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# The Shoreline Observer

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## *Newsletter for the Shoreline Amateur Astronomical Association*

**President** - Mark Logsdon    **Vice President** - Gary Stroven    **Secretary/Treasurer** - Phil Sherman

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March 1994

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### **March Meeting**

The March meeting of the Shoreline Amateur Astronomical Association will be held on Thursday March 17th, beginning promptly at 7:00 PM in the West Ottawa Middle School Planetarium.

Business meeting.

Sandy will give a tour of the March night sky.

Pete will present part two of the slide show on the Solar System.

Phil will bring refreshments.

### **Minutes of SA<sup>3</sup> Meeting 2-17-94**

Treasurers Report: \$303.63.

Article III, Section I of the constitution was amended by an unanimous vote. The term of office for current officers will expire as scheduled this autumn. Thereafter, term of office will last two years.

Pete put forth several good reasons why we should have a Westshore Mall display this year. So, as in recent years, SA<sup>3</sup> will present one. The associated poster contest is also a "Go".

Sandy noted that the West Ottawa Middle School Planetarium's telephone "Hot Line" will carry a daily sound bite from "Star Date", the syndicated astronomical radio show. Dial 786-1200 and punch in #4344 on your touch tone phone. Thank you Sandy!

Gary demonstrated the work he has done to vastly upgrade the 6" reflector housed at the planetarium. A dobsonian mount, handily made, now supports the scope. Eyepieces were found in storage also. Thank you Gary! Tremendous improvement!

Bill outlined the Muskegon group's plans for May 10- annular eclipse day. A trek to the centerline in Indiana is on tap and it looks to be of interest to several members. Bill's new phone number is 798-7660.

Mark relayed Mike's request for members to submit written accounts of their interest in astronomy. Why do we enjoy the

hobby? They will be printed in the April newsletter to coincide with Astronomy Day. Inquiring minds want to know!

Welcome David Harvey to SA<sup>3</sup>.

## Astro Quiz

by Mike Henry

Every month I will print 5 questions about astronomy. Bring the correct answers to me at the next meeting. When you get 25 questions correctly answered then you will win a gift certificate from Great Lakes Pizza Co.

Last months answers: 1-4 2-Galicticos 3-88 4-Ecliptic 5- -26.72.

- 1) If the celestial globe is divided into 24 hours, then how many degrees are in a minute?  $\frac{1}{4}^{\circ}$
- 2) The angular distance between Dubhe and Merak is about 5.4 degrees.
- 3) To the nearest second, how long is a sidereal day? 23h 56m 4s.091
- 4) What is the radiation law that states that the total energy emitted by a blackbody is proportional to the fourth power of its absolute temperature? Stephan - Boltzman Law
- 5) A nova, as opposed to a supernova, refers to any star which appears very suddenly to become bright in the sky.

## March Star Party/ Messier Marathon

This months Star Party will be Friday March 11th OR Saturday March 12th if the weather doesn't cooperate on Friday. We will be meeting at Vivekananda Monastery (see map in Jan newsletter). Expect a phone call from one of the board members on Friday or Saturday to "confirm the weather".

Since March makes for an excellent month to view almost all of the Messier objects, we will be having a Messier Marathon. This means that we will be viewing M objects all night long, so come prepared for some intense viewing! Binoculars, chair, warm clothes, snacks, drinks, a blanket and a red flash light are just some things you may want to bring.

## New evidence for planets orbiting a pulsar

After two years of additional study, a radioastronomer reports "irrefutable" evidence confirming the existence of two planets orbiting a dense Milky Way star. Estimated at about three times the mass of Earth, these planets would be the first identified outside the solar system.

Alexander Wolszczan of Pennsylvania State University in University Park reported his initial planetary finding in 1992, after studying radio emissions from a compact star some 1,300 light years from earth. Now dubbed PSR B1257+12, this dense resident of the Virgo constellation is a millisecond pulsar--a neutron star that rotates like clockwork hundreds o

times a second. A millisecond pulsar acts like lighthouse beacon, aiming radio waves toward Earth at precise intervals.

But in studying the pulsar with the 305-meter radio telescope at Arecibo Observatory in Puerto Rico, Wolszczan detected small fluctuations in the arrival time of the star's radio signals. Some of the waves arrived about three-thousandths of a second sooner than predicted, while others arrived about three-thousandths of a second later.

The variations suggested that the pulsar wobbles, moving closer to and farther from Earth in a quasiperiodic fashion. Wolszczan and a colleague concluded that the best explanation for the wobbling would be the gravitational tug supplied by two or possibly three unseen planets orbiting the pulsar (SN: 11/92, p. 20).

Because it's unlikely that current telescopes could detect the dim, faraway planets directly, Wolszczan searched for other ways of verifying his finding. In the Jan. 23, 1992 NATURE, a team of astronomers, including Frederic A. Rasio, now at the Institute for Advanced Study in Princeton, N.J., suggested a strategy. Given the special relationship between the orbital periods of two of the proposed planets, their mutual gravitational tug should produce a tiny additional wavering of the pulsar's radio signals. This wavering, produced by an extra wobble in the pulsar's motion as the two planets alter each other's orbit, should be detectable within a few years, the astronomers noted.

At a January meeting in Aspen Colo., Wolszczan announced that after analyzing three years of emissions from the pulsar, he had found the predicted wavering, a variation of a few millionths of a second in the arrival time of radio signals detected between 1990 and 1993. Astrophysicist Stephen E. Thorsett of the California Institute of Technology in Pasadena describes Wolszczan's work in the Feb. 24 NATURE.

"To me the evidence is now irrefutable," says Rasio. "It's the first time we've known for sure that there is a planetary system other than our own." He adds that noise in the data or the motion of the pulsar across the sky could not create the pattern of radio-wave emissions observed.

Wolszczan says the additional data confirm his 1992 report that at least two planets orbit the pulsar. One planet, he says, lies about one-third of an astronomical unit (AU)--the mean distance between Earth and the sun, nearly 93 million miles--from the dense star and has an orbital period of 66.6 Earth-days. The other lies about half an AU from the star and takes 98.2 Earth-days to orbit it. The data also reveal another orbiting body, which has a mass similar to our moon, and hint that other planets of unknown mass lie at least 5 AU from the star.

Although the known masses and orbits of the pulsar planets resemble that of Earth, their composition is likely to be quite different, Wolszczan notes. Astronomers theorize that planets arise from a disk of gas and dust encircling a star. Because a millisecond pulsar

is elderly and most likely formed planets much later in life than the infant sun, its planets probably contain far more iron and other heavy elements typical of older stars, he says.

R. Cowen

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# How many astronomers does it take to screw in a lightbulb?

None.  
First the guy up for turning on the  
light. One to screw it in, and two to

(Read answer in the mirror)