

June 2006

**Special points of interest:**

- Dark Sky Site Selection
- Comet
- How Super Earths Might Form

## June Meeting:



**Wednesday, June 21**

**Speaker: "To Be Announced"**

The meetings begin at 7:30 P.M., but come as early as you like since many members will be there ahead of time to share their latest activities in astronomy. We generally have a presentation on some topic of interest to amateur astronomers by club members or guest speakers, or occasionally special programs devoted to astronomical computing, members' telescope equipment, and the like. In addition, we have a number of active astrophotographers, and generally reserve time to show slides of their latest efforts.

## Meeting Information

Wednesday, June 21  
7:30 p.m.

Physics-Astronomy Building  
Room A102  
University of Washington  
Seattle

*Come early at 7 p.m. for coffee  
and snacks and to visit with  
your fellow members!*



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# Seattle Astronomical Society

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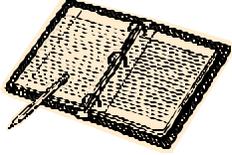
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## From the President's Desk...

# Dark Sky Site Selection

*By Thomas Vaughan*

## Dark Sky Site Selection

In May we had the second Dark Sky Site members meeting. We elected three Dark Sky Site members to serve on the Dark Sky Site governing board:

- Ray Michlig
- Maxine Nagel
- Bob Suryan

Congratulations to the new board members! Scott Cameron and Thomas Vaughan are the other two members of the governing board, as SAS Treasurer and President respectively.

Another outcome of the meeting was the agreement that we had enough money and member commitments to purchase and improve a site costing \$20K or less. So we are now actively looking for dark sky sites in Eastern Washington that meet our criteria:

- Minimum of 8-9 months of accessibility.
- Dark sky.
- Maximum 3 hours drive from Seattle.
- 2-4,000 feet altitude.
- Accessible without 4 wheel-drive.
- Southern sky exposure.
- Not too windy.
- Flat areas for scopes/parking.
- Around 20 acres.

Since the meeting, several members have made excursions out to Eastern Washington to inspect sites, and the Dark Sky governing board members have been talking to real estate agents and scouring websites looking for properties. We hope to have some candidate sites selected soon! At the moment we have 29 Dark Sky Site members, with more joining each month. Purchasing a site in 2006 is a real possibility.

It's not too late to join the Dark Sky Site effort! You can check out the progress, and print out a membership form, at <http://www.seattleastro.org/dark-sky.html>.

## SAS Gear at CafePress.com

Want an SAS t-shirt, mug, or hat? We have set up a store with SAS gear at CafePress: <http://www.cafepress.com/seattleastro>. Have suggestions for other offerings at the store? Let us know!

Many thanks to Chris Karcher for setting this up. We are selling these items at cost to keep the prices as low as possible.

## SAS Picnic

Thanks to all who came out for the SAS picnic at Greenlake on June 3rd! We had our telescopes out, and more than a few passers-by stopped to ask questions about the SAS. It was a great day to sit out on the grass, enjoy the sun, and cook on the grill. Hopefully this is the beginning of a yearly tradition.

## July Events

Don't forget: Table Mountain is July 20th - 22nd. And if you aren't going to Table Mountain, consider stopping by TrailsFest 2006 at Rattlesnake Lake (<http://www.wta.org/trailsfest/>). The SAS will be there, along with a lot of other area organizations, Saturday July 22nd.

Happy Observing-

-Thomas

# SAS May 2006 Club Meeting Minutes



## **Announcements:**

Information is needed regarding SAS history. Specifically, when was SAS originally founded?

Registration is still open for the Table Mountain Star Party, but hurry -- attendance is limited and filling fast.

SAS will have a booth at TrailsFest, which will be held at Rattlesnake Lake on 7/22

The SAS Dark Sky Site now has 27 members and about \$17K in the coffers. We are nearly ready to begin a property search in earnest. This will no doubt require a number of field trips to view prospective properties. During the Dark Sky Site members' meeting held on 5/10, Dark Sky Site board members Ray Michlig, Maxine Nagel and Bob Suryan were elected.

An SAS picnic and telescope tune-up will be held at Greenlake near the Bath House Theatre, starting at 11:00AM on 6/3, followed that evening by the monthly Greenlake star party.

Rattlesnake Lake after-hours access for SAS members is currently undergoing revision due to the increased security requirements regarding the Cedar River Watershed.

