

# UH Hilo astronomy student Austin Jennings conducts spectral research

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By Staff

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**At the Canada-France-Hawai'i Telescope on Maunakea, Austin Jennings tested ways to simultaneously use two different spectrographic instruments to catalog stars. His findings were unexpected.**

By [Leah Sherwood](#)



Austin Jennings and Canopus, an F-type supergiant and the second brightest star in the night sky. In his research, Jennings focused on the main spectral types of stars: O, B, A, F, G, K, and M, which are categorized through temperature, O being the hottest and M being the coolest. [NASA photo via Wikipedia.](#)

*This is the second in a series on projects done by UH Hilo physics and astronomy students awarded research positions.*

**Austin Jennings**, a senior majoring in [astronomy with a physics minor](#) at the University of Hawai'i at Hilo, recently completed a summer internship at the [Canada-France-Hawai'i Telescope](#) (CFHT) on Maunakea, where he tested ways to simultaneously use two different spectrographic instruments to catalog stars by their spectral type.

Working alongside his mentor **Nadine Manset**, a resident astronomer at the CFHT, Jennings was doing his research as an intern, having been awarded one of 30 coveted slots in the [Akamai Internship Program](#) for summer 2018. Akamai is an eight-week summer program that offers college students from Hawai'i an opportunity to gain a summer work experience at an

organization, observatory, or scientific or technical facility in Hawai'i and is funded by a large group of organizations and agencies.

## The research

"For our project, we mainly focused on the main spectral types of stars: O, B, A, F, G, K, and M, which are categorized through temperature, O being the hottest and M being the coolest. For reference our sun is a G type star," says Jennings.

"I determined how feasible it was to use two spectrograph instruments, one in the VIS light spectrum the other in the near-infrared, at CFHT simultaneously or quasi-simultaneously," Jennings explains. "I did this by using their respective exposure time calculators, ETCs, to catalog all the major spectral types and luminosity types of stars. I looked for similar exposure times on both instruments using different signal-to-noise ratios, SNR. From this, we had a feasible range of magnitude—brightness of the star—for both instruments."

Jennings says they discovered unexpected results.

"We expected to be able to use only a few spectral types of stars—because you would think there would be few spectral types that had similar exposure times in two different wavelengths—but it turns out we could theoretically cover the vast majority, possibly more than 99 percent, of the stars in our sky in some way," he says.

## The perfect place to study astronomy

Akamai internship spots are awarded to undergraduates or recent graduates in one of the STEM fields (science, technology, engineering or math). If students are accepted into the program, they are placed at a company or observatory on Maui, Hawai'i Island, or in Pasadena, Calif. Students gain hands-on experience and work under the guidance of an engineer or scientist in their field.

The goal of the eight-week internship is to combine coursework, a project in advanced technology, and communication skill building to foster the development of future scientists.

Hawai'i Island is less than an hour flight from home for Jennings, who hails from O'ahu. He now feels that the island is the perfect setting for him—it's a short trip away from home in the same state, but he is able to experience one of the best astronomy programs in the world with access to many resources many universities don't have such as Maunakea.

"Hawai'i is an amazing place to study the stars mainly because it's isolated, meaning there isn't a lot of light pollution for telescopes," he says. "And we have Maunakea, which provides great conditions for star visibility as it's well above the inversion layer."

Jennings was not always sure about which field to study.

"In terms of major, I jumped around a lot," he says. "For the majority of my high school career, I wanted to be an engineer, but in the back of my mind I always had an interest in astronomy but never really fully committed to it. At the end of my senior year, I decided to go with my gut

and attend UH Hilo majoring in astronomy and haven't looked back since.”

After his Akamai internship experience, Jennings says he now sees astronomy research from a wider perspective.

“My work is related to the field as it helps to understand how our universe works,” he explains. “I see this as sort of like a puzzle—you have to put the small pieces together in order to see the big picture. That is essentially what the end goal of researching astronomy is.”

*About the author of this story: Leah Sherwood is a graduate student in the tropical conservation biology and environmental science program at UH Hilo. She currently serves as an intern in the Office of the Chancellor. She received her bachelor of science in biology and bachelor of arts in English from Boise State University.*

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