



# Northwest Skies

The Official Newsletter of the Tacoma Astronomical Society  
Tacoma, Washington State, USA

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73 Years of Amateur Astronomy in the Pacific Northwest

November—December 2004

## The President's Message

by Matt Flood

This will be my last message to you as President of the Tacoma Astronomical Society. According to the bylaws the president may only serve two consecutive one year terms. It has been my pleasure to serve you these last two years. Being President is exhilarating, hilarious, sometimes maddening and always hard work. Without the help of key members and the Board of Trustees it would be impossible. But, of course, the work continues. Your new President will need your support, so please do all that you can to keep this society going strong. I have two more years as a Trustee so I will still have the pleasure of working with Tacoma Astronomical Society. Please accept my profound thanks for all the help both behind the scenes and out front by those of you who contributed.

I would like to mention just a few of the projects that Tacoma Astronomical Society tackled whilst I was President. Public

Nights moved from PGO to Pierce College without interruption, including the construction and maintenance of the hilltop viewing site. We revived the past tradition of the Astronomy Fairs. After many years, we also established our official associate society status with the University of Puget Sound to insure our General Meetings can be held there at no cost for the indefinite future. I am certainly not solely responsible for any of these achievements, they just happened to be on my watch and I was happy to have helped them along. Many thanks go to our Trustees and those hard working members.

November is our election month for the Board of Trustees. Our Board has twelve members, four of which turn over every year. The four Board members whose terms are up this year are; Joan Koch, Lisa Schmidt, Al George and Joe Witherspoon. Joe and Joan were filling terms

vacated by past Trustees. Also, two additional Trustees will need one year replacements due to the resignations of George Hiles and Ed Miller. In total six of our Board members need to be replaced. This makes the election very important to our society. You must be present at the November 2nd General Meeting to cast your ballot. Please carefully consider your vote. The list of nominees from the October meeting who accepted their nominations are as follows; Joan Koch, Dave Armstrong, Nate Andrews, Joe Witherspoon, John Pettit and Ken Board. In addition, more candidates can be nominated at our November meeting prior to our vote. You may nominate other candidates, but they must be present to accept, otherwise please notify the Board in advance so that we can verify their acceptance.

The election of the officers for the club will be made by preferential ballot

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Article contributions are strongly encouraged and may be submitted as an email attachment to

[editor@tas-online.org](mailto:editor@tas-online.org)

## People to Contact

You can also contact us via email through our website at:

[www.tas-online.org](http://www.tas-online.org)

Our mailing address is:

**The Tacoma  
Astronomical Society  
PO BOX 8881  
Tacoma, WA 98418**

President	<b>Matt Flood</b>	<b>253.564.3302</b>
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Information Officer	<b>Bill Briggs</b>	<b>360.893.1153</b>
Historian	<b>Matt Flood</b>	<b>253.564.3302</b>

**Last month Bert Brown detailed the teaching of astronomy at Washington State University. This month he details the academic studies in astronomy and facilities offered by the University of Washington.**

## What's Up In Astronomy

by Bert Brown

Last time we gave a brief description of the astronomy program that is developing at Washington State in Pullman. This article will be about the department at the University Of Washington in Seattle. My primary source is Dr. Bernard Bates, of the UPS physics faculty, who got his Ph.D. astronomy degree from the University Of Washington in 1986. Bernie has given several presentations to TAS over the years. [Editor: Dr. Bates is scheduled to give a presentation at an upcoming General Meeting soon.]

The University Of Washington department has a staff of 22 faculty, plus 6 post-doctoral fellows. They presently have

about 23 graduate students. So there is a major astronomy program there, offering Bachelors, Masters and Ph.D. degrees. A former TAS student member, Jennifer Reams, entered her undergraduate program a few years ago. I have not heard how she is doing.

On campus they have an observatory for students, named the 'Theodor Jacobsen Observatory', after the man who was the department from 1928 to about 1964. It has a 6" Brashear refractor. The University Of Washington Alumni Magazine for December 2003 reports that Professor Jacobsen died in July, 2003, at age 102. A Danish immigrant, he earned

degrees from Stanford and University of California. He was curator of astronomy at the Burke Museum until retirement in 1971. At age 98, he wrote a book, *Planetary Systems from the Ancient Greeks to Kepler*, published by the University of Washington Press.

