

## Tri City Astronomy Club Prime Focus

### September 2010 Issue

Oregon Star Party Sunset with the Moon and Venus - Art Stithem

**Next Meeting:** September 16, 2010, 7:30 pm, at the  
*All Saints Episcopal Church, 1322 Kimball, Richland, WA.*

### Club News

The Club Meeting for August was held on the 19th.

- It was reported that the LIGO/TCAC joint event “Friday Sky Night” (which coincided with the Perseid Meteor Shower, Friday 8-13-10) was a great success! An estimated 400 to 500 people came out to view movies, the Perseids, and the excellent night sky (M31 was visible naked-eye). Bobbie, Paul, Wayne #1, Thom, Steve, Gary, Dale and former member Thomas Pearson were on hand with 5 telescopes for public viewing. It was a very good night, and a very good crowd!
- Messier Marathon #3 @ Rattlesnake Shooting Facility (8-14-10) was not so good; smoke from two local range fires spoiled the viewing. Paul, Robbie, Thom, Gary were on hand, but with no public interest and poor viewing, retired early.
- Club members Art, Mark, and Phil attended the Oregon Star Party, August 9th - 12th. Mark reported that the event was well attended and, except for a thunder shower on Tuesday night, went well. Guests Theresa and David Campbell reported Table Mountain attendance was down this year. Event organizers reported approximately 640 attendees.
- Attendance at the Table Mountain Star Party was also reported to be down from previous years, but the weather was generally good.

## Upcoming Club Events:

- The [Blue Mountain Star Party](#) is scheduled for Sept. 9th to Sept 12th. Directions are on the club web site.
- September 17th, [Lynnwood Loop Public Viewing](#).
- Dr. Story Musgrave, NASA Scientist-Astronaut who served onboard all of the Space Shuttles and performed in-space-repairs to the Hubble Telescope, will speak at Columbia Basin College October 7th. <http://www.storymusgrave.com>
- Tentative, stay tuned... **Astronomy Day at LIGO**, another LIGO/TCAC joint event, October 16th ... maybe.

## Astronomy News

### The Turbulent Tale of a Tiny Galaxy

by Trudy Bell and Dr. Tony Phillips

Next time you hike in the woods, pause at a babbling stream. Watch carefully how the water flows around rocks. After piling up in curved waves on the upstream side, like the bow wave in front of a motorboat, the water speeds around the rock, spilling into a riotous, turbulent wake downstream. Lightweight leaves or grass blades can get trapped in the wake, swirling round and round in little eddy currents that collect debris.

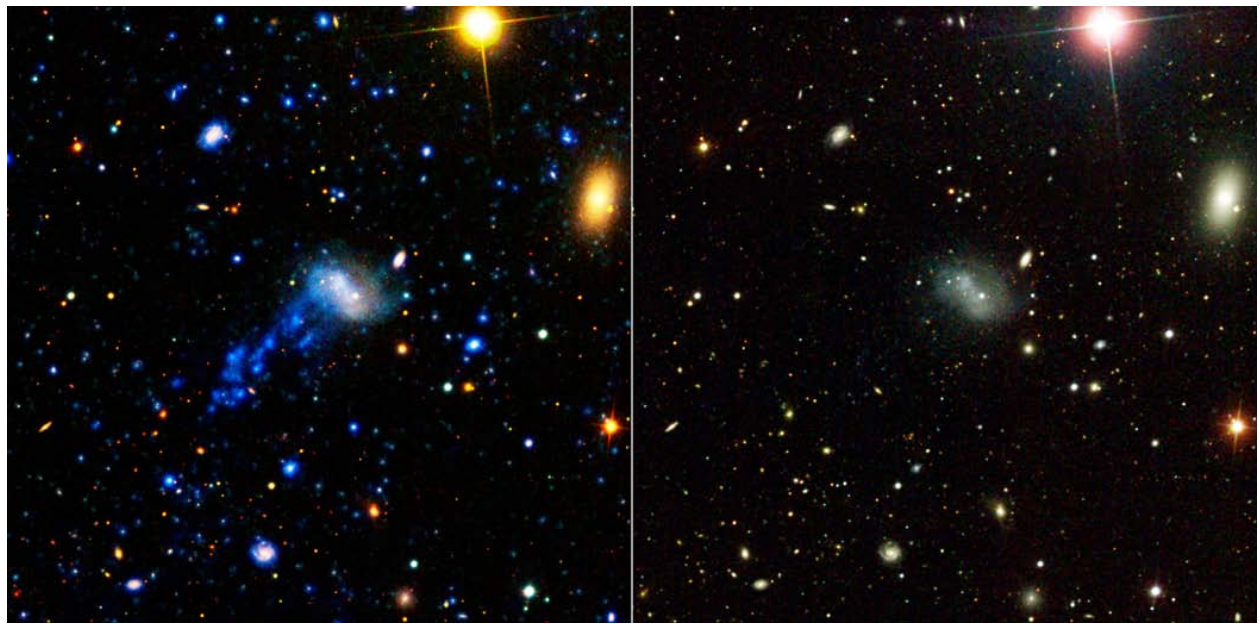
Astronomers have found something similar happening in the turbulent wake of a tiny galaxy that is plunging into a cluster of 1,500 galaxies in the constellation Virgo. In this case, however, instead of collecting grass and leaves, eddy currents in the little galaxy's tail seem to be gathering gaseous material to make new stars.

