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# **The Shoreline Observer**

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## *Newsletter for the Shoreline Amateur Astronomical Association*

**President - Phil Sherman   Vice President - Arlin Ten Kley   Secretary/Treasurer - Mike Henry**

**Mike Henry, Editor 396-0509**

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### **December Meeting**

The December meeting of the Shoreline Amateur Astronomical Association will be held on Thursday December 15th, beginning promptly at 7:00 PM in the West Ottawa Middle School Planetarium.

Business meeting.

Sandy will give a tour of the December night sky (and hopefully a Christmas show).

Mike will be bringing refreshments.

### **November Business Meeting**

**Start                      7:00 PM**

**Location:                Mike's House**

**Members present    Mike**

**End:                      7:01 PM**

**P.S. This was my favorite meeting so far.**

### **Hubble finds dark matter still a mystery**

For more than 2 decades, astronomers have found evidence that at least 90 percent of the matter in the universe goes unseen. Now, findings from the Hubble Space Telescope have dashed the hopes of researchers who had suggested that this invisible material, known as dark matter, might consist simply of ordinary stars too dim for groundbased telescopes to detect.

Instead, the Hubble data upholds the prevailing view that most of the mass in the cosmos consists of exotic material totally unlike the stuff that forms stars.

Although it wasn't certain that the cosmos possessed enough dim stars to account for dark matter, the option seemed plausible to some astronomers. Faint stars tend to have a low mass.

And just as many more small pebbles than large rocks exist on a beach, the Milky Way contains many more low-mass stars than large, massive stars. In our stellar neighborhood, the number of faint, low-mass stars known as red dwarfs nearly equals that of all types of more massive stars put together.

Given the number of red dwarfs visible from Earth, scientists reasoned that the supply of stars lower in mass - those too faint to be seen from the ground - should be higher. These unseen dwarfs might constitute the dark matter.

But two groups of astronomers using Hubble to search for red dwarfs 100 times dimmer than those visible from Earth found far fewer than expected. They reported their results last week at a press briefing in Washington, D.C.

One team, led by Francesco Paresce of the European Space Agency and the Space Telescope Science Institute in Baltimore, examined the globular cluster NGC 6397, a star-packed region 7,200 light-years from Earth.

"I expected to see a carpet of faint stars covering the cluster," says Paresce. "But I was astonished instead to find just a few faint stars; you could see right through the cluster."

Another group, led by John N. Bahcall of the Institute for Advanced Study in Princeton, N.J., and Andrew Gould of Ohio State University in Columbus, examined patches of the Milky Way chosen at random. It found that dim red dwarfs make up no more than 15 percent of the mass of the Milky Way's spiral disk and no more than 6 percent of the halo, the sphere of gas and stars that surrounds the disk.

The findings, Paresce says, indicate that faint red dwarfs are too scarce to account for dark matter - at least in the Milky Way. Moreover, nature seems to impose a cutoff on

star formation: Stars smaller than 20 percent of the mass of the sun don't seem to exist in our galaxy or perhaps anywhere else in the universe. That's a surprise, because in theory, agglomerations of gas and dust as small as 8 percent of the mass of the sun can shine as stars.

The observations don't directly exclude the possibility that dark matter may reside in brown dwarfs - proposed objects, lower in mass than red dwarfs, that don't emit light. David N. Schramm of the University of Chicago notes that some component of dark matter must take the form of ordinary matter in order to explain the abundance of light elements forged in the Big Bang.

*R. Cowen*

Sciences News Nov 26, 1994 Pg 357

### **Donations Accepted**

Mike would accept a donation of a 720 DPI Color Bubblejet printer. Any person or persons that would like to get one for him would be thanked a lot. After all, he only wants one to improve the quality of this newsletter, and not for his own personal gains.