

# Henrietta Swan Leavitt Biography

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# Biography

Henrietta Leavitt was born in Lancaster, Massachusetts, on July 4, 1868. She attended public school in Cambridge, Massachusetts, and graduated from Radcliffe College. In 1892, during her senior year, Leavitt took a course in astronomy and became very interested in the subject. She became a volunteer at the Harvard Observatory in 1895, was appointed to a permanent staff position in 1902, and soon became the head of the photographic photometry department.

Photometry deals with the measurement of the brightness of stars. Knowing the magnitude (brightness) of a star helps determine its distance. Leavitt's most important discovery involved Cepheid variable stars. Cepheids are stars that brighten and dim very regularly. In 1904 Leavitt noticed that the longer a Cepheid took to complete a single cycle, the brighter it was. Obviously there was a relationship between the period of pulsation (time) and luminosity (brightness), but that could not be determined by observing Cepheids within our galaxy. A star that was actually dim might appear bright if it were close to us, while a brighter star could look dim either because it might be very far away, or because dust within our galaxy could be blocking some of the star's light. While observing the Magellanic clouds from Harvard University's Peruvian observatory in 1912, Leavitt found Cepheid variable stars and determined the relationship between period and brightness for them. The Magellanic clouds are star systems that are outside our Milky Way galaxy. The stars in these systems are all about the same distance from Earth, so if the range of just one Cepheid could be calculated, it would be possible to calculate the distances to the Magellanic clouds, as well as to Cepheids in more remote objects. It was Ejnar Hertzsprung who determined their distance (about 100,000 light-years), thus making it possible to use the period-luminosity relation that Leavitt and Harlow Shapley established to determine other distances. The Cepheid variable yardstick was the first method that gave scientists a conclusive grasp of the immense size of the universe.