



CADSTI-NE

Newsletter

Empowering Caribbean youth through science & engineering experiences

November 2022

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President's Message

Dear Friends and Supporters of CADSTI-NE,



Dinah Sah - President

It's a great pleasure to share with you the highlights of the 2022 CADSTI-NE summer internship program, which was a success! We organized 6 student internships in biotech and high tech this year. Our SPISE graduates from the Caribbean were hosted by 5 organizations in Massachusetts

and Barbados: CAMP4 Therapeutics, Emera Caribbean, Foursquare Rum Distillery, Lenstec-Barbados and Ocular Therapeutix. In total, CADSTI-NE has now organized 60 internships for Caribbean youth since 2014! The CADSTI-NE organizing committee again worked tirelessly throughout the year, meeting on-line nearly every Sunday morning to plan, coordinate and implement this program. All of this was made possible by your support and the support of the host organizations, both financial and in-kind. A huge thank you to our donors and host organizations for sharing in our vision to provide these transformative experiences in STEM for our very gifted Caribbean students!

Sincerely yours,

Dinah Sah, PhD

President, CADSTI-New England, Inc.

About CADSTI-NE

CADSTI-NE is a U.S.-based 501(c)(3) non-profit organization launched in 2014 that focuses on empowering Caribbean youth through science and engineering experiences. Our major projects are to:

1. **Coordinate and finance the summer internship program for graduates of the Student Program for Innovation in Science and Engineering (SPISE).** SPISE is an annual intensive residential (or virtual) summer program launched in 2012 by the Caribbean Science Foundation for gifted Caribbean high-school students 16-17 years of age who are interested in studying and exploring careers in science and engineering. SPISE is modeled after MIT's MITES Program, and a major goal is to help groom the next generation of science, engineering, and business leaders in the Caribbean. CADSTI-NE's student internship program provides opportunities for SPISE graduates to experience first-hand the application of STEM to research and development within biotech, high tech and other organizations in the U.S., Canada, UK and Caribbean.

2. **Support SPISE**

CADSTI-NE Leadership Team

Karen-Leigh Edwards, PhD, MBA

Lori Fitz, PhD

George Marecheau

Paul McLean, PhD

Dinah Sah, PhD

Joshua Sheldon, MBA

Cardinal Warde, PhD

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Dominique Bryan

Dominique Bryan (Barbados)

- First year Environmental Science major at the University of the West Indies - Mona, Jamaica
- Lenstec – Barbados

Lenstec, Inc. is a Florida-based medical device corporation serving the global ophthalmic surgical market, with products currently marketed in more than 60 countries. Lenstec designs, manufactures, and distributes a wide range of intraocular lens implants and lens injection systems. The company has an established reputation for rapid prototype design and development, and high quality/low-cost manufacturing which occurs at the Barbados site.

Dominique took on the role of a project manager which gave him an opportunity to gain various technical and soft skills. In particular, he used Gantt charts, a common tool for project planning to display activities (tasks) as a function of time. He also expanded his skills in Excel, as some of his daily tasks included compiling productivity data and equipment information into large spreadsheets. The internship also gave him an opportunity to further develop soft skills, like networking, effective communication, conflict management, interview techniques, and public speaking.

A highlight of this internship was a project to improve quarterly reports which gave Dominique an opportunity to see how a company follows regulatory standards such as those from the USA Food and Drug Administration (FDA). This gave him a good understanding of the importance of record keeping, and research and development requirements in order for the company to remain compliant with regulations as well as meet the needs of patients in a rapidly developing industry. In addition, Dominique's supervisor gave him insightful mentorship and opportunities to give presentations and participate in workshops. A job application workshop was very helpful to Dominique as he learned how to make his application stand out, write an effective CV, and conduct successful interviews. This greatly improved Dominique's understanding of how he can increase his employability, as well as his general understanding of the corporate world.

Overall, Dominique found this experience to be an interesting one that diverged from his usual studies and experiences. Related to management, Dominique is now considering pursuing six sigma certification in the future.



