experiences for Undergraduates (REU) funded by National Science Foundation, Project Directors: Prof. David Lieberman and Prof. Kimberly Riegel.
- "Bridges to the Baccalaureate" program funded by National Institutes of Health, Project Director Prof. Patricia Schneider.
- "Collaborative Research: Of Mice and Monsters" funded by National Science Foundation, Project Director Prof. Jillian Bellovary.
- "Developing Data Analysis Skills of Community College Students using Cloud Technologies (DDASCT)" funded by National Science Foundation, Project Directors Prof. Monica Trujillo and Prof. Esma Yildirim.
- "Tuning in to the echoes of Black Hole Seeds" funded by National Science Foundation, Project Director Prof. Jillian Bellovary.
- "Using Space Technology to Engage and Inspire Students to Explore (SpaceTech EngInE)" funded by National Aeronautics and Space Administration, Project Director Prof. Chantale Damas.
- Science and Technology Entry Program (STEP) funded by New York State Department of Education, Project Director Dean Hui-Yin Hsu.
- Collegiate Science and Technology Entry Program (CSTEP) funded by New York State Department of Education, Project Director Marie Francesca Berrouet.
- Ionic Liquids funded by STREM Chemicals, Project Director Prof. Sharon Lall-Ramnarine.
- College Now & STEM Research Academy funded by the Pinkerton and Simons Foundations, Project Director Mary Anne Meyer.
- BioPREP: Biology Partnership funded by National Institutes of Health, Project Director Prof. Nidhi Gadura.
- Institutional Partnership to Create Successful Student Transition in Smart Energy and Materials funded by National Science Foundation, Project Director David Sarno.

QCC Undergraduate Research Programs

Bridges to the Baccalaureate Program
Research Initiative to Maximize Science Skills

Anaheim. California 2022

Program Director: Dr. Patricia Schneider,
Email: pschneider@qcc.cuny.edu

Location: QCC Biology Department, Room M-208
Telephone: 718-631-6335

In 2002, the Bridges to the Baccalaureate Program was established at Queensborough Community College with funding from the National Institutes of Health. The Bridges program is a partnership between QCC, Queens College and City College created to improve QCC's ability to train and graduate under-represented (UR) science students, and to facilitate their transfer to baccalaureate programs in biomedicine or behavioral science. A hallmark of the program is a strong focus on authentic research carried out under the mentorship of faculty in biology, chemistry, math, physics and behavioral science. These mentors serve as role models and provide students with encouragement, career advisement and visibility within the academic community. Scientific communication skills are explicitly taught, and each student gives an oral presentation and submits a written report at the final seminar.

In the past five years, twenty students were listed as co-authors on peer reviewed research publications. Students have received 23 national and 30 regional research awards. A comprehensive system of academic and psychosocial support is provided to participants and interactions with the senior colleges facilitate transfer. Overall, 88% of participants have transferred and 81% have graduated from BA/BS programs in science or biomedicine. Ninety students pursued postgraduate degrees. To date, 9 PhD, 5 MD, 4 PharmD and 53 Master's degrees have been awarded to Bridges students.

Eligibility
- Full time student planning to transfer to a senior college and major in science or biomedicine
- US citizen or US permanent resident
- GPA of at least 2.7 (B-)
- Member of a group identified by NIH as underrepresented in biomedicine:
    ○ Black, Hispanic, Native American, US Pacific Islander
    ○ Students of any ethnicity with a disability or from a disadvantaged financial or educational background
- Completion of 1 semester of science (2 preferred)

Support
Fifteen students per year participate in the program. All participants receive a salary so they can focus on their research project: $150 to $300/week. during the academic year and/or $5250 for ten-week full time summer program. Students making good progress may continue for up to two-years.

2021 - 2022 STUDENT HIGHLIGHTS

Vanessa Almonte received a PhD in biomedicine from Albert Einstein College of Medicine, Daniel Nova received a PhD in Chemistry from Princeton University and Viviana Torres was awarded a DDS from SUNY Stony Brook. Leandro Pimentel Marcelino graduated last year with a BS in biochemistry from City College and received NSF REPS award for post baccalaureate research. This project year, he received CUNY's prestigious Jonas E. Salk Award and entered the Tri-Institutional (Cornell, Rockefeller, Memorial Sloan Kettering) PhD Program in Chemical Biology.

Collegiate Science and Technology Entry Program (CSTEP)

Program Director: Ms. Marie-Francesca Berrouet
Email: MBerrouet@qcc.cuny.edu

Ms. Berrouet came to the U.S. from Haiti in 2002 and started working at QCC that same year. Over the years, she has served students in various capacities. Since 2011, she has been serving students as the Project Director of CSTEP where she also plays the role of academic advisor and mentor. The Collegiate Science and Technology Entry Program (CSTEP) is a New York State grant funded initiative designed to foster academic excellence for under-represented or economically disadvantaged full-time college students majoring in the STEM fields (Science Technology Engineering Math) and licensed professions (i.e. Health related careers, Accounting, Law, Psychology, Massage Therapy, Social Work, etc.).

Ms. Berrouet is a proud QCC graduate and continue to passionately seeks, obtains and encourages her students to participate in experiences that will enhance their skills, knowledge, network and engagement in the community. (Internship, Research, Volunteer). CSTEP is a small program, serving only 130 students per academic year however, CSTEP has a high retention rate and students have great things to say about their experience.

Ms. Berrouet and her team continue to recruit students and continue to offer guidance and support to all eligible students.

Thank you for referring students to https://www.qcc.cuny.edu/cStep/

Fall 2022 Student Engagement at the KHC

The KHC is an exhibition and education center with a specialized library that uses the lessons of the Holocaust to educate current and future generations about the ramifications of prejudice, racism, and stereotyping. The Center offers public programs (including virtual and in- person Holocaust commemorations, special events, and faculty-led National Endowment for the Humanities colloquium); an archive of recorded events on YouTube; tours of originally researched exhibitions; educational resources; student internships; and survivor testimony archive.

IN-PERSON AND VIRTUAL INTERNSHIPS

This opportunity is for students interested in gaining valuable experience working at a nonprofit committed to human rights. Project areas include: research on Holocaust and genocide education, exhibition development, and archival research on KHC past projects. Students commit at least 30 hours of service, correspond weekly with their supervisor, and meet monthly as a group.

For Summer and Fall 2022, student interns helped with research and educational initiatives related to the KHC's new exhibition, **The Concentration Camps: Inside the Nazi System of Incarceration and Genocide.** This original KHC exhibit surveys how—and why—the Nazis tortured tens of millions of people during World War II. It features images, text, sounds, maps, statistics, artifacts, as well as personal testimonies from local Holocaust survivors in order holistically examine these excruciating landscapes of degradation and dehumanization. Interns helped design and write content for virtual and audio tours of the exhibit.

For More Information about the Kupferberg Holocaust Center at QCC:

Visit: khc.qcc.cuny.edu

Email: KHC@qcc.cuny.edu

The CUNY Research Scholars Program (CRSP) at Queensborough

Program Directors: Provost Sandra Palmer and Dr. Sharon Lall-Ramnarine
spalmer@qcc.cuny.edu; slallramnarine@qcc.cuny.edu
CRSP Programming Coordinator: Ms. Christina Denny
cdenny@qcc.cuny.edu
Location: Office of Academic Affairs, Room A-507
Telephone: 718-281-5572

The CUNY Research Scholars Program provides funding to facilitate laboratory experiences for associate degree students over a one-year period. The goal of the program is to encourage undergraduate participation in authentic research and to increase persistence in STEM and Social Science disciplines. Students receive a $5,000 stipend and approximately 300 hours of mentoring from faculty members and participate in structured activities on campus, including sessions on laboratory safety, library research, public speaking, and poster preparation. Each year, the program culminates in a symposium where students display and present their work to peers and mentors. *The CUNY Research Scholars Program at QCC currently supports 19 students and 19 faculty mentors.*

Eligibility
Associate degree students with at any stage in their academic career can participate. Students must have at least a 2.7 GPA and commit to being part of the program for one full academic year. Graduating and transfer students who leave the college may take a partial scholarship for work completed, providing that they prepare a poster of the research conducted for presentation by the student or faculty mentor at the CUNY Research Scholars Program symposium at the end of the funding year.

Support
Students receive a $5000 stipend for approximately 300 hours of research activities. The program also provides compensation for faculty mentors in the amount of $1000 per student mentee. This amount is for one year of the program. Faculty must commit to working with the student for the entire academic year.

Applications
Applications open in August every year and close in mid-September.
For more information visit: http://www.qcc.cuny.edu/ur/crsp.html

CUNY Research Scholars Program 2022-2023 Cohort

CRSP Highlights from 2021-2022

Awards:

QCC CRSP Scholars won presentation awards at the CRSP 2022 Summer Symposium:

- **Tsz Wa Ellen Chu**, **mentored by Dr. Amy Traver** on the project: *Children on the move and in the news: Reports of Child Emigres in New York State Media 1853-1929.*
- **Shaniakay Williams, mentored by Dr. Mangala Tawde** on the project: *Antimicrobial Resistance in Environmental Microbes.*
- **Elijah Bernard,** m**entored by Dr. Sharon Lall-Ramnarine**, Michael Keating (CCNY) & Dr. Elizabeth Biddinger (CCNY) on the summer project (at the CCNY NASA Center for Advanced Batteries for Space): *Development of Ionic Liquid and Solvate Ionic Liquid Electrolytes for Lithium-Metal batteries.*

Research Presentations:

CCNY Department of Chemical Engineering & NASA summer intern presentation, August 2022.

- **Elijah Bernard**, Michael Keating, Sharon Lall-Ramnarine, Elizabeth Biddinger: "Development of Ionic Liquid & Solvate Ionic Liquid Electrolyte for low temperature Li-metal battery."

Summer Intern Poster and Oral Presentations (Virtual), Brookhaven National Laboratory, Upton, NY, August 2022.

- **Mehreen Mughal**, James F. Wishart, Edward W. Castner, Sharon Lall-Ramnarine: "Synthesis and Characterization of Ionic Liquids Bearing Thioether Side Chains."
- **Ho Martin Yuen**, Sharon Lall-Ramnarine and James F. Wishart: "Tailoring the Properties of Imidazolium-Thioether Ionic Liquids through Structural Modification."

69th Annual Undergraduate Research Symposium, American Chemical Society (ACS) Local Section NY, Virtual Presentations, May 7, 2022.

- **Mehreen Mughal**, James F. Wishart, Edward W. Castner, Jr., and Sharon Lall-Ramnarine: "Imidazolium And Pyrrolidinium Thioether Functionalized Ionic Liquids."
- **Ho Martin Yuen** and Dr. Sharon Lall-Ramnarine: "Tailoring the Properties of Imidazolium-Thioether Ionic Liquids through Structural Modification."
- **Elijah Bernard**, Domenec Paterno, Sophia Suarez and Sharon Lall-Ramnarine: "Development of Electrospun Ionic Liquid-Polymer Membranes."

2021 Metropolitan Association of College and University Biologists

- Dr. Regina Sullivan, Dr. Sarbani Ghoshal, **Janice Williams**, "Differential Breast Cancer Cell Gene Expression after treatment with Single Walled Carbon Nanotubes"

Summer 2022 Research Locations & Programs Include:

Community College Internship program, Brookhaven National Laboratory
NASA-CCNY Center for Advanced Batteries for Space Summer Internship at City College of CUNY
American Museum of Natural History
Physics Dept., The City College of New York
Summer Undergraduate Research Fellowship at the University of Rochester (Rochester, NY)
Queensborough Community College

The Society for the Advancement of Chicanos/Hispanics and Native Americans in Science

SACNAS

SACNAS QCC Chapter Advisors

Dr. Maria Mercedes Franco, Math and Computer Science, mfranco@qcc.cuny.edu
Dr. Joan Petersen, Biological Sciences and Geology, jpetersen@qcc.cuny.edu

The SACNAS QCC chapter was established in Spring 2016 as the second and only active chapter in the state of NY, and the second chapter established at a community college. QCC SACNAS offers a forum to come together for academic, social, and service activities. The chapter has a strong presence on campus that is dedicated to raising awareness about issues of importance to our diverse community. Any student or faculty member is welcome to join the QCC Chapter.

SACNAS is Multidisciplinary and Multicultural

QCC Students and Faculty at the 2022 SACNAS Diversity in STEM National Conference

At SACNAS we are changing the face of science together

SACNAS QCC Chapter Highlights

Travel Scholarships to attend the 2022 SACNAS *Diversity in STEM* National Conference:

● James Hardat, Chapter President 2021-2022, was fully funded by SACNAS to participate in C.O.L.O.R. (Chapter Officer Leadership October Retreat), a pre-conference student leadership event and attend the conference
● Simona Mitec, Chapter Vice President 2021-2022, received a SACNAS Travel Scholarship to attend the conference
● Dr. Bianca Sosnovski, Chapter Advisor 2021-2022, received a MMW Travel Scholarship to attend the Modern Math Workshop (pre-conference) and the conference

Presentations at the 2022 SACNAS *Diversity in STEM* National Conference:

● "Early Undergraduate Research Experiences for Community College Students Promote DEI in STEM," and all-QCC panel with Dr. Yusuf Danisman, Dr. Maria Mercedes Franco (Chapter Co-advisor 2022-2023), Dr. Simran Kaur, Dr. Alison Mello, and Dr. Joan Petersen (Chapter Co-Advisor 2022-2023)
● "Supportive Research Mentoring in Computational Sciences for 1st and 2nd Year College Students" Panel with Dr. Maria Mercedes Franco and two faculty members from 2 non-CUNY institutions
● "Un Paso Pa'lante: Putting Hispanic/Latinx STEM Doctoral Students on the Path to Teach at Community Colleges" Panel with Dr. Dugwon Seo (Chapter Co-Advisor 2021-2022) and five faculty/researchers from other CUNY and non-CUNY institutions

Other SACNAS Awards:

• Dr. Maria Mercedes Franco was selected to participate (on a full scholarship from SACNAS) in the 2022 Linton-Poodry SACNAS Leadership Institute.

SACNAS has helped defray the cost of 56 individual trips (26 students/alumni, 30 faculty/ professionals) to the national conference made by members of the QCC community since 2012. The savings to travelers and the college is estimated to be $45,000. Beyond the conference, SACNAS offers intensive support to its members via web-based services, leadership development, student scholarships, internships, and fellowships.

Achieving **TRUE DIVERSITY** in STEM

SACNAS is an inclusive organization dedicated to achieving **True Diversity**. True diversity means the field (including leadership positions) reflects the demographics of the population. Thus, since its founding 49 years ago, SACNAS has been working to "make sure that those most underrepresented in STEM have the support they need to obtain advanced degrees, careers, and positions of leadership." Since 2018, new funding allocations have been made to fund travel awards for *all* students regardless of citizenship or residency status, an effort particularly helpful for DREAMers. All other SACNAS programs for students have been unrestricted since their inception. SACNAS also strives to secure unrestricted funding for postdocs and professionals.

NSF Research Experience for Undergraduates (REU)
National Science Foundation supported Research Opportunities in Physics, Bio-physics and Astronomy for Community College Students

Program Director: Dr. Todd Holden
E-mail: THolden@qcc.cuny.edu

Location: Physics
Department Telephone:
718-631-6366

Undergraduate participation in physics research at Queensborough Community College has been part of the college's academic program for over 20 years. Sponsors have included NIH RIMS, LSAMP, NASA NSF and PSC-CUNY. The college is offering Research Experiences for Undergraduates this summer supported by the National Science Foundation. Students will have the opportunity to participate in current research projects in physics, bio-physics or astronomy and perform independent research on a wide range of projects that aim to broaden their understanding of science and involve them in the acquisition, analysis and presentation of experimental data.

Research Program Objectives:
- To introduce students to a variety of current issues in science.
- To define and discuss useful methods.
- To provide instruction in experimental design and efficacy.
- To have meaningful faculty-student discussions on the experimental results.
- To assist with the production of a presentation of each student's work at a conference.
- To inform students of opportunities at four-year colleges and summer initiatives.

Program Details

The program is a 10 week-long research program that runs from June 6, 2022 to August 12, 2022. This program provides an opportunity to do interesting research in a wide variety of topics with individual mentors. In addition, basic research skills are highlighted including responsible conduct in research, statistics, data handling and presentation skills. Each student will have an opportunity to present their summer research at a symposium at Queensborough and will be encouraged to present and publish their results in other forums.

