

## EVENTS CALENDAR

(unless otherwise noted, all events are at the Edwin Ritchie Observatory, Battle Point Park)

### MARCH

MARCH 3

7 p.m. BPAA Board Meeting

MARCH 6

7 p.m. Planetarium Show  
“Andromeda: When Galaxies Collide,” and Star Party

MARCH 7 ●

John Rudolph Memorial  
Planetarium Fund Kiwanis  
Brunch, Wing Point

MARCH 10

“Big Bang to an Immigrant Sun: the Birth and Life of Spiral Galaxies,”  
Science Speakers Series at UW

MARCH 13

7:30 p.m. Members Meeting  
(subject to cancellation; check [www.bpastro.org](http://www.bpastro.org) and [bpaa@yahoo.com](mailto:bpaa@yahoo.com))

MARCH 13

2010 Messier Marathon

MARCH 14

Daylight Saving Time begins

MARCH 15 ●

MARCH 17

“Galactic Gas: Simulating Stellar Birthplaces,” Science Speakers Series at UW

MARCH 20

Vernal Equinox, 10:32 a.m. PDT

MARCH 21

Saturn at Opposition

MARCH 23 ●

MARCH 29 ○

### APRIL

APRIL 4

John Rudolph Memorial  
Planetarium Fund Kiwanis  
Brunch, Wing Point

APRIL 6 ●

APRIL 7

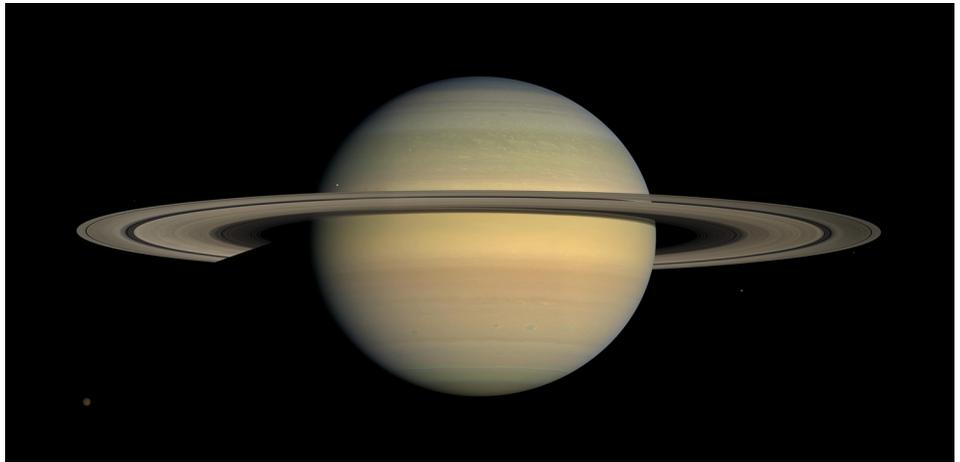
7 p.m. BPAA Board Meeting;  
“Brown Dwarfs: The Little Stars

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# Quarterly

[www.bpastro.org](http://www.bpastro.org) Bainbridge Island, WA



## Vernal Equinox Saturn at Opposition

**CALENDAR NOTES:** Time once again for the spring newsletter. Well, it's about time, I say. We've already had several days of spring-like weather. Spring will arrive officially on March 20. The vernal equinox happens each year when day and night are nearly the same length and when the center of the Sun can be observed to be vertically above the Earth's equator. Perhaps the official arrival of spring will allow us to view Saturn at opposition on March 21 or Mercury and Venus together, just 3.0 degrees apart, on April 3. Best part about the spring sky: the Big Dipper is nearly overhead, providing pointer stars galore for linking many major stars and star groups. The three  
*can't page 2*

## 20" Dobsonian Ready to Roll



BPAA members built the Dobsonian truss tube telescope (a type of Newtonian reflector) around a 20" f/4.3 primary mirror. Doug Tanaka led the project with help from Malcolm Saunders, Stephen Ruhl, Harry Colvin, Dan Caster, Allan Saunders, and David Browning. The basic design is from *The Dobsonian*

*Telescope: A Practical Manual For Building Large Aperture Telescopes*, a wonderful book by Dave Kriege and Richard Berry. This design for large telescopes is portable, easy to set up, and very stable in use. We made several unique changes to the basic design, to be covered in detail in future articles.

