



Impact Statement

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Reading the Stars, 2026

Digital artwork

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Unsung Hero: Cecilia Payne-Gaposchkin

Cecilia Payne-Gaposchkin was an astronomer whose research fundamentally changed our understanding of the universe. Born in England in 1900, she eventually moved to the United States because opportunities for women in science were severely limited in Britain. At Harvard, she studied starlight using spectroscopy, a technique that allows scientists to determine the chemical composition of stars by analyzing the patterns in their light. In 1925, she published her doctoral thesis, *Stellar Atmospheres*, proposing that stars were composed primarily of hydrogen and helium.

At the time, this conclusion challenged the accepted scientific beliefs of the period. Henry Norris Russell, a leading astronomer, initially encouraged Payne-Gaposchkin to weaken her conclusions because they differed so greatly from existing ideas. However, later evidence supported her research, and Russell eventually acknowledged that her conclusions were correct. Her work helped establish hydrogen and helium as the dominant elements in stars and became foundational to modern astrophysics.

Payne-Gaposchkin's impact went beyond identifying what stars are made of. Her research demonstrated that scientists could learn about objects millions or billions of miles away simply by studying the light they emit. Her discovery helped scientists better understand how stars form, evolve, and change, as well as how elements are distributed throughout the universe. She also made important contributions to the study of stellar spectra and variable stars throughout her career.

Her achievements were especially significant because she pursued science at a time when women faced major barriers in academia. In 1956, she became the first woman promoted to full professor from within Harvard's Faculty of Arts and Sciences and later became the first woman to head a department at Harvard. Her career showed that scientific ability and curiosity could break through barriers that had previously prevented many women from receiving recognition for their work.

My artwork, *Reading the Stars*, represents Payne-Gaposchkin's discovery as a moment of seeing something that had previously been misunderstood. Behind Payne-Gaposchkin, I included spectrograph data to represent the evidence that formed the basis of her research. Hydrogen and helium symbols appear throughout the composition to symbolize how the invisible contents of stars became visible through her work, mirroring planets floating around a star.

The glowing sphere between her hands is a star, but it also symbolizes knowledge and discovery. I wanted it to feel almost tangible, as though Payne-Gaposchkin is holding the discovery that changed our understanding of the universe. The warm glow of the star contrasts with the cool colors of space, drawing the viewer's attention toward the center of the artwork. This contrast also represents the connection between the vast, unknown universe and the human desire to understand it.

The title *Reading the Stars* reflects the idea that stars communicate with us through their light. Payne-Gaposchkin learned how to interpret that light and uncover information that could not be seen directly. My artwork visualizes the relationship between the stars, their light, and the scientist who learned how to understand it. The composition is meant to show that even something incredibly distant can reveal its secrets when we take the time to carefully study the evidence.

Ultimately, I hope this piece makes Cecilia Payne-Gaposchkin feel more like a person whose curiosity changed how humanity sees the universe. Rather than simply representing her as a historical scientist, I wanted to show her as someone who was willing to question what others believed and follow the evidence she discovered. Her story reminds us of the importance of challenging assumptions, trusting evidence, and continuing to pursue knowledge even when others doubt our conclusions. "Reading the Stars" celebrates not only what Payne-Gaposchkin discovered, but also the curiosity, determination, and courage that allowed her to make that discovery.