Benefits
- A $6000 stipend
- Travel support to and from campus
- An option to continue paid research with your mentor throughout the academic year
- A rich research experience and collaborative environment

QCC NSF S-STEM Scholars Program in Smart Energy
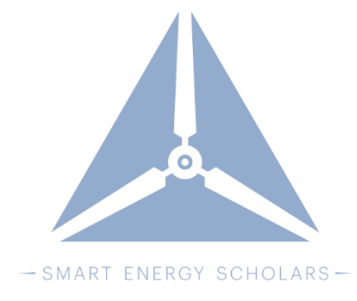
Program Director: Dr. David Sarno
E-mail: dsarno@qcc.cuny.edu
Location: Chemistry Department
Telephone: 718-631-6058
http://www.qcc.cuny.edu/s-stem/index.html

The National Science Foundation has awarded a five-year Scholarship in Science, Technology, Engineering, and Mathematics (S-STEM) grant to QCC and its partners at Binghamton University (BU) and Broome Community College (BCC). Its goal is to support academically talented QCC students who demonstrate financial need by providing scholarships to complete their associate's degrees in a variety of STEM disciplines. They will also gain knowledge and experience in smart energy fields that will enable a future of alternative energy sources and energy efficient technologies. In addition, they will practice vital "soft skills" such as writing, making presentations, networking, and persistence. While at QCC, S-STEM students will participate in a weekly online seminar with their peers at BU and BCC. They will also receive advisement from faculty mentors and support from their peers and colleagues at the partner institutions.

This is the final year of the program, but new students will be recruited for spring 2023!

Program Features

- Up to $10,000 per academic year towards cost-of-attendance
- Opportunities for mentored research at QCC
- Mentoring and advising by smart energy faculty at BU
- Weekly online seminar and cohort-building events with Smart Energy Scholars from all campuses

Eligibility

- Full-time enrollment at QCC
- US citizenship or permanent residency
- Minimum 3.0 GPA
- Demonstration of financial need based on completed and filed FAFSA
- Working towards an A.S. degree in STEM (pre-Health and related majors are not supported by this program)

Priority is given to students who are

- in chemistry, physics, or engineering A.S. programs
- planning transfer to a bachelor's degree program in a STEM field
- on track to graduate from QCC by the end of spring 2023

QCC NSF S-STEM Smart Energy Scholars Program Highlights 2022

Smart Energy Scholars alumni, pictured left to right: Isabela Velasquez Gutierrez, Xiaofang Yu, Edison Mera, James Pitarresi (PI-BU), Harpreet Singh, Helen Park, David Sarno, Danial Mokhtari Sharghi, Miaolan Chen Weng, and Devani Mahabir

Highlights:

- 18 students have participated since spring 2018. Ten students have transferred to BU to pursue their bachelor's degrees.
- Many of the Smart Energy Scholars participate in undergraduate research at QCC and are also supported by the CUNY Research Scholars Program.
- Ho Martin Yuen participated in the 2022 Brookhaven National Laboratory Community College Internship Program
- Miaolan Chen Weng participated in the 2021 CUNY Summer Undergraduate Research Program
- Harpreet Singh participated in a 2019 NSF-REU at City College and was a Presentation Winner at the 2020 Annual CRSP Symposium.
- Danial Mokhtari Sharghi participated in a 2019 NSF-REU at QCC.
- Edison Mera participated in a summer 2018 NSF-REU program at Binghamton University.
- Isabela Velasquez Gutierrez won a Best Poster award at the 2018 Annual CRSP Symposium.
- Xiaofang Yu participated in a summer 2018 NSF-REU program at University of Pennsylvania.

Recent Presentations:

- H.M. Yuen*, S. Lall-Ramnarine, J.F. Wishart "Tailoring the Properties of Imidazolium-Thioether Ionic Liquids through Structural Modification", Summer Intern Poster and Oral Presentations (Virtual), Brookhaven National Laboratory, Upton, NY (August 2022)
- D. Mahabir*, D.M. Sarno "Polyaniline nanofiber-metal nanoparticle composites for the catalytic degradation of congo red and other targets: A mini-review" Middle Atlantic Regional Meeting of the American Chemical Society, University of Delaware, Newark, DE (June 2021)
- H. Zui*, P. Sideris "Surfactant-assisted hydrothermal synthesis of LiFePO4 using sodium dodecylbenzenesulphonate" *67th NY-ACS Undergraduate Research Symposium*, Queens College, (May 2019)

QCC Origins of Black Holes Research Program
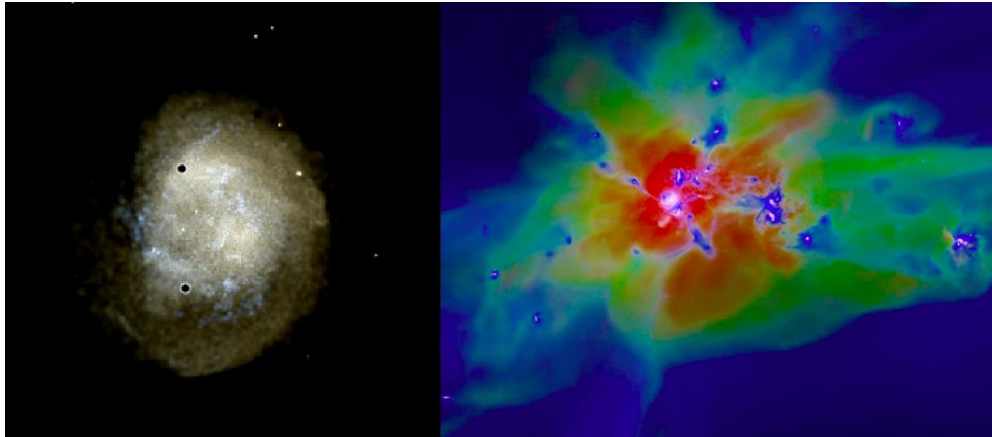
Principal Investigator: Jillian Bellovary, Physics email:
jbellovary@qcc.cuny.edu

Location: Physics Department

About the Project

Supermassive black holes are some of the heaviest, densest objects in the universe! They are usually found at the centers of massive galaxies. But, we don't understand how they got there! Professor Jillian Bellovary is trying to answer these questions using computer simulations. She uses a program called ChaNGa, which combines the laws of physics and with the ways we think the universe works, to create groups of simulated galaxies. In these galaxies, baby supermassive black holes form. She studies how these black holes form, grow, merge with each other, and affect their surroundings.

This project will make important predictions for a gravitational wave detector that is being designed and built right now. It's called LISA, the Laser Interferometer Space Antenna. Professor Bellovary hopes that she and her students can predict what LISA will detect, which will help us understand how cosmic structure is built at the very beginning of the universe.

Participation

Students can get paid to participate during the school year and/or during the summer. All students are eligible to apply, but students planning to major in physics will be given preference. Students who participate will learn valuable skills such as scientific knowledge, computer programming, science writing, data visualization, presenting, and problem solving. For more information see this website: https://www.qcc.cuny.edu/physics/nsf-grant.html

Using Cloud Technologies to Develop the Data Analysis Skills of Community College Students

NSF ATE Award # 2100027

Principal Investigator: Dr. Monica Trujillo, MTrujillo@qcc.cuny.edu Co-Principal
Investigator: Dr. Esma Yildirim, EYildirim@qcc.cuny.edu Senior Personnel:
                            Dr. Yusuf Danisman, YDanisman@qcc.cuny.edu
                            Dr. Mercedes Franco, MFranco@qcc.cuny.edu

High-tech jobs are a key driver of New York City's place in the US economy and the need for high- tech workers is growing. This National Science Foundation Advanced Technological Education (ATE) supported project aims to increase the number of students graduating with the skills necessary to enter the workforce in the areas of big data analytics, cloud computing, and biomedical and health informatics. The curriculum was developed with industry and academic partners to respond to the needs of the job market.

Student Training

For QCC students interested in developing their Data Analysis/Science skills. Women, Black/African American and Latinx students encouraged to apply

- 4-week summer bootcamp in August 2022 (hybrid mode, $1000-stipend, up to 20 students)
- Year-long industry/academy-led research projects after the summer bootcamp
- Preparation for internship applications, job interviews, and the *AWS Certified Cloud Practitioner* certification
- Data Analysis/Science seminars

To request additional information, please complete the

Student Interest Form

Faculty Training

For faculty across the disciplines who are interested in incorporating Data Analysis/Science into their college courses

- Winter session workshop (virtual mode, 12-hour Python for Beginners workshop in January 2022)
- Data Analysis/Science seminars
- Mentoring opportunities in course module development

To request additional information, please complete the

Faculty Interest Form

Using Cloud Technologies to Develop the Data Analysis Skills of Community College Students

Background
Queensborough is a Hispanic Serving Institution with over 10,000 students and a 3-year graduation rate of 28.5%. 50% of students are first generation, 90% graduate without debt. 70% of full-time faculty have earned doctoral degrees or other non-doctoral terminal degrees.

- The Project Team meets once a week
- Anonymous surveys are used to evaluate all project activities
- The evaluator provides feedback

Business Industry Leadership Team (BILT) includes industry and academia leaders in data analysis/science fields

16 students, 100% retention for summer boot camp

Faculty development activities included 18 faculty members from 4 departments

Students had very positive evaluations for both the student panel and the summer boot camp

"I appreciate the practical exercises and deep-dive into these topics, topics that are not taught or are presented in overview mode in regular classes"

"I learned actual applications that I can bring to the workforce and use to build my resume"
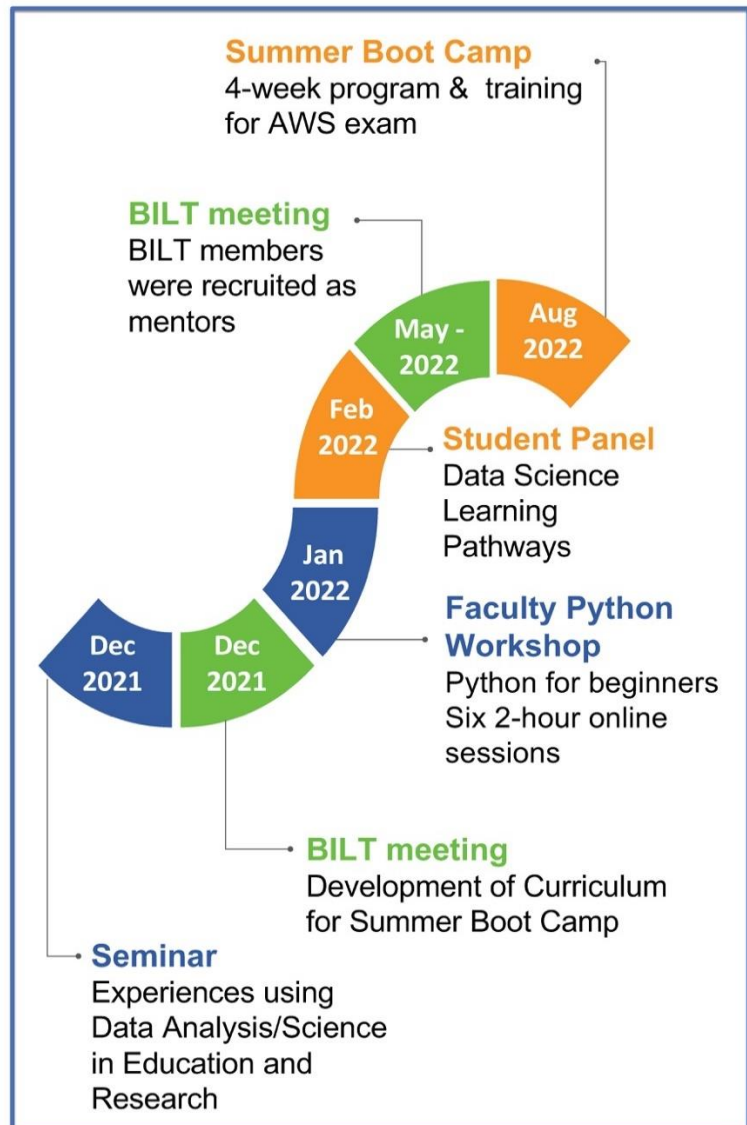
Summer Boot Camp
4-week program & training for AWS exam

BILT meeting
BILT members were recruited as mentors

Aug 2022

May - 2022

Feb 2022

Student Panel
Data Science Learning Pathways

Jan 2022

Dec 2021

Dec 2021

Faculty Python Workshop
Python for beginners Six 2-hour online sessions

BILT meeting
Development of Curriculum for Summer Boot Camp

Seminar
Experiences using Data Analysis/Science in Education and Research

NIH BioPREP - QCC
(Biology Partnership in Research and Education Program)

Principal Investigator: Dr. Daniel Moloney, Stony Brook University QCC

coordinator: Dr. Nidhi Gadura
E-mail: Ngadura@qcc.cuny.edu

Special thanks to QCC faculty Drs. Danzi-Engoron, Novick and Ghoshal

NIH funded program to encouraged underrepresented community college students who wish to further their education and pursue careers in biomedical sciences. Paid, 8-week intensive lab experience in biotechnology labs learning molecular biology techniques and performing mentored research projects. Students work on different projects in small groups and the program pays for them to attend regional and national conferences.

So far, **112 students from QCC** have participated in BioPREP since **1997**.
BioPREP Alumni include**s Carlos Penaloza,** Chancellor at Leeward Community College, HI, who said that the experience changed his life and the way he views science.

Eligibility
- Full-time student at Queensborough Community College
- U.S. Citizen or permanent resident
- Underrepresented student in biomedical sciences (see application)
- Minimum of 24 credits by the end of the Spring semester
- An introductory biology course is a prerequisite (more biology and/or chemistry is preferred)
- Minimum cumulative 3.0 GPA
- The program requires a full-time commitment Monday through Friday for the full eight- week period.

2022 QCC students who completed BioPREP at Stony Brook University

Jordan Nacimba
Suncheng Gao
Engeddy Meran

FINANCIAL DATA ANALYSIS WITH PYTHON

Principal Investigator: Dr. Yusuf Danisman
Email: ydanisman@qcc.cuny.edu
Location: Mathematics and Computer Science

This fully online program is aimed to cover several important aspects related to Machine Learning in Finance. For this purpose, 5-10 students will be recruited for the June of 2023. This program is supported by IBM Global University Program Academic Award.

Content

The Financial Data Analysis with Python program will cover the following three modules:
- Module 1: Machine Learning with Python
- Module 2: Algorithmic Trading
- Module 3: Capstone Group Project

Eligibility/Prerequisite

Open to all students who have a strong interest in the stock market and data science. Students are required to have prior knowledge of Python. Members of groups traditionally underrepresented in STEM are especially encouraged to apply.

Responsibilities

- Attend online sessions.
- Complete lab assignments.
- Complete a capstone project.

Support

Eligible students may receive a stipend upon availability.

NASA-CCNY

Center for Advanced Batteries for Space

Principal Investigators: Dr. Robert J. Messinger & Dr. Elizabeth Biddinger
City College of New York, CUNY
QCC Coordinator: Dr. Sharon Lall-Ramnarine
E-mail: slallramnarine@qcc.cuny.edu

The NASA-CCNY Center for Advanced Batteries for Space is recruiting talented undergraduates for an exciting summer internship.

The NASA-CCNY Center for Advanced Batteries for Space is a joint research and education center between The City College of New York, NASA's Jet Propulsion Lab, & regional universities that offers a collaborative research network in electrochemical energy storage & a multi-faceted student internship program. Our research objectives are to develop novel battery materials, chemistries, & prototypes that operate under the extreme conditions necessary to significantly enhance the scope & ambition of future NASA planetary science missions.

- This 10-week internship will run from June 2023 through August 2023.
- Learn how to address the needs of batteries to operate in extreme conditions including making novel batteries and utilizing ionic liquid electrolytes
- Work with a multi-disciplinary team of CCNY chemical engineering faculty, postdoctoral researchers, Ph.D. & undergraduate students, & collaborators

Eligibility Requirements & Stipend:
- Minimum 3.0 G.P.A.
- Major in Chemical Engineering, Chemistry, Physics or a related discipline
- Participants will receive a $6,000 stipend.

Students from under-represented groups are particularly encouraged to apply
Interested? Submit your resume & unofficial transcript to SLallramnarine@qcc.cuny.edu by Feb. 14th, 2023.

NASA-CCNY Center for Advanced Batteries for Space
Program Highlights 2022

2022 Summer Intern: Elijah Bernard

Recent Research Presentations:

• **Elijah Bernard**, Michael Keating, Sharon Lall-Ramnarine, Elizabeth Biddinger, Development of Ionic Liquid & Solvate Ionic Liquid Electrolyte for low temperature Li-metal battery, CCNY Department of Chemical Engineering & NASA summer intern presentation, Aug. 2022

• **Elijah Bernard**, Michael Keating, Sharon Lall-Ramnarine and Elizabeth Biddinger, Development of Ionic Liquid & Solvate Ionic Liquid Electrolyte for low temperature Li-metal battery, CUNY Research Scholars Program Summer Symposium, CUNY Zoom, July 2022. *Best presentation of the day award winner.*

• **Elijah Bernard**, Domenec Paterno, Sophia Suarez and Sharon Lall-Ramnarine, Development of Electrospun Ionic Liquid-Polymer Membranes, Presented Virtually at the New York American Chemical Society's 69th Annual Undergraduate Research Symposium, May 7, 2022.