“It’s a fascinating case of turbulence [rather than gravity] trapping the gas, allowing it to become dense enough to form stars,” says Janice A. Hester of the California Institute of Technology in Pasadena.

The tell-tale galaxy, designated IC 3418, is only a hundredth the size of the Milky Way and hardly stands out in visible light images of the busy Virgo Cluster. Astronomers realized it was interesting, however, when they looked at it using NASA's Galaxy Evolution Explorer satellite. “Ultraviolet images from the Galaxy Evolution Explorer revealed a long tail filled with clusters of massive, young stars,” explains Hester.

Galaxies with spectacular tails have been seen before. Usually they are behemoths—large spiral galaxies colliding with one another in the crowded environment of a busy cluster. Tidal forces during the collision pull gas and stars of all ages out of these massive galaxies to form long tails. But in IC 3418, the tail has just young stars. No old stars.

“The lack of older stars was one tip-off that IC 3418’s tail isn’t tidal,” says Hester. “Something else must be responsible for these stars”



*In the ultraviolet image on the left, from the Galaxy Evolution Explorer, galaxy IC 3418 leaves a turbulent star forming region in its wake. In the visible light image on the right (from the Sloan Digital Sky Survey), the wake with its new stars is not apparent.*

Hester and eight coauthors published their findings in the June 10, 2010, issue of *The Astrophysical Journal Letters*. The team described the following scenario: IC 3418 is speeding toward the center of the Virgo cluster at 1,000 kilometers per second. The space between cluster galaxies is not empty; it is filled with a gaseous atmosphere of diffuse, hot hydrogen. Thus, like a bicyclist coasting downhill feels wind even on a calm day, IC 3418 experiences “a stiff wind” that sweeps interstellar gas right out of the little galaxy, said Hester—gas that trails far behind its galaxy in a choppy, twisting wake akin to the wake downstream of the rock in the babbling brook. Eddy currents swirling in the turbulent wake trap the gas, allowing it to become dense enough to form stars.

“Astronomers have long debated the importance of gravity vs. turbulence in star formation,” Hester noted. “In IC 3418’s tail, it’s ALL turbulence.”

To many astronomers, that’s a surprising tale indeed.

See other surprising UV images from the Galaxy Evolution Explorer at <http://www.galex.caltech.edu>. Kids (and grownups) can play the challenging new Photon Pileup game at <http://spaceplace.nasa.gov/en/kids/galex/photon/>.

## Fireball On Jupiter

On August 20th at 18:22 UT, two amateur astronomers in Japan independently recorded an apparent impact on Jupiter. Masayuki Tachikawa of Kumamoto city was first to report the event. His [movie of the fireball](#) shows the fireball scintillating (twinkling) along with other features on the planet -- persuasive evidence that this is a genuine event on Jupiter. Soon after Tachikawa made his report, Tokyo amateur astronomer Kazuo Aoki realized that he had [recorded the fireball](#), too:



Image credit: *Kazuo Aoki*

The ~800 km separation of the two observers rules out an event near Earth and reinforces the association of the fireball with Jupiter. The most likely explanation: A small comet or asteroid hit the giant planet.

This is the third time in only 13 months that amateur astronomers have detected signs of impact on Jupiter. The earlier events occurred on July 19, 2009, and June 3, 2010. Jupiter is getting hit more often

than conventional wisdom would suggest, leading many researchers to call for a global network of telescopes to monitor Jupiter 24/7 and measure the impact rate.

"Like the event of June 3rd, this fireball did not produce any visible debris," notes John Rogers, director of the British Astronomical Association's Jupiter section. "[Here](#) are some hi-resolution images taken 1-2 rotations before and 1-2 rotations after the event. As the observers commented, there was no visible mark (not in RGB, nor UV, nor methane), post-impact. Dark brown spots on the North Equatorial Belt were already there before the fireball."

### Kepler's Transit Trio

NASA has announced the discovery of two Saturn-size planets, as well as one likely Earth-size planet, all transiting a star called Kepler 9. This is the first confirmed planetary system with more than one planet transiting the same star.



This artist's concept illustrates the two Saturn-sized planets discovered by NASA's Kepler mission. The star system is oriented edge-on, as seen by Kepler, such that both planets cross in front, or transit, their star, named Kepler-9. This is the first star system found to have multiple transiting planets. Image credit: *NASA/Ames/JPL-Caltech*

The measurements were made using NASA's Kepler spacecraft and were confirmed by the W. M. Keck Observatory in Hawaii. The observations are published in the journal *Science*.

"This system of planets is a thrilling example of the Kepler mission's power," said co-author Tim Brown, scientific director of the Las Cumbres Observatory Global Network.