On Manastash Ridge in Eastern Washington, near Ellensburg, the University Of Washington department has a 0.76-meter (about 30") reflector, with excellent Ritchey-Chretien optics.

Among research projects, the University Of Washington is associated with the Sloan digital sky survey, which has been described at a Tacoma As-

tronomical Society General Meeting some time ago. The University Of Washington is also a member of the Astrophysical Research Consortium, which owns the Apache Point observatory in the Lincoln National Forest of the Sacramento Mountains of New Mexico. The observatory has a 3.5-meter (about 138") reflector. Other institutions sharing this facility are New Mexico State, University of Chicago, University of Colo-

rado (Boulder), Johns Hopkins University, and Princeton.

The University Of Washington department has access to the physics workshops in the same building on their Seattle campus. These workshops, operated by the physics department, have provided important hardware for astronomy research projects.

Several astronomers from the University Of

Washington campus have given programs for Tacoma Astronomical Society meetings; those that come to mind are Don Brownlee, Paul Hodge, and Woody Sullivan. Maybe we can invite them again?

For additional info on the University Of Washington astronomy program, check out their excellent website at:

[astro.washington.edu](http://astro.washington.edu)

#### Continued from front page

at our December meeting. You will receive ballots in the mail after the November election and you can mail your ballot or bring it to the Christmas Party. There are two restrictions on who is eligible for Officers; the President and Treasurer must have one year of experience on the Board and are limited to two consecutive one-year terms. Our ballots will clearly state who is eligible for each office.

Our Christmas Party this year will be held at Mama Stortini's Restaurant, 3207 E. Main Street in Puyallup, at 6:00PM, December 11<sup>th</sup>. Those who have eaten there know of their fine reputation for good food at a reason-

able price. We will more details on the website soon or at the November General Meeting. Please try to make this a fun family event. It is one of the society's best opportunities to socialize and get to know your fellow club members better. See you there!

The TAS Board of Trustees has voted to increase membership dues beginning January 1, 2005. This is the first increase in 18 years. The reason is due to increased costs in two areas. Firstly, our insurance rates have doubled in the last two years and we must maintain our insurance coverage for Outreach events and Public Nights. Secondly,

our continued membership in the Astronomer's League, which we maintain for each of our individual members, has also increased greatly. This caused us to run at a slight deficit for the 2004 budget. Obviously, we need to get our expenses in line with revenues. Our new dues for 2005 will be \$35 for a family, up from \$29. A single membership is \$25, up from \$20. Student memberships are now \$15, up from \$10 and senior membership are \$10, up from \$5 per year.

Once again, thanks to all of you and I look forward to a active and exciting 2005!

*Matt*



#### Don't Forget To Vote!

In addition to the November 2nd General Election we also have our own nominations and voting in of the new appointees for the Board of Trustees. The nominees so far are:

**Nate Andrews**  
**Dave Armstrong**  
**Joan Koch**  
**John Pettit**  
**Ken Board**

Nominations for other member candidates can be made at the meeting before voting.

After the November General Meeting the preferential ballots for Trustee Officer positions will be mailed out. You can mail back your vote or bring it along to the Christmas Party.



**Snacks for the General Meeting**

The following good people have volunteered to bring cookies or other snacks to our upcoming general meetings:

**November**

John Pettit

**December**

Joe

Witherspoon

Thank you for making our meetings more enjoyable.



**Reflective Optics for Astronomical Telescopes**

By Jarvis Krumbein

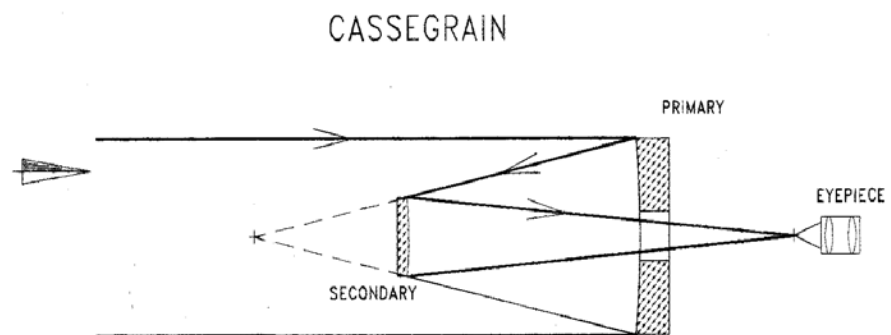
After the Newtonian, the most common form in amateur use is the Cassegrain telescope. These consist of a concave primary mirror and a small convex secondary mirror to magnify the focal length. This type of telescope combines the advantage of a large primary mirror and long overall focal length with a compact tube assembly. There are two main branches of this type, 1) the conventional Cassegrain which uses a non-spherical primary mirror and 2) those that use a spherical primary mirror and an additional corrector lens to eliminate the aberrations of the primary. The two main categories of this second type are the Schmidt Cassegrain and the Maksutov