This is a large telescope. If you attend any of the annual, regional star parties, you'll see telescopes that are larger, sometimes much larger. But

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That Couldn't," Science Speakers Series at UW

APRIL 10

12:30-3:30 p.m. Telescope Workshop; 8 p.m. Planetarium Show and Star Party

APRIL 11

40th Anniversary Apollo 13 Launch

APRIL 14 ●

APRIL 17

7:30 p.m. Members Meeting (subject to cancellation; check *www.bpastro.org* and *bpaa@yahoogroups.com*)

APRIL 19-25

Astronomy Week *www.astroleague.org/allastroday/astrofacts.html*

APRIL 21 ●

APRIL 24

Space shuttle Discovery launched (1990), deploying Hubble Space Telescope

APRIL 28 ○

## MAY

MAY 2

John Rudolph Memorial Planetarium Fund Kiwanis Brunch, Wing Point

MAY 5 ●

7 p.m. BPAA Board Meeting "Survey Science: The Universe at Our Fingertips," Science Speakers Series at UW

MAY 8

8:30 p.m. Planetarium Show and Star Party

MAY 13 ●-16

Camp Delany Star Party, *www.olympicastronomicalsociety.org*

MAY 15

Members Meeting 7:30 p.m. (subject to cancellation; check *www.bpastro.org* and *bpaa@yahoogroups.com*)

MAY 19

"Earth as an Extrasolar Planet," Science Speakers Series at UW

MAY 20 ●

MAY 27 ○

### CALENDAR, con't from p.1

brightest stars in the spring sky are Regulus, Spica and Arcturus. Arcturus is one of the nearest bright stars. It's a giant, twenty-three times the diameter of our sun. Its pale orange color can be spotted with the naked eye.



If you want to get an early start on the regional star party scene, try the Camp Delany Star Party on May 13–16. It's sponsored by our neighboring club in Bremerton, the Olympic Astronomical Society. I've attended in the past, and it's a great venue, both by day and night. The hosting club is most congenial. More information is available at the club's Web site, listed in the Calendar.

And for those of you hungry for science lectures, try the Science Speakers Series at UW. It's a great concept, a pilot program aimed at helping doctoral candidates explain their research to non-specialists. PhD students are provided with an opportunity to build their skills in communicating with the public about their work. Topics are listed in our calendar. More information on the topics and the speakers can be found at *http://engage-science.com/*. The talks are held in the Physics Astronomy Auditorium Building on campus in Room 118. Doors open at 6:45 p.m., start time is 7:00 p.m. One of the speakers, Rok Roskar, presenting on March 10, gave a talk to BPAA last year.

Join us for our monthly members meetings on March 13, April 17, and May 15. We've reserved the weekend nights closest to the new moon—the best nights for stargazing. We're experimenting with different formats for these meetings—see the February 8 BPAA blog entry at *bpastro.org/blog/*. They are intended to provide members with an opportunity to socialize and share experiences, perhaps accomplish some tasks, and if the skies are clear, have a star party. And don't miss our planetarium shows on March 6, April 10, and May 8. These shows will be accompanied by star parties if the skies are clear. Note that the starting times are 7:00 p.m. in March, 8:00 p.m. in April, and 8:30 p.m. in May.

Astronomy Week is April 19–25. The purpose of this week is to bring astronomy to the people. If the skies are clear, consider practicing a little sidewalk astronomy.—*Diane Colvin, BPAA Events Manager*

Any member who is planning to observe can invite others to join in by sending an email to *bpaa@yahoogroups.com*. To join our email group, send an email with your name to *bpaa-owner@yahoogroups.com* and we can enroll you. If you want to have web access to the messages and files, you can join the Yahoogroups by clicking the register link for new users on *http://groups.yahoo.com/*. Request to join at *http://groups.yahoo.com/group/bpaa/*. The system will send us a message, and we'll approve your request after we verify your membership.