Farah Chin

Farah Chin (Guyana)

- Third year Biology and Math double-major at McMaster University, Canada
- Ocular Therapeutix, Bedford MA, USA

Ocular Therapeutix is a biopharmaceutical company focused on the development of an innovative delivery system for ophthalmic drugs by incorporating bioresorbable hydrogel technology. Its products reduce the need for repeated manual application of these drugs, thus lessening the potential for patient error.

When entering the internship, Farah, who is interested in pursuing bioinformatics, expected to gain more experience, and learn more techniques in this field. Additionally, she anticipated gaining insight into the typical work environment at a STEM-focused company. For the first eight weeks, she worked with two biostatisticians to develop R programs and applications to run statistical analyses on data from clinical trials and present the results in a readily accessible manner. This allowed her to hone her existing coding techniques, and to investigate more specific packages better suited to clinical data. For the final four weeks, she observed the process development team as they conducted experiments pertaining to the properties of the hydrogel. This proved an interesting opportunity to learn about a new area of chemistry, gain practical lab experience, and witness the dynamic process of experiment design, which constantly evolves to accommodate new results.

After having worked in these two departments, one notable insight Farah gained was that of the interconnected nature of statistics and process development within the company, as both teams depend on the other's results to influence future projects. Working with her various supervisors was a valuable networking opportunity for Farah, as they not only advised her in terms of her work, but also shared their experiences and career journeys within the industry. She attended meetings with the biostatisticians to report on her progress, and with the process development team where they discussed the results of their experiments. Additionally, she attended a company-wide meeting where she met employees from several other departments. At the end of her internship, she gave a presentation which summarized her internship experience.

Overall, the internship at Ocular Therapeutix was an extremely rewarding experience, allowing Farah to gain skills that will be valuable in her future academic work, and also affirming her goal to pursue a career in biostatistics.



Maela Hickling

Maela Hickling (Barbados)

- Third year Chemical and Biological Engineering major at MIT, MA, USA
- CAMP4 Therapeutics, Cambridge MA, USA

CAMP4 Therapeutics is focused on a novel approach to addressing genetic diseases: programmable therapeutics that upregulate gene expression by targeting regulatory RNA with anti-sense oligonucleotides (ASO).

In this internship, Maela learned about the people who work at CAMP4, the company's background, their platform of algorithms used to determine their ASO targets, and the groundbreaking science they are doing. Maela attended R&D, lab operations and hiring meetings. Over the course of the internship, she learned how to perform screens by observing then performing multiple techniques including thawing and culturing multiple cell lines taken from patients and healthy donors, performing free uptake and transfection experiments to treat cells with ASOs, lysing cells, extracting mRNA, synthesizing cDNA and conducting qPCRs for comparative analysis. Maela mastered the wet lab skills she learned this summer. Importantly, she was taught how to analyze the data step-by-step and interpret the results as well as think about next steps. Many staff at the company including the senior management team made the time to meet with Maela. She was excited to learn about their journeys and to apply their experiences to her future plans. Maela took advantage of the company's open culture through biweekly lunches to make connections. These interactions are helpful in determining where she might fit in the biotech/pharma industry. Maela also had the chance to present her work 3 times this summer which was very worthwhile; there were many questions and discussions at these presentations.

Overall, although she is still not sure what she wants to do or be, she is a step closer. Maela learned a lot this summer and is very grateful for the opportunity.





Lael Charles

Lael Charles (Barbados)

- First Year Marine Biology major at the University of the West Indies - Mona, Jamaica
- Foursquare Rum Distillery, Barbados

Foursquare Rum Distillery manufactures rum with state-of-the-art equipment and systems. It also bottles distilled water and recovers CO₂ produced by yeast during the fermentation of molasses for production of rum. The CO₂ is converted to dry ice by a standard industrial process for sale locally.