• **Elijah Bernard**, Domenec Paterno, Sophia Suarez and Sharon Lall-Ramnarine, Development of Electrospun Ionic Liquid-Polymer Membranes, Presented Virtually at the 2022 Queensborough Community College Spring Student Symposium, May 6, 2022.

UNDERGRADUATE RESEARCH PROGRAMS AT QCC
2022-2023 Academic Year

Research Program	Director	Contact
Bridges to the Baccalaureate Program: Research Initiative to Maximize Science Skills	Dr. Patricia Schneider	PSchneider@qcc.cuny.edu
Fall 2022 Student Engagement at the KHC	Laura B. Cohen & Marisa Hollywood	LCohen@qcc.cuny.edu MHollywood@qcc.cuny.edu
Financial Data Analysis with Python	Dr. Yusuf Danisman	YDanisman@qcc.cuny.edu
NASA-CCNY Center for Advanced Batteries for Space	Dr. Robert J. Messinger, Dr. Elizabeth Biddinger (CCNY) & Dr. Sharon Lall-Ramnarine (QCC)	SLallRamnarine@qcc.cuny.edu
NIH BioPREP - QCC (BioPREP: Biology Partnership in Research and Education Program)	Dr. Daniel Moloney (Stony Brook University) & Dr. Nidhi Gadura (QCC)	NGadura@qcc.cuny.edu
NSF Research Experience for Undergraduates (REU)	Dr. Todd Holden	THolden@qcc.cuny.edu
QCC NSF S-STEM Scholars Program in Smart Energy	Dr. David Sarno	DSarno@qcc.cuny.edu
QCC Origins of Black Holes Research Program	Dr. Jillian Bellovary	JBellovary@qcc.cuny.edu
The CUNY Research Scholars Program (CRSP) at Queensborough	Dr. Sharon Lall-Ramnarine	SLallRamnarine@qcc.cuny.edu
Using Cloud Technologies to Develop the Data Analysis Skills of Community College Students	Dr. Monica Trujillo & Dr. Esma Yildirim	MTrujillo@qcc.cuny.edu EYildirim@qcc.cuny.edu

Faculty involvement in Research
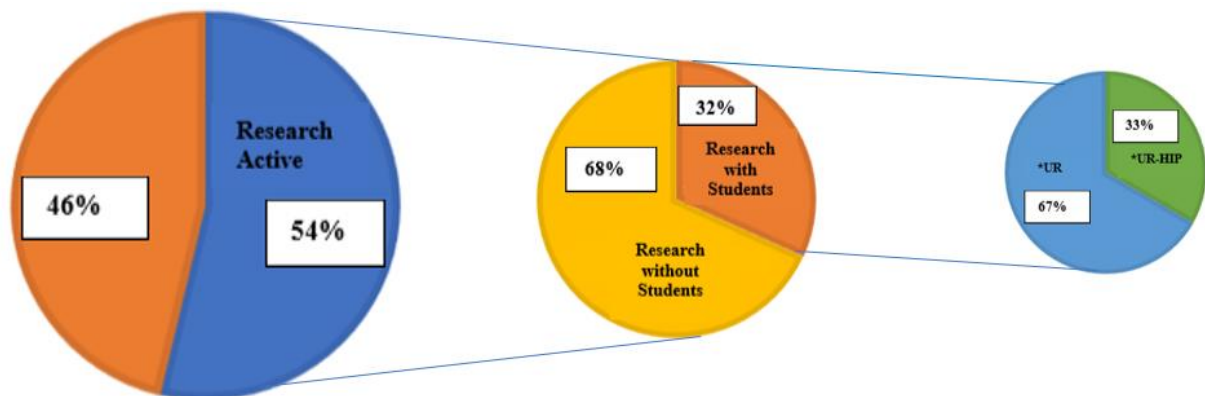
Based on combined data from Spring and Fall 2022 Faculty Notification of Research Activities Surveys (281 responses)

* Undergraduate Research & Undergraduate Research as High Impact Practice

Faculty Involved in Undergraduate Research as a High Impact Practice (UR-HIP)
(Self-identified in Spring and Fall 2022 Notification of Research Activities surveys)

Lorraine Cupelli
Steven Dahlke
Yusuf Danisman
Robert Donley
Sarbani Ghoshal
Urszula Golebiewska
Zivah Katz
Sharon Lall-Ramnarine
Christopher Leary
Nicole McClam
Rommel Robertson
David Sarno
Regina Sullivan
Emily Tai
Monica Trujillo
Roumen Vragov

Faculty Participating in UR-HIP training in Spring 2022 and Fall 2022

Parisa Assassi
Adrian Bordoni
Trikartikaningsih Byas
Carolina Chaves
Steven Dahlke
Michael DeMarco
Ari Fulton
Aviva Geismar
Michele Holden
Christopher J. Jimenez
Jonathan Kilom
Nicole McClam
Susana Pinheiro
Jody Resko
Jahaj Safet
Bianca Sosnovski
Jodi Van Der Horn-Gibson
Zhou Zhou

Undergraduate Research Day Presenters

Presenter	Mentor	Department	Presentation #
Jack Cesarano	Katherine Griefen	Art and Design	AD1
Jung Mi Park	Katherine Griefen	Art and Design	AD2
Raheem Popley-Carvey	Sarbani Ghoshal Sanjai K. Pathak	Biological Sciences and Geology	BG1
Audrey Arias	Patricia Schneider Raji Subramaniam Moni Chauhan	Biological Sciences and Geology	BG2
James Babo	Regina Sullivan	Biological Sciences and Geology	BG3
Sumaiya Husain Ramondjini Rosefort	Sarbani Ghoshal	Biological Sciences and Geology	BG4
Anna Liu	Monica Trujillo	Biological Sciences and Geology	BG5
Jose Romero	Sanjay Koul	Biological Sciences and Geology	BG6
Olivia Ovide Jalen Nicolas Lupe Garcia	Rondi Davies	Biological Sciences and Geology	BG7
Hafiz Tariq	Mark Emerson Miruna Ghinia-Tegla Thabelo Lekoetje	Biological Sciences and Geology	BG8
Maha Almaflehi Sebastian Aulestia Alexander Harry Erika Juarez Allison Mapes Alexander Tilas Maria Reyes Rodriguez Miguel Yturralde	Joan Petersen	Biological Sciences and Geology	BG9
Jamal Beatty Noel Beckles Sunphechuwat Chaijinda Mariia Ihnatiuk Anna Liu Anthony Rodriguez Benjamin Wade Anthony Gittens	Joan Petersen	Biological Sciences and Geology	BG10
Thriston Alkins Sebastian Aulestia Aidan Blainey Luca Calomarde Ivory Chisom	Joan Petersen	Biological Sciences and Geology	BG11

Presenter	Mentor	Department	Presentation #
Luis Esteban Lucia Goeller Mariia Ihnatiuk Kayla Reddick Benjamin Wade Hao Yang Sky Zheng			
Chris Na	Andrew Nguyen	Biological Sciences and Geology	BG12
Valerie Muse	Sarbani Ghoshal	Biological Sciences and Geology	BG13
Valerie Muse	Rochelle Nelson	Biological Sciences and Geology	BG14
Brandon Ackerman	Roumen Vragov	Business	BU1
Nickayla Spence	Moni Chauhan	Chemistry	CH1
Bethva Robert	Tirandai Hemraj-Benny	Chemistry	CH2
Chen Wu	Zhou Zhou	Chemistry	CH3
Ho Martin Yuen	Sharon Lall-Ramnarine	Chemistry	CH4
Mehreen Mughal	Sharon Lall-Ramnarine	Chemistry	CH5
Elijah Bernard	Sharon Lall-Ramnarine	Chemistry	CH6
Mariia Ihnatiuk	David Sarno	Chemistry	CH7
Marisa Marin	Josh Rothenberg	Communication, Theatre, & Media Production	CTMP1*
Sade Alleyne	Jonathan Kilom	Communication, Theatre, & Media Production	CTMP2*
Kevin Imbaquingo Kuish Giancarlo Rodas	Liisa Yonker Heather Huggins	Communication, Theatre, & Media Production	CTMP3*
Jazmin Rodriguez	Heather Huggins	Communication, Theatre, & Media Production	CTMP4*
Matthew Smith	Huixin Wu	Engineering Technology	ET1
Aisha Frampton-Clerk	Je'aime Powell (Univ. of Texas at Austin)	Engineering Technology	ET2
Jorge Garcia	Carolina Chaves	Foreign Languages and Literature	FL1
Niyireth Castaneda	Carolina Chaves	Foreign Languages and Literature	FL2

Presenter	Mentor	Department	Presentation #
Jocelyne Ramirez Cosmas Iwuanyanwu Orleisha Jones	Edward Diller	Health, Physical Education, and Dance	HPED1
Stephanie McGinty Bryan Garcia Moumita Rahman Yan Mcguire	Edward Diller	Health, Physical Education, and Dance	HPED2
Poonam Persaud Allesandra Perez	Edward Diller	Health, Physical Education, and Dance	HPED3
Dominic Epps	Emily Berry	Health, Physical Education, and Dance	HPED4*
Bridget Chirinos	Emily Berry	Health, Physical Education, and Dance	HPED5*
Zarina Medwinter	Emily Berry	Health, Physical Education, and Dance	HPED6*
Reyona Oyama	Emily Berry	Health, Physical Education, and Dance	HPED7*
Alexia Wang	Marisa Hollywood	Kupferberg Holocaust Center	KHC1
Arafat Akon Junpeng Liao	Esma Yildirim	Mathematics and Computer Science	MA1
Yuanhong Yu Jun Ha Kim	Zeynep Akcay Ozkan	Mathematics and Computer Science	MA2
Xiaolin Huang	Wenjian Liu	Mathematics and Computer Science	MA3
Sean He	Yusuf Danisman	Mathematics and Computer Science	MA4
Maximillan Yam	Yusuf Danisman	Mathematics and Computer Science	MA5
Martina Hove	Carolyn King	Mathematics and Computer Science	MA6
Jeremy Ramos	Steven Dahlke	Music	MU1*
Laurie Antoine Carlos Atachi Eyzaguirre Rameik Golden, Keshava Jones, Brianni Lee, Christine Pak, Alejandro Pellet, Lauren Pippen, Jeremy Ramos, Ayana Ritchie, Vincent Rodriguez, Alicia Santiago, Tenajae Thompson, Elias Villanueva, Ricky Ye, Lorenzo Zorrilla	Steven Dahlke	Music	MU2*
Ice Lin	Randelle Sasa	Nursing	NU1
Delfino Urbina	Georgina Colalillo	Nursing	NU2
Yuantong Luo	Jillian Bellovary	Physics	PH1
Matthew Fennell	Jillian Bellovary	Physics	PH2
Dennis Li	Jillian Bellovary	Physics	PH3
Yaakoub Muslemani	Paul Marchese	Physics	PH4
Nina Zabat Borja	Rex Taibu	Physics	PH5
Dumas Buffa	Raul Armendariz	Physics	PH6

Presenter	Mentor	Department	Presentation #
Eli Blatter	Raul Armendariz Marie Damas	Physics	PH7
Jenyffer Espinoza Julia Lee Priscilla Reyes	Amy Traver	Social Sciences	SS1
Fabiola Caba Omar Realegeno Bibi Ishmael	Amy Traver	Social Sciences	SS2
Stephany Platero	Jody Resko	Social Sciences	SS3
Clarence Chen	Jody Resko	Social Sciences	SS4
Kaitlyn Murphy	Patrick Byers	Social Sciences	SS5
Ziyue Du	Michael DeMarco Mark Zelcer	Social Sciences	SS6
Melissa van Ravenswaay	Jody Resko Michael DeMarco	Social Sciences	SS7

*These presentations are performances that will take place in the RFK Building, Room 214 (Dance Studio) from 3:00 to 4:30 p.m.

Undergraduate Research Day Projects

Art and Design

AD1

Case Study of the National Video Game Museum. Jack Cesarano and Katherine Griefen. Art and Design Department, Queensborough Community College, Bayside, NY 11364.

AD2

Case Study of the Nassau County Museum of Art. Jung Mi Park and Katherine Griefen. Art and Design Department, Queensborough Community College, Bayside, NY 11364.

Biological Sciences and Geology

BG1

Anti-cancer Effects of Dual-action Inhibitors of Nek2 and EGFR Kinases: Investigation of Synergy in a Lung Cancer Cell Line. [1]Raheem Popley-Carvey, [2]Ashif Bhuiyan, [2]Tuhin Das, [2]Dianne Hernandez, [2]Rafael Musayev, [3]Tanaji T. Talele, [1]Sarbani Ghoshal and [2]Sanjai K. Pathak. [1]Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364, [2]Queens College of the City University of New York, [3]St. John's University, Queens, NY 11439.

BG2

Microbial Contamination on Disposable Face Masks Used in Community Settings. Audrey Arias, Patricia Schneider, Raji Subramaniam, and Moni Chauhan. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG3

Investigation of SWCNT Treatment on the Mitochondrial Function of Lung Cancer Cells. James Babo and Regina Sullivan. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG4

Detection of Sickle Cell Anemia by Southern Blotting. Sumaiya Husain, Ramondjini Rosefort, and Sarbani Ghoshal. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG5

Wastewater-Based Epidemiology in Monitoring Influenza. <u>Anna Liu</u> and Monica Trujillo. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG6

Inhibition of Proliferation of Human Pancreatic Cancer Cell Line CFPAC1. <u>Jose Romero</u>, Hadi Abdelaal, and Sanjay Koul. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG7
Heavy Mineral Concentrates Sediment from Alley Pond Park: Insights into the Origin of Glaciers in Western Long Island. <u>Olivia Ovide, Jalen Nicolas, Lupe Garcia</u> and Rondi Davies. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG8

Retinal Cell Fate Determination of Bipolar and Cone Photoreceptor Cells by Blimp1 Gene Regulatory Elements. [1]<u>Hafiz Tariq</u>, [2]Thabelo Lekoetje, [2]Miruna Ghinia-Tegla, and [2]Mark Emerson. [1]Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364, [2]City College of the City University of New York.

BG9

The Importance of Habitat Restoration for the Survival of Native Species: The Meadow, The Milkweed and the Migratory Monarch. <u>Maha Almaflehi, Sebastian Aulestia, Alexander Harry, Erika Juarez, Allison Mapes, Alexander Tilas, Maria Reyes Rodriguez, Miguel Yturralde</u> and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG10

Water Quality Monitoring and Microbial Analyses of Vernal Pools in Alley Pond Park. <u>Jamal Beatty, Noel Beckles, Sunphechuwat Chaijinda, Mariia Ihnatiuk, Anna Liu, Anthony Rodriguez, Benjamin Wade, Anthony Gittens</u> and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG11

The Identification of Benthic Macroinvertebrates Collected from Vernal Pools in Alley Pond Park. Thriston Alkins, Sebastian Aulestia, Aidan Blainey, Luca Calomarde, Ivory Chisom, Luis Esteban, Lucia Goeller, Mariia Ihnatiuk, Kayla Reddick, Benjamin Wade, Hao Yang, Sky Zheng and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG12

Examining the Functions of STAT3 in Regulating Reactive Oxygen Species in Pre-osteoclastic RAW264.7 Cell Line. Chris Na and Andrew Nguyen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG13

An Elemental Public Health Crisis: Arsenic in Drinking Water. Valerie Muse, Simon Ramnauth, Chehak Chhabra, Shawn Mathew, Marie Joseph, Deasha Auslander, and Sarbani Ghoshal. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

BG14

Imposter Phenomenon in Community College Undergraduate Students Studying General Biology. Valerie Muse and Rochelle Nelson. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Business

BU1

A Comparative Study of the Forecasting Accuracy of Financial Websites. Brandon Ackerman and Roumen Vragov. Business Department, Queensborough Community College, Bayside, NY 11364.

Chemistry

CH1

Poly Rhodanine-Transition Metal Nanocomposites and Its Applications. [1]Nickayla Spence, [1]Moni Chauhan, [2]Qiaxian Johnson, and [2]Bhanu P. Chauhan. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Chemistry, William Patterson University, NJ.

CH2

A Comparative Study on the Interactions Between Single-Walled Carbon Nanotubes and Imidazolium and Pyrrolidinium-based Ionic Liquids. Bethva Robert, Ho Martin Yuen, Sharon Lall-Ramnarine and Tirandai Hemraj-Benny. Chemistry Department, Queensborough Community College, Bayside, NY 11364

CH3

Synthesis of Building Blocks for Cyanine Dye with Double Activation Sites. Chen Wu and Zhou Zhou. Chemistry Department, Queensborough Community College, Bayside, NY 11364.

