

The Day I Found ...

Amateur astronomy is a field rife with the possibility of discovery.

AS A CHILD, I dreamed of someday making a grand celestial discovery — perhaps unearthing a new world among the stars. By age 25, with my dreams already a reality, I realized that my most meaningful discovery was the one I made as a teenager, alone with a telescope in my backyard.

The Day I Found a Galaxy I was 17, struggling to point an unwieldy telescope. The metal tube was cold against my cheek as I looked through the finder. With my squinting left eye, I peered through the old 4-inch Newtonian on loan just for the weekend. I had never before looked through a real telescope, but there was no doubt what I had found — a fuzzy glob of whitishness, 100-billion-plus stars in a single glance — the Andromeda Galaxy. Like a sacred moment in a crowded cathedral, the experience seemed profoundly universal, yet wholly personal. Photons of light had been on a one-way trip for more

than 2 million years to a single final destination: my eye. At that moment, I gained an intimate understanding of how small I am in our vast universe.

The Day I Found an Asteroid I was cold, tired, and alone; the fate of a physics major relegated to the Calvin College Observatory for an all-night observing run. It was a senior project, the culmination of my college years in preparation for graduate work in astronomy. The computerized 16-inch telescope found its target quickly, tracking on a main-belt asteroid as it moved slowly across the sky. A CCD camera hung from the scope, collecting photons far better than my eye ever could. After six hours, I had nearly 40 images of asteroid 3091, more than enough to complete my undergraduate thesis. In an animated loop of the night's images, the bright asteroid zoomed across the field. There, in the bottom corner, a faint speck

of light, like a mote of dust, slowly drifted past the stars. My heart fluttered as I wondered, "Could this be a new asteroid?"

Three days later a message from the Minor Planet Center told me that the faint object was indeed a new asteroid, VDH001 K03R11A. It was mine; I found it, me! But truth be told, the CCD deserved the credit.

The Day I Found an Exoplanet As a 22-year-old graduate student, working in a warm, well-lit control room, I sat with two other grad students behind eight computer monitors. On the other side of a thick steel wall, the Kitt Peak 2.1-meter telescope lumbered to its next target. A series of seemingly identical black-and-white spectra appeared on one screen. I hardly even looked at the pictures — just another one of the 30 stars we observed that night.

There was no eureka moment, no fluttering of hearts, but rather a slowly growing consensus among our research group that the sinusoidal radial-velocity curve of HD 102195 was consistent with a Jupiter-mass planet orbiting the star every four days. The discovery was inevitable, a product of our carefully planned search. When we published our discovery in the *Astrophysical Journal*, my name was seventh on the author list.

Only 440 exoplanets have ever been discovered by humans, and perhaps only 1,200 people can say they personally found an asteroid. I am certainly proud of these achievements. But on that night years ago, alone in my backyard with an old used telescope, I made a far greater discovery — a discovery that left me humbled. ♦

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