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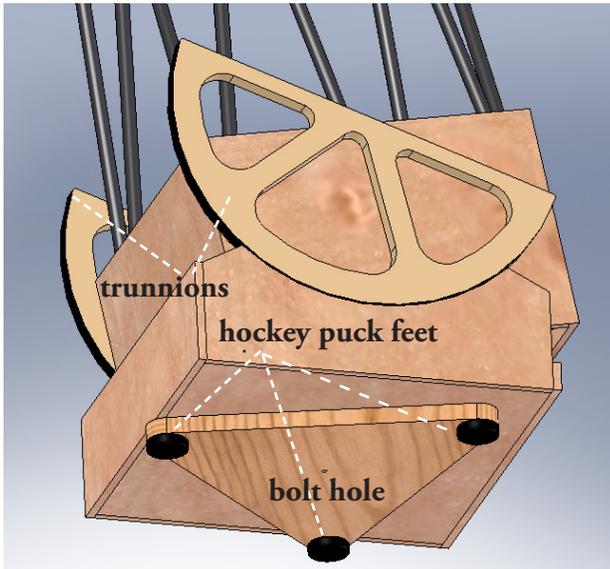
for most of us, this is the largest portable telescope we're likely to ever see. It's about 7' tall when pointed straight up and even when lowered to a 45-degree angle most adults will need a stepping stool to reach the eyepiece comfortably.

It is also a totally manual telescope. With no motors to move it around and no computers to help you find objects, you operate this telescope the old-fashioned way—by pushing or pulling it where you want it to go. The telescope's size might make this sound strenuous, but it can be moved about with a surprisingly light touch, thanks to proper balance combined with moving parts with special laminate surfaces that slide on pieces of Teflon.



For those unfamiliar with the design of Dobsonian telescopes there are three main parts that allow movement—the ground board, the rocker box and the mirror box. The ground board is triangular and sits on the ground supported by three pads (in our case, three hockey pucks, which are durable, hard, and rot resistant). We've glued three pieces of pure Teflon directly over the pads. The bottom of the rocker

box is covered with a special laminate that gives the least amount of friction when in contact with the Teflon pads. The rocker box rotates around a bolt that comes up through the center of the ground board. Combined with the Teflon pads and laminate this bolt allows very free rotational movement of the rocker box.



CAD drawing by Malcolm Saunders

the mirror box and fit into matching arcs cut into the sides of the rocker box. We have glued strips of laminate to the trunnions and glued four Teflon pads (two on each side) to the arcs cut into the rocker box, allowing the mirror box to rotate freely and smoothly in an up/down direction. This movement, combined with the rotational movement provided by the bolt from the ground board, allows the telescope to point anywhere in the sky.

The beauty of this design is that all the weight of the telescope is transferred directly to the ground. The ground board is sized so its Teflon pads are directly below the sides of the mirror box, and since they are placed directly over the hockey puck feet, there is no place where the wood can flex and induce vibration. This is crucial since the view through any telescope, especially at higher magnifications, requires a rock-steady eyepiece—vibrations that are imperceptible to the naked eye become earthquakes through an eyepiece. With the Dobsonian design any vibrations caused by the initial movement of the telescope are dampened within one or two seconds.

At about 140 lbs the finished telescope might be difficult to move around and set up, even for two people, were it not for the addition of two wheelbarrow handles and wheels that attach to the sides of the rocker box. With these in place the telescope is relatively easy to cart around, even over bumpy terrain. Ramps make it possible to wheel the telescope into the back of a mini-van or SUV for transportation to other, preferably darker sky, locations, something I truly hope and expect our members to do (and report about!).

The telescope is too new and the opportunities too few for us to have given it any serious tests for optical quality, but in the few times we've had to test it images have been very bright with exceptional resolution. It will be set up for viewing after all of our monthly planetarium shows (weather permitting) and I encourage everyone to come out and see it for themselves. In a world with few guarantees, I guarantee you will not be disappointed!

—Doug Tanaka



## Time for a Change

**PRESIDENTS MESSAGE:** Over three years ago I was elected by the membership and given the privilege of serving as the BPAA president. BPAA's role in the community was changing. We had purchased a planetarium projector and had fought hard to prevent soccer field lights from destroying the relatively dark sky at Battle Point Park. But we were mostly "nerds with telescopes." Our community outreach programs were small. We were surprised to have ten persons at many of our events.

