



President's Message

By Doug Brown

In the last issue of the *Observer*, I mentioned that the FPOA Board of Directors would be starting a strategic planning process. While not yet finished, we'd like to report that we've made good progress.

Planning Approach

We are following a three-step process of answering the questions:

What is our mission?

How shall we achieve our mission?

How shall we allocate our resources toward that mission?

Parts of our February and March board meetings were devoted to discussing the first question. To make sure we didn't do it in a vacuum, we used results from the survey Bob Black sent and you returned with your membership renewal. We also solicited the views of members who attended the Board Meetings, and received suggestions from the January meeting of the SJAA.

Interim Conclusions

We've concluded unanimously that Section 1 of the Objectives and Purposes Article in our bylaws needs to be replaced in its entirety. Very clearly the *de facto* objectives of FPOA are not reflected in that section. For example, it is devoid of any mention of astronomy, and even states that one of our purposes is to sell firewood!

As a more appropriate description, we will propose for ratification at the Star-B-Q and Annual Meeting the following statement of purpose.

Fremont Peak Observatory Association volunteers spread the word about the wonder of the heavens, educate the public through presentations and observing sessions, and provide quality observatory facilities:

- We offer the public access to high quality astronomical equipment and interpretative services in a convenient, dark sky, family-friendly environment.
- We offer serious amateur observers a good dark sky site and observatory with high availability, in return for help interpreting the night sky for the public.
- We offer philanthropists and community-spirited people the satisfaction of donating time or money to a worthy, cost-effective means of promoting public knowledge and interest in astronomy and related sciences.

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FPOA Programs: 2007

Note: please check <http://www.fpoa.net/schedule-2007.html> for changes to events and schedules

Saturday Evening Programs

April:	14th, 21st
May:	12th, 19th, 26th
June:	9th, 16th, 23rd
July:	7th, 14th, 21st
August:	4th, 11th, 18th
September:	1st, 8th, 15th
October:	6th, 13th, 20th
November:	3rd

The observatory is open to the public on these evenings

Solar Programs

May:	19th
June:	16th
July:	14th
August:	11th
September:	8th
October:	13th

Solar observing is offered at the Observatory during the afternoon on these dates.

Board Meetings

April:	14th	FPOA Observatory
May:	19th	FPOA Observatory
June:	16th	FPOA Observatory
July:	14th	FPOA Observatory
August:	11th	FPOA Observatory
September:	8th	FPOA Observatory
October:	13th	FPOA Observatory
November:	10th	FPOA Observatory

Special Programs

August:	11th	Star-B-Q
		Annual Meeting
September:	8th	Rob Toebe Night
		Member Appreciation

President's Message (cont. from p. 1)

- We partner with educators, researchers, and private enterprise to provide various opportunities in return for assistance with publicity, funding, or operations.
- We offer the California Department of Parks and Recreation interpretive services, increased visitorship, and management of Fremont Peak State Park's "Ranger Row" area, in exchange for continued free access to the observatory and pads.

Next Steps

In April we began brainstorming the second question—how to achieve our mission—the results of which I'll cover in the summer edition of the *Observer*.

BE A HERO TO KIDS IN YOUR LOCAL SCHOOLS BY BEING A VISITING ASTRONOMER

Project ASTRO is looking for amateur or professional astronomers who would like to spend a little time working with teachers and students in 3rd - 9th grade classrooms. This is an opportunity to help kids learn science, sharing your love of astronomy with the most receptive audience you can find (and sharpening your teaching or communication skills in the process.)

Through Project ASTRO, you will be paired in a one-on-one partnership with a Bay Area teacher at a school near you. Together, astronomer and teacher partners attend a two-day summer training workshop where they learn effective hands-on astronomy activities and receive a copy of Project ASTRO's rich curriculum resource book, "The Universe at Your Fingertips" (with materials to lead a wide range of hands-on activities.)

The project emphasizes ongoing partnerships, not just one-time class visits. During the school year, astronomers make at least four visits to their adopted classroom at mutually convenient times. The program has been operating for 10 years in the Bay Area, and previous participants often report that it has been one of the most satisfying volunteer endeavors they have undertaken.

Astronomer applications are now being accepted for the 2007 - 2008 school year. The deadline is May 4th and space is limited. All participants must attend a hands-on training workshop, held August 3rd & 4th, 2007, at the San Mateo County Office of Education in Redwood City.

More information and astronomer application forms are available online at: <http://www.astrosociety.org/baprojectastro.html>

Or feel free to contact:

Vivian White

Tel. 415-337-1100 ext. 101;

E-mail: vwhite@astrosociety.org

(Project ASTRO, a program of the nonprofit Astronomical Society of the Pacific, began with support from the National Science Foundation and the NASA Office of Space Science. It has now expanded to 14 other sites around the country and has trained over 2000 astronomer-teacher partnerships.)