CH4

Exploring the Properties of ether- and thioether-functionalized imidazolium Ionic Liquids. [1]Ho Martin Yuen, [1]Sharon Lall-Ramnarine, [2]Mehreen Mughal, [3]Nicole Zmich, [3]Furong Wang, and [3]James Wishart. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Chemistry and Biochemistry Department, Queens College, Flushing, NY 11367, [3]Chemistry Division, Brookhaven National Laboratory, Upton, NY 11973.

CH5

Exploring the Properties of Pyrrolidinium Thioether Ionic Liquids. [1]Mehreen Mughal, [1]Sharon Lall-Ramnarine, [2]Nicole Zmich, [2]Furong Wang, [2]James Wishart, and [3]Gopal Subramaniam. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Brookhaven National Laboratory, Upton, NY 11973, [3]Queens College of the City University of New York.

CH6

Development of Ionic Liquid and Solvate Ionic Liquid Electrolytes for Low Temperature Li-metal Batteries. [1]Elijah Bernard, [1]Sharon Lall-Ramnarine, [2]Michael Keating, and [2]Elizabeth Biddinger. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]The City College of the City University of New York.

CH7

Polyaniline Thin Films for the Removal of Metal Ions from Aqueous Solution. Mariia Ihnatiuk and David Sarno. Chemistry Department, Queensborough Community College, Bayside, NY 11364.

Communication, Theatre, & Media Production

CTMP1

Design and Management of Props. Marisa Marin and Josh Rothenberg. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

CTMP2

Scenic Design and Construction. Sade Alleyne and Jonathan Kilom. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

CTMP3

Creating a Character. Kevin Imbaquingo Kuish, Giancarlo Rodas, Liisa Yonker and Heather Huggins. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

CTMP4

Interpreting Text Into Vocal Performance. Jazmin Rodriguez and Heather Huggins. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

Engineering Technology

ET1

Mobile Robotic Arm. Matthew Smith and Huixin Wu. Engineering Technology Department, Queensborough Community College, Bayside, NY 11364.

ET2

Are ADA Requirements Making NYC Subways Fully Accessible for Wheelchair Users? Aisha Frampton-Clerk[1] and Je'aime Powell[2]. [1]Engineering Technology Department, Queensborough Community College, Bayside, NY 11364. [2]Texas Advanced Computing Center, The University of Texas at Austin.

Foreign Languages and Literature

FL1

Spanish Memory in the Holocaust. Jorge Garcia and Carolina Chaves. Foreign Languages and Literature Department, Queensborough Community College, Bayside, NY 11364.

FL2

Memory of the Last Spaniard Survivor of Mauthausen Concentration Camp. <u>Niyireth Castaneda</u> and Carolina Chaves. Foreign Languages and Literature Department, Queensborough Community College, Bayside, NY 11364.

Health, Physical Education, and Dance

HPED1

Student Stress at Queensborough Community College. <u>Jocelyne Ramirez, Cosmas Iwuanyanwu, Orleisha Jones</u> and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED2

The Personal Health Practices of Queensborough Community College Students. <u>Stephanie McGinty, Bryan Garcia, Moumita Rahman, Yan Mcguire</u> and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED3

The Stigmatization of Sexually Transmitted Diseases. <u>Poonam Persaud</u>, <u>Allesandra Perez</u> and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED4

The Lesson. <u>Dominic Epps</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED5

Can I Be Me? <u>Bridget Chirinos</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED6

Who Will I Soon Become? <u>Zarina Medwinter</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

HPED7

Time and Space. <u>Reyona Oyama</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

Kupferberg Holocaust Center

*KHC1

KHC Exhibition Research-The Concentration Camps: Inside the Nazi System of Incarceration and Genocide Virtual Tour Development. <u>Alexia Wang</u> and Marisa Hollywood. Kupferberg Holocaust Center, Queensborough Community College, Bayside, NY 11364.

Mathematics and Computer Science

MA1

End-to-end Data Transfer Throughput Prediction and Replica Selection in the Cloud. <u>Arafat Akon</u>, <u>Junpeng Liao</u> and Esma Yildirim. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

MA2

Predicting Student Success in College Algebra Classes Using Machine Learning. <u>Yuanhong Yu</u>, <u>Jun Ha Kim</u> and Zeynep Akcay Ozkan. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

MA3

The Probability Distribution of n-sided Dice Sum. <u>Xiaolin Huang</u> and Wenjian Liu. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

MA4

Comparing Different Cross Validation Techniques for Classification Problems in Finance. <u>Sean He</u> and Yusuf Danisman. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

MA5

Comparing Cross Validation Techniques. <u>Maximillan Yam</u> and Yusuf Danisman. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

MA6

Using Series to Solve Differential Equations. <u>Martina Hove</u> and Carolyn King. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

Music

MU1

Science, Song and Motion. <u>Jeremy Ramos</u> and Steven Dahlke. Music Department, Queensborough Community College, Bayside, NY 11364.

MU2

The Hill We Climb -- Music Department Composition Project. Music Department Pop Choir: <u>Laurie Antoine, Carlos Atachi Eyzaguirre, Rameik Golden, Keshava Jones, Brianni Lee, Christine Pak, Alejandro Pellet, Lauren Pippen, Jeremy Ramos, Ayana Ritchie, Vincent Rodriguez, Alicia Santiago, Tenajae Thompson, Elias Villanueva, Ricky Ye, Lorenzo Zorrilla</u> and Steven Dahlke. Music Department, Queensborough Community College, Bayside, NY 11364.

Nursing

NU1

Skin Preparation and Accuracy of Capillary Blood Glucose Readings: A Limited Literature Review. <u>Ice Lin</u>, Nicole Csatari, Jessica Marvin, Jalwa Batul, Venice Brown-Thomas, Stefania Loor, Amer Alsaidi, Vochelle Marks and Randelle Sasa. Nursing Department, Queensborough Community College, Bayside, NY 11364.

NU2

Rethinking Screening for Suicide Risk Among the Adolescent Population. <u>Delfino Urbina</u> and Georgina Colalillo. Nursing Department, Queensborough Community College, Bayside, NY 11364.

Physics

PH1

Mass Growth of Supermassive Black Holes. <u>Yuantong Luo</u> and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH2

Quasi-Stars in Simulations. <u>Matthew Fennell</u> and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH3

Black Hole Mergers and Gravitational Recoil. <u>Dennis Li</u> and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH4

Is Hurricane Energy Increasing in the North Atlantic as a Result of Global Warming? <u>Yaakoub Muslemani</u> and Paul Marchese. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH5

Textbooks' Presentation of Radiation Risks: Communication and Interdisciplinary Perspective. <u>Nina Zabat Borja</u> and Rex Taibu. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH6

Design and Construction of a Cosmic Ray Particle Telescope on a Computer Controlled Altitude/Azimuth Rotating Base. <u>Dumas Buffa</u> and Raul Armendariz. Physics Department, Queensborough Community College, Bayside, NY 11364.

PH7

Making Space for a MakerSpace. <u>Eli Blatter</u>, Raul Armendariz, and Marie Damas. Physics Department, Queensborough Community College, Bayside, NY 11364.

Social Sciences

SS1

Sociological Insights into the Enrollment Crisis: Data and Analysis from Students in Sociology 101-D4. <u>Jenyffer Espinoza, Julia Lee, Priscilla Reyes</u> and Amy Traver. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS2

Sociological Insights into the Enrollment Crisis: Data and Analysis from Students in Sociology 101-D2. <u>Fabiola Caba, Omar Realegeno, Bibi Ishmael</u> and Amy Traver. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS3

Academic Perseverance Among First Generation Community College Students: An Exploration of the Social and Cultural Capital Phenomenon. Stephany Platero and Jody Resko. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS4

Understanding the Relationship Between Hardiness and Academic Performance During COVID. Clarence Chen and Jody Resko. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS5

Understanding Transformations of Truth and Reality Online Through the Use of Language and Narrative. Kaitlyn Murphy and Patrick Byers. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS6

How Does the Experience of Chinese International Students Affect Their Academic Goals. Ziyue Du, Michael DeMarco, and Mark Zelcer. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

SS7

An Examination of College Students' Perceptions of Cell Phone Use and Privacy. Melissa van Ravenswaay, Jody Resko, and Michael DeMarco. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Undergraduate Research Day Abstracts

Art and Design

AD1

Case Study of the National Video Game Museum. <u>Jack Cesarano</u> and Katherine Griefen. Art and Design Department, Queensborough Community College, Bayside, NY 11364.

This project was conducted by a gallery and Museum Studies major who is currently taking ARTH252 Art Institutions and the Business course at QCC. It focuses on a case study of the National Videogame Museum, located in Frisco, Texas. The presentation will convey the strengths, weaknesses, opportunities, and threats (SWOT) to this institution in the form of a report. As a supporter of video game preservation, the author will present an accurate detailing of the museum and its current standing.

AD2

Case Study of the Nassau County Museum of Art. <u>Jung Mi Park</u> and Katherine Griefen. Art and Design Department, Queensborough Community College, Bayside, NY 11364.

As a student of Gallery and Museum Studies, I had a chance to research a specific museum in my ARTH 252 Art Business class. As a result of research, I will present a case study of Nassau County Museum of Art located in Roslyn Harbor on the North Shore of Long Island. The Nassau County Museum of Art was established in 1989 and became a private not-for-profit institution. My presentation will take the form of a S.W.O.T. report wherein the Strengths, Weaknesses, Opportunities and Threats to the museum are identified.

Biological Sciences and Geology

BG1

Anti-Cancer Effects of Dual-Action Inhibitors of Nek2 and EGFR Kinases: Investigation of Synergy in a Lung Cancer Cell Line. [1]<u>Raheem Popley-Carvey</u>, [2]Ashif Bhuiyan, [2]Tuhin Das, [2]Dianne Hernandez, [2]Rafael Musayev, [3]Tanaji T. Talele, [1]Sarbani Ghoshal and [2]Sanjai K. Pathak. [1]Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364, [2]Queens College of the City University of New York, [3]St. John's University, Queens, NY 11439

Lung cancer is the leading cause of mortality among all cancer types for both men and women. Never in mitosis gene A (NIMA)-related kinase 2 (Nek2) is a member of NEK family, a Serine/Threonine kinase, that is known to be overexpressed in highly metastatic cancers, including lung cancer. Studies from our laboratory have shown that abnormal expression of Nek2 kinase can promote aggressive tumor behavior and metastasis in-vivo. Many such tumors also often overexpress another key oncogene, epidermal growth factor receptor (EGFR), that has shown to

induce cell proliferation, angiogenesis, and tumorigenesis. Hence, concomitant inhibition of Nek2 and EGFR kinases can potentially be a promising therapeutic strategy for cancer. Our research goal is to develop anticancer agents that target inhibition of both Nek2 and EGFR activities. Our hypothesis is that such dual-action inhibitory agents will provide superior efficacy due to a more predictable PK/PD profile in vivo. In this work, we first test our hypothesis that dual inhibition of Nek2 and EGFR kinases by small molecules, namely rac-CCT 250863, and Lapatinib and Erlotinib will induce enhanced cancer cell death in a lung cancer cell line A549. Our results from cell viability assay show synergy in cytotoxicity when A549cells were treated simultaneously with individual inhibitors of Nek2 and EGFR kinases. Our data suggests that single agent, dual-action inhibitors of Nek2 and EGFR kinases, when developed, may exhibit superior anti-cancer effects.

BG2

Microbial Contamination on Disposable Face Masks Used in Community Settings. Audrey Arias, Patricia Schneider, Raji Subramaniam, and Moni Chauhan. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

The effectiveness of face masks against droplet transmission of COVID-19 has been well documented. But, only a few studies in experimental and clinical settings have examined bacterial and fungal contamination on masks. Surgical masks are a potential source of bacterial shedding in hospitals. Evidence on bacterial cross-contamination suggests that mask use could lead to disruption in the skin and nasal microbiome. There is a need for information on microbial contamination on masks worn in community settings. A pilot study in our lab focused on isolating and characterizing bacteria on disposable face masks. This study expands on the preliminary study by processing more masks and assessing antibiotic resistance. Twenty-three used disposable masks were donated anonymously. The three-ply, non-woven, polypropylene masks were placed in sterile containers of Luria broth for 20 minutes. The spread plate procedure was used to assess microbial contamination. Bacteria were cultivated on Luria broth agar plates incubated at 37°C for 48 hours to estimate bacteria levels (cfu/piece). Isolates were selected based on colony morphology and Gram stain reaction. Identification of isolates with 16S rRNA gene sequence analysis is ongoing. Using the Kirby-Bauer disk diffusion method, the isolates were tested for susceptibility to twelve antibiotics. The three mask layers are being examined with scanning electron microscopy (SEM) to provide information on the distribution of bacteria. Preliminary results demonstrate the presence of antibiotic resistant bacteria and potential pathogens confirming the biosafety risk especially in vulnerable populations. Clear guidelines for the general public on mask use and disposal are required to reduce the bacteria-related biosafety risk. Audrey participated in QCC NIH Bridges to Baccalaureate Program.

BG3

Investigation of SWCNT Treatment on the Mitochondrial Function of Lung Cancer Cells. James Babo and Regina Sullivan. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Lung cancer is a major cause of death in the United States. Although treatment options have expanded in recent years the need for novel therapeutics remains. Many studies have suggested

that biomedical applications of Single-walled Carbon Nanotubes (SWCNT) have the potential to expand cancer treatment options. These nanosized cylindrical carbon tubes have unique properties including stability under various conditions and high surface area. Such properties could facilitate the use of SWCNT as cancer drug delivery systems. We have focused on using pristine nanotubes to investigate the effect on a non-small cell lung cancer cell line, A549. Our lab and others have shown cancer cells have reduced rates of migration after treatment with dispersed SWCNTs. In addition, our previous results using the MTT assay revealed 50% cytotoxicity after SWCNT treatment in concentrations as low as 12mg/ml. Our current study will test the hypothesis that SWCNT alters mitochondrial functionality leading to cytotoxicity and reduced rates of migration. Our objectives are to 1) establish SWCNT doses and treatment times producing a dose response 2) Using MitoTracker to assess mitochondrial membrane potential in treated and untreated cells 3) Analyze genes regulating reactive oxidative species signaling by real time PCR (including the apoptotic inhibitor,Bcl-2). Anticipated data from our studies may help reveal novel therapeutic treatment options for lung cancer.

BG4

Detection of Sickle Cell Anemia by Southern Blotting. Sumaiya Husain, Ramondjini Rosefort, and Sarbani Ghoshal. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Sickle cell anemia is a genetic recessive disorder and is caused by a single nucleotide mutation in the hemoglobin gene. This leads to the dysfunction of red blood cells as these cells become sickle-shaped and cannot perform their normal function of carrying oxygen well enough. The single mutation in the hemoglobin gene also alters the electrophoretic mobility of the cell. People with sickle cell disease (SCD) have two alleles of the sickle cell gene, and those with Sickle cell trait (SCT) have one allele of the sickle cell gene. Phenotypically, SCT persons appear normal. To find if a person has SCD or SCT, the isolated DNA is digested with the Mst II restriction enzyme (RE). The Mst II restriction enzyme recognizes the specific sequence of the normal hemoglobin gene (CCT-GAG-GAG) but not the mutated gene (CCT-GTG-GAG). In our experiment, two parents wanted to know if their child carried the gene for SCD. To answer this research question, we performed Southern Blotting on MST II digested samples from both parents and the child. Our results were able to identify the genotypes for both parents as carriers and the child to be normal. Following the Mendelian inheritance pattern, we confirm that there is a 25% chance of having a normal child from two carrier parents for SCD.