Now we regularly have crowds that exceed the seating capacity at the Observatory. Our events attract students, families with children, and members of the general public. The change in BPAA's role in the community did not happen by accident: it was the result of key changes in the type of programs we offered to the public. We transitioned from talks and star parties, the latter limited by visibility, to regular monthly indoor planetarium programs.

Administrative changes in the last three years are not as visible as those in our outreach programs but are just as important. For example, to plan for the future the BPAA needed an administrative structure that was capable of supporting grant requests for capital funding programs and expanding funding sources. Members drafted new bylaws that better defined the roles and duties of board members and key administrative positions within the organization. We also produced a Capital Improvement Initiative document that outlined our goals for expansion and upgrades to the Ritchie Observatory.

Our ability to reach out to the public has been a direct result of improved publicity in local newspapers and Web sites. We improved our own Web site. Members can renew online, and most of our administrative documents, such as minutes of board meetings, by-laws, and newsletters are available to anyone with Internet access. We added an online Observatory weather station. We have surround sound in our meeting room in the Observatory and a wide screen monitor in the entryway. We are still telescope nerds, and have installed wireless controls and software upgrades to the Ritchie telescope and constructed a new 20" Newtonian on a Dobsonian mount.

Current projects include developing an active student intern program with the University of Washington, continued work on a request for a \$250,000 NASA grant for remote telescope, collaborating with the Park District on the Master Plan for Battle Point Park, and the construction of a solar system path and sundial.

All of this was accomplished through the efforts of a dedicated corps of active volunteers. There is a remarkable depth of talent in our membership. Believing that a change in leadership is healthy for all organizations, I have asked the BPAA board to find someone to replace me as BPAA President. I look forward to a continuing active role in the BPAA and to supporting new leadership in service to our community and in accomplishing BPAA's mission. —*Harry Colvin*



## Thornburg Service at Ritchie Observatory

A memorial service was held for William "Bill" Q. Thornburg on November 15, 2009. His passion was astronomy, and he retired

## Introducing the heavens to anyone who would look up.

early to pursue a second career as a Lecturer of Astronomy and Physics at Sacramento State University. He was a longtime member of the Sacramento Valley Astronomical Association and came to the Battle Point Astronomical Association near the end of his life. Mr. Thornburg enjoyed introducing the heavens to any one who would take time to listen and look up.

Approximately 60 people came and listened to an informal talk and remembrances of his life by family and friends.

After the sharing of his life I gave a brief planetarium show highlighting the more spectacular objects in the sky, a fitting way to close the memorial service of a man who had dedicated his life's work to physics and astronomy. The family has requested memorial contributions be made either to PAWS of Bainbridge Island or to the Battle Point Astronomical Association.—*Nels Johansen*



*Harry was instrumental in bringing aliens to Bainbridge Island.*

# BPA

## Workshops



### Sundials

Two hours long, this BPA/Parks Department workshop will include a short history of sundials around the world, followed by descriptions and demonstrations of how to build a sundial for your own yard or house. We'll have examples of classic sundials at hand.

The workshop will be held at the Ritchie Observatory, at Battle Point Park, this summer, date and time to be determined.

If interested, let Russ know how to reach you. He'll send the workshop's date and time when they are confirmed.

To learn more about either workshop, contact Russ Heglund at (206) 842-8758 or [rmheglund@yahoo.com](mailto:rmheglund@yahoo.com).—Russell M. Heglund



### Telescopes

Learn techniques for setting up and using small to medium size astronomical telescopes in the Ritchie Observatory at Battle Point Park, on Saturday, April 10, from 12:30 to 3:30 p.m. BPA will furnish telescopes and other equipment, but you can bring your own telescope, if you are looking for advice. There will be a BPA Star Party that evening, starting at 8 p.m., where you can practice your newly acquired techniques (weather permitting). You must pre-register with Bainbridge Parks, on-line at [www.biparks.org](http://www.biparks.org) or phone Russ at (206) 842-8758. Space is limited. This is an adult level class.

To check out a telescope you must have been a member for at least two months. Before you check out any telescope, you must be trained on the use of that particular telescope by an experienced member/trainer. This usually takes about an hour, but varies with the complexity of the telescope and your own level of experience. The trainer signs and dates the check out sheet.



