

The Shoreline Observer



Newsletter for the

Shoreline Amateur Astronomical Association

October 1996

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October Meeting

The October meeting of SAAA will be held on Thursday October 17th at 7:00 PM in the West Ottawa Middle School Planetarium.

- ♦ Business Meeting.
- ♦ Sandy will give a tour of the October night sky.
- ♦ Randy Schut will speak on Basic Research of the Astrophysicist.
- ♦ Bill will be bringing refreshments.

Treasurers Report

As of May 9, 1996: \$244.52

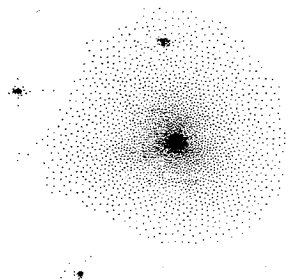
October Observations

Planets: Brilliant Venus rises 3 hours before sunrise; in E to ESE at dawn. Faint Mars is 14 to 32 degrees upper right of Venus. Both planets have very pretty conjunctions with Regulus this month, described in Skywatcher's Diary and illustrated on our Sky Calendar. Mercury Oct 1-19 is very low in E, 23 to 29 deg lower left of Venus. Saturn sets in W in twilight first two weeks, in predawn darkness rest of October. Bright Jupiter is in S to SSW at dusk; the Moon is nearby on Oct. 17 and 18. Saturn is in E to ESE at dusk, higher as month progresses; the Moon passes nearby on the night of Oct. 23.

Comet Hale-Bopp may outshine zero magnitude in March and April 1997. By the end of this month, if the comet behaves well, it may brighten to 4th magnitude. Until it sinks from view in late December, best time to see the comet remains around end of twilight, about 1-1/2 hours after sunset.

Comet Tabur, discovered August 19, glows between 6th and 5th magnitude during October. As the Moon wanes during the first week, Comet Tabur becomes an easy predawn object for binoculars provided skies are dark. During Oct. 12 through 21, Comet Tabur passes through the bowl and near the han-

dle, ending within a degree of the handle's end star, Eta in Ursa Major, on Oct. 21. By that date, the comet's motion has slowed to 2 degrees per day. Four additional mornings remain dark and moonless, with the comet moving 5 degrees lower left of Eta UMa by Oct. 24. Bright moonlight interferes Oct. 25-27, then the best viewing shifts to evening, about 1-1/2 hours after sunset. On Oct. 28, the comet is in the NW as darkness falls, 12 deg left of Eta Uma (end of Big Dipper's handle) and within 4 deg lower right of 3.5-mag Beta in Bootes, the star at the top of that kite-shaped constellation. By nightfall on Oct. 31, Comet Tabur passes within a degree below Beta Boo and is 16 deg from Eta Uma. By Nov. 3, the comet's motion slows to 1 degree per day.



Reverse Image of Comet Tabur

QUIZ TIME

What Star am I?

"What star am I?" is a new feature for our newsletter. Enigmatic clues as to the identity of a star currently placed in the sky are revealed. Who will solve the mystery?

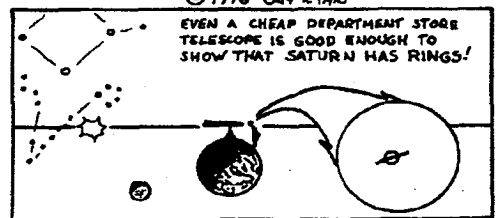
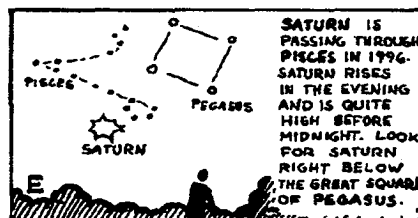
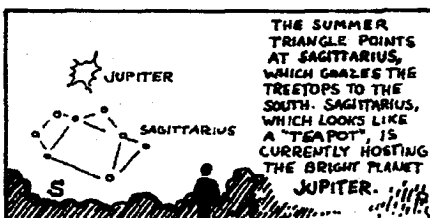
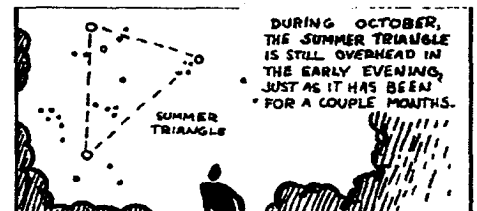
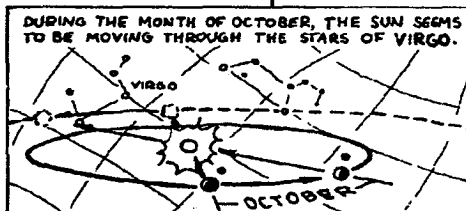
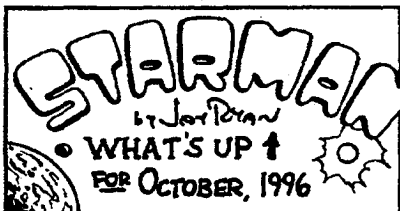
*I am easily triangulated
(even though it is now fall)*

