

UMWIP

“Draco dormiens nunquam titillandus.”

Weekly meetings

- April 6 - Meeting
- April 11 - Social Night
- April 19 - Meeting
- April 20 - WiP at UM STEM Fest
- April 27 - Coffee and Conversation

Upcoming events

- April 3 - Oxford Science Cafe at Lusa Bakery at 6pm
- April 8 - UM-MSU Joint Physics Research Symposium at the Law Center from 9:30am to 5pm
- April 20-21 - UM STEM Fest

Talks and awards

Congratulations to Chandrima Chatterjee for getting 2nd place is the podium session of the 8th Annual Research Symposium!

April 7 - Dripta Bhattacharjee, Shrobana Ghosh, and Sumeet Kulkarni will perform at India Night at the Ford Center at 5:30pm.

April 14-17 - Shrobana Ghosh, Vishal Baibhav, and Sumeet Kulkarni will present at the April APS Meeting.



The Harvard Computers

Original article: Forgotten Women in Science: The Harvard Computers - <https://cosmosmagazine.com/mathematics/forgotten-women-in-science-the-harvard-computers>

This article, which is a small excerpt from the book “Forgotten Women: The Scientists” by Zing Tsjeng, tells us the history of the Harvard Computers, a group that came before the West Computers and the Bletchleyettes. Due to the advancement of photographic technology, astronomers at Harvard College Observatory were faced with an overwhelming amount of data to analyze. At this time, the director of the observatory was Edward Charles Pickens. He decided that the best solution was to employ a team of women who would analyze the photographic plates.

Fortunately, there were many female graduates who were looking for jobs with more exciting perspectives than the typical 19th



Williamina Fleming (1857-1911)

Williamina Fleming, a Scottish astronomer, worked as a housekeeper for Edward Pickering, the director of the Harvard College Observatory, after immigrating to the US. Although lacking in formal education, Pickering hired her to analyze stellar spectra. By the end, she had created a system to classify stars by the amount of hydrogen in the spectra.

Although she is best known for her discovery of the Horsehead Nebula, she was not given credit in the publications following her discovery or in the first Dreyer Index Catalogue. It wasn't until the second Dreyer Index Catalogue that Fleming received credit for her discoveries.

Fleming was also a strong advocate for women in science. She believed that women should be given equal educational opportunities as men in order to overcome the culturally constructed idea that women were inferior to men. This was the focus of her talk at the 1893 World's Fair in Chicago. By the end of her career, she had catalogued over 10,000 stars and discovered over 310 variable stars.

century schoolteacher or housewife roles. This team of women, who came to be known as the Harvard Computers (1881-1919), would spend hours analyzing photographic plates in order to calculate the brightness and positions of the stars in the sky. Hence, the Harvard Classification Scheme, which categorized the stars by brightness and temperature, was created by one of these scientists, Annie Jump Cannon.

Moreover, some of the 'computers' became prominent figures in astronomy, such as Williamina Fleming, who became the Curator of astronomical photographs in 1899, and Henrietta Swan Leavitt, who noticed that there are stars that pulsate. These Cepheid variables became benchmarks for calculating distances. In fact, Edwin Hubble used Cepheids to answer the controversial question of whether the Universe consisted of the Milky Way or if it contained many more galaxies. This led to the formulation of the Hubble constant and, later, to the realization that the Universe is expanding.

Today, the Harvard-Smithsonian Center for Astrophysics is cleaning and digitizing each of the 500,000 glass plates for its archive.

Photo description: "The Crab Nebula is cataloged as M1, the first object on Charles Messier's famous list of things which are not comets. In fact, the Crab is now known to be a supernova remnant, expanding debris from the death explosion of a massive star. This intriguing false-color image combines data from space-based observatories, Chandra, Hubble, and Spitzer, to explore the debris cloud in X-rays (blue-white), optical (purple), and infrared (pink) light. One of the most exotic objects known to modern astronomers, the Crab Pulsar, a neutron star spinning 30 times a second, is the bright spot near picture center. Spanning about 12 light-years, the Crab Nebula is 6,500 light-years away in the constellation Taurus."

Photo credits: NASA - <https://apod.nasa.gov/apod/ap180317.html>