## **Meeting Topic:**

Ken Crowell provided an inspiring and informative talk based on information in his book, Ten Worlds: Everything That Orbits the Sun.

Meeting was adjourned around 9:00PM.

# Comet

A comet (KOM iht) is an icy body that releases gas or dust. Most of the comets that can be seen from Earth travel around the sun in long, oval orbits. A comet consists of a solid nucleus (core) surrounded by a cloudy atmosphere called the coma and one or two tails. Most comets are too small or too faint to be seen without a telescope. Some comets, however, become visible to the unaided eye for several weeks as they pass close to the sun. We can see comets because the gas and dust in their comas and tails reflect sunlight. Also, the gases release energy absorbed from the sun, causing them to glow.

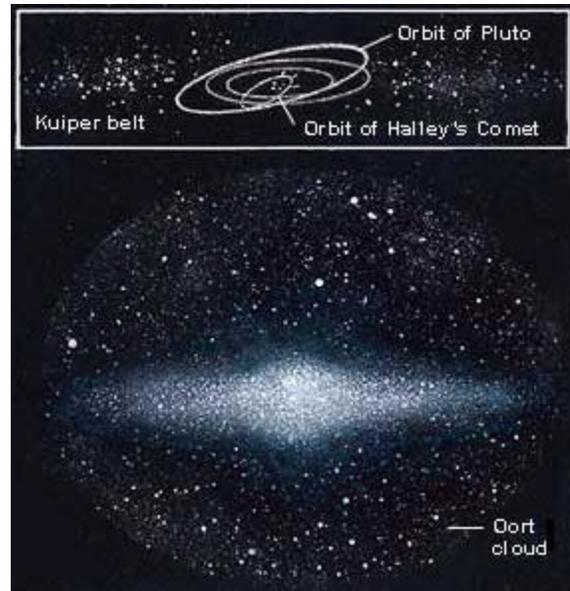
Astronomers classify comets according to how long they take to orbit the sun. Short-period comets need less than 200 years to complete one orbit, while long-period comets take 200 years or longer.

Astronomers believe that comets are leftover debris from a collection of gas, ice, rocks, and dust that formed the outer planets about 4.6 billion years ago. Some scientists believe that comets originally brought to Earth some of the water and the carbon-based molecules that make up living things.

## Parts of a comet

The nucleus of a comet is a ball of ice and rocky dust particles that resembles a dirty snowball. The ice consists mainly of frozen water but may include other frozen substances, such as ammonia, carbon dioxide, carbon monoxide, and methane. Scientists believe the nucleus of some comets may be fragile because several comets have split apart for no apparent reason.

As a comet nears the inner solar system, heat from the sun vaporizes some of the ice on the surface of the nucleus, spewing gas and dust particles into space. This gas and dust forms the comet's coma. Radiation from the sun pushes dust particles away from the



*Comets that pass near the sun come from two groups of comets near the outer edge of the solar system, according to astronomers. The disk-shaped Kuiper belt contributes comets that orbit the sun in fewer than 200 years. The Kuiper belt lies beyond Pluto's orbit, which extends to about 4.6 billion miles (7.4 billion kilometers) from the sun. The Oort cloud provides comets that take longer to complete their orbits. The outer edge of the Oort cloud may be 1,000 times farther than the orbit of Pluto. Image credit: World Book diagram by Terry Hadler, Bernard Thornton Artists*

coma. These particles form a tail called the dust tail. At the same time, the solar wind -- that is, the flow of high-speed electrically charged particles from the sun--converts some of the comet's gases into ions (charged particles). These ions also stream away from the coma, forming an ion tail. Because comet tails are pushed by solar radiation and the solar wind, they always point away from the sun.

Most comets are thought to have a nucleus that measures about 10 miles (16 kilometers) or less across. Some comas can reach diameters of nearly 1 million miles (1.6 million kilometers). Some tails extend to distances of 100 million miles (160 million kilometers).

### **The life of a comet**

Scientists think that short-period comets come from a band of objects called the Kuiper belt, which lies beyond the orbit of Pluto. The gravitational pull of the outer planets can nudge objects out of the Kuiper belt and into the inner solar system, where they become active comets. Long-period comets come from the Oort cloud, a nearly spherical collection of icy bodies about 1,000 times farther away from the sun than Pluto's orbit. Gravitational interactions with passing stars can cause icy bodies in the Oort cloud to enter the inner solar system and become active comets.