"It is astounding that Kepler can show us, circling one star, a pair of planets that pull each other's orbits around, and also an object

that is likely a planet not much bigger than the Earth," he said. "Rich systems like this one will be the best laboratories for understanding how planets form, and how planetary systems evolve."

The Kepler mission looks for the data signatures of planets by measuring tiny decreases in the brightness of stars when planets transit or cross in front of them. In June of this year, mission scientists announced that the mission has identified more than 700 planet candidates, including five candidate systems that appear to have more than one transiting planet.

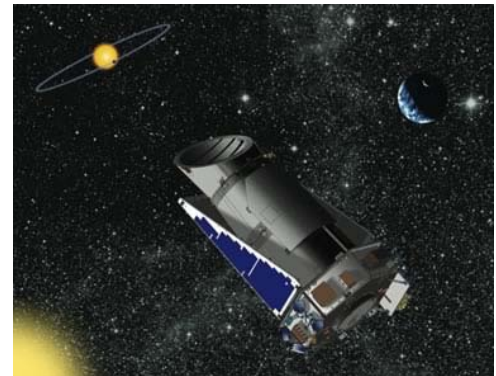
The more massive planets were named Kepler-9b and 9c. The observations show Kepler-9b is the larger of the two planets, and both have masses similar to but less than Saturn. Kepler-9b lies closest to the star with an orbit of about 19 days, while Kepler-9c has an orbit of about 38 days.

By observing several transits by each planet over the seven months of data, the time between successive transits could be analyzed.

The data suggest the transits of a super-Earth-sized planet about 1.5 times the radius of Earth in a scorching, near-Sun 1.6 day-orbit. Additional observations are required to determine whether this signal is indeed a planet or an astronomical phenomenon that mimics the appearance of a transit.

Launched in 2009, the Kepler space-borne telescope is designed to search the nearby region of our galaxy for planets the size of Earth, orbiting in the habitable zone of stars similar to our Sun. Scientists describe the habitable zone as the region around a star where temperatures permit water to be liquid on a planet's surface.

Liquid water is considered essential for the existence of life as we know it. Therefore, the challenge for Kepler is to look at a large number of stars in order to statistically estimate the total number of Earth-size planets orbiting Sun-like stars in the habitable zone. Kepler will survey more than 100,000 stars in our galaxy.



NASA's Kepler spacecraft was launched from NASA's Kennedy Space Center on March 6.  
Credit: NASA

## Club Info

**Club Meetings:** on the 3<sup>rd</sup> Thursday of each month. 7:30pm – 9:00 pm, at All Saints Episcopal Church, 1322 Kimball, Richland, WA. You do not have to be a member to attend.



Tri-City Astronomy Club  
P.O. Box 651  
Richland, WA 99352

[www.tricityastronomyclub.org](http://www.tricityastronomyclub.org)

<b>President:</b> Paul Rittmann paulrittmann@gmail.com	<b>Vice-President:</b> Thom Ahl thomahl@msn.com
<b>Secretary:</b> Gary Maupin garymaupin@aol.com	<b>Treasurer:</b> Mark Bryant mw.bryant@hotmail.com
<b>Program Coordinator:</b> Paul Rittmann paulrittmann@gmail.com	<b>Web Master/Prime Focus Editor:</b> Art Stithem <a href="mailto:webmaster@tricityastronomyclub.org">webmaster@tricityastronomyclub.org</a>
<b>Refreshments:</b> Barbara Rittmann	<b>Scholastic Programs:</b> Wayne (#1) Richey 375-0533

# TCAC Sky Events Calendar

## September 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	 1 Venus 45.3° E Last Quarter 10:22	2 Moon N Dec 04:20	3 Mercury Infer 05:29 Moon D Node 17:16	4
5 Mars-Spica 10:03	6	7 Moon Perigee 21:00 <b>Challenge No. 10:</b> See a very, very old Crescent Moon	 8 New Moon 03:30	9	10	11 Moon-Venus 06:05
				<a href="#">Blue Mountain Star Party</a>		
12	13 Mercury-Reg. 04:14 Moon-Antares 22:55	 14 Moon S Dec 16:47 First Quarter 22:50	15	16 <a href="#">Club Meeting</a> Moon A Node 06:56	17 <a href="#">Lynnwood Loop</a>	18
19 Mercury West 09:59	20	21 Moon Apogee 01:03 Jupiter Opp 05:11 Uranus Opp 09:42	22 Autumn Eq 20:09	 23 Full Moon 02:17	24	25
26	27 Moon-Pleiades 22:32	28	29 Moon N Dec 10:37	 30 Saturn Sun 17:18 Moon D Node 19:42 Last Quarter 20:52	1	2

Sky Events Calendar by Fred Espenak and Sumit Dutta (NASA's GSFC)  
All event times are given for Pacific Daylight Time (UTC -7:00).

On the Website Calendar of Events, all dates for 1<sup>st</sup> Quarter Moon will be held at Lynnwood Loop Park from March until October. Other public viewing events maybe also scheduled at LIGO. New moon dates will be announced at monthly club meetings and locations are optional as we have several to choose from.