*Keith Ost, Telescope Loan Manager*

Telescopes and accessories may be checked out for 30 days. Check out sheets are kept in the telescope storage office at the Ritchie Observatory. To make arrangements to borrow a telescope, contact the Telescope Loan Manager Keith Ost at [k1671o@yahoo.com](mailto:k1671o@yahoo.com), (425) 238-2210 or email [equipmentloan@bpaastro.org](mailto:equipmentloan@bpaastro.org).



*90mm Meade ETX Maksutov/Cassegrain*

## Take a Telescope Home

### BPA Telescope Loan Program

The BPA has seventeen portable telescopes for members to borrow, including six Dobsonian telescopes (4", 6", 8", 10", 16", and the new 20"), Schmidt/Cassegrain telescopes on fork and equatorial mounts, and a 90mm Meade ETX Maksutov/Cassegrain—a small and portable telescope. We have two mount systems with motor drives that can be controlled by a laptop computer, on which various telescopes can be mounted. We even have a Edmund Astroscan telescope with a table mount, very easy to use.



*8" Schmidt Cassegrain*



*10" Dobsonian*

*8" Celestron Schmidt Cassegrain with Motor Drive*

# A Rose is a ... ? Astronomy 0.001

**SEEING STARS:** Why do we name things? So we'll remember what they are? To impress on them what we want for them? For amusement, the way we might name a white kitten "Dust Ball?"



For instance, Shedar marks the place of Cassiopeia's "breast," and Denebola is "the tuft of hair in the tail of Leo." Homan in Pegasus is "the lucky star of the high-minded man." But then,

there's Gomeisa in Canis Minor that means "the bleary-eyed one." Was that dog barking all night long?



Menkent is the "shoulder" in Centaurus, Deneb "the hindmost one" in Cygnus the Swan, Markab "the saddle" in Pegasus, and Enif is his "nose." Fomalhaut in Pisces Austrinus shows "the fish's mouth." Alpherad, the one bright star in Hydra the sea serpent, means "the solitary one." It has a second name given it by Tycho Brahe: Cor Hydrae, "the heart of the serpent."



Hamal, "the lamb," is in Aries the Ram, and Al Nath could be marking the head of Taurus the bull because in Arabic it's the one "who butts." Nunki is supposed to be the "shoulder" in Sagittarius, but it's more logically part of the archer's bow.

Rigel is the "left foot" which helps me remember where it is in Orion, and so Betelgeuse belongs as Orion's "hand." Ophiuchus the serpent bearer has both Ras al-hague, "the head of the snake charmer," and Sabik, "the victorious one." (These all mean that I pretend I'm seeing the mythological figures.)

Along with the constellations, some of the stars were named for people. The two brave twins, Castor and Pollux, were the gods whom warlike youth in Greece and Rome worshipped. (Incidentally, the name Pollux means "much wine," and as for Castor "the beaver," he was the one the women fell for.)

Two other stars were named, somewhat whimsically, by the assistant astronomer of the Palermo Observatory, Nicolaus Venator, for himself when his superior was publishing a star catalog in 1814. These are Sualocin and Rotanev in the Dolphin. Did Venator enjoy diving backwards into the sea?

One of the heroes not often appearing in the story of the Trojan War is Canopus, steersman of King Menelaus' ship and head pilot of the whole fleet. Canopus is alpha in the constellation Carina the Keel, and the second brightest star in the sky, dimmed only by Sirius and, of course, our Sun. The steersman has the distinction of being remembered with two stars. The other, Suhail in Vela the sail, is his Arabic name. Both stars are visible from Egypt south, appropriately because Egypt was Canopus' home. By coincidence, the star Canopus has been used to hold a course in space navigation.

And then, some of them seem misplaced. What are either Mirfak, "the hen's head," or Diphda, "the frog," doing in Cetus the Whale? Is Zuben



el-genubi, "the southern claw of the scorpion" encroaching from the constellation Serpens into

Libra the scales? What's the reason for Alioth, "the fat-tailed sheep," in Ursa Major? Did the bear eat that sheep? Is Capella, "the little goat" pulling Auriga the Charioteer? Is Mirfak, "the elbow of the Pleiades," reaching into Perseus? Altair, "the flying one" belongs in Aquila the eagle, but why is Vega, "the swooping eagle," in Lyra the Harp?