On a Clear Day, You Can See Forever... and Maui, Too!

By Donn Mukensnabe

As many FPOA-ers know, I moved with my family to the Big Island of Hawai'i (also known as 'Hawai'i' to confuse the tourists, and the Post Office) to take a new job. The place I'm living in now is known as Waimea to the locals and Kamuela to the Post Office (who was probably still smarting from that "Hawaii" business and decided to rename the town, since there are "Waimea"s on this island, O'ahu and Kaua'i too. Our house is just outside town, at 2800 ft elevation, with pastureland to the south. And, a view of a mountain: Mauna Kea. On clear days, it's easy to see the big telescopes there and recently a cap of snow, too. Some nights when they are using the laser adaptive optics rig on the Keck I telescope, we can see the bright laser beam shooting into the heavens. Talk about 'star wars'!

The Visitor Information Station (or VIS) is about 40 miles away by bumpy road and at 9000 ft altitude. I'm volunteering there about every other weekend and a couple of evenings in between. They have a decent public program there, with a pair of C-14's, a TeleVue 102 on an AP mount, and a bunch of smaller dobs for incidental use. This is the same place on the mountain as the support facility for the observatories, known as Hale Pohaku (or 'The Stone House'). They've got a cafeteria there too; did I mention that volunteers get free meals? Beats diet coke and peanuts! (Sorry, Robert.) My son Alex also volunteers and has contributed several astrophotos to the VIS and their website (URL <http://www.ifa.hawaii.edu/info/vis/>)

On weekends, we guide the escorted summit tours up to the astronomy reserve, reached by 8 miles of mostly gravel road that climbs another mile closer to the sky. The top of Mauna Kea, the highest peak in the Polynesian island group and revered by the native peoples as a home to the gods, is at 13,796 feet. Going into two of the observatories (Keck and the venerable UH 88-inch, oldest 'big' telescope on the mountain) while doing interpretation and monitoring folks for altitude sickness. With 40% less oxygen than at sea level, the air feels really 'thin' and many people have trouble breathing. A few do pass out, briefly. The lead vehicle carries rescue oxygen and there's a ranger with the group who's first-responder trained. Haven't lost anyone yet.

Well, enough of the travelog; you're probably asking how the viewing is? Fantastic! The nearest town, Hilo, only has about 45,000 people and it's almost always cloudy there, 35 miles to the southeast. To the south is another volcano (Mauna Loa, the most massive mountain on Earth) while the "big" town of Kona lies about 50 miles away to the southwest, behind yet another dormant cone known as Hualalai. The airflow at the VIS is laminar and very dry; the summit is even drier with humidity often in the single digits. Clouds normally get scrunched down under an inversion layer at night so the misty blanket hovers a few thousand feet below, but occasionally they escape and fog the VIS in for a few extra hours or very rarely an entire night. So, the sky is dark. *Really* dark! Pitch dark; seventh-magnitude

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CCD Imaging: Chapter 2: Equipment

By Frank Dibbell

It is always extremely important to have the right equipment when undertaking a task such as astrophotography with a CCD camera. It is best to make a list of the equipment you will need. Usually this task is enough to discourage most people from proceeding.

The first piece of equipment, if not the most obvious, is a telescope. Normally the fool undertaking this exercise has a telescope, and a subscription to *Sky & Telescope* magazine - where he saw gorgeous professional-quality pictures taken by skilled astrophotographers, which gave him (or her) the idea that they too may be able to do this.

So, what kind of telescope should you have? As it turns out, most any kind will do - it's not the scope itself that is important, but rather the mount that supports the telescope. You see, in order to take good pictures that may be 5 or 10 minutes in duration, you need a support that can do two things: (1) hold the telescope rock-steady and (2) track the object being photographed as it slowly moves across the night sky.

Now at this time I should mention that there are two kinds of mounts for telescopes: altazimuth and equatorial. Both are capable of being driven electrically to track a star or object, but only one will do it properly. And, one kind of mount is much cheaper than the other kind. Can you guess which mount you need for astrophotography? Yes! The more expensive one! (It's the equatorial mount...).

A decent equatorial mount with a motor drive will set you back a few thousand dollars, and this is what you will need. I myself have a Takahashi EM-10 mount, which when I bought it retailed for about \$2,500.

I know I said almost any kind of telescope will do, and that is true. But you do need to understand that the telescope in this case is going to act like a very large telephoto lens, and things like F-ratios are as important here as they are in regular photography. In regular photography, one usually shoots with F-ratios of f/11 to f/16, because these long ratios give good depth of field. However, with dim night sky objects, one wants a "fast" system, usually f/5 or less. So you will need to know the focal ratio of your telescope.

