

**High School
Initiative in Remote
Sensing of the
Earth Systems
Engineering &
Science (HIRES)**

HIRES Annual Report

2020-2021

Submitted by
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Introduction:

2020 HIRES Virtual Summer Internship program was conducted from June 29th through August 10, 2020. Sixty-two (62) applicants competed for the 25 slots available. Out of the 62 students who applied (*e.g., 32-female/30 male*); (*29-Asian; 6-African American; 3-Hispanic/Latino; 16-White; 2-Bi-racial; 6-Preferred Not to Answer*) from all five boroughs of New York City applied to be part of this opportunity. The program received applications from over 30 NYC public schools, and a few applicants from private schools. Since for the first time the program was operated virtually due to the COVID-19 pandemic, and a lot of students throughout the City were left without an internship opportunity, the program decided to provide this internship opportunity to 31 students rather than the 25 usually recruited. After a long selection process, the 31 selected candidate breakdowns were as follows: (*Gender--19-female/12 male*); (*Ethnicity--(e.g., 12-Asian; 2-African American; 8-Hispanic/Latino; 6-White; 3-Bi-racial)*).

Program Events:

Starting June 29, 2020, students were introduced to the program during a brief orientation session and also sat through mentor presentations on the research projects available to them to review and select based on their research interests. Each student received a form where they



HIRES 2020 Orientation, June 29, 2020

selected their top three (3) projects and based on the number of students per project, the committee assigned one of their top three choices as their research project. Before beginning their research projects, the students received training in Remote Sensing, QGIS, and OCTAVE. Students worked on a total of 18 NOAA mission relevant [research projects](#) on topics such as “*Changing Water Use Patterns during COVID-19 in NYC*” and “*Heat Vulnerability of NYC caused by the Urban Heat Island using uHMT Weather Station Data*”. Altogether, students spent [7 weeks](#) taking courses and conducting research daily from 9 AM to 5:00PM. Also, a series of one-day boot camps (i.e., “How to think like a computer scientist” and “Statistics and R”), as well as professional development seminars, weekly topic-driven brown bags, and personal development skills through IRONDALE, were some of the many activities that made this summer a success. They presented their work at the “End of Summer Research Symposium” hosted by The City College of New York along with our students from our CESSRST Summer Bridge program, along with City Tech’s REU and IESU program. Students’ testimonials and surveys conducted at the end of the program document the success of our 2020 HIRES program.



Seminar on NOAA STEM Careers Pathways, by Dr. DaNa Carlis, NOAA Deputy Director, ESRL Lab, Boulder CO, August 5, 2020



Introduction

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A novel coronavirus (SARS-CoV-2) has recently emerged from China with a total of 45171 confirmed cases of pneumonia (as of February 12, 2020) [1]. Together with Severe Acute Respiratory Syndrome (SARS) coronavirus and Middle East Respiratory Syndrome (MERS) coronavirus [2], this is the third highly pathogenic human coronavirus that has emerged in the last two decades. Person-to-person transmission has been described both in hospital and family settings [3]. It is therefore of utmost importance to prevent any further

spread in the public and healthcare settings. Transmission of coronaviruses from contaminated dry surfaces has been postulated including self-inoculation of mucous membranes of the nose, eyes or mouth [4,5], emphasizing the importance of a detailed understanding of coronavirus persistence on inanimate surfaces [6]. Various types of biocidal agents such as hydrogen peroxide, alcohols, sodium hypochlorite or benzalkonium chloride are used worldwide for disinfection, mainly in healthcare settings [7]. The aim of the review was therefore to summarize all available data on the persistence of all coronaviruses including emerging SARS-CoV and MERS-CoV as well as veterinary coronaviruses such as transmissible gastroenteritis virus (TGEV), mouse hepatitis virus (MHV) and canine coronavirus (CCV) on different types of

- Background information of the topic you are researching
- Includes the problem
- Includes hypothesis/prediction

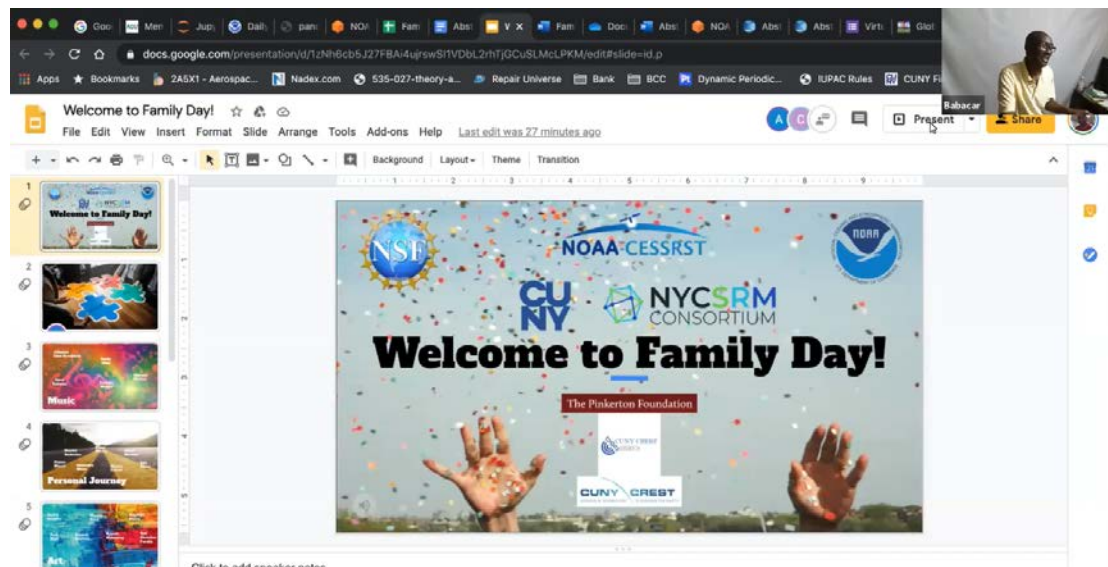
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<https://doi.org/10.1016/j.jhin.2020.01.022>
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STEM Workshop on How to write a Technical Papers, August 5, 2020



HIRES interns presenting during the Summer Research Symposium – August 10, 20



CUNY HIRES Family Day – July 30, 2020

Summary:

Even though HIRES summer 2020 was offered virtually, the program was able to introduce the following activities to ensure the HIRES interns gain rewarding experiential learning opportunities:

- One-week orientation to help students learn about the 7-week program in details.
- Boot-camps to help students get refresher/crash course on computer coding and data/statistical analysis.
- Special workshops offered on how to download required software to successfully complete 3-college credits.
- Each instructor was supported by 2-3 teaching assistants to ensure all students are being provided with support and help during 3-college credit course workshops.
- Irondale workshop was extended to the UG mentors to provide peer-based mentoring/networking opportunities to all summer interns.
- Most research projects were geared towards COVID-19 related scientific problems with focus on environmental, social, economic impacts, using GIS and remote sensing techniques.
- Daily-tag ups – CUNY HIRES program staff met with students every day in the morning (attendance) and evening at 5:00PM, to ensure all students are progressing. These tag ups were more social rather than technical to help students socially bond and provide support systems as needed.
- Student led Family day, was phenomenal – all interns grouped their presentations based on their personal hobbies, with videos of cooking, playing music and sharing their amazing personal stories.
- The program also included three (3) guest speakers seminars focused on Career pathways and early career advise/tips.
- STEM HIVE workshop on how to write technical papers was well received by the students.
- HIRES program was able to accommodate 31 students in 2020 (6 more than normal class size of 25 students in the past) to support more students during COVID-19 Pandemic.