Lael went into this internship with an open mind, to learn more about STEM and its applications in local industry. He also saw the opportunity to learn more about himself, as he would experience challenging new activities that would test his knowledge and passion for science. Lael spent most of his time with

the chemist, and the operators and assistants in the control room, whom he grew to know well. He marveled at the scope of chemistry applications in rum production, from pH testing to measuring alcohol content, and the microbiology expertise required to control bacteria and yeast contamination. In the control room with the operators and assistants, he collected samples for testing from the large-scale molasses fermentation. He observed raw products being prepared for fermentation and distillation and learned how conditions such as pressure and temperature had to be closely regulated. Lael also became familiar with the software that the distillery uses, as well as its network of pumps and pipes. He was offered an extension to the internship and with more time in the control room, he learned more about the division of roles between the operator and the assistant.

Lael says that his prior SPISE (and university) experiences provided critical thinking skills which were tremendously useful in helping him adjust quickly to this working environment. This was especially important as an intern because he had to understand tasks without slowing down the workers who were demonstrating them to him. All in all, although the internship was outside of his Marine Biology focus, Lael gained valuable experience, knowledge and discipline during his internship. Moreover, these skills can be applied to other areas of study and employment. Having completed the process, Lael is more confident than ever that he will continue to dedicate his life to a career in STEM.



Energy Industry



Abigail Battick

Abigail Battick (Jamaica)

- First year Computer Engineering major at Howard University, Washington D.C., USA
- Emera Caribbean, Barbados



Najeh Francis

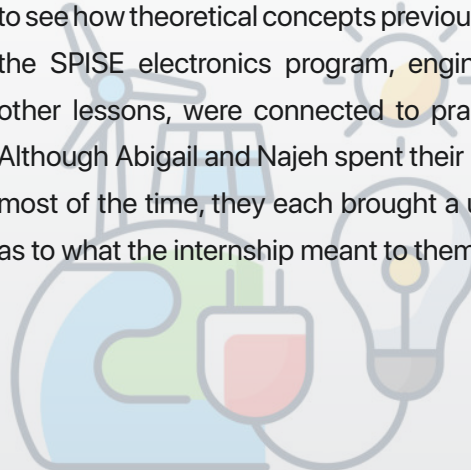
Najeh Francis (Dominica)

- Gap year, Biology, Physics and Math major at Dominica State College, Dominica
- Emera Caribbean, Barbados

Emera Caribbean is the sole provider of electricity in Barbados and includes Barbados Light and Power Co. (BLPC) and Emera Caribbean Renewables Ltd. (ECRL).

Emera hosted two interns, Abigail Battick and Najeh Francis. The goal of the internship was to experience the realities of working in a STEM-related field and more specifically, to gain an overview of STEM as applied to electrical power generation and supply/distribution. The rotations through different departments at Emera Caribbean provided

opportunities to learn firsthand from field engineers and other professionals about energy generation including renewables, and energy distribution. The interns were able to see how theoretical concepts previously learned through the SPISE electronics program, engineering books and other lessons, were connected to practical applications. Although Abigail and Najeh spent their internship together most of the time, they each brought a unique perspective as to what the internship meant to them.



Abigail's Experience

With the Emera internship, Abigail had the opportunity to learn about a fairly new area of engineering which in turn, helped steer her career decision as she learned more about herself. She particularly enjoyed seeing "Physics finally coming to life" as she navigated the various plants over the six weeks. Her mentors at the company first reviewed the theory of electricity generation and distribution and then showed her the practical side of everything. Notable experiences included learning how to cut and connect power lines, calibrating an oil detector for use, meeting different types of engineers and touring generation sites. She valued the relationships she established with her passionate, innovative, and knowledgeable supervisors. Abigail joined engineering meetings at different substation locations and got the opportunity to meet international contractors from Canada. Abigail had some background in electrical engineering and physics, but this real-world experience helped her to see these theoretical concepts applied. Due to this experience, she has become more interested in networking and electronics, and has gained invaluable insight to guide her career in STEM.