I suppose it's okay for Bellatrix, "the woman warrior," to accompany Orion the hunter. As for Orion himself, an Arabic name is "Nesak" which means both "order" and "a string of pearls," so Alnilam, "one of the string of pearls," may not be so unlikely in the constellation. Alpheratz, "the horse's navel," shares the constellation of the Ethiopian princess Andromeda with Pegasus.

Alphecca, "the broken one," seems puzzling in Corona Boreales, and perhaps Spica, "the spike of barley," could be what Virgo the Virgin is holding. But why is Nihal, meaning "the camels quenching their thirst," in the Hare?



Some are almost poetic. Alkaid in Ursa Major is "the leader of the mourning maidens," Wasat in Gemini is "the center of the sky" (which I thought we'd decided was

Detail of painting by Aladar Körösfői-Kriesch



in Sagittarius), and Muliphein in Canis Major means “the two causing a dispute and the necessity of answering it with an oath.” (Was it so explosive the wranglers ended up in the sky?)

While the names of the constellations are almost all from Greek and Roman mythology, by far the most star names come from Arabic. Their authors must have been those imaginative astronomer-shepherds who kept watch so many nights so long ago. Our later generations have mispronounced, mixed up, and misunderstood their words, or merely given them names we like better. Orion’s hand is a recent example: Betelgeuse has become Beetle Juice. Poetic?

That suggests the question of what the next person sees in the name we’ve chosen. If we call something beautiful, does the name make it beautiful for others? It makes me wonder what people were thinking of when the best they could do for the bright stars in the Southern Cross were Alpha, Beta, Gamma... I accept Beta Geminorum, but I prefer “the swashbuckling, drunken Pollux.”

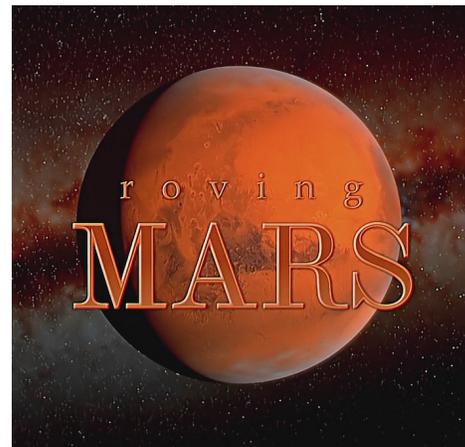
Oh – and why not a star named Jonah near “the belly” (Baten Kaitos) of that whale (Cetus)?

—Anna Edmonds

## Astronomical Movies

**Roving Mars, at the Pacific Science Center IMAX through May 27**

The Pacific Science Center in Seattle is hosting a major Mars exhibit, *Facing Mars*, until May 9. To accompany the exhibit they are showing the IMAX movie “Roving Mars.” They previewed the movie to local astronomy groups, including the BPA. The 40-minute movie was made in 2006, so it is not completely up to date. However, as a documentary of the development and testing of the Mars rovers, it is quite good. The mechanical works of the Rovers are shown up close in the lab/workshops where they were developed and constructed. A lot of the test engineering is demonstrated, especially the problematical development of the landing parachutes. The deployment of the rocket and Rover transport vehicle from earth to orbit insertion at Mars is nicely demonstrated in CGI. The film includes thrilling live footage of NASA scientists awaiting the first signals from the rovers on Mars.



### Movie Nights at BPA Member Meetings



We’ve been screening classic science fiction movies at selected member meetings. At the February 13 meeting we watched Russian movie-maker Pavel Klushantsev’s retro-futuristic “Planet of Storms.” This groundbreaking film was

made in the Soviet Union in the 60’s, when the Russians were winning the space race. The special effects are so good clips were stolen for several Hollywood productions.

Elliot Swanson, former film librarian for the KRL, introduced the film, dressed up as an Russian Officer, fur hat, mock AK47 and all, and gave a history of the movie. Elliot also provided a comic short, a “Rocket Man” spoof that has never been released.

Elliot will be returning for the March 13 meeting (7:30 p.m. at Ritchie Observatory) with “Star Dreamer,” a 54 minute Danish documentary about Pavel Klushantev, a man George Lucas and Stanley Kubrick referred to as a godfather and teacher. This featurette includes clips from Klushantsev’s major works. Elliot will also bring a short, a 3-D version of the descent to the Titanic (Elliot will provide 3-D glasses).