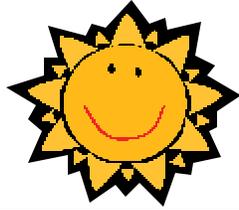
Comets lose ice and dust each time they return to the inner solar system, leaving behind trails of dusty debris. When Earth passes through one of these trails, the debris become meteors that burn up in the atmosphere. Eventually, some comets lose all their ices. They break up and dissipate into clouds of dust or turn into fragile, inactive objects similar to asteroids.

The long, oval-shaped orbits of comets can cross the almost circular orbits of the planets. As a result, comets sometimes collide with planets and their satellites. Many of the impact craters in the solar system were caused by collisions with comets.

### **Studying comets**

Scientists learned much about comets by studying Halley's Comet as it passed near Earth in 1986. Five spacecraft flew past the comet and gathered information about its appearance and chemical composition. Several probes flew close enough to study the nucleus, which is normally concealed by the comet's coma. The spacecraft found a roughly potato-shaped nucleus measuring about 9 miles (15 kilometers) long. The nucleus contains equal amounts of ice and dust. About 80 percent of the ice is water ice, and frozen carbon monoxide makes up another 15 percent. Much of the remainder is frozen carbon dioxide, methane, and ammonia. Scientists believe that other comets are chemically similar to Halley's Comet.

*Read more at:* [http://www.nasa.gov/worldbook/comet\\_worldbook.html](http://www.nasa.gov/worldbook/comet_worldbook.html)



# June 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 UW Astronomy Colloquium	2	3  Green Lake Star Party Paramount Park Star Party
4	5	6	7 UW Campus Observatory public view- ing night	8	9	10 Amateur Telescope Makers SIG Meeting
11 	12	13	14	15	16	17
18 	19	20	21 SAS Meeting UW campus Observatory public viewing night	22 Shingletown Star Party	23 Shingletown Star Party	24 Shingletown Star Party Tiger Moun- tain/Poo Poo Point Star Party
25  Shingletown Star Party	26 Shingletown Star Party SAS Board Meeting	27	28	29	30	



# July 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						<b>1</b> Green Lake Star Party Paramount Park Star Party
<b>2</b>	 <b>3</b>	<b>4</b>	<b>5</b> UW Campus Observatory public viewing night	<b>6</b>	<b>7</b>	<b>8</b> Amateur Telescope Makers SIG Meeting
<b>9</b> Astrophotography/ Imaging SIG Meeting	<b>10</b>	 <b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
<b>16</b>	 <b>17</b>	<b>18</b>	<b>19</b> SAS Meeting	<b>20</b> Table Mountain Star Party	<b>21</b> Table Mountain Star Party	<b>22</b> Table Mountain Star Party
<b>23</b>	<b>24</b> SAS Board Meeting	 <b>25</b>	<b>26</b>	<b>27</b>	<b>28</b> Stellafane	<b>29</b> Stellafane New Member Orientation Meeting Green Lake Star Party Paramount Park Star Party
<b>30</b>	<b>31</b>					

# Not a Moment Wasted

[By Dr. Tony Phillips]



The Ring Nebula. Check. M13. Check. Next up: The Whirlpool galaxy.

You punch in the coordinates and your telescope takes off, slewing across the sky. You tap your feet and stare at the stars. These Messier marathons would go much faster if the telescope didn't take so long to slew. What a waste of time!

Don't tell that to the x-ray astronomers.

"We're putting our slew time to good use," explains Norbert Schartel, project scientist for the European Space Agency's XMM-Newton x-ray telescope. The telescope, named for Sir Isaac Newton, was launched into Earth orbit in 1999. It's now midway through an 11-year mission to study black holes, neutron stars, active galaxies and other violent denizens of the Universe that show up particularly well at x-ray wavelengths.

For the past four years, whenever XMM-Newton slewed from one object to another, astronomers kept the telescope's cameras running, recording whatever might drift through the field of view. The result is a stunning survey of the heavens covering 15% of the entire sky.

Sifting through the data, ESA astronomers have found entire clusters of galaxies unknown before anyone started paying attention to "slew time." Some already-known galaxies have been caught in the act of flaring—a sign, researchers believe, of a central black hole gobbling matter from nearby stars and interstellar clouds. Here in our own galaxy, the 20,000 year old Vela supernova remnant has been expanding. XMM-Newton has slewed across it many times, tracing its changing contours in exquisite detail.

