

HEAVENLY NEWS

“Observing our Cosmic Neighbors”

By Forrest Lockhart, Cameron Park Rotary Club Community Observatory

www.communityobservatory.com

Open Friday, Saturday, Sunday (Weather Permitting) 8:00 PM – 10:00 PM

For millennia, humans have marveled at the night sky filled with stars and highlighted by a glowing band of nacreous light crossing it. Known in several cultures as the Milky Way, what is now known to be our home galaxy seemed to encompass all of creation. Even after the invention of the telescope our known universe was bounded by what we could see, and all of the faint objects detected, from nebulae to strange spiral objects, were assumed to be local. Some books even referred to the Milky Way as our Island Universe. Beyond it there was...nothing.

Ninety years ago, our picture of the universe expanded from that of a lonely stellar outpost to the nearly infinite cosmos of today. Stellar astronomy was forever changed in the year 1919, when astronomer Edwin Hubble discovered that the Great Nebula in Andromeda was not merely a whirlpool of stars within the Milky Way, but a galaxy much akin to our own 2.5 million light years away, a distance never thought possible at the time.

Following Hubble's discovery, other galaxy distances were measured and our concept of the universe grew by leaps and bounds. Today, most public observing programs at the Cameron Park Rotary Community Observatory will feature one or more of these distant objects residing many tens of millions of light years away. Many amateur astronomers with modest telescopes have seen hundreds of galaxies from their backyards.

Galaxies come in a variety of shapes and sizes. Some are relatively small and without standard form, such as the Magellanic Clouds. Others take on a classical spiral shape with bands of stars wrapped around a bright core. The largest galaxies known are elliptical in shape. Formed when two or more galaxies collide and merge, elliptical galaxies resemble a stellar football.

Scientists now believe that most, if not all, galaxies harbor a resident black hole in their core. Contrary to common thought and theatre imagery, black holes do not ravenously gobble up stars and gas until the galaxy has been consumed, but instead are thought to be a major component in early galaxy formation and ongoing stability.

One question frequently asked at the observatory is how many galaxies there are in the universe. There is no firm answer to that question, but there have been scientific efforts to make a reasonable estimate of galaxies that are detectable from earth orbit, most notably the Hubble Deep Field and subsequent Hubble Ultra-Deep Field images.

In 1996 the Hubble Space Telescope was pointed toward a small area in the constellation Ursa Major. It imaged an area equal in apparent size to a tennis ball seen from 100 meters for ten consecutive days. The resulting image showed nearly 3000 galaxies in that small area of sky.

In 2004 Hubble took another long exposure, this time in the southern constellation Fornax. The extent of the image was equal to an area one tenth the apparent diameter of the Moon. Known as the Hubble Ultra-Deep Field, this image recorded over 10,000 galaxies.

Always faint and elusive, the ghostly image of a distant galaxy seen through a telescope eyepiece is a memorable experience. That the light we see left its home long before humans walked the Earth is a stark reminder of how new we are to the universe.