—Russell M. Heglund and Vicki Saunders

FEBRUARY 20, BAINBRIDGE ISLAND: BPAA celebrated three of their dedicated volunteers at the annual Awards Dinner. BPAA members and friends filled a long banquet table at Casa Rojas. Much astronomy talk flowed over enormous platters of Mexican food.



Vicki Saunders, BPAA *Newsletter* editor and publicist, checks her plaque as Nels Johansen applauds.



Harry, Doug, and Mauri Pelto.



Nels and Keith Ost, new BPAA equipment manager.



# 2010 Awards Dinner

Mike Walker, long-time BPAA Board member and science teacher receives his award from Harry Colvin, BPAA President.



Jody Heglund and Anna Edmonds share a laugh.



George McCullough and Mike Browning.



Steve Ruhl, Mike Walker, and Lori Ellison.



A plaque and a handshake from Harry to Doug Tanaka, BPAA telescope designer and builder (see article p. 1).



Vicki shows off a gift from Anna Edmonds, *Newsletter* editor emeritus.

# Backyard Astrophotography

## First Light with the SBIG ST-8300M



*The Pleiades*



*The Orion Nebula*



*The Crab Nebula (image cropped for publication.)*



*The Horsehead Nebula*

Santa was nice to me last Christmas but the weather gods have not been nice since. My new camera has been sitting dormant for two months with the exceptions of some indoor testing. Thursday, February 18th was my first real chance to use the camera. M45, M42 & M1 were my targets that night. All photos are from my backyard on Bainbridge and are full image (uncropped).

M45 (the Pleiades) was 20 shots at 60 seconds. Total exposure time is 20 minutes.

M42 (the Orion Nebula) was 20 shots at 10, 30 and 60 seconds. Total exposure time is a little less than 32 minutes. The trapezium area of Orion is so bright that it comes through as over-exposed. Ultimately, I will revisit this shot and try to pull out more detail with the shorter exposures.

M1 (the Crab Nebula) was 20 shots at 60 seconds.

The second night, February 19th, I did the Horsehead Nebula and M78.

The Horsehead nebula (IC434) was 20 shots at 240 seconds. Total exposure time is 80 minutes.

Messier Nebula 78 (NGC2068) was 20 shots at 120 seconds. Total exposure time is 40 minutes.



*Messier Nebula 78*

When you shoot astronomical images, you use calibration images to remove noise. Typically these shots are:

- Bias—shortest possible exposure. Used to detect electronic noise in readout of picture.
- Darks—used to normalize all of the CCD detectors. Typically, darks are the same exposure as the shot they are used against.
- Flats—A shot with flat light source. This is used to detect imperfections in the detector and any vignetting that may be in the system.

I processed all shots through the software *Deep Sky Stacker* to merge the images and the calibration shots, and then used *Photoshop* to control contrast. The shots on the first night do not include flats. As a result, you may notice some ‘doughnut shadows,’ caused by dust on the detector. After examining the stars on the first night, it was clear that the scope was out of collimation. So before the second night, I collimated the scope, but my flats were done before the collimation. So you may still find ‘distorted doughnut’ shadows.

My filter wheel is on order so color is on its way.

Equipment:

Camera: SBIG ST-8300M

- Scope: Celestron C8 w/ f 6.3 Corrector/Reducer (effective focal length = 1260mm)
- Mount: Losmandy G-11
- Guide Scope: Celestron 500mm F5.6 w/ Orion StarShooter Autoguider
- Guiding: PHD
- Image Software: Nebulosity 2, Deep Sky Stacker, Photoshop

—Stephen Ruhl

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*BPA*A Quarterly is a publication of the Battle Point Astronomical Association. Submissions due on the 10th of the month before the quarter begins: quarters begin December, March, June, and September. Query [newsletter@bpaastro.org](mailto:newsletter@bpaastro.org). Send graphics as separate files. Newsletter Editor **Vicki Saunders**.



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1993–1997

#### John H. Rudolph, Facility Director

1993–2003

*BPA*A would like to thank  
for their  
generous  
support

