



The
Webfooted Astronomer

April 2002

UW Professor Emeritus George Wallerstein to Speak at April Meeting

By Laurie Moloney

April Meeting

George Wallerstein
Professor Emeritus

University of Washington
Astronomy Department

Wednesday, April 17
7:30 p.m.

Physics-Astronomy Building
Room A102
University of Washington
Seattle

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

Bring your slides to show
after the program.

UNIVERSITY of Washing-
ton Professor Emeritus
George Wallerstein will
speak at our April 17 meeting.

Professor Wallerstein's research is oriented around the chemical composition of stellar atmospheres. Stars reflect the environments of their formation by the composition of the gasses in their atmospheres. For example, stars formed 10-15 billion years ago in globular clusters show that these clusters ceased to produce the heavy elements seen in the Sun after only 1 percent of the solar level of heavies were produced. Other stellar atmos-

pheres show a composition that was changed by nuclear reactions in their interiors. Professor Wallerstein also studies the structure of the interstellar medium through emission and absorption lines.

The meeting will be held at 7:30 p.m. in room A102 of the Physics-Astronomy Building on the University of Washington campus.

Dark Skies Northwest will hold its monthly meeting prior to the SAS meeting from 6:30-7:30 p.m. in room A216 of the Physics-Astronomy Building. They will discuss the lighting of the Lower Woodland playfield.

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Little Bear's Corner

Redeeming the Much Maligned Little 60 mm Refractor

By Tim McKechnie

I remember being at a Green Lake star party around 10 years ago where a woman and her son, neither of whom was from the club, came with their little 60 mm Orion refractor for a first view of the stars and planets. They didn't know too much about the sky or the operation or their telescope and were very grateful for any help the astronomers would be willing to give them. Naturally, they got more help than they expected from just about everybody. Amateur astronomers are, after all, nothing if not helpful.

The little scope worked okay for the most part, but both Ken Applegate and I thought that it could do better without its .965-inch eyepieces provided. I dug out a hybrid diagonal, which allowed use to use 1¼-inch eyepieces on the smaller focuser. With the diagonal and a medium focal length TeleView Plössl, the little scope suddenly came to life. No longer did the observer have to squint through a small hole with no eye relief. Now the field was wide and clear with high through-put, excellent correction, and comfortable eye relief. Although Jupiter was fairly low in the South, the image at 92x was quite pleasing and the two new astronomers couldn't believe the difference. They were very happy with their scope and vowed to obtain these parts.

This example is fairly common in the astronomical community. Just about everyone with any scope mileage will have a similar story. The poor 60 mm refractor has received more of a bad rap than any other scope in existence. That's a pity because most 60 mm scopes are not too bad intrinsically. There's nothing wrong with the overall specifications of its optical design. But as Terence Dickinson once wrote, "The problem with the 60 mm isn't the objective lens, which is usually pretty good; it's everything else!" This includes the sub-standard focuser and poorly executed eyepieces, cheap and worthless finders that can't find anything, the poorly machined and proportioned mountings with weak, spindly legs, and so forth.

But when a 60 mm refractor is made with quality and performance foremost in mind and economy secondary, they can be a powerful tool. An example of this is the old and legendary Uni-tron 60 mm scope's. from yesteryear. They were and are excellent

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Little Bear's Corner (Continued from page 3)

performers that are today considered valuable collector pieces. And hard as it may be to imagine, even the old Tasco's from the 1960s will give surprisingly high-quality images when refitted with new optics as with the scope belonging to the two visitors at Green Lake.

Why, then, don't the various manufacturers of telescopes bring out a 60 mm like the old Unitron's, or something similar? It's primarily a question of economics, not ability or desire. As a thought experiment back in 1998, the engineering staffs at Celestron and Tasco played with some figures to see what kind of market existed and where the various parameters stood in this regard. As the cost of manufacturing has risen over the years, the optical firms have found it increasingly necessary to modify the methods and materials used in building small telescopes in order to keep them competitive within their respective cost/performance ratios.

Those readers who were involved in astronomy back in the mid-1980s may recall when an 80 mm equatorial refractor from Japan sold for around \$550 and the 60 mm alt-azimuth sold for about \$180. Before that, in 1974 when the dollar plunged against the yen, a 60 mm equatorial was selling for the same \$550 that would buy the 80 mm 10 years later.