BG5

Wastewater-based Epidemiology in Monitoring Influenza. Anna Liu and Monica Trujillo. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Influenza is a seasonal respiratory viral infection that is easily transmitted through infectious droplets. Its symptoms include, headache, cough, sudden onset of fever, sore throat, runny nose, muscle and joint pain, and severe malaise. Most people recover from the symptoms of influenza without medical attention. However, in high risk populations, like the elderly, pregnant persons,

and the very young, influenza can cause severe illness and even death. In 2018, influenza was responsible for 5 million cases of severe illness, and 290,000 to 650,000 deaths worldwide, making it a major public health concern. In New York State, influenza activity is monitored by the New York State Department of Health (NYSDOH) year round. The New York City Department of Health and Mental Hygiene (NYC DOHMH) actively promotes vaccination for the seasonal flu, tracks vaccination rates, and provides influenza surveillance reports on a weekly basis. Wastewater-Based Epidemiology (WBE) is a new epidemiology tool that monitors pathogen levels in collected sewage water. Importantly, wastewater surveillance includes information from symptomatic and asymptomatic individuals. WBE can therefore be used to inform decision making in public health officials. The purpose of this study is to conduct wastewater surveillance for Influenza A and compare wastewater data with clinical data provided by NYSDOH, NYC DOHMH and NYC Health & Hospitals (NYC H+H). The wastewater is collected from manholes or sewer pipes from NYC H+H across the Bronx and Queens by deploying a device that concentrates viruses from the hospital manhole. The device is then brought to the laboratory where using proprietary buffers and a commercial kit, total nucleic acids are extracted. Following the CDC RT-qPCR protocol and a commercially available standard the concentration of Influenza A virus in each sample is determined. Wastewater surveillance of influenza can be used to predict outbreaks before they happen.

BG6

Inhibition of Proliferation of Human Pancreatic Cancer Cell Line CFPAC1. Jose Romero, Hadi Abdelaal and Sanjay Koul. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

GST's (Glutathione S transferases) is a large family of proteins involved in variety of cellular physiological functions, such as metabolism, detoxification and elimination of potentially genotoxic foreign compounds, metabolizing variety of carcinogenic compounds, and protecting cells against DNA damage. Glutathione S-transferase Pi (GSTP1) belonging to this family of isozymes encoded by GST pi gene is often observed to be involved in various disease states. In case of cancer in several tumor tissues from different anatomical sites, more than 90% of the GSTs is GSTP1. GSTP1 overexpression has been observed at both transcriptional as well as translational level in different cancers like colon, bladder, lungs, ovarian and pancreatic cancer. Using cellular colony forming assay as a first readout here we show the exploration of the possibility to see whether inhibition of GSTP1 can play any role in reducing the proliferative state of human pancreatic cancer. We have used human pancreatic cancer cell line CFPAC1 as a model system.

BG7

Heavy Mineral Concentrates Sediment from Alley Pond Park: Insights Into the Origin of Glaciers in Western Long Island. Olivia Ovide, Jalen Nicolas, Lupe Garcia and Rondi Davies. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

New York State's geological history has been shaped substantially by ice glaciers, dating back to the Pleistocene Ice Age. A formation of glaciers passed through New York City and Long Island,

leaving behind the numerous glacial landforms seen today. For example, Long Island consists of several distinct moraines, those being the Harbor Hill, Roanoke Point, and Ronkonkoma moraines. Our research is focused in Alley Pond Park in Bayside, located on the Harbor Hill moraine. There is a dearth of geologic research on the glaciers that formed this landscape. Our goal is to determine the proportions of heavy minerals (>2.7 gm/cm3) in glacier sand (250 125 microns) to identify their source rocks. Samples of undisturbed glacial sediment were collected from the park, sorted by size using a sieve, cleaned using HCl acid, and separated by density using sodium polytungstate in order to isolate heavy minerals. We sorted 500 grains and determined the proportions of mineral types in the sample. Heavy mineral analysis allows us to research Long Islands geological past, giving insight into how sediments have traveled and past climate conditions. This can teach us much about the origin of the materials that make up the glaciers from the Pleistocene Age. The resulting data can give insight informing us about the direction of glacial movement.

BG8

Retinal Cell Fate Determination of Bipolar and Cone Photoreceptor Cells by Blimp1 Gene Regulatory Elements. [1]Hafiz Tariq, [2]Thabelo Lekoetje, [2]Miruna Ghinia-Tegla, and [2]Mark Emerson,. [1]Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364, [2]City College of the City University of New York.

The retina is the part of the eye that is sensitive to light. It receives the light signals and converts them into the neural signals. The brain receives these signals and perceives the world accordingly. Vertebrate retina consists of different cells that originate from multipotent retinal progenitor cells (RPCs). These cell's fate is influenced by the activity of gene-regulatory elements that control the expression of genes. The RPCs have the potential to give rise to six different cell classes. We will determine the role of the Blimp1 gene in the development of cone photoreceptors or bipolar cells. In the retina, Blimp1 acts as a cell fate determinant for whether a cell will differentiate into a cone photoreceptor or bipolar cell. Near the Blimp1 locus, there are two accessible chromatin regions that are possible enhancers for Blimp1. Primers will be used to amplify these DNA regions using PCR. These amplified DNA regions will be cloned into a reporter plasmid containing both alkaline phosphatase (AP), and GFP green fluorescent protein reporters. The AP reporter will show if the enhancer is active in the chick retina; and if active, the GFP reporter would localize where in the retina the enhancer is active. We used other lab techniques such as gel electrophoresis, gel extraction, ligation, transformation, mini prep, midi prep, sanger sequencing, restriction enzyme digest, electroporation of plasmid into the Chick retina, fixing the retina in paraformaldehyde and sectioning the retina using cryostat apparatus. Confocal imaging will be used to analyze the results. As the DNA encoding the chromatin region can be placed in either the forward or reverse orientation relative to the reporter, the analysis will be done with both. These research findings can be a good foundation to design cell replacement therapies for patients suffering from retinal degeneration.

BG9

The Importance of Habitat Restoration for the Survival of Native Species: The Meadow, The Milkweed and the Migratory Monarch. Maha Almaflehi, Sebastian Aulestia, Alexander Harry, Erika Juarez, Allison Mapes, Alexander Tilas, Maria Reyes Rodriguez, Miguel Yturralde, and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Migratory Monarch butterflies were recently put on the endangered species list. To ascertain the cause of the decline of Monarch butterflies, our class compiled information from a literature search. This search revealed that habitat loss, drought from climate change, pesticide use, and host plant parasites are the main causes of Monarch decline. Milkweed is an important host plant for Monarchs: its toxic milky discharge is consumed by Monarch caterpillars, which protects it from predation. Adult Monarchs rely on several types of native wildflowers for food. Therefore, restoration of Monarch habitat should include milkweed as well as other wildflowers to support all stages of Monarch development. We also conducted field observations and collected soil samples at the Oakland Lake Wildflower Meadow: a former construction landfill site that is currently being restored to create habitat for many native species including the Monarch. Soil samples were analyzed for nitrate and phosphate content, pH, and texture using the LaMotte soil macronutrients kit. Our results showed that Oakland Lake Wildflower Meadow soil texture is loamy sand, with a slightly acidic pH. These soil conditions are suitable for the growth of milkweed and many other native wildflowers including Wild Bergamot, Late Boneset and Eastern Columbine. We planted these wildflowers in bare patches within the wildflower meadow to provide additional habitat and food sources for native pollinators. The relationships between milkweed, meadow wildflowers and the Monarch demonstrate the importance of the ecological restoration to expand the habitat of the endangered Monarch and other pollinators. This will encourage the growth of native plants that are vital to the local ecosystem. With the continued restoration of the wildflower meadow, necessary research can continue to monitor the local population of the Monarch.

BG10

Water Quality Monitoring and Microbial Analyses of Vernal Pools in Alley Pond Park. Jamal Beatty, Noel Beckles, Sunphechuwat Chaijinda, Mariia Ihnatiuk, Anna Liu, Anthony Rodriguez, Benjamin Wade, Anthony Gittens, and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Vernal pools are ephemeral bodies of water with no permanent inlet or outlet. Since they do not support fish, they provide favorable breeding grounds for many types of amphibians and insects. We monitored the water quality of the vernal pools at a restoration site in Alley Pond Park. This area has four vernal pools: one natural pool, one constructed without a liner (Pool A) and two constructed with liners (pools B and C). The constructed pools were created by NYC Parks in 2016 to increase vernal pool habitat within the park. Water samples from each pool were tested for standard water quality parameters, including temperature, pH, nitrate, phosphate, and dissolved oxygen. A YSI meter was used to collect pH, temperature, and dissolved oxygen data on site. Hach kits were used in the field to measure nitrate and phosphate levels. We determined total bacterial

numbers using serial dilution and plate counts. Additionally, we detected levels of enterococci, an indicator of fecal contamination, using the Enteroalert System (IDEXX). Our results showed that temperature, pH, and dissolved oxygen were fairly consistent throughout the four pools. Phosphate and nitrate levels were more variable- phosphate levels were higher in the natural pool and Pool A; nitrate levels were higher in Pools B and C. Total bacterial counts ranged between 1.3×10^4 and 6.9×10^4 CFU's/ml. Levels of enterococci were between 111.2 CFU's/ 100 ml (Pool B-acceptable value) and 1732.9 CFU's/ 100 ml (Pool A- above acceptable range for freshwater). Comparisons with water quality parameters from previous years indicate that conditions in these vernal pools are continuing to change over time. These data are being used by the Parks Department to evaluate the success of the constructed vernal pools and provide information for future restoration efforts.

BG11

The Identification of Benthic Macroinvertebrates Collected from Vernal Pools in Alley Pond Park. Thriston Alkins, Sebastian Aulestia, Aidan Blainey, Luca Calomarde, Ivory Chisom, Luis Esteban, Lucia Goeller, Mariia Ihnatiuk, Kayla Reddick, Benjamin Wade, Hao Yang, Sky Zheng, and Joan Petersen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Benthic macroinvertebrates are organisms in their larval and nymph stages that are found in aquatic sediments. Since taxa vary in their tolerance to environmental conditions, they are important indicators of water quality. Our class sampled benthic macroinvertebrates from a vernal pool restoration site within Alley Pond Park to determine taxa diversity and to assess the health of the vernal pools. Samples were collected from a natural pool and three constructed pools (A, B and C) using a dipnet that was submerged, angled and dragged through the sediments three times at each pool. Samples were transferred into jars and preserved in ethanol. Benthic macroinvertebrates were sorted from each sediment sample, and dissecting microscopes and guidebooks were used to identify macroinvertebrates to the taxonomic level of order. The Shannon-Wiener Diversity Index was calculated for each pool. Results showed that the taxonomic diversity of pool C was higher than the other three pools (natural pool, pools A and B). Mollusks were the dominant taxa in the natural pool and pool B, abundant in pool C, and absent in pool A. In pool C the most abundant taxa were Coleoptera (beetles). Compared to 2019 data, taxonomic diversity increased in 2022, whereas the total number of organisms isolated from each pool was much lower. Three new orders - Plecoptera, Hirudinea and Hymenoptera - were represented in the 2022 survey but not detected in the 2019 survey. Additionally, pollution sensitive taxa were less abundant and pollution tolerant taxa were more abundant in 2022 as compared to 2019. The shift to more tolerant species and decline in total numbers of benthic macroinvertebrates may indicate a decrease in water quality in these vernal pools. Continued observations are needed to determine the status of the benthic macroinvertebrates and the overall success of the vernal pool restoration at this site.

BG12

Examining the Functions of STAT3 in Regulating Reactive Oxygen Species in Pre-osteoclastic RAW264.7 Cell Line. <u>Chris Na</u> and Andrew Nguyen. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

The skeletal system lays the foundation for our body's mobility and security of vital organs while manages to maintain bone mineral homeostasis. The principal mineral homeostasis actions depend on crucial interactions between the osteoblasts and osteoclasts. The coordinated efforts between two contrasting cells, osteoblasts and osteoclasts, sustain average bone growth. Osteoblasts are responsible for producing bones, whereas osteoclasts are responsible for the reabsorption of bones. Previously studies in our laboratory have shown that alteration of the transcriptional factor, STAT3, in either osteoblasts or osteoclasts cause bone abnormalities. Mice with reduction of STAT3 gene expression in osteoclasts showed signs of scoliosis, reduced bone density, and increased risk of bone fracture. Furthermore, the deletion of STAT3 with the adverse outcomes solely in female mice suggests the functions of STAT3 may be regulated by sex hormones. To explore this observation further, a pre-osteoclastic cell line, RAW264.7 cells will be used to examine the effect of estrogen stimulation. Previous study in the laboratory has shown that RAW264.7 cells deleted of STAT3 showed more apoptotic cells when stimulated with 17β-estradiol or alendronate. The mechanism by which 17β- estradiol or alendronate caused apoptosis however is not known. We hypothesize that STAT3 under 17β-estradiol or alendronate stimulation alters the reactive oxygen species (ROS) of the cells. The goal of my project is to test this hypothesis. The prediction is that the cells with functional STAT3 show higher ROS when stimulated with 17β-estradiol or alendronate.

BG13

An Elemental Public Health Crisis: Arsenic in Drinking Water. <u>Valerie Muse</u>, Simon Ramnauth, Chehak Chhabra, Shawn Mathew, Marie Joseph, Deasha Auslander and Sarbani Ghoshal. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Arsenic (As) is a naturally occurring element distributed in the Earth's crust, generally found in soil and minerals. Arsenic is a metalloid and can be classified as inorganic when combined with elements such as oxygen, chlorine, and sulfur and organic when combined with carbon. Arsenic can enter the air, water, and land in small particles from anthropogenic sources like the discharge of industrial waste, combustion processes, mining, and also from natural occurrences. Organic arsenic is considered to be less harmful than inorganic forms. Inorganic arsenic, especially the trivalent form, is known to be a hazardous substance that triggers various human health issues after substantial exposure. It has been estimated that 200 million people worldwide are at risk from health effects associated with high concentrations of arsenic in drinking water. Epidemiology studies have linked arsenic exposure to drinking water with skin lesions, hyperkeratosis, cancer, and multiple other health conditions. According to the Department of Health and Human Services (DHHS) and the International Agency for Cancer Research (IACR), arsenic is regarded as a Group 1 human carcinogen causing skin, bladder, and lung cancer. The present work will summarize data from major genetic and molecular epidemiology studies to show cancer risks through arsenic in

drinking water. Additionally, we will focus on current literature that illustrates the anti-cancer effects of a few arsenic metabolites.

BG14

Imposter Phenomenon in Community College Undergraduate Students Studying General Biology. <u>Valerie Muse</u> and Rochelle Nelson. Biological Sciences and Geology Department, Queensborough Community College, Bayside, NY 11364.

Imposter Phenomenon is a debilitating experience where individuals have extreme doubts about their accomplishments, skills, talents, and goals. Individuals also have internal fear of being discovered as fraud. The impostor phenomenon appears widespread in community college undergraduate students studying general biology. Upon achieving the goal of entering college, students fight overwhelming thoughts that their success is due to luck and end up feeling as though they do not belong in college. These feelings create a lack of self-confidence and self-esteem and increase self-doubt. The imposter phenomenon becomes a substantial problem for biology students because the imposter mindset leads to emotional exhaustion and burnout. In this study, we have reviewed PubMed, a database focused on life sciences and biomedical sciences, to identify available research on the imposter phenomenon amongst community college students. Our search query, "imposter syndrome or imposter phenomenon or impostor syndrome or impostor phenomenon," yielded various results which were published between 1976 to 2022. There was significant underrepresentation of community college students in the cohort of individuals studied for the imposter phenomenon. This suggests a great need for more research on the imposter phenomenon as it occurs in community college students. This study aims to understand how the impostor phenomenon has been studied and observed in various research populations.

Business

BU1

A Comparative Study of the Forecasting Accuracy of Financial Websites. <u>Brandon Ackerman</u> and Roumen Vragov. Business Department, Queensborough Community College, Bayside, NY 11364.

Short term forecasting websites are known to contain large amount of inaccuracies that can have negative financial effect on its users. The purpose of this research project is to analyze and compare multiple websites that produce short-term stock market forecasts. The study will collect one two-week forecast for each stock in a random sample of stocks from each site and calculate the percentage deviation between the forecast and the actual closing price. The sample means from each site will be compared through a binary comparison using a standard t-test. The data will be collected manually and stored in spreadsheet form. It is expected that websites with more experience in forecasting will provide better forecasts. The results will be helpful to new short-term investors as to choosing which online forecast to take into consideration.

Chemistry

CH1

Poly Rhodanine-Transition Metal Nanocomposites and Its Applications. [1]<u>Nickayla Spence</u>, [1]Moni Chauhan, [2]Qiaxian Johnson, and [2]Bhanu P. Chauhan. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Chemistry, William Patterson University, NJ.

