

# CloudyCluster Helps Students Build Bright Futures in HPC

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Looking for a future in HPC, some students literally taught themselves Python in a day while competing in the [Cloud HPC Hackathon](#) (also known as the Omnibond CloudyCluster competition) at Supercomputing 2019 in Denver, Colorado. This is, by itself, the very definition of motivation and shows the thirst students have for the technical knowledge they can use to gain internships and qualify for well-paying technology jobs. Energy, enthusiasm, and technical excellence, all enabled by [Omnibond](#) and the NSF-funded Science Gateways Community Institute ([SGCI](#)) [\[1\]](#) along with partners such as [Intel HPC](#), [TACC](#), [Google Cloud](#), and [AWS cloud](#) is creating a host of skilled new HPC data scientists and programmers.



Figure 1: A diverse group of students showed their energy, enthusiasm and technical excellence in the Cloud HPC Hackathon at Supercomputing 2019 in Denver Colorado

**Life-changing stories**

Each of the students at the competition has a remarkable story behind them, many of which will warm your heart about how life changing these competitions can be. Equally important is how these stories highlight the importance of entry points such as science gateways into STEM (Science Technology Engineering Math) careers for all youth, plus how these entry points can level the employment playing field for disadvantaged youth.

A couple of examples are Josselyn Slavado, age 21, and Pablo Enrique, age 19, two competitors in the SC19 Cloud HPC Hackathon in Denver.

From a young age, Josselyn has worked in her family's cleaning business. One evening she was cleaning the floors at a Sprint store. An employee mentioned there might be an opportunity for her in computer science via science gateways. Josselyn asked to participate even though she did not have any computer science background. Months went by and she did not hear anything so she sadly chalked that conversation (and opportunity) up as a non-starter – something that frequently happens in her part of town.

Contrary to expectations, a text eventually arrived on her phone that put her in contact with Dr. Linda Hayden (an NSF Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring who is currently the Associate Director of Workforce Development at Elizabeth City State University), a [science gateways ambassador](#). Things really started happening once Josselyn was accepted into the science gateways program that included a four week coding internship. Shortly thereafter she found herself on a flight to Denver accompanied by her boyfriend fellow competitor Pablo to compete in the Cloud HPC Competition at Supercomputing 2019. Attending the competition represented several firsts for both of them including working in Python, a language they had to learn the first day during the competition, along with the flight to Denver as neither Pablo nor Josselyn had been on an aircraft before. Josselyn saw the opportunity to compete as “a dream come true” noting that “School has finally started paying off.”

Both students had to overcome a plethora of obstacles to compete, obstacles that simply don't exist for more advantaged youth.

### **Kudos to science gateways and those sponsors who support their efforts**

It is not possible to emphasize the importance of these entry points to STEM and the world of HPC computing enough including SGCI and the SC19 Cloud Hackathon. Look to the various routes each of us have taken to enter a STEM career. Think of how tenuous were all our beginnings and the importance of those who supported and encouraged us along the way. With these thoughts in mind, we can make our own assessment and appreciate the importance of STEM entry points like the science gateways projects and the hackathons like the SC19 Cloud HPC Competition. The picture below shows graphically the tremendous impact those who sponsor and actively work to give students a real shot at a technology career regardless of their race, gender, and economic background.

Tom Krueger, Global Sales Enablement Director, with Intel, one of the sponsors of the hackathon, explained that the company was initially interested because “it supports our goals of showing how accessible HPC in the cloud can be and we were delighted when

the registrations came in with such a diverse group of students – including so many female students – which supports Intel’s emphasis on diversity.”

Omnibond observes that 47 percent of the entrants who completed their projects were women.



Figure 2: Students acknowledging all who contributed to the competition

### **Employers take note! Job seekers look to your competition**

Following are the five projects that were completed by the teams at the Supercomputing 2019 Cloud HPC Competition.

Employers should take note as these students could easily be working as interns or employees at your company. Seeking these students out for career opportunities will certainly be a well-rewarded effort. Job seekers also take note, students from the competition will be listing their successful work on the following projects when they apply for a job. Clearly these are bright, motivated, and highly-employable people.

- DeepDishData Team: Array of Things – Data visualization of a networked urban sensor project – Sensors spread across Chicago Measuring: temperature, humidity, quantity of particulate matter, traffic, and more.
- PhotoBombers Team: A parallel malware analysis gateway that provided disassembled data from submitted executable malware samples.
- SMS2CCQ Team: A Twilio chatbot that allows user to submit and manage CloudyCluster HPC jobs and check status via text messages.
- LambdaUI Team: A User interface to execute, manage and monitor jobs on CloudyCluster via both Jupyter Lab and HTML/javascript UI.
- Sacred CHORDS Team: A python module that allows scientists to fetch and visualize pre-existing data housed in CHORDS using Jupyter Notebooks.

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[i]The SGCI was key in making this hackathon work along other hackathons and programs such as [the Practice & Experience in Advanced Research Computing series](#).