Nowadays with more and more work being sent to China, a 60 mm alt-azimuth usually goes for under \$100, and while more of it is now plastic, at least the tube and mount are still metal and the focuser is now a true 1¼-inch. These scopes are very affordable and are no worse than the same style from the 1980s; in fact they are better in some ways. If the old standards had been maintained over the years and a manufacturer still built the 60 mm the way Unitron did in 1965—with machined aluminum focusers and adjustable objective cells—a simple alt-azimuth 60 mm refractor would have cost around \$675 in 1998 dollars, and even more today. This would hardly be cost effective for the level of optical performance and within the intended market: beginners and occasional observers, not serious hobbyists or educators.

How to redeem your 60 mm

Well, let's say that perhaps you got one of these lovable pariahs for Christmas or maybe you have one living in its natural environment; a closet! Should you throw it out? Give it to the Goodwill or some unfortunate neighbor kid who would become a fortunate kid if you didn't? I would submit that you keep it and use it! A good 60 mm can be a fine second telescope for quick views under variable or inclement conditions, a nice light travel scope or even

a loaner for that same neighbor kid once they get the astronomy bug from you. There are some tricks you can do to the scope to perk up its performance. As you may have guessed, the first, best step is to use good eyepieces. If you have a bigger scope, chances are you already have some high quality eyepieces you can use in the 60 mm. If it is one of the older scopes with a .965" focuser, you will have to get a hybrid diagonal so the quality 1 1/4-inch eyepieces will fit the smaller focuser drawtube. These are readily available from Orion, Captain's Nautical, or most dealers.

A good finder scope is vital! Unfortunately, a good replacement for the crummy 5x24 mm that came with the scope is not very cheap. A quality, achromatic 6x30 mm with mounting bracket will cost around \$60. However, because the 60 mm scope doesn't have that much light grasp for serious observations of faint objects, a large optical finder for locating them is not all that important. A reflex-type finder would work just fine. A Telrad would cost almost as much as an optical finder but the small and light Starpointer from Celestron or Orion would cost less than \$20 and would work just fine for the Moon, planets, brighter stars, and deep sky objects within the range of a 60 mm.

For the mounting and tripod, it's hard to recommend proper solutions that don't require a machine shop. But there are some steps you can take. If you have a wooden tripod, see that the leg bolts are the biggest that will fit the holes and that they have fender washers under them. These are large surface washers with small holes in the centers. Get whatever washers go almost to the edge of the leg and have a hole just large enough for the bolt to pass through. This will allow you to tighten the bolt sufficiently to suppress twist and vibrations without driving the bolt into the soft wood under tension. If you have an aluminum tri-

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Classifieds

For Sale

Meade 8" f/4 MTS Schmidt-Newtonian on a fork mount with dual axis drives, 8x50mm finder, 2" focuser, 20mm 1 1/4" Erfle eyepiece (40x, 1.2 degree actual, 62 degree apparent field), 4" aluminum pier and vibration suppression pads. Has AC and DC power cables. This scope has excellent resolution and contrast with 1/3 the aberrations of a conventional f/4 Newtonian. Asking \$500 obo. Tim McKechnie, (206) 243-8028 or Docstogie50@aol.com.

Little Bear's Corner (Continued from page 5)

pod, take the caps off the top of each leg section and fill the extrusions with sand to add density to the legs for vibration suppression. If you have one of those despicable black, round steel tripods, take the caps off the top of each leg and epoxy the cap onto the leg, then reset the screws. Make sure that you do one leg at a time and get the caps back on with the same orientation. They cannot be attached randomly. Also, the accessory shelf holes in the legs are wide enough to take much larger bolts. Replace the original bolts with the largest that will fit through the holes. Once these larger bolts are tightened down and the tripod caps are immobilized, these tripods suddenly become quite stable.

The mountings are not the acme of precision machining! But they are not terribly poor, all things considered. Sometimes a little Teflon or Delrin plastic can make all the difference in the way these mounts perform. Because the loads are light, plastic bearings work well for the 60 mm mounts. Take a look and see if there aren't places that could use some firming or tightening with Teflon washers or bearings. These can be fabricated at home from blank stock or purchased from a hardware or plumbing store. Boeing Surplus is a good source for blank stocks of Teflon. On some bearing surfaces, it may be necessary to use metal washers. On 60 mm models that have the latitude slow motion control/support arm, this piece can be disassembled and the slop taken out with plastic spacers and new grease. The plastic around frozen pizzas is strong, quite thin and makes excellent shims at this point. So, too, are plastic coffee can and Cool Whip lids (astronomy, just like the army, travels on its stomach). Use a little creativity to see where a problem might exist and what you can come up with to effectively eliminate it. On these scopes a simpler mount is better!