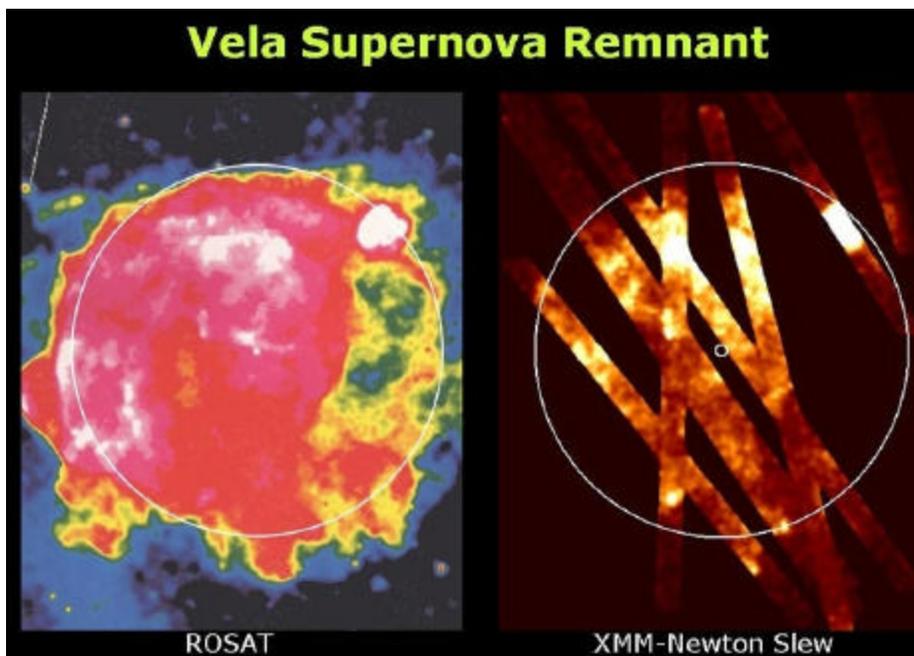
The slew technique works because of XMM-Newton's great sensitivity. It has more collecting area than any other x-ray telescope in the history of astronomy. Sources flit

through the field of view in only 10 seconds, but that's plenty of time in most cases to gather valuable data.

The work is just beginning. Astronomers plan to continue the slew survey, eventually mapping as much as 80% of the entire sky. No one knows how many new clusters will be found or how many black holes might be caught gobbling their neighbors. One thing's for sure: "There *will* be new discoveries," says Schartel.

Tap, tap, tap. The next time you're in the backyard with your telescope, and it takes off for the Whirlpool galaxy, don't just stand there. Try to keep up with the moving eye-piece. Look, you never know what might drift by.

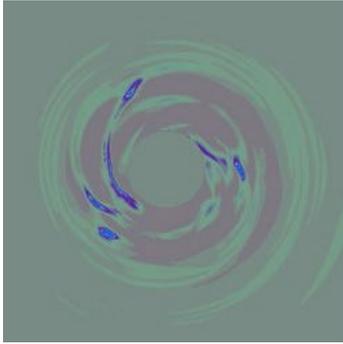
See some of the other XMM-Newton images at <http://sci.esa.int> . For more about XMM-Newton's Education and Public Outreach program, including downloadable classroom materials, go to <http://xmm.sonoma.edu>. Kids can learn about black holes and play "Black Hole Rescue" at The Space Place, <http://spaceplace.nasa.gov/>, under "Games."



*The image on the left is the Vela Supernova Remnant as imaged in X-rays by ROSAT. On the right are some of the slew images obtained by XMM-Newton in its "spare" time.*

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

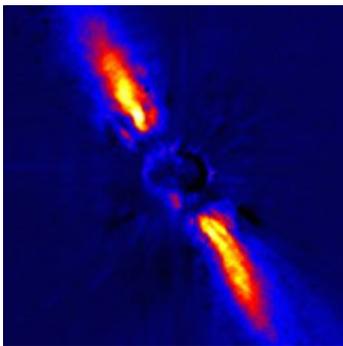
## Space Bits



### How Super Earths Might Form

Although our Solar System only contains a “regular Earth”, astronomers predict that other systems could contain “super Earths”; rocky planets with several times the mass of our planet. A new theory predicts that these planets should be most commonly found orbiting red dwarf stars. As red dwarf stars have less mass, they’re unable to hang onto the lighter gas that go onto form gas giants. The remaining heavier elements have time to form very massive terrestrial planets.