*My colors are of topaz yellow and
blue
(through a telescope visible to all)*

*Truly a "star" at a star party
(my beauty is at your beck and
call)*

What star am I?

Keep looking up!
Mark



Firm Evidence of Milky Way Black Hole

Astronomers have speculated for 25 years that a monster lurks at the center of the Milky Way. Now they appear to have proof.

The beast in our cosmic backyard is a black hole — a dark, dense object as massive as 2.5 million suns crammed into a space the size of the solar system.

Over the years, two pieces of evidence have provided the strongest support for the idea of a black hole at the center of our galaxy. In 1974, researchers discovered a compact, powerful radio source, called Sagittarius A*. Scientists suggested that the emissions represent the last gasps of gas falling into this candidate black hole.

Other astronomers, including Reinhard Genzel of the Max Planck Institute for Extraterrestrial Physics in Garching, Germany, found hints of a black hole in measurements of the velocity of stars close to the center of the Milky Way. Stars within 1.5 light-years of that core whip around at a furious rate, they discovered. Researchers surmised that the rapidly orbiting stars are caught in the stranglehold of an unseen resident

-- an extremely massive, compact object too dense and too dark to be an ordinary grouping of stars.

That line of reasoning has an admitted shortcoming. Of the three components of the stars' velocity, astronomers had measured only one -- the back-and-forth motion along the line of sight to Earth. Such motion is relatively easy to detect: Light emitted by an object moving toward Earth is shifted to bluer, or shorter, wavelengths; light emitted by an object moving away is shifted to redder, or longer, wavelengths.

Measuring the other two components, which represent the motion of stars across the sky, presented a more formidable task. Most scientists assumed that the unmeasured components would be comparable to the line-of-sight velocity. In the unlikely event

that the stars move much more slowly across the sky than they do along the line of sight to Earth, the unseen heavyweight need not be as massive or compact as a black hole.

Using the European Southern Observatory's New Technology Telescope in La Silla, Chile, Genzel and his Max Planck colleague Andreas Eckart homed in on 40 stars -- most lying within 0.3 light-year of the galactic core -- and tracked their motion across the sky for 4 years. They now report that the velocities of the 20 stars whose motion they could reliably measure are indeed similar to the component along the line of sight. In addition, velocity falls off significantly at distances farther from the center.

Taken together, the new and previous velocity measurements provide strong evidence that a massive, dark object lies within 0.05 light-year of Sagittarius A*, Genzel and Eckart report in the Oct. 3 *Nature*.

"It's clear that they have closed a major loophole," says Mark Morris of the University of California, Los Angeles. "Astronomers will now have to face the fact that there's a large concentration of dark matter right at the nucleus."

The researchers note that their study still allows the possibility of a cluster of star-sized black holes at the galaxy's center, but they believe a single, massive black hole is more likely. Higher-resolution observations are likely to disprove the cluster model, Morris notes. A team led by UCLA's Andrea M. Ghez plans such a study with the W.M. Keck Telescope atop Hawaii's Mauna Kea.

In another study, Susan R. Stolovy of Cornell University and her colleagues have produced the first mid-infrared image of an object that seems to coincide with Sagittarius A*. The infrared emission they detect is greater than that predicted by some models of the suspected black hole. The emission might come from dust associated with material falling onto the black hole, the team reports in the Oct. 10 *Astrophysical Journal Letters*.