Rhodanine is a 5-membered ring heterocyclic organic compound derived from a thiazolidine core. The derivatives of Rhodanine possess a broad spectrum of pharmacological and biological activities such as antidiabetic, antibacterial, antifungal, pesticidal, antimycobacterial, and so on. In addition, Rhodanine and its derivatives can prevent HIV-1 integrase, JSP-1 Phosphates, RNA polymerase, hepatitis C virus NS5B polymerase, and PMT1 mannosyl transferase. We hypothesize that the shape-controlled synthesis of Poly Rhodanine will provide an exciting perspective for diagnosing and treating diseases and other applications in the biomedical field. In our research, we investigated the morphology of the Poly Rhodanine complexes formed from reacting Rhodanine with various transition metals such as silver, copper, zinc, and palladium. So far, two types of morphologies have been identified, namely core-shell and nanotubular. The experiment involved a single-step oxidation-reduction reaction in a microwave or an oil bath at 80°C in ethanol. Potassium Permanganate was added to increase the reaction rate due to its strong oxidative properties. The reaction has two stages. In the initial stage, the Rhodanine monomer consisting of coordinating sites: sulfur, oxygen, and nitrogen, reacts with the metal ions to form a one-dimensional complex. In the final stage, the Rhodanine oxidizes, and the metal ions reduce to form a Rhodanine-based polymer with embedded metal nanoparticles. The compounds were analyzed with an Infra-Red and Ultra-Violet-vis Spectrophotometer, Scanning Electron Microscope, Transmission Electron Microscope, and Energy Dispersive X-Ray Spectrophotometer. Poly Rhodanine core-shell nanospheres can efficiently degrade 80% methyl orange dye present in wastewater. Poly Rhodanine-metal nanocomposites will be tested for antibacterial and anti-cancerous activities.

CH2

A Comparative Study on the Interactions Between Single-Walled Carbon Nanotubes and Imidazolium and Pyrrolidinium-based Ionic Liquids. <u>Bethva Robert</u>, Ho Martin Yuen, Sharon Lall-Ramnarine and Tirandai Hemraj-Benny. Chemistry Department, Queensborough Community College, Bayside, NY 11364.

Supercapacitors have great potential to serve as efficient energy storage devices. However, to facilitate more widespread usage in practical applications, developing more efficient electrodes and electrolytes is necessary. Carbon nanotubes can serve as effective electrodes due to their high surface area. Additionally, ionic liquids (ILs) can act as excellent electrolytes due to their expansive electrochemical windows. It is important to investigate the specific interactions between single-walled carbon nanotubes (SWCNTs) and various ILs to contribute to the development of optimal electrodes and electrolytes for energy storage devices. In this comparative study, mixtures containing SWCNTs and ILs containing imidazolium and pyrrolidinium cations coupled with

bis(trifluoromethylsulfonyl)amide (NTf_2^-) anion were investigated by Mid-IR spectroscopy and UV-Visible spectroscopy. All SWCNT-IL mixtures were prepared by an ultrasonic method for two hours. It was determined that the ILs facilitated some degree of de-bundling of the SWCNTs, and mixtures can remain stable for more than a year. UV-Visible data indicated that the electronic properties of the SWCNTs were not significantly affected upon the incorporation of the ILs. Mid-IR data indicated that all characteristic vibrations of the ILs were maintained in the presence of the SWCNTs. It was concluded that the single-walled carbon nanotube bundles interacted with the imidazolium and pyrrolidinium-based ionic liquids via weak van der Waals interactions, and the ILs' structural properties were unaffected upon sonication.

CH3

Synthesis of Building Blocks for Cyanine Dye with Double Activation Sites. <u>Chen Wu</u> and Zhou Zhou. Chemistry Department, Queensborough Community College, Bayside, NY 11364.

From tumor scanning in human patients to cell imaging in the research lab, to shooting real-time movies of living virus, small organic fluorophores have been extensively used as imaging probes or light sources in the life science and health industry. Among these fluorophores, cyanine dyes are one of the most widely studied owing to their photophysical properties and structural variety. One of the key steps in fluorescent imaging is site-specific labeling. The carboxylic acid group in cyanine dyes can be chemically activated and covalently bonded to a specific atom in the target biomolecules. Although this site-specific fluorescent labeling has received great attention and success, the variety of this approach is limited to carbonyl chemistry. We propose that a built-in amino group would offer two orthogonal reactive groups in cyanine dyes, which would allow more choices in site-specific fluorescent labeling and healing agent coupling. One reactive group is a carboxylic acid group; the other is an amino group. This approach will significantly broaden the applications of current cyanine fluorophores. Here we report the synthesis of the compounds that will be used as building blocks in the synthesis of target cyanines. Synthetic studies in amino cyanine dyes are rare. This scarcity is likely caused by the reactivity of the amino group. In our work, nosyl ((4-nitrophenyl) sulfonyl) group was used to protect the amino group in the synthesis of these building groups. In future work, three different amino cyanine dyes will be synthesized using these building blocks. These dyes will have double activation sites and four sulfonic groups to improve their water solubility.

CH4

Exploring the Properties of ether- and thioether-functionalized imidazolium Ionic Liquids. <u>[1]Ho Martin Yuen</u>, [1]Sharon Lall-Ramnarine, [2]Mehreen Mughal, [3]Nicole Zmich, [3]Furong Wang, and [3]James Wishart. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Chemistry and Biochemistry Department, Queens College, Flushing, NY 11367, [3]Chemistry Division, Brookhaven National Laboratory, Upton, NY 11973.

The growing global demand for energy gives rise to the need for safer, more efficient energy storage and process devices. Ionic liquids (ILs) hold the potential to enable superior alternative technological solutions for efficient energy systems. ILs are liquid salts at room temperature and their nanostructure can be tailored to optimize physical properties needed for different

applications. However, their relatively high viscosity is a major obstacle to the use of ILs for certain applications. It contributes to slower charge transport and reduces the effectiveness of ILs as electrolytes. Previous research work from our group and collaborators has shown the inter- and intramolecular interactions between ions and side chains with different lengths and functionalization influence the viscosities of imidazolium ILs. We report here on the synthesis and characterization of a series of alkyl-, ether-, and thioether-functionalized methyl and dimethyl imidazolium ILs with various anions. Target ILs were synthesized by reacting 1-methylimidazole and 1,2-dimethylimidazole with selected halogenated substituents followed by the metathesis with different fluorinated sulfonamides. The structures of the ILs were confirmed by ^{1}H, ^{19}F, and [13]C Nuclear Magnetic Resonance (NMR) spectroscopy. Physical properties including conductivity, viscosity, and thermal profile will be discussed and compared. Preliminary results reveal that ether-functionalization leads to ILs with the lowest viscosity (EOEmimNTf$_2$: 46 cP @25 °C) compared to analogous thioether- (ESEmimNTf$_2$: 82 cP @25 °C) and alkyl-substituted (C$_5$mimNTf$_2$: 58 cP @25 °C) imidazolium bis(trifluoromethylsulfonyl)amide ILs. The results are expected to make important contributions to the design of ILs for large-scale applications.

CH5

Exploring the properties of pyrrolidinium thioether ionic liquids. [1]Mehreen Mughal, [1]Sharon Lall-Ramnarine, [2]Nicole Zmich, [2]Furong Wang, [2]James Wishart, and [3]Gopal Subramaniam. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]Brookhaven National Laboratory, Upton, NY 11973, [3]Queens College of the City University of New York.

Ionic Liquids (ILs) have impactful applications in devices for the production, storage, and efficient utilization of energy. They are being extensively investigated as safer, alternative electrolytes in electrochemical devices, including rechargeable lithium cells, solar cells, and supercapacitors. However, most ILs have significantly higher viscosities than electrolytes based on conventional solvents, resulting in slower charge transport that limits effective operation. It is established that substituting ether groups with oxygen atoms in place of the carbon atoms in alkyl side chains attached to the IL cations lowers the viscosities of ILs. However, research reveals that data is largely missing from the literature on ILs with related thioether side chains (possessing sulfur atoms), particularly those with thioether chains covalently linked to the N atom of pyrrolidinium cation rings. We report here on the synthesis and characterization of a series of alkyl, ether, and thioether functionalized pyrrolidinium ILs with different anions. Target ILs were synthesized by reacting methyl pyrrolidine with respective halogenated thioethers followed by metathesis with various fluorinated sulfonamides. The structures of the synthesized ILs were confirmed using ^{1}H, and [13]C Nuclear Magnetic Resonance (NMR) spectroscopy. The physical characterization included the determination of density, thermal profile, viscosity, and conductivity. Preliminary results reveal that @25 °C Pyrrolidinium NTf$_2$ ILs with five atom side chains containing ether groups have the lowest viscosity (EOEmPyrr NTf$_2$: 53 cP), compared to alkyl side chains (C5mPyrr NTf2: 90 cP) and thioether side chains (ESEmPyrrNTf$_2$: 171 cP). This work is a part of a larger collaborative project where we seek to examine the atomistic origin of viscosity by comparing ILs with alkyl, ether and thioether side chains. Results are expected to make important contributions to the design of ILs optimized for larger-scale use in energy storage devices such as batteries.

CH6

Development of Ionic Liquid and Solvate Ionic Liquid Electrolytes for Low Temperature Li-metal Batteries. [1]Elijah Bernard, [1]Sharon Lall-Ramnarine, [2]Michael Keating, and [2]Elizabeth Biddinger. [1]Chemistry Department, Queensborough Community College, Bayside, NY 11364, [2]The City College of the City University of New York.

Lithium-Ion batteries are used for energy storage in everyday electronics such as cellphones, and computers. However, the limited energy density capacity cannot keep up with advancing demands and there are safety concerns of the organic electrolytes within the batteries owing to their high flammability. We attempt to solve this issue by developing new electrolytes, containing a mixture of ionic liquids and Lithium-based solvate ionic liquid complexes. Ionic liquids are low temperature molten salts that exhibit attractive properties, including non-flammability, high conductivity and a wide electrochemical window. Lithium Solvate Ionic Liquid complexes (SILs) are formed via mixing equimolar amounts of glymes with Li-salts, such as lithium bis(trifluoromethylsulfonyl)imide (LiTFSI). Further, ILs with ether side chains are expected to modify and interact with the SIL structure, leading to an improvement in the electrolyte's thermal and electrochemical properties such as: remaining a liquid through a wider temperature range, maintaining a large electrochemical window (>5V) and higher conductivity. They demonstrate similar properties as ILs but offer higher Li^+ concentration and better Li^+ transport. In this work, SILs were mixed with imidazolium and pyrrolidinium based ILs containing various ether functionalized side chains in equimolar amounts. The mixtures were characterized for physical and electrochemical properties as well as their efficiency as electrolytes. Conductivity and electrochemical properties were measured using a Potentiostat via Linear Sweep & Cyclic Voltammetry. SIL:IL mixtures with imidazolium ether functionalized ILs showed an increase in conductivity (1.91 - 7.69 mS/cm) relative to alkyl functionalized ILs (1.79 - 7.18 mS/cm) and SIL (0.95-4.64 mS/cm) at 20 - 60 °C. The electrolyte has shown uniform Lithium metal deposition on a copper disc, while SEM imaging results showed dendritic/ needle-like deposition. Li^+ transference number will be used to determine the electrolyte's efficiency in a battery using a potentiostatic polarization method in a symmetric lithium cell.

CH7

Polyaniline Thin Films for the Removal of Metal Ions from Aqueous Solution. Mariia Ihnatiuk and David Sarno. Chemistry Department, Queensborough Community College, Bayside, NY 11364.

Polyaniline (PANI) is a widely used conductive polymer with a variety of applications. The amine groups on the polymer backbone are capable of binding to certain metal cations, which can be advantageous for the remediation of wastewater. For this purpose, nanoscale morphologies such as nanofibers are used to increase the surface area and provide more active sites for interaction with the ions. However, PANI dispersed in an aqueous solution commonly aggregates and may pollute the systems in which it is deployed. To avoid aggregation, we deposited PANI as a thin film on glass microscope slides, which can then be immersed in wastewater solutions. This method was chosen because it is relatively simple and does not require special equipment. After deposition

times of 10 minutes and 1 hour, the slides had developed a transparent green coating, and the formation of PANI was confirmed by characteristic UV-VIS and FTIR spectra. SEM images show the films are smooth and relatively featureless except for the occasional appearance of pores and clusters of PANI nanofibers that have precipitated from the polymerizing solution. Next, we will expose our thin films to aqueous solutions containing copper (II) ions as a model test subject. UV-VIS, FTIR, SEM, and EDS will be used to determine if metal ions were extracted from the solution by coordination to polyaniline. Moreover, we will examine the effects of ion concentration, exposure time, and solution pH on absorption of metal ions.

Communication, Theatre, & Media Production

CTMP1

Design and Management of Props. Marisa Marin and Josh Rothenberg. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

Queensborough Theatre produces live performances on campus every semester. Each production is a collaboration between students, faculty, and staff. Queensborough Theatre majors have the opportunity to serve in leadership roles on the production team. In this presentation, Marisa Marin will share her experience in technical theatre, serving as props manager for the Fall 2022 Theatre Program production Small Mouth Sounds. The role includes supporting the guest scenic designer and faculty director by selecting props from the QCC stock, in order to curate a selection of props that are consistent with the design for the production. The job also involves researching props that are not in stock, in order to consider which items might be built or purchased. Marisa will also share about Stagecraft II projects in prop design and construction, demonstrating how she learned to conduct visual research, to design a model in VectorWorks (industry standard software), and to build a prop to scale.

CTMP2

Scenic Design and Construction. Sade Alleyne and Jonathan Kilom. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

Queensborough Theatre majors have the opportunity to work on advanced projects in technical theatre through co-curricular activities. In this presentation, theatre major Sade Alleyne will share their design and construction of a prototype for a scenic model inspired by Audrey II (Twoey) puppet from "Little Shop of Horrors." They will describe their research process which includes drawing by hand, constructing, and painting. They will also share their design and plans for scaling the prototype.

CTMP3

Creating a Character. <u>Kevin Imbaquingo Kuish, Giancarlo Rodas</u>, Liisa Yonker and Heather Huggins. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

Queensborough Theatre produces live performances on campus every semester. Each production is a collaboration between students, faculty, and staff. Participating students enroll in Actors Workshop where they learn how to interpret a role within a script. They apply their performance skills to investigate the given circumstances, to create a character, and to exist believably in the world of the play. For this UR Day Performance, students will perform monologues from the Fall 2022 Production "Small Mouth Sounds:" Kevin Imbaquingo Kuish in the role of Teacher and Giancarlo Rodas in the role of Ned.

CTMP4

Interpreting Text Into Vocal Performance. <u>Jazmin Rodriguez</u> and Heather Huggins. Communication, Theatre, & Media Production, Queensborough Community College, Bayside, NY 11364.

In Th153 Voice and Speech for the Actor, theatre majors learn how to interpret text through cycles of action research. Interpretation is the creative practice of transforming written communication (for example, a contemporary script or poetry) into relaxed, flexible, and intentional vocal performance. Action research cycles generate knowledge in three distinct ways. Students research across modes of knowing: 'know-that,' learning theory on breath, voice, and speech; 'know-how,' cultivating embodied knowledge through sensory practices which integrate mind and body; and 'know-what,' engaging in critical reflection. Jazmin Rodriguez will perform selections from her coursework.

Engineering Technology

ET1

Mobile Robotic Arm. <u>Matthew Smith</u> and Huixin Wu. Engineering Technology Department, Queensborough Community College, Bayside, NY 11364.

3D printing is a cost-effective way to design and prototype in engineering. Prior projects have applied 3D printing to prototype designs within robotics. This project incorporates 3D printing, circuit control using Arduino, and 3D modeling to explore a more accessible route into the field of robotics by considering a cheaper alternative for entry-level creators to design and test their robotic inventions. The Mobile Robotic Arm will be designed and printed with polylactic acid (PLA) plastic. It will utilize a base on Mecanum wheels for more advanced movement and an Arduino Uno as the microcontroller for the robot. Mecanum wheels provide a more unconstrained source of movement for a robotic vehicle of this size and has been shown to be able to provide similar robots with improved mobility and control over standard wheels. Utilizing a Bluetooth receiver, Bluetooth signals will be transmitted from a developed smartphone application to control

the robot wirelessly. The project will take place in four phases. The first phase of this project involves investigating and designing two 3D models of a mobile robotic arm. The functionality of each 3D model will be tested and evaluated, and the model with the highest viability as the final prototype will be used. The second phase of this project involves printing the final prototype and observing any real-world complications that might arise during the 3D modeling process. The third phase of this project involves creating and testing a circuit controller to move the mobile robotic arm base and the robotic arm itself. The fourth phase of this project involves creating a smartphone application to control the mobile robotic arm circuit wirelessly. During this time, the experimental result will be compared to other similar projects to gauge the quality of and improve the mobile robotic arm and smartphone application.

ET2

Are ADA Requirements Making NYC Subways Fully Accessible for Wheelchair Users?
Aisha Frampton-Clerk[1] and Je'aime Powell[2]. [1]Engineering Technology Department, Queensborough Community College, Bayside, NY 11364. [2]Texas Advanced Computing Center, The University of Texas at Austin.