Link: <http://www.universetoday.com/2006/06/09/how-super-earths-might-form/>



### Large Amounts of Carbon Around a Distant Star

Astronomers have discovered a solar system with an unusually high amount of carbon; it could be at the stage where the rocky planets are forming. The system, called Beta Pictoris, is located 63 light-years from Earth and has a central star with twice the mass of our Sun. NASA’s FUSE (Far Ultraviolet Spectroscopic Explorer) and Hubble observed that gas around the star matches the composition of our own Solar System quite well. The stars intense radiation should be driving this gas away, but ionized carbon atoms are acting as a brake to keep it contained.

Link: <http://www.universetoday.com/2006/06/09/large-amounts-of-carbon-around-a-distant-star/>



### Definition of 'Planet' Expected in September

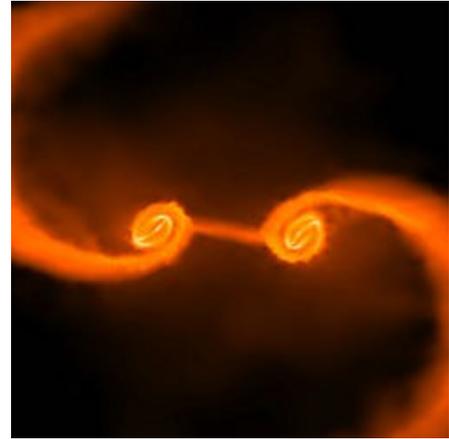
Historians and educators have joined astronomers in an effort to break a deadlock on contentious discussions over a definition for the word *planet*.

A decision is expected in September, but history suggests rewriting the textbooks could be more challenging than finding tiny new worlds at the edge of the solar system.

Link: <http://www.space.com/scienceastronomy/06060>

## Colliding Galaxies Simulated

Just like many businesses, galaxies grow through mergers and acquisitions. As galaxies are made up of countless individual stars, simulating these mergers is tremendously challenging, even for the most powerful supercomputers. A international team of researchers have produced a new simulation that shows how colliding galaxies are connected by a “bridge” of material, and spew out enormous tails of dust and debris. New programming and hardware upgrades have made this kind of simulation possible to do.



Link: <http://www.universetoday.com/2006/06/05/colliding-galaxies-simulated/>



## Mars Analog on Earth: Taking a Trek in the Outback

Astrobiologists explore extreme environments on Earth to understand life. They seek to understand the origin and evolution of life here in order to develop tools and strategies for seeking life on Mars, Europa, and beyond.

Link: [http://www.space.com/searchforlife/0seti\\_outback\\_060608.html](http://www.space.com/searchforlife/0seti_outback_060608.html)

## Space Adventures Confirms Fourth Space Tourist

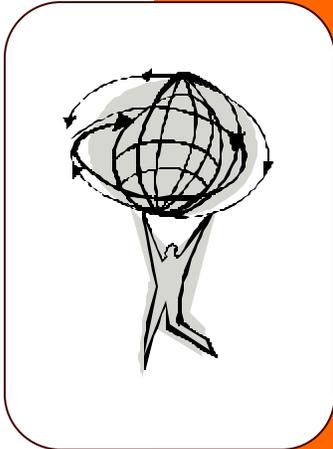
Japanese entrepreneur Daisuke 'Dice-K' Enomoto is officially confirmed to become the world's fourth space tourist later this year, Space Adventures announced today. The company also confirmed that X Prize sponsor Anousheh Ansari will be Enomoto's official backup, putting her in line to become the world's first female space tourist.



Link: [http://www.space.com/news/060607\\_iss\\_ansari.html](http://www.space.com/news/060607_iss_ansari.html)

## We promise you the sun, moon and stars and we deliver...

The Seattle Astronomical Society is an organization created and sustained by people who share a common interest in the observational, educational, and social aspects of amateur astronomy. Established in 1948, the SAS is a diverse collection of over 200 individuals. A variety of programs and activities is presented by the SAS throughout the year. Monthly meetings feature speakers on a wide range of topics, from the Hubble Space Telescope to electronic imaging to personal observing experiences. The club holds public observing "star parties" at Green Lake every month, dark sky observing parties outside Seattle, plus such activities as meteor watches, public telescope and astronomy displays, National Astronomy Day, and an annual Awards Banquet.



We're on the Web!  
[www.seattleastro.org](http://www.seattleastro.org)



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