Najeh's Experience

The Emera internship gave Najeh a better understanding of what it takes to generate power for both residential and commercial consumers. She had diverse opportunities that helped her to see this process. Internship highlights included working in the field with the linesmen, shadowing the Supervisor for Engineering Maintenance, visiting the new photovoltaic plant and seeing the grazing sheep keeping the areas surrounding the solar panels clean (one of many green and exciting initiatives experienced). One important aspect of the internship was getting to witness a healthy working culture. She took pride in being part of the Emera team, enjoyed interacting with her coworkers and helping with various tasks, and appreciated seeing the efficiency and ease with which employees responded to situations. The ability to interact with a diverse group of colleagues was just as exciting for her as seeing the transformer that was capable of generating 24kV. Najeh's connection with them allowed her to leave the internship with a journal full of notes outlining her coworkers' career choices which will help guide her career decisions. One highlight was when she had a "Eureka!" moment when calibrating an oil and water sensor. This was a moment that Najeh describes as a demonstration of "what being an engineer is about." Most importantly, she appreciated the advice and guidance given by her fellow employees. The one piece of advice that she will carry forward with her is "enjoy the journey and follow your heart."

SPISE 2022



The **Student Program for Innovation in Science and Engineering (SPISE)** is an intensive 5-week summer program in science and engineering, offered by the Caribbean Science Foundation for the most promising and gifted Caribbean high school students 16 and 17 years of age. Dr. Dinah Sah and Professor Cardinal Warde are the Directors of SPISE which is modelled after the MITES program at MIT, for which Professor Warde also serves as the Faculty Director. SPISE students are totally immersed (24/7) in university-level calculus, physics, biochemistry, computer programming (python), entrepreneurship, and hands-on projects in electronics. The SPISE environment discourages rote learning and teaches students how to focus on understanding and applying the fundamentals to achieve mastery of the material, and thus be able to solve complex problems. Instructors and lecturers include university professors from the Caribbean and the Diaspora (including MIT), and senior management professionals from leading biotechnology companies in the Diaspora. The students also benefited from career seminars by luminaries

in their respective fields and received valuable guidance through workshops that focused on time management, the college application process and effective CV preparation.

To date, the Caribbean Science Foundation has been able to serve a total of 206 graduates, including a class of 15 students in SPISE 2022, which was held virtually due to COVID-19. The aims of the program are being realized, with SPISE graduates attending top-tier universities in the US, Canada, the UK and the Caribbean, including MIT, Caltech, Harvard, Stanford, Princeton, Yale, Dartmouth, Columbia, Cornell, U Penn, Howard, McMaster University, and UWI, where they pursue bachelor's, master's and doctorate degrees in a range of STEM-based subjects. This achievement could not have been accomplished without your support, for which we are extremely grateful.

Further details can be found at <http://caribbeanscience.org/projects/spise.php>.

Where are the Interns Now?

We are delighted to feature 2 former CADSTI-NE interns in this newsletter: Matthew Clarke and Shamone Fine. Other former interns will be highlighted in future newsletters.



Matthew Clarke

Software Development Engineer, TraceLink (Massachusetts)

SPISE 2017 Central Bank of Barbados Scholar

Internship: TraceLink (2020)

B.S. Computer Engineering, Lehigh University

My name is Matthew Clarke and I am a 22 year old Barbadian who graduated from the SPISE program in 2017. I currently work as a Software Development Engineer in Test at TraceLink in Wilmington, Massachusetts. In my current role, I am responsible for testing new software features through the formulation of detailed test plans and then coding these automated tests. I am most excited for the upcoming release of the product that I have been working on since my second summer internship with TraceLink and have continued to work on as a full-time employee.

My first internship at TraceLink as a QA intern in 2020 was established through the CADSTI-NE internship program. This experience led me to change my career goals from wanting to become a software developer to roles which I felt offered more cross-functional collaboration such as a test engineer and project manager. This real-world experience

helped me to realize how much I enjoyed the interpersonal interaction in the workplace that these roles offered - a perspective I would not have received simply from school. TraceLink invited me back for a second internship in 2021. During this internship round, I honed my skills of effectively identifying problems before they occurred which is a necessary skill to be an effective test engineer. The main difference between disciplines is the subject matter whilst that skill remains constant across the board. My experiences with TraceLink taught me the importance of solving problems efficiently and methodically. This is something that I was aware of, but never fully grasped until now.