In my case, my telescope is an f/8 refractor, which is a tad too slow without some optical assistance (for those who care it is a Takahashi F102C calcium fluorite refractor. If it were a car it would be a Bentley). To compensate for its rather long focal ratio I purchased a special lens called a focal reducer, which makes the camera think that the scope is really operating at f/4.

Once you have established that you have the appropriate telescope and mount, then you can consider the CCD camera. If you should google CCD cameras you will find out rather quickly that their cost approximates a small 3rd world country's GNP. Fortunately, after asking around I found that there is a really good "cheap" CCD camera called the Orion StarShoot™ Deep

Space Color Imaging Camera. Orion Telescopes sells them for \$399, and they come complete with the software you will need.

Now, in case you haven't realized it yet, these cameras must be hooked up to a computer to be operated. That makes a laptop pretty much mandatory. One with a USB 2.0 port. Well, you can use a USB 1.1 port, but the data transfer rate is very slow.

So, let's summarize...

- Telescope with the right focal ratio
- A focal reducer
- Decent equatorial mount
- CCD camera
- Computer
- Software drivers for the camera (included with camera)
- Image processing software (included with camera)
- Appropriate cables (included with camera)

As you can see, this is not a "cheap" endeavor. But you should be able to put together a decent beginners system for under \$5,000, assuming you need to buy a laptop.

In the next issue, I will cover learning the CCD camera features, in preparation for an actual attempt at astrophotography.

INTERN PROGRAM TRAINING ON MAY 19

The Hartnell College student internship program, which was successfully piloted last year, is scheduled to have its "on the peak" training session on Sat. May 19. The interns will then begin staffing and assisting with the public observing nights on June 9 and continue throughout the 2007 season.

By the time you read this article, the intern selection process will have been completed. The interns, most of them Engineering majors at Hartnell Community College in Salinas, will be profiled in the summer edition of the *Observer*. The paid internships are sponsored through a NASA-CIPA (curriculum improvement partnership award) grant recently awarded to Hartnell College. Hartnell's project is titled "Engineering Program Upgrade with Project Management". The funding for this project management initiative was generated through the Space Shuttle Columbia Commission's report. The report cited a critical need for NASA's and the aerospace industry's potential future workforce to improve their skills in project management, including team communication and risk assessment. One of the requirements for the team of Hartnell interns is to produce a project plan on how to properly execute all aspects of a public observing night including what to do if things go wrong.

This program also offers FPOA members the opportunity to get involved in the early development of a young scientist, mathematician or engineer. Members are needed to provide mentorship and guidance in night sky interpretation, use of the Association's instruments, career choices, project management techniques and researching and presenting an astronomy topic.

For more information or to get involved, contact Doug Brown, the FPOA Board or Andy Newton at Hartnell College anewton@jafar.hartnell.edu (831 755-6803)

dark; see-the-zodiacal-light-every-night dark. I'd say it's darker than the inside of a cave, but that's not true. You can see *quite* a bit by starlight, after you've gotten dark adapted. The summer Milky Way almost casts shadows. That pic of Alex's on the VIS site was a 30 second exposure with a DSLR. That's about the visual impression too. NGC253 and M33 are visible unaided; when Comet McNaught was at perihelion some folks saw it in the daytime by putting their thumb over the sun.

There **is** a downside; it's cold (mid-40's) at the VIS almost all the time, and frequently windy. Few shirtsleeve summer nights here. But, coats are easy to put on and one can stand behind the building to avoid the breeze. Every long while they get enough snow to close the road (about as often as at Fremont Peak, though the summit gets some every winter) and occasionally there's a brush fire; that part seems very much like California.

If any of the FPOA members are making a trip to the Big Island; give me a call. I'd be glad to show you the cook's tour of the place. My contact information in the board masthead is current, or you can always send email to dmuk@hawaii.rr.com

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The **Fremont Peak Observer** is published four times a year (Winter, Spring, Summer, and Fall). Articles from members are encouraged, and should be emailed to fpoa@sbcglobal.net. Articles should be either in plain text or MS Word format. Deadlines are Feb 1, May 1, Aug 1 and Nov 1 respectively. The Observatory's phone number is 831-623-2465.

FPOA on the internet

Website: www.fpoa.net
Reservations/Events: members.fpoa.net/ical.html
Members Only Page: members.fpoa.net
Members email/list signup:
fpoa.net/mailman/listinfo/fpoa-members
For Observatory scheduling and access:
email: schedule@fpoa.net

Check out our web site improvements. Among others, we've added a number of hyperlinks to the public page, and there's a new Who's Who page in the members-only section that we hope to expand over time. Send your photos, bios, and other suggestions to webmaster@fpoa.net.

I'm pleased to report that half of the year-to-year members have already renewed their memberships. To all of you who have renewed, thank you! Furthermore, about half of the renewals included a response to the questions. Again, thanks. Your responses will help the board in shaping FPOA to meet your needs and expectations.