



The Shoreline Observer



Newsletter for the

Shoreline Amateur Astronomical Association

February 1996

President - Phil Sherman

Vice President - Pete Burkey

Secretary/Treasurer/Editor - Mike Henry

February Meeting

The February meeting of SAAA will be held on Thursday February 15th at 7:00 PM in the West Ottawa Middle School Planetarium.

- Business Meeting.
- Sandy will give a tour of the February night sky.
- Mark will be telling us about the constellations Lynx and Camelopardalis.
- Pete has an astronomical activity for all to do.
- Sandy will be bringing refreshments.

Treasurers Report

As of February 12, 1995: \$283.13

ASTRONOMY IN THE NEWS

Project BETA to Continue Search

The February 5, 1996, issue of Time magazine reflected the thoughts of many with its cover story, "Is Anyone Out There?". With the recent discovery of two more planets, interest in the search for extraterrestrial life is again increasing. Since 1993, when NASA's SETI program was eliminated by Congress, the search has been carried out mainly by two groups, one of which is the Planetary Society, an organization to which several of SAAA's members belong. The society's equipment for seeking alien radio signals has recently been upgraded to monitor 250 million frequencies at which interstellar communications is presumed to be most likely. This new Project BETA replaces Project META which scanned 8.4 million channels for ten years without detecting any obvious extraterrestrial transmissions.

Two New Planets Discovered

San Francisco State University astronomers Geoffrey Marcy and Paul Butler recently announced the discovery of two more planets orbiting stars other than our sun. The first, orbiting the star 47 Ursae Majoris, is about twice the size of Jupiter and probably consists mainly of methane, ammonia, and hydrogen sulfide. The planet orbits at a distance of about 300 million km, or slightly farther than the orbit of Mars. The second planet, circling the star 70 Virginis, in Virgo, has more than six times the mass of Jupiter and orbits at a distance of 72 million km, which is about half the size of the earth's orbit. Due to their proximity it is being speculated that both of them are temperate enough to allow water to exist in liquid form.

The discovery was made by analyzing the Doppler shift in the light of 120 stars looking for slight variations that may be caused by the gravitational influences of objects in orbit around the star. Since there are dozens of factors that can similarly affect starlight, the astronomer had to rely on newly-written software they had developed especially for the project. According to Butler, he and Marcy are very close to finishing the analysis of all 120 stars and they would not be surprised if they found several more planets, perhaps very soon.

Planets This Month

As usual, bad weather prevented us from observing Saturn's rings edge-on last Sunday, February 11. After that date, the rings tip farther into view each night until the planet disappears into the twilight by month's end. Venus continues to dominate the evening sky with its brilliance and will

continue to climb higher throughout March. This is the best evening apparition in 8 years and for 8 years to come. Remember to watch the moon and Venus on Wednesday, February 21.

The morning planets are Jupiter and Mercury which are both found in the SE before dawn. Look for brightly shining Jupiter above the Teapot in Sagittarius and then scan left and down with binoculars to spot elusive Mercury. Happy viewing.

Pete Burkey

New Members

We would like to welcome two new members to the club. Kelly DeWitt and Dave Benedict. They officially joined us in January. Please ask Mike if you would like telephone and address information.

Star Party Agenda

On Feb 23rd or 24th we will have our monthly star party and the monestary. And on March 23rd or April 20th, we will be having our "All New" annual Caldwell-Messier Marathon. This is an all night event where we try to find all the M objects. the "All New" part is that this year we will also be looking for "C" objects at the same time. More info to come.

We have also tentatively planned to have a sun observing party at the mall for Astronomy Day. This would be on April 20th or 27th. Please consider donating time for this public event.

HUBBLE FINDS SEARCHLIGHT BEAMS AND MULTIPLE ARCS AROUND A DYING STAR

This image of the Egg Nebula, also known as CRL2688 and located roughly 3,000 light-years from us, was taken in red light with the Wide Field and Planetary Camera 2 (WFPC2) aboard NASA's Hubble Space Telescope. The image shows a pair of mysterious "searchlight" beams emerging from a hidden star, criss-crossed by numerous bright arcs. This image sheds new light on the

(Reverse image shown, to save on ink)

poorly understood ejection of stellar matter which accompanies the slow death of Sun-like stars. The image is shown in false color. The central star in CRL2688 was a red giant a few hundred years ago. The nebula is really a large cloud of dust and gas ejected by the star, expanding at a speed of 20 km/s (115,000 mph). A dense cocoon of dust (the dark band in the image center) enshrouds the star and hides it from our view. Starlight escapes more easily in directions where the cocoon is thinner, and is reflected towards us by dust particles in the cloud, giving it its overall appearance. Objects like CRL2688 are rare because they are in an evolutionary phase which lasts for a very short time (~1,000 to 2,000 years). However, they may hold the key to our understanding of how red giant stars transform themselves into planetary nebulae. For the first time, we can see a 10,000 year-old history of mass-ejection in a red giant star in such exquisite detail. The arcs in CRL2688 represent dense shells of matter within a smooth cloud, and show that the rate of mass ejection from the central star has varied on time scales of ~100 to 500 years throughout its mass-loss history. With Hubble we have detected matter in this nebula to a radius of 0.6 light-years -- much further out than has been possible before, giving a better estimate of the amount of matter in the nebula. Other unexpected results seen in this image are the very sharply defined edges of the beams and fine spoke-like features which suggest that, contrary to previous models, the searchlight beams

are formed as a result of starlight escaping from ring-shaped holes in the cocoon surrounding the star. The spoke-like features result from shadows cast by blobs of material distributed within the region of the ring-like holes. Such holes may be carved out by a wobbling, high-speed stream of matter -- they will play a crucial role in the shaping of the planetary nebula which will result from CRL2688. Alternatively, the searchlight beams may result from starlight reflected off fine jet-like streams of matter being ejected from the center, and confined to the walls of a conical region around the symmetry axis. Such fine jets are not unprecedented: they have recently been observed in Hubble images of a planetary nebula (the Cat's Eye Nebula). Both the above scenarios require the ejection of high-speed material in a narrow beam. The presence of such material in CRL2688 has been inferred from other observations. However, the mechanism for ejecting high-speed jets or for producing the cocoon are not understood. But it seems likely that if the central star in such objects has a faint companion star, the gravitational interaction between the two stars and/or the outflowing matter from the red giant star may play an important role in the production of the cocoon and the jets.

When Sun-like stars get old, they become cooler and redder, increasing their sizes and energy output tremendously: they are called red giants. Most of the carbon (the basis of life) and particulate matter (crucial building blocks of solar systems like ours) in the universe is manufactured and dispersed by red giant stars. When the red giant star has ejected all of its outer layers, the ultraviolet radiation from the exposed hot stellar core makes the surrounding cloud of matter created during the red giant phase glow: the object becomes a planetary nebula. A long-standing puzzle is how planetary nebulae acquire their complex shapes and symmetries, since red giants and the gas/dust clouds surrounding them are mostly round. Hubble's ability to see very fine structural details (usually blurred beyond recognition in ground-based images) enables us to look for clues to this puzzle.