The CADSTI-NE and SPISE network has been integral to my educational and professional development. I was first introduced to programming at SPISE and obtained my TraceLink internship through CADSTI-NE which connected me to the company that has provided me with the first step for my career after graduation.

Where are the Interns Now? (cont'd)



Shamone Fine

Senior Technologist, Turnstone Biologics (Canada)

SPISE 2014 Caribbean Development Bank Scholar

Internships: Voyager Therapeutics (2017), VML (2018)

B.S. Biochemistry and Molecular Biology, Trent University

Currently, I am a senior technologist on the analytical operations team at Turnstone Biologics, a biotech company developing viral immunotherapies and tumor infiltrating lymphocyte (TIL) therapies for cancer. I spend most days either running assays to aid drug substance characterization and in-process matrix characterization or testing the feasibility of new assays and technologies to enable additional characterization. In the past few years, I have been able to work in different fields in biopharma, from neuroscience to cancer, as well as on different teams (R&D and TechOps). These different experiences have helped me gain exposure to the culture and business of biotech companies and make a definitive choice on my career path. Next fall, I am hoping to attend graduate school as a PhD candidate in a pharmacology or molecular biology program.






My journey to this decision would not be the same without the summer internships I participated in. From 2017 to 2019, I was able to participate in a few internships that helped me learn more about the drug discovery and development process and learn techniques that would not be taught in an undergraduate lab. Every internship was a much-needed add-on, from the skills developed to the mentorship provided by the managers. During my time at one of the internships, my team and I discovered a phenomenon that would affect the safety profile of our drug. This discovery sparked a lot of conversations and further showed the company that their investment in a very costly

technology was beneficial. This scenario also helped me realize I had chosen the right career. Full disclosure - I am a great team player, but the internships helped me realize I'm also able to thrive independently. Critical thinking and being able to troubleshoot are two skills that are required in my field. Every internship helped me to hone these skills and demonstrate to managers my ability to work alone and meet deliverables. As my internships were lab-based and involved research, I believe they gave me the best exposure to the concept of STEM, how each of its elements align, and how the skills and learnings from STEM education can be translated to everyday life and success in any field.

These internships would not have been possible without the CADSTI-NE team. Likewise, my scholarship for undergrad and my current job would not have been possible without the CADSTI-NE network. Despite my good grades, the university had decided to give the scholarship to another candidate. After reaching out through my SPISE network which was connected with a professor at the university, I was given a revised offer from the university that covered ~50% of the tuition for each year of study. In addition, as is well known, the biotech community in Canada is very small. Luckily, with the help of my CADSTI-NE network, I was able to land an interview at my current company which allowed me to show the value I could bring to their analytical team. After spending the last 5+ years in industry, I believe I am in a really good position to go to grad school and excel as a pharmacology or molecular biology student. This would not be possible without each summer internship. Forever grateful to CSF, SPISE, Caribbean Development Bank (my SPISE sponsor), and CADSTI-NE!

2022 Internship Hosts and Sponsors

Sincere thanks to our partner organizations, who devoted time and resources to plan for, on-board and mentor the student interns.

Host Organization	Location	Company Focus	Student Intern
	Cambridge MA, USA	Small biotech company addressing the fundamental cause of disease by controlling the output of genes central to disease.	Maela Hickling
	Barbados	Energy company providing electrical power for several Caribbean islands, including renewable energy.	Abigail Battick Najeh Francis
	Barbados	Small company that manufactures rum with state-of-the-art equipment and systems.	Lael Charles
	Barbados	Medical device company that designs, manufactures and distributes a wide range of intraocular lens implants and lens injection systems.	Dominique Bryan
	Bedford MA, USA	Small biotech company focused on the development of an innovative delivery system for ophthalmic drugs by incorporating bioresorbable hydrogel technology.	Farah Chin

Caribbean Diaspora for Science Technology & Innovation New England



*Empowering Caribbean youth through science
& engineering experiences*

Thank You!

CADSTI-NE Leadership Team



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George Marecheau



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