

Cape Cod Astronomical Society
Minutes of April 1, 2010 Meeting

Attendance: Total 25 Members 23 Guests 2

President Tom Leach opened the meeting at 7:30 P.M., welcoming CCAS members as well as two guests. Tom encouraged members look at the current issue of *Sky and Telescope* Magazine as it features several articles regarding light pollution and highlights for observing in May.

After the meeting, the observatory was for opened for viewing.

The meeting adjourned at 9:20 P.M.

Presentation

A special presentation was made tonight by Marcia Bartusiak. She has been covering the fields of astronomy and physics for three decades. The author of five books, she is currently an Adjunct Professor with the Graduate Program in Science Writing at the Massachusetts Institute of Technology and a columnist for *Natural History* magazine. Her talk, "The Cosmologist Left Behind" was adapted from her latest book "The Day We Found The Universe". For more information, reference her website www.marciabartusiak.com

The presentation started by looking at two early astronomers, Thomas Wright and William Herschel, who in the 1700's discovered hundreds of nebulae in the night sky. William Parsons, an Irish astronomer was later credited with discovering spiral nebulae. As time progressed, the search to determine the size of the universe became one of the most important topics in astronomy. In the late 1800's James Keeler, the director of the Lick Observatory increased the estimate of nebulae to 120,000. He is also credited with establishing the reflecting telescope as the best type for astronomical use. After his death in 1900, Heber Curtis also a Lick Observatory astronomer continued the sky survey and increased the estimate of nebulae to one million. He also saw features in these nebulae that seemed similar to our own galaxy, the Milky Way. He determined brightness in distant nebulae and determined they were outside of the Milky Way. During this same period, a Harvard University employee, Henrietta Leavitt looked for variable stars on thousands of photographic plates. She confirmed in 1912 that the variable stars of greater intrinsic luminosity – Cepheid Variables – did have longer periods. This helped determine the "Standard Candle" tool, creating a "Cosmic Yardstick" for measuring distances to objects in the universe.

The next two astronomers, Harlow Shapley and Edmund Hubble further advanced the search to define our place in the universe. At Mount Wilson, Shapley found Cepheid variables in globular clusters at the outskirts of the Milky Way. This allowed him to determine both our position and size of the Milky Way. In 1920 he entered into a debate with Heber Curtis to determine the size and make up of the universe. Shapley argued that both nebulae and globular clusters were within the boundaries of our galaxy. This theory was later proved to be incorrect.

Edmund Hubble, an astronomer at Mount Wilson in the years after World War I used the 100 inch telescope to further research the size of the universe. He found Cepheid

variables in the Andromeda nebulae and believed that the observed nebulae were outside of our own galaxy. Another astronomer, Vesto Slipher used spectroscopy to observe the spectral lines of galaxies, making him the discoverer of red shifts. Additional research was done Georges Lemaitre who in 1927 published a paper regarding the expansion of the universe.

Edmund Hubble is often credited with discovering our place in the universe.

The discovery was really the work of many individuals who took nearly two hundred years to unlock one of the most important discoveries in scientific history.

Respectfully submitted by

Charles Burke