Cassegrain such as manufactured by Celestron, Meade and others. This category (2) will be discussed in the next installment.

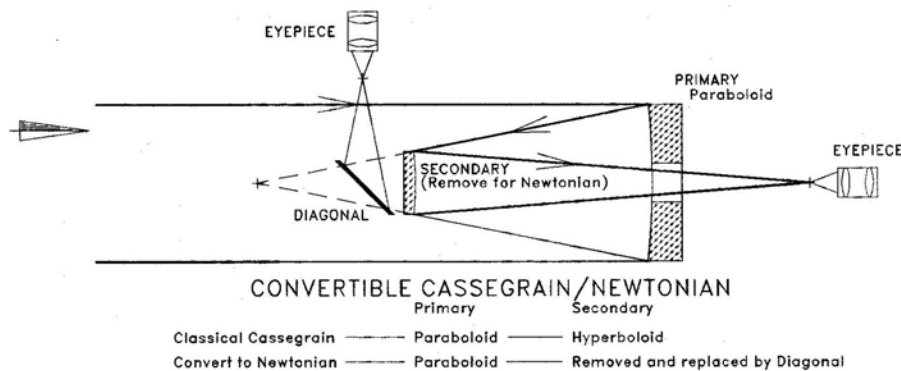
The (1) category of Cassegrain telescopes are comprised of four different optical variations. These are (A) the Dall-Kirkham or DK, (B) the conventional Cassegrain and (C) the Ritchey-Chretien or RC. The fourth, (Pressman-Camichel) uses a spherical primary and an oblate spheroid secondary. This configuration, while fairly easy to fabricate has so much coma that it is rarely used and will not be discussed further. All of the Cassegrain types have various aberrations which affect

their performance. A curved focal plane and astigmatism as well as the already mentioned coma being common. Almost all use a perforation (hole) in the center of the primary to permit the focal plane to be in back of the primary where it is easily accessed. A small diagonal mirror can be used just in front of the primary to get the focal plane to where it can be used, eliminating the need for the perforation in the primary but this is rarely done except in the largest professional telescopes.

A) Most amateur and some professional built Cassegrain telescopes are the Dall-Kirkham type which is the easiest to fabricate. The DK re-



Common Cassegrain Variations	Primary	Secondary
Classical Cassegrain	Paraboloid	Hyperboloid
Dall-Kirkham	Prolate Ellipsoid	Sphere
Ritchey-Chretien	Hyperboloid	Hyperboloid
Pressmann-Camichel	Sphere	Oblate Ellipsoid



quires an ellipsoidal primary mirror and a spherical secondary mirror. The optical performance is not as good as the other two types, the main aberration being off axis coma but on axis, the images are very excellent. Some very high quality DK's, such as those made by Takahashi, add corrective lenses near the final focal point to correct the coma and provide a much wider and flatter field of view.

The reason for the DK's popularity is the ease of fabricating the spherical secondary mirror, which if carefully made requires no testing. The convex hyperbolic secondary of the conventional and RC types can be very difficult to figure and to test, requiring either test plates or a large spherical test mirror.

B) The conventional Cassegrain uses a concave parabolic primary and a

convex hyperbolic secondary. On axis performance is very good and while some coma is present off axis, there is not as much as the DK. The hyperbolic secondary is much more difficult to make than the DK's spherical secondary. One advantage of this type is the possibility of being used in more than one configuration. Because the primary is parabolic, a diagonal can be used instead of the hyperbolic secondary for a fast Newtonian. An example would be a f4 Newtonian convertible to an f16 Cassegