UMass senior helps find universe’s brightest galaxies

Kevin Harrington near an observatory in Amherst. The UMass Amherst senior helped discover some of the brightest galaxies in the universe.

By Nestor Ramos | GLOBE STAFF  MARCH 30, 2016

Kevin Harrington’s hobbies aren’t so different from a typical college kid’s: He plays the drums, shares Facebook posts about Bernie Sanders and marijuana legalization, and has some pretty trippy ideas about the origins of the universe.
But Harrington’s cosmic thinking isn’t the stuff of bull sessions with bongos. This month, his groundbreaking research was published in one of Europe’s most prestigious astronomy journals.

The University of Massachusetts Amherst senior is among the team of scientists credited with discovering several of the universe’s brightest shining galaxies, each billions of light years from earth and brighter than hundreds of trillions of suns. He was lead author of a paper outlining the findings in this month’s edition of *Monthly Notices of the Royal Astronomical Society*. He has added to the growing body of research examining the early expansion of the universe. And he’s 23 years old.

Harrington made the remarkable discovery first in mountains of publicly available data and then confirmed it on a literal mountain in Mexico, peering through a powerful telescope.

But to find light in some of the universe’s distant corners, Harrington had to wade through considerable darkness. The constellation of inspirations Harrington draws from includes the celestial and the personal, from the birth of stars to the death of a parent.

“It’s kind of funny,” said Harrington, of the expectations he routinely confounds. He sounded nearly as excited about talking about the time he drummed with one of the Neville brothers as he was about helping to unlock the secrets of the universe’s origins. “All of it goes into the mix.”

Harrington’s search began not in the stars but in taking the publicly available data sets from two telescopes to identify bright objects.
“At that stage it’s mostly just crunching numbers,” Harrington said, but when he was done he had a list of several bright objects. After weeding out those already known to astronomers, he had a short list of unknown shiny things that were very far from Earth.

Finally, he was ready to peer into the deep recesses of the universe. Harrington spent spring break two years ago using a 50-meter telescope on an extinct volcano in Sierra Negra, Mexico. The Large Millimeter Telescope is operated by UMass Amherst and Mexico’s Instituto Nacional de Astrofísica, Óptica y Electrónica.

It didn’t take long to get results: Harrington said collecting light often takes days, but the galaxies that he and the rest of the team discovered were so bright that some were apparent within minutes.

“The galaxies we found were not predicted by theory to exist; they’re too big and too bright, so no one really looked for them before,” said Min Yun, Harrington’s astronomy professor. The galaxies they observed are about 10 billion years old — formed only about 4 billion years after the Big Bang.

Some of the most luminous galaxies previously discovered had black holes at their center, Harrington said, powered by their incredible energy.

“Things falling into a black hole are going to exert a lot of energy,” Harrington said. But the galaxies Harrington and the team discovered were powered by starbursts — the rapid formation, billions of years ago, of new stars.
“Knowing that they really do exist and how much they have grown in the first 4 billion years since the Big Bang helps us estimate how much material was there for them to work with,” said Yun in a news release. “Their existence teaches us about the process of collecting matter and of galaxy formation.”

Life on earth can be complex, too.

Harrington was interested in learning how things worked when growing up, he said, but school wasn’t something he was drawn to.

Then the shape of his universe changed. When Harrington was a 15-year-old Barnstable High School student, his mother died.

But black holes harbor tremendous energy. His mother’s death — he prefers not to discuss the details — became a driving force in his life.

Through a high school teacher, Mike Gyra, he found astronomy. This spring, he’ll graduate from UMass with degrees in astronomy and neuroscience with a minor in African-American studies. He plans to start his doctoral work in September at Germany’s Max Planck Institute for Radio Astronomy and the University of Bonn. Thinking of how proud his mother would be, he said, brings tears of joy to his eyes.

Along the way, he fell in love with drumming, which he teaches other undergrads.

“Looking back at it now, it was definitely an outlet for me — a way to drum things out.”
He teaches meditation, and said his interest in neuroscience stemmed from an intuition that the discipline might one day overlap with astronomy — each in some measure involving the study of intricate networks, one very large and one very small.

“The universe has a way of reflecting itself at different scales,” he said.

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