If you were to buy everything to bring your 60 mm up to its potential, you could easily spend over \$200. This would be hard to justify for a \$100 telescope. But eyepieces aside, a typical "department store" 60 mm could be improved for around \$50. This would give you a fine working instrument which would show good detail on the planets and the Moon, resolve double stars to around 2 arc/sec. and would certainly show the major examples of deep sky object including all of the Messier objects. It would make a fine loaner for people you know who might be interested in pursuing astronomy or the occasional night out when you don't feel like setting up the big scope. You will have had a fun project, learned more about telescopes, helped improve an instrument of science and elevated it out of its sleazy reputation of mediocrity. And you will have the satisfaction of helping the unfortunate and downtrodden; the unfortunate little 60 mm refractor.

IDA Pacific Northwest Conference to be Held on April 13, Near Portland

By Bruce Weertman

THE Second Annual Pacific Northwest Conference of the International Dark-Sky Association will be held near Portland, Oregon, on Saturday April 13, 2002, 8 a.m. - 6 p.m.

The conference will be held at the John Inskip Environmental Learning Center & Haggart Memorial Observatory, Clackamas Community College, 19600 S. Molalla Avenue, Oregon City, OR 97045. Oregon City is near Portland.

The conference speakers include:

- Elizabeth Alvarez, Associate Director, IDA, Tucson, AZ
- Richard Berry, author, former editor of Astronomy Magazine, astrophotographer
- Ken Bronstein - lighting activist
- Mike Crossland - PGE Senior Lighting Specialist
- Scott Davis, Technical Manager, IDA - Tucson
- Glenn Graham - astro-imager, amateur astronomer
- Bill Hughes - Roadway Glare Taskforce Chair, IES
- Robert McGown - author, astronomer, electrical contractor
- Tom Thrall, M.D. - naturalist, amateur astronomer
- Bruce Weertman - Chair of Dark Skies NorthWest, IDA

Space for the conference is still available. Please see <http://www.rca-oms.org/conferenceinfo.htm> for more details.

Bunker Project Meeting April 14

A meeting will be held at Karl & Judy Schroeder's, 15761 Palatine Ave N, on Sunday, April 14, at 2 p.m. for everyone who is interested in participating in the "Bunker Project."

The meeting will be for information and planning on the use of a bunker at Sandpoint to build an SAS facility/observatory.

Pictures of the bunker site are on the SAS Web site at <http://www.seattleastro.org/bunker.html>.



From the President's Pen . . .

STS-109 Hubble Servicing Mission a Success

By Mary Ingersoll

ON March 12 Columbia and its seven-member crew returned after completing an 11-day mission to repair and upgrade the Hubble Space Telescope (HST). Five EVAs were required to accomplish the servicing, which included the installation of an advanced camera system (ACS), a new Cryocooler, which allowed the reactivation of an existing infrared instrument (NICMOS) that had been shut down for two years, the new improved solar arrays (SA3) and the new power controller unit (PCU).

Orbiter Columbia gave Hubble a boost to a higher orbit. This mission was part two of the third servicing mission. Originally scheduled for launch Nov. 19, 2001, this fourth servicing mission launched on March 1, 2002.

SA3 will ensure adequate power to run the new instruments. These rigid units are originally from the Iridium program, and have much higher output than the current floppy ones that roll up.

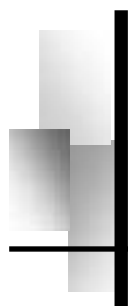
PCU controls all the power that flows from the arrays and batteries to the spacecraft. A fault with the previous unit was discovered a few years ago. The replacement of this unit required that the HST be powered down, something that had not been done in space.

ACS will offer 10 times the discovery factor from any other previous HST instrument. Data from ACS will be available in May 2002. A Reaction Wheel Assembly was also installed, which will allow for HST to orient itself without the use of propellants. There are four such units on the spacecraft.






A fifth servicing mission is planned (to replace COSTAR with the Cosmic Origins Spectrograph, refurbish the Fine Guidance Sensor, and Wide Field Camera 3 will replace Wide Field Camera 2).

If it should be decided to bring Hubble back to Earth after its mission is completed, some (if not most) of this hardware will have to be jettisoned into space. Disposal will be necessary because the landing of the shuttle is very traumatic, and they can't risk hardware shaking loose inside the Cargo Bay and damaging the Orbiter (and the solar arrays just wouldn't fit).

HST began its 20-year mission on April 24, 1990.



April 2002

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 April Fool's Day	2	3	 4	5	6
7 Daylight Savings Time Begins	8	9	10	11	 12	13 Poo Poo Point 7 p.m.
14	15	16	17 SAS Meeting	18	19	 20 UW Astro Day Green-lake Star Party
21	22 Lyrid Meteor Shower Peaks	23	24	25	 26	27 Telescope Makers at Peter Hirtle's
28	29 SAS Board	30	1	2	3	 4

Volunteers Needed at Public Events

THERE are several opportunities in the next few weeks to bring astronomy to the public. Volunteers are needed for these events.

UW Astronomy Open House, April 20

We need people to staff our information table and solar scopes from 4–8 p.m. at the UW Physics/Astronomy Building and for observing from 8–10 p.m. at the observatory on Astronomy Day Saturday, April 20. Contact Mary Ingersoll, 206-246-0977, to confirm that you will be there.

Museum of Flight, May 2

The Museum of Flight (MOF) will be hosting a Space Day event on Thursday, May 2. The Museum would like to have SAS there during the evening from 6–9 p.m. The first Thursday night of the month is a free admission night, as a public service to the community. The MOF expects to have a larger audience that day.

If you would like to volunteer to staff the SAS table, display/discuss telescopes, or if you have a solar filter you can set up your telescope outside, please contact Mary Ingersoll, 206-246-0977.

Pacific Science Center, May 4

Volunteers with telescopes and solar filters are needed for the opening a new exhibit on the International Space Station at the Pacific Science Center on Saturday, May 4. Contact Ed “cookie man” Barnes at 206-242-0123. Free admission and free parking .

UW Astronomy Department Colloquia

The UW Astronomy Department hosts free weekly colloquia. They begin at 4 p.m. in room A102 of the Physics-Astronomy Building.

April 4: “Links between circumstellar debris disks and extrasolar planets,” Paul Kalas, Department of Astronomy, University of California/Berkeley

April 18: “The bias of galaxies and the density of the Universe from the 2dF galaxy redshift survey,” Licia Verde, Department of Astrophysical Sciences, Princeton University Observatory

April 25: “Galactic Structure and Substructure with the SDSS,” Constance Rockosi, Department of Astronomy, University of Washington

May 2: “Astrometry with HST, a New Gold Mine,” Ivan King, Department of Astronomy, University of Washington

For more information, see <http://www.astro.washington.edu/dept/colloquium.html>.

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Minutes

PINEing for Great Observing . . .

By Greg Donohue

SAS will be participating in several public events in the next couple of months. Please contact one of the club officers if you would like to help out at any or all of them:

The UW Astronomy Department will hold its 3rd annual Astronomy Open House on Saturday, April 20, Astronomy Day. The event will be held later in the day this year (4–8 p.m.) to take advantage of the “The Planet Show of the Decade” that evening, with public observing from 8–10 p.m. (weather permitting).

“Space Day” at the Museum of Flight, Thursday, May 2. This is an all-day event, with SAS participation from 6–9 p.m.

Pacific Science Center, Saturday, May 4. This is to help kickoff the new IMAX film about the International Space Station opening in May.

We were happy to welcome at least a half-dozen first-time attendees to the March general meeting. And don't forget that Daylight Savings Time begins at 2 a.m. Sunday morning, April 8, so set your clocks ahead before going to bed that Saturday night.

Project ASTRO

Prior to the evening's main address, UW Professor Dr. Woody Sullivan showed a video, presented information, and answered questions about Project ASTRO (<http://www.astro.washington.edu/projastro>). Now in its 5th year, Project ASTRO Seattle is one of 10 daughter sites for this excellent program that teams up teachers and astronomers (both amateur and professional) for public outreach education in schools. Currently there are some 65 such partnerships in the local area. Project ASTRO provides a two-day training seminar for participants, including practical planning sessions, hands-on demonstrations, and the “Universe at Your Fingertips” resource guide packed with activities for students from 3rd to 12th grades. We have a number of SAS members who participate in Project ASTRO, including yours truly, your friendly neighborhood SAS board secretary. I thoroughly enjoy being part of Project ASTRO, and find great fulfillment in spreading enthusiasm for astronomy with the 4th and 5th grade students at Eagle Rock Multi-Age School in Duvall. I strongly encourage you to consider checking out this tremendous opportunity for the coming year!

Friends of Pine Mountain Observatory

Our main guest speaker for March was Rick Kang, Public Education/Outreach Coordinator for the Friends of Pine Mountain Observatory (FOPMO).

Located southeast of Bend in central Oregon, Pine Mountain Observatory is operated by the University of Oregon Physics Department. (Those who saw Bruce Weertman's presentation a while back will remember the map showing how dark the skies are in that area.) Composed of amateur astronomers, FOPMO itself helps maintain the observatory's three telescopes, runs a number of observing and outreach programs, and facilitates remote access of the telescopes by amateur astronomers for CCD-based research. FOPMO's main goal is "to provide authentic space science experience to all who are interested."

Pine Mountain Observatory lies at 6500 feet altitude. Those who have been to the Table Mountain Star Party will appreciate the benefits of having that much less atmosphere between oneself and the stars, and will also know that it can get *cold* (below freezing) even on summer nights. The site consists of three domes to house the telescopes, an astronomer's residence, and a primitive "first-come first-served" forest service campground nearby.

As Rick Kang puts it, the observatory can be accessed in several different "modes." Starting Memorial Day weekend, and running through the end of September, public viewing programs using the two smaller telescopes run from about 9 p.m. until midnight. In addition, there is a flat gravel area, complete with electrical outlets, available for those who wish to set up their own portable telescopes.

FOPMO is always looking for motivated individuals to help with their public outreach and observing programs. They have training sessions in April to certify people to run the two telescopes used for visual observing. The first of these is a 24-inch Boller & Shivens f/13.5 Cassegrain. Piggybacked on this is an SBIG ST6 CCD that takes images through a 90 mm Maksutov lens. The other visual instrument is a custom built vintage (circa 1900) 15-inch f/15 Cassegrain that is excellent for viewing. Contact Rick if you would like to be placed on the mailing list that tells about the training/certification program (yours truly is already on said list...).

The third (and largest) telescope is used for digital imaging only. This 32-inch Sygma Research f/3 (ex-Cassegrain) scope was

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Minutes (Continued from page 13)

built by a firm in Pasco in the 1970s. Its sister telescope overlooks the Tri-Cities from atop Rattlesnake Ridge. The 32-inch has been fitted with a custom built CCD at prime focus. This 1Kx1K CCD features low noise, rapid readout, RGB filters, and returns 5-Meg images in *Flexible Image Transport System (FITS)* format, which is the standard in professional astronomy.

The observatory archives digital images that the public can access through the Web. And amateur astronomers can put in requests for new data, which the observatory staff will take and forward to the requestor.

Finally, following certain criteria and using approved software, amateur astronomers can request to take their own digital data by remotely controlling either of the two larger telescopes.

In addition to the public viewing nights, FOPMO facilitates visits to the observatory by various groups, such as churches, schools, scouting troops, and so forth.

The group's involvement in public education is multifaceted. They provide real data to students and encourage them to use the data for authentic research purposes. Some of the research includes: searching for asteroids (using image registering and blink techniques); monitoring light curves of variable stars; and determining certain stellar characteristics.

To help students make good use of the data, FOPMO outreach includes both classroom visits, as well as staff development for educators in everything from beginning subjects to advanced astrophysics. This enables the teachers to aid their own students in research projects.

Rick can be reached by e-mail at rkang@efn.org, or phone at (541) 683-1381; or go to the *Friends of Pine Mountain Observatory* Web site: <http://pmo-sun.uoregon.edu/~pmo>. Contact Mary Hill (visions@pacifier.com) if you are interested in joining FOPMO (\$20 or more per year).

Sure... I know what you're thinking: Pine Mountain Observatory may be a bit of a drive from here. But hey, isn't that a lot better than simply *pinning away* over clear, dark skies that seldom materialize in Seattle?

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The Seattle Astronomical Society

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