Transport is something we take for granted but for those with anything from minimal to severe mobility restrictions simply getting from A to B can be complex. I hope to highlight the inequality that disabled commuters face on a daily basis. Using publicly available MTA data I will be building an image of what challenges those with mobility differences face as they attempt to traverse the city. It is clear to see that disabled members of our community deserve a more accessible route to their spaces of work, recreation and play. This is seen in the discrepancies between reported and accurately documented information about the true accessibility of our public transit system. Demonstrating how nearly 20% of the NYC population cannot access over 40% of the city with ease is a first and important step in demonstrating the importance of accessibility issues

Foreign Languages and Literature

FL1

Spanish Memory in the Holocaust. Jorge Garcia and Carolina Chaves. Foreign Languages and Literature Department, Queensborough Community College, Bayside, NY 11364.

One of the most silenced episodes of the Spanish Civil War exile, as part of the extermination policies of the Franco regime, is that of the Spanish exiles who were interned in the Nazi concentration camp of Mauthausen during the Holocaust. It was not until the 21st century that Spain finally paid tribute to the memory of these anti-fascist Spaniards, long forgotten in the history of their country. Although it is believed that more than 9,000 Spaniards ended up in places such as Mauthausen, Buchenwald and Auschwitz, very little bibliography can be found on these cases in Spanish. This poster explores and pays tribute to the presence of Spanish Republican prisoners in Mauthausen and their contribution through their organized resistance in collecting and concealing photographs that later served as evidence in the Nuremberg trials of the atrocities committed at Mauthausen. This research is part of an expository essay writing exercise for the Spanish for Heritage Speakers class LS221. As part of the process of consulting sources for the

realization of this work, the students visited the Kupferberg Holocaust Center, watched the film The Photographer of Mauthausen and observed several documentaries available online, as well as searched for bibliographies available on the subject in Spanish. Unfortunately, very little information in Spanish was available online, and little to nothing in the resources available on campus. For the same reason, this work wants to draw attention to the need to create a body of consultation in Spanish so that the issue of the Holocaust can also be reviewed from language classes and the use of Queensborough's cultural resources maximized.

FL2

Memory of the Last Spaniard Survivor of Mauthausen Concentration Camp. Niyireth Castaneda and Carolina Chaves. Foreign Languages and Literature Department, Queensborough Community College, Bayside, NY 11364.

Approximately 4,400 Spanish Republicans, exiled under Francisco Franco's fascist regime in Spain, died in the Mauthausen Nazi concentration camp between 1940 and 1945. Many others survived but their stories have only recently come to light in Spain until this century. Republican Spaniards captured by the Franco regime were initially sent to France but ended up in Mauthausen due to the collaboration between France and Nazism. The Spaniards wore a red triangle that identified them as communists or socialists or a blue one that identified them as stateless. With the fall of Nazism, the released Spanish prisoners could not return to Spain because Franco continued to rule and they were no longer Spanish citizens. While in France they were welcomed with dignity and honored, in Spain it was not until 2019 that an official tribute was paid to the Spanish victims of Nazism. This poster focuses on the personal story of the last Spanish survivor of the Mauthausen concentration camp, Juan Romero, and his memories of the terrible experiences he suffered there. This research is part of an expository essay writing exercise for the Spanish for Heritage Speakers class LS221. As part of the process of consulting sources for the realization of this work, the students visited the Kupferberg Holocaust Center, watched the film The Photographer of Mauthausen and observed several documentaries available online, as well as searched for bibliographies available on the subject in Spanish. Unfortunately, very little information in Spanish was available online, and little to nothing in the resources available on campus. For the same reason, this work wants to draw attention to the need to create a body of consultation in Spanish so that the issue of the Holocaust can also be reviewed from language classes and the use of Queensborough's cultural resources maximized.

Health, Physical Education, and Dance

HPED1

Student Stress at Queensborough Community College. Jocelyne Ramirez, Cosmas Iwuanyanwu, Orleisha Jones and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

There is no doubt that a willingness to take on life's challenges and the stress that accompanies it can be a motivating force for success. The college experience can be a time of great stress for students at Queensborough Community College (QCC). In addition to the stress of meeting their

academic requirements many QCC students also have family and work responsibilities. For many students, these multiple stressors, school, work, and family/home become difficult to manage. Our goal for this project is to acknowledge that QCC students often have great stress and better understand how stress impacts their ability to succeed academically at QCC. Utilizing a stress survey questionnaire this project will interview at least 50 current QCC students, collating their responses in a poster presentation. We especially want to discover what makes some students more resilient in their ability to better manage stress and how QCC might be better able to help all students deal with stress.

HPED2

The Personal Health Practices of Queensborough Community College Students. Stephanie McGinty, Bryan Garcia, Moumita Rahman, Yan Mcguire and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

The COVID-19 pandemic highlighted the importance of personal hygiene and health behaviors such as diet, and exercise in preventing disease and enhancing health. The goal of our project is to discover if QCC students are undertaking positive health practices, especially personal hygiene, diet, and exercise. Utilizing a survey questionnaire this project will interview at least 50 current QCC students, collating their responses into a poster presentation. We want to determine how the pandemic might have impacted QCC students regarding these health behaviors. We especially want to discover the key factors motivating students to choose healthy foods, exercise, and employ beneficial hygiene practices. Additionally, we hope to provide recommendations that QCC could implement to help all students employ positive health behaviors to achieve better health outcomes.

HPED3

The Stigmatization of Sexually Transmitted Diseases. Poonam Persaud, Allesandra Perez and Edward Diller. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

The purpose of this project is to measure the level of understanding Queensborough Community College (QCC) students have regarding Sexually Transmitted Diseases (STDs). According to the Centers for Disease Control (CDC) young people 18-24 have the highest prevalence and greatest incidence of STDs. We believe it is vital that all QCC students are educated about STDs and end the stigmatization that often accompanies an individual diagnosed with an STD. We intend to survey at least 50 students to better ascertain QCC student understanding of STDs, especially with regard to student knowledge about transmission, prevention, and testing for STDs. We also intend to ask students to provide ideas regarding the role QCC could play in implementing programs at school that would be beneficial for the student body regarding STDs. Our project would present these ideas and recommendations to QCC in the hope these ideas could be realized on campus.

HPED4

The Lesson. <u>Dominic Epps</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

This dance piece, which is being developed as part of the Choreography I course, explores the unexpected lessons learned in love. This piece was developed through improvisation, writing, use of choreographic tools and responding to feedback from peers and mentors.

HPED5

Can I Be Me? <u>Bridget Chirinos</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

This dance piece which is being developed as part of the Choreography I course, began with Bridget writing a poem. It explores a struggle with emotional and psychological health and the challenge of meeting outside expectations. The work portrays a struggle between the internal self and external appearances. This piece was developed through improvisation, use of choreographic tools and responding to feedback from peers and mentors.

HPED6

Who Will I Soon Become? <u>Zarina Medwinter</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

This original dance work explores personal identity as it evolves over time. This piece is being developed as part of the Choreography I course in which students use movement improvisation, writing and choreographic tools in their development process. The piece has also been informed by feedback from peers and mentors.

HPED7

Time and Space. <u>Reyona Oyama</u> and Emily Berry. Health, Physical Education, and Dance, Queensborough Community College, Bayside, NY 11364.

This original, developing dance explores how freedom can emerge from bondage, moving the dancer beyond time and space. This piece is being developed as part of the Choreography I course in which students use movement improvisation, writing and choreographic tools in their development process. The piece has also been informed by feedback from peers and mentors.

Kupferberg Holocaust Center

*KHC1

KHC Exhibition Research-The Concentration Camps: Inside The Nazi System of Incarceration and Genocide Virtual Tour Development. Alexia Wang, Marisa Hollywood, and Laura Cohen. Kupferberg Holocaust Center, Queensborough Community College, Bayside, NY 11364.

In this presentation, KHC Curatorial Fellow Alexia Wang discusses her role in the audio tour design of the KHC's core exhibit - "The Concentration Camps: Inside the Nazi System of Incarceration," where she assisted with the audio guide through the research she conducted at other institutions and Holocaust museums. She will present the initial design of the audio guide and the following improvements made by the KHC according to the visitors' feedback.

Mathematics and Computer Science

MA1

End-to-end Data Transfer Throughput Prediction and Replica Selection in the Cloud. Arafat Akon, Junpeng Liao and Esma Yildirim. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

Cloud storage systems replicate multiple copies of large datasets across geographically distributed data centers. Selecting the best replica is a cost-effective approach to increase cloud data transfer throughput, however the constant short-term variations in cloud networks makes the prediction of end-to-end data transfer throughput a very challenging task. There are promising results from the use of neural networks, however the datasets are limited and only measure memory-to-memory transfers where end-system parameters such as I/O bandwidth and CPU utilization are not considered as part of the problem. In this research project, we will collect multi-variate data time series data to design a prediction model for end-to-end data transfer throughput using neural networks (e.g., MLPs, CNNs, LSTMs). The time series data is collected using Amazon Web Services (AWS) such as Elastic Compute Cloud (EC2), Simple Storage System (S3) and Cloud Monitoring System (CloudWatch). The end-to-end transfers are conducted between S3 object storage system and EC2 instances. CloudWatch metrics such as Bytes Downloaded, Total Request Latency, CPU Utilization, Network In Bytes and Volume Write Bytes are collected using boto3 library of Python and recorded in a NoSQL database service (AWS DynamoDB) using JSON data format. After parsing, preprocessing, and uploading the metric data to DynamoDB, a time series data format will be generated and used as input data for multi-variate time series neural network models to predict the transfer throughput given a few past transfer metrics.

MA2

Predicting Student Success in College Algebra Classes using Machine Learning. <u>Yuanhong Yu</u>, <u>Jun Ha Kim</u> and Zeynep Akcay Ozkan. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

Algebra is a gateway course for STEM majors with large enrollment and low passing rates. We analyze the factors which contribute to student success in College Algebra (MA 119) courses at Queensborough Community College. Characteristics and grades of more than ten thousand students who were enrolled in College Algebra courses between the years 2017 and 2021 are analyzed. Among the students' characteristics being studied are age, gender, ethnicity, first-generation college status, grade point averages, placement exam scores, latest mathematics course and its grade received prior to enrollment in College Algebra. The course modalities include online, hybrid or in-person. Using powerful data science tools with the Python programming language, we identify the factors that contribute to students' success. We share visual representations that show correlations between students' features and grades. Using supervised machine learning models, we predict student success based on these features. The models used include K-Nearest Neighbor and Decision Tree algorithms. We evaluate and compare the accuracy of the models using Jaccard index and F1-scores. Our initial analysis showed that students older than age 22, female students and students from Asian or Pacific Islander origin tend to perform better compared to their peers. There was no correlation between first-generation college status and student grades. Positive correlation between students' GPA and performance in this course was also observed. The results of this study can be utilized by the college administration to make predictions about student success in College Algebra courses to be able to provide better advisement to incoming students regarding course selection.

MA3

The Probability Distribution of n-sided Dice Sum. <u>Xiaolin Huang</u> and Wenjian Liu. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

In this project, we explore a dice problem, the polyhedra of n faces that are numbered by the positive integers {1, 2,..., n}. A die is rolled repeatedly and summed. We are interested in the probability that the sum will ever be a given value x, and the expected number of rolls until the sum satisfies some condition, such as the expected time of rolls to hit or pass a given number x. We apply the recursive method and generating function to give a delicate analysis of the sum barriers by estimating order of convergence, and obtain a general asymptotic result.

MA4

Comparing Different Cross Validation Techniques for Classification Problems in Finance.
Sean He and Yusuf Danisman. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

In finance, machine learning is an important tool used for predicting change in the stock market. Stock market predictions can predict the change of a stock, and more specifically in classification machine learning algorithms, whether a stock price will increase, decrease, or remain unchanged. In the process of creating a machine learning model, the performance of a model must be evaluated thoroughly. In order to test how well a machine learning model will generalize, meaning how well they will perform on previously unseen data, models are often evaluated with the technique of cross validation. Cross validation is a method in which training data is split into its own training and testing sets, and tested upon itself. Due to stock data being a time series, this introduces an extra challenge, as traditionally used methods to split data will not work. Time series data has to be handled differently, since there are additional considerations to be made, such as avoiding the use of future data in the prediction of past values. In this project, various cross validation techniques are analyzed and compared in their performance in different classification algorithms, such as logistic regression, XGBoost Classifier, and Support Vector Classifier.

MA5

Comparing Cross Validation Techniques. Maximillan Yam and Yusuf Danisman. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

Machine learning algorithms play an important role in many fields such as the finance industry where it is used to predict stock prices. We can predict the value of the stock prices either to go up or down (classification), or we can predict the value of the stock prices to be a constant value (regression). This project aims to develop innovative machine learning models to achieve better stock market return value predictions on unseen (new) data. We can apply different methods in order to create a model that can handle and perform well on new data. One method is cross validation, where a training data set will be split into multiple training sets and a model will be built for each split. However, cross validation will not work properly for stock data as it is recognized as a time series. To further elaborate, cross validation will split a dataset into multiple smaller datasets, and it may have split the dataset where we will be using the "future" data to predict past data which is improper. In this case we will have to resort to different cross validation methods in order to work with time series data. In this project, different cross validation techniques will be compared by using various regression machine learning algorithms including Support Vector Machine Regressor, Linear Regression, Ridge, Lasso and, XGBoost Regressor for stock data. In this talk, I will discuss different cross validation methods that can be applied to stock data with different supervised learning algorithms for regression.

MA6

Using Series To Solve Differential Equations. <u>Martina Hove</u> and Carolyn King. Mathematics and Computer Science Department, Queensborough Community College, Bayside, NY 11364.

How can we model the spread of COVID, the unequal distribution of wealth, and the behavior of electric and magnetic fields? Differential Equations (DE's) prove to be very important in creating models of real-world situations. Given that DE's are used to solve mathematical, physical and even social problems, it is imperative we focus on them. Initial value differential equations, especially those that represent real-world applications can often be analyzed by computing the higher derivatives of the unknown function. In this research we use series to find solutions to DE's. We will direct our focus to the application of DE's in the launch of rockets. The change in mass, time, and acceleration as the rocket is launched means a complexity in modeling and solving these DE's. Polynomials and functions constructed from polynomials by a finite number of operations are the simplest functions in calculus. We will use series and computer algebra systems (CAS) like MAPLE or MATLAB to analyze the launch of a rocket.

Music

MU1

Science, Song and Motion. <u>Jeremy Ramos</u> and Steven Dahlke. Music Department, Queensborough Community College, Bayside, NY 11364.

A brief description of the physics of vocal phonation, and the possibilities of expression through its dynamic nature will be followed by a performance of selections from Ralph Vaughan Williams (1872-1958) "Songs of Travel." The relationship that is possible among the laws of physics, poetic expression, and the compositional style of Vaughan Williams will be explored, and possible applications to emotional well-being examined.

MU2

The Hill We Climb -- Music Department Composition Project. Music Department Pop Choir: <u>Laurie Antoine, Carlos Atachi Eyzaguirre, Rameik Golden, Keshava Jones, Brianni Lee, Christine Pak, Alejandro Pellet, Lauren Pippen, Jeremy Ramos, Ayana Ritchie, Vincent Rodriguez, Alicia Santiago, Tenajae Thompson, Elias Villanueva, Ricky Ye, Lorenzo Zorrilla</u> and Steven Dahlke. Music Department, Queensborough Community College, Bayside, NY 11364.

The Pop Choir composed together a choral setting of selected lines from Amanda Gorman's "The Hill We Climb." The presentation will include commentary from selected students on the composition, rehearsal, and performance process, which will be followed by a performance of the original piece, entitled "The Promise to Glade." Pop Choir members: Laurie Antoine, Carlos Atachi Eyzaguirre, Rameik Golden, Keshava Jones, Brianni Lee, Christine Pak, Alejandro Pellet, Lauren Pippen, Jeremy Ramos, Ayana Ritchie, Vincent Rodriguez, Alicia Santiago, Tenajae Thompson, Elias Villanueva, Ricky Ye, Lorenzo Zorrilla

Nursing

NU1

Skin Preparation and Accuracy of Capillary Blood Glucose Readings: A Limited Literature Review. <u>Ice Lin</u>, Nicole Csatari, Jessica Marvin, Jalwa Batul, Venice Brown-Thomas, Stefania Loor, Amer Alsaidi, Vochelle Marks and Randelle Sasa. Nursing Department, Queensborough Community College, Bayside, NY 11364.

In 2019, the American Diabetes Association estimated that 37.3 million Americans have diabetes mellitus. Skin preparation prior to self-monitoring of blood glucose (SBMG or "fingersticks") has been identified as a factor that may affect the accuracy of capillary blood glucose (CBG) readings. This led the proponents to conduct a limited literature review, with the aim of answering the following questions: [1] which skin preparation modality (handwashing or alcohol wipe) ensures accuracy of CBG readings? and [2] which capillary blood sample (first or second drop) ensures accuracy of CBG readings? Article selection was based on relevance and limited to peer-reviewed studies from 2011 to 2022. Eight articles were included in this review. Most of the articles reviewed were in concordance that: (1) handwashing with soap and water followed by thorough drying of the hands is the preferred skin preparation prior to SBMG, and (2) the first drop of blood is recommended to be applied on the CBG test stip. While most studies deemed that use of alcohol wipes is a suitable skin preparation whenever handwashing is not practical, one study reported that the former may falsely lower CBG readings. More studies are needed in this area given that the evidence available is thin and low-level.

NU2

Rethinking Screening for Suicide Risk Among the Adolescent Population. <u>Delfino Urbina</u> and Georgina Colalillo. Nursing Department, Queensborough Community College, Bayside, NY 11364.

In 2020, suicide ranked as the second and third leading cause of death among adolescents ages 10 to14-years and ages 14 to 24 years, respectively. Contributing factors include being LGBTQ, bullying, parental divorce, changes in friendships, substance abuse, problems in school and influence of social media. Currently, there is no uniform guidance from the CDC and among health care professionals, of when and where suicide screening be done and what types of screening tools to use. Adolescent depression screening alone might miss those with unidentified suicide risk. There is a need to examine the use and effectiveness of suicide screening among adolescent population. In this study, library database searches included Gale, ProQuest, and Pub Med peer reviewed journals from 2017- 2022, Key words used were: Suicide, suicide ideation, teenagers, youth, adolescents, assessment, screening tools, suicide screening, universal suicide screening. Findings show that universal screening for suicide should be implemented in primary care setting in conjunction with other mental health screening. In a study identifying the risk of suicide among adolescents in the primary care setting, 56.4% of patients screened positive for any type of depression, 24.7% screened positive for moderate depressive symptoms, and 21.1% screened positive for suicide risk. If suicide screening was not performed 21.1 %, according to the study, would have not been identified. A study conducted of 4,786 patients in a pediatric urgent care,

95(2%) tested screened positive for suicide screen using the Ask Suicide Questionnaire (ASQ). Of those who tested positive, 93% did not have a previous mental health chief complaint. When screening for suicide is performed, even though mental health is not the chief complaint, adolescents who are at risk for suicide are identified. Conclusion: Universal screening for suicide and mental health should be implemented in primary care settings to detect at risk adolescents.

Physics

PH1

Mass Growth of Supermassive Black Holes. Yuantong Luo and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

The goal of this research is to find how supermassive black holes grow and if growth is dominated by black hole mergers or the accretion of gas and dust. We study the mass growth of black holes using a smooth particle hydrodynamics (SPH) cosmological simulation. Specifically, we examine the D.C Justice League simulation suite, which consists of four SPH simulations of milky way type galaxies with surrounding dwarf satellites. The simulation starts at the start of the universe until current time so we can study how a black hole grows over time. Deep analysis of one of the four simulations shows several black hole mergers occurring in the early universe, and thus mergers appear to be the dominant growth mechanism for black holes in low-mass galaxies. Also, we find evidence for an inverse correlation between black hole mass and the percentage of mass gained by accretion; generally, black holes gain 1-10% of their mass through accretion.

PH2

Quasi-Stars in Simulations. Matthew Fennell and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

Quasi-stars are star-like formations consisting of a black hole encased in an "envelope" of gas. Formation requires very specific conditions, the gas must be atomic hydrogen and helium, with low metallicity and a low concentration of molecular hydrogen. In my research, I am using Mystique, a ChaNGa simulation that is able to replicate these formation requirements. Using pynbody to interface with snapshots of Mystique, I have analyzed the initial conditions of the quasi-stars, such as how often, when, and where they form. I have examined the distributions of formation temperatures, densities, and times. I have also measured the distance of each black hole from the center of its host halo, as well as the overall quasi-star formation frequency. This research will give us clues to how the seeds to supermassive blackholes form in the early universe.

PH3

Black Hole Mergers and Gravitational Recoil. Dennis Li and Jillian Bellovary. Physics Department, Queensborough Community College, Bayside, NY 11364.

The combined phenomena of spinning black holes and black hole mergers form the displacing effect known as gravitational recoil. Also referred to as a black hole kick, these cosmological

ejections are the result of classical momentum conservation from merger events and have their characteristics defined by the spins and mass ratio between mergers. Our objective is to make predictions about the nature of recoil and its effects on their home galaxy via simulation technology with the CHaNGa code. The simulation features an isolated galaxy halo where we engage black holes in a simple halo of dark matter, and measure the recoil kick on the fly based on the black hole characteristics. This approach enables us to observe the behavior of mergers and the effects of recoil over extended periods of time. We then vary the conditions to observe the remnant recoiling black hole's position and velocity in multiple different merger scenarios, to fully explore the parameter space of mass ratios and spins.

PH4

Is Hurricane Energy Increasing in the North Atlantic as a Result of Global Warming?
Yaakoub Muslemani and Paul Marchese. Physics Department, Queensborough Community College, Bayside, NY 11364.

The proposed project will study if hurricane energy has been increasing in the North Atlantic. Human activities have resulted in the concentration of greenhouse gases in the atmosphere (Carbon Dioxide has gone from 320 ppm in 1960 to over 410 ppm in 2021). This has resulted in increased temperatures worldwide, including an increase in sea surface temperatures (SST). This is concerning because higher SSTs produce Hurricanes in the North Atlantic. Despite increased temperatures, there has not been a corresponding increase in the number of hurricanes. This project is studying how total hurricane energy varies overtime. We are using data from the NOAA National Hurricane Center data repository. This dataset contains hurricane measurements in the North Atlantic since 1980 and includes information such as wind velocity, position, and temperature recorded. From that information they will calculate the rotational velocity, linear velocity and mass of the hurricane. We can then calculate the Total Hurricane Energy (THE) for every year and look to see if this has been increasing over time.

PH5

Textbooks' Presentation of Radiation Risks: Communication and Interdisciplinary Perspective. Nina Zabat Borja and Rex Taibu. Physics Department, Queensborough Community College, Bayside, NY 11364.

Radiation is an interdisciplinary concept often discussed in physics, chemistry, and biology, playing an important component in medicine, industry, and research. This is being explored in health to develop techniques in medical treatment, especially in cancer treatment. Although beneficial, the risks of medical applications of radiation are commonly highlighted, specifically the risk of developing cancer, which results in misconceptions, doubt, and fear of the public towards radiation; therefore, in understanding radiation's nature, the presentation and communication of information is key. Science education is the backbone of communicating and molding perceptions of concepts such as 'radiation risks'. Thus, science educators play a vital role in relaying current and relevant information to the public. In this study, various general science textbooks are being examined with respect to their communication of radiation's risks on cancer development. Using a hybrid approach of a priori and a posteriori coding, content analysis methods

are used to develop a coding scheme which will facilitate the categorization of data. Significant differences between physics, chemistry, and biology textbooks have been observed in the presentation of information. Future research awaits the application of the coding scheme to a convenient sample of science textbooks, and the usage of the software HYPEResearch to aid in the coding and categorization of common themes. Such analysis will focus on the inclusion of interdisciplinary views and establish patterns of communicating cancer development due to radiation.

PH6

Design and Construction of a Cosmic Ray Particle Telescope on a Computer Controlled Altitude/Azimuth Rotating Base. Dumas Buffa and Raul Armendariz. Physics Department, Queensborough Community College, Bayside, NY 11364.

A cosmic ray tracking telescope is being built to measure subatomic particle flux of astrophysical origin. The telescope's base is a computer driven altitude/azimuth dual axis rotator; the Stelarium planetarium program feeds the telescope astronomical coordinates of right ascension and declination. The cosmic ray detector consists of three plastic scintillator sheets, 30 cm x 100 cm in area, and three photomultiplier tubes for subatomic particle detection. We designed wooden frames to mount the detectors, and 3D printed enclosures for the photo tubes. We are reducing the size of the telescope's base; to do this an analysis of the telescope's weight distribution was performed.

PH7

Making Space for a MakerSpace. Eli Blatter, Raul Armendariz, and Marie Damas. Physics Department, Queensborough Community College, Bayside, NY 11364.

Many colleges and universities in the United State promote the interdepartmental collaboration between students to achieve goals that would not be accomplishable otherwise. Queensborough Community College is currently lacking such a space. Of course, there are laboratories spread around campus that are unique to each department, but the previously mentioned collaboration is very difficult to almost impossible. This is because there is a missing link between the departments. This missing link is a new MakerSpace laboratory. The goal of this project is to develop a space at Queensborough Community College where students in different disciplines can work amongst each other and develop ideas together. The room proposed to provide the necessary room for a MakerSpace is the Science Building Room 309, which currently act as the main physics laboratory for student and teacher collaborative research. The plan is to renovate the room and add necessary stations and equipment for non-physics majors (as well as non-science majors) to come and work together. The MakerSpace will provide two main resources to QCC students: one, the MakerSpace will hold workshops for students who want to advance their knowledge in their own field or a field that might interest them. The MakerSpace will also hold hackathons for students to promote creativity and collaboration. Second, the MakerSpace will serve its main purpose, which is to just be a room where students can connect and work together.

Social Sciences

SS1

Sociological Insights into the Enrollment Crisis: Data and Analysis from Students in Sociology 101-D4. <u>Students from Introduction to Sociology</u> and Amy Traver. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Colleges and universities across the United States are contending with declines in student enrollment. In an effort to better understand this phenomenon, students in section D4 of Introduction to Sociology (SOCY-101) spent five weeks in the fall of 2022 collecting and analyzing data on students' experiences at Queensborough Community College (QCC), CUNY. This data, which was gathered via diverse research methods (i.e., field research, interviews, surveys, and historical-sociological methods) and linked to significant sociological concepts (i.e., culture, social structure, social stratification, and social change, respectively), aimed to answer the following research question: "Given the decline in enrollment across college sectors in the United States, what can we learn about support for and barriers to college-going from research on/with students at QCC?" In this poster presentation, students ground their research in the literature, present their unique findings, and offer suggestions for administrators, faculty, and students interested in supporting students' enrollment and retention at QCC and beyond.

SS2

Sociological Insights into the Enrollment Crisis: Data and Analysis from Students in Sociology 101-D2. <u>Students from Introduction to Sociology</u> and Amy Traver. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Sociological Insights into the Enrollment Crisis: Data and Analysis from Students in Sociology 101-D2 Colleges and universities across the United States are contending with declines in student enrollment. In an effort to better understand this phenomenon, students in section D2 of Introduction to Sociology (SOCY-101) spent five weeks in the fall of 2022 collecting and analyzing data on students' experiences at Queensborough Community College (QCC), CUNY. This data, which was gathered via diverse research methods (i.e., field research, interviews, surveys, and historical-sociological methods) and linked to significant sociological concepts (i.e., culture, social structure, social stratification, and social change, respectively), aimed to answer the following research question: "Given the decline in enrollment across college sectors in the United States, what can we learn about support for and barriers to college-going from research on/with students at QCC?" In this poster presentation, students ground their research in the literature, present their unique findings, and offer suggestions for administrators, faculty, and students interested in supporting students' enrollment and retention at QCC and beyond.

SS3

Academic Perseverance Among First Generation Community College Students: An Exploration of the Social and Cultural Capital Phenomenon. Stephany Platero and Jody Resko. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

First-generation community college students (FGS) regularly enter college with no frame of reference of the academic experience and are frequently confronted with a unique set of challenges and systematic disadvantages. Studies have found that FGS differ significantly from non-FGS in areas such as academic preparation (i.e., SAT prep), racial/ethnic demographics, socioeconomic status, and parental involvement. The literature has also revealed that FGS students had much greater dropout rates and reported lower levels of life satisfaction. Accordingly, interpersonal resources and parental involvement have been identified as common themes for confidence in their academic choices and adapting to the college setting. These factors have been characterized as social capital (i.e., qualitative resources that are inherited by interpersonal relationships such as parents with postsecondary degree) and cultural capital (i.e., inherited norms and values that can help an individual advance their goals and successfully navigate their environment). Studies have demonstrated that when social and cultural capital is lacking, academic persistence is low. This research aims to investigate the foundations of social and cultural capital in FGS and to explore the role social and cultural capital play on the academic persistence of FGS. Students will complete a modified version of the Social and Cultural Capital Questionnaire. Descriptive statistics and correlation will be conducted using SPSS. It is expected that students who score lower on the survey measuring social and cultural capital will report lower academic perseverance.

SS4

Understanding the Relationship Between Hardiness and Academic Performance During COVID. Clarence Chen and Jody Resko. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Students have varying degrees of abilities to cope with the rigors of the academic system. Even more so during the COVID period when issues such as depression and work-life balance are emphasized and lack of confidence, loss of sense of control, and inability to commit to their academic necessities may be exacerbated. The construct of Hardiness proposes that in order to live a vibrant life, individuals must demonstrate all 3Cs: Commitment, Challenge, and Control. These characteristics are thought to feed into the existential courage to make the necessary and difficult choices for future success. As such, this study will examine student responses to a survey measuring personal hardiness, resilience, and academic performance. It is expected that those who score low on the 3Cs (i.e., have poor hardy attitudes), would be associated with poor academic performance during COVID. It is also expected that low scores on academic resilience will be associated with lower academic performance during COVID. The purpose of the study is to fill the gap in the literature on the construct of hardiness, which goes beyond resiliency, during COVID. This will contribute to our understanding of the struggles that college students face as a result of the pandemic and can help inform educators and administrators on how to best meet those needs. This can help facilitate a healthier environment that can improve hardy attitudes and ultimately lead to better academic performance even during difficult times.

SS5

Understanding Transformations of Truth and Reality Online Through the Use of Language and Narrative. Kaitlyn Murphy and Patrick Byers. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Disputes over truth have become prominent in recent years--e.g., with the popularity of terms such as misinformation, disinformation, post-truth, fake news, etc. But what distinctions can be made when trying to define something as representative of truth or reality? While popular discourse tends to treat truth as simply a matter of what is or isn't factual, this overlooks a much more complex and multifaceted reality. Judgments of something as true can mean several different things (factual truth vs. narrative or coherent truth). In addition to the multiple meanings of truth, the assertion that something is true must be understood in terms of Austin's distinction between the "constative" (descriptive) and "performative" (pragmatic) functions of language--i.e., using language to describe what is the case in the wider world vs. using language to do things (pragmatic functions of language) and to create new consensually established realities. This obscuring of truth can be understood when looking at the conspiracy theories surrounding Barack Obama's birth certificate and citizenship, commonly referred to as the "birther" controversy. In the case of the "birther" controversy, a different sense of truth arises, with truth being informed by convincing narratives, political bias, and emotions. Narrative or coherence truth eclipses the importance of factual truth for those who support the skepticism surrounding Obama's citizenship. Language and narrative are manipulated in this case in order to create new truths and realities that correlate with personal bias. Through analysis of online discourse and publications, a better understanding of how and why these narratives come to fruition can be deduced. The legacy of the "birther" controversy persists today, with political misinformation becoming increasingly prevalent and destructive in real-world political forums.

SS6

How Does the Experience of Chinese International Students Affect Their Academic Goals. Ziyue Du, Michael DeMarco, and Mark Zelcer. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

In fall 2020, according to CUNYfirst and CUNY IRDB, 4.5% of registered students in Queensborough Community College's country of birth is China (This does not include 3,296 students who do not report their country of birth.). More students at QCC are born in China than any other country other than the United States. Because of the large number, this group is well studied. Previous research investigated the factors that may impacted the academic performance of Asian international students. Heggins and Jackson (2003) identified seven factors that influence Asian international students, which are: adjustment, communication, learning, participation, internal family pressure, and traditional values. More recently, in 2020, Nasirudden and Xiao found that English language difficulties affected Asian international students' GPA scores. This study will focus on factors that affect Chinese students' (in Queensborough Community College) achievement of their academic goals. Language difficulties, family pressure, and fear of seeking help are factors being studied in this research. The experiment is conducted in form of a survey

and interviews. Participants answer questions that include their study abroad experience, difficulties, the factors affecting them, and whether or not they are meeting their academic goals.

SS7

An Examination of College Students' Perceptions of Cell Phone Use and Privacy. Melissa van Ravenswaay, Jody Resko, and Michael DeMarco. Social Sciences Department, Queensborough Community College, Bayside, NY 11364.

Cell phone use has become synonymous with everyday life. With the increased use of cell phones for both professional and personal purposes, there is a wealth of private information that can be stored on one's cell phone. The issue of privacy raises some questions regarding the right to access such information. This study aims to examine college students' perceptions of cell phone privacy using vignettes based on real life events. The goal of this study is to understand how students view privacy issues in cases that may be relevant to their everyday lives. The findings of this study can help inform students as to their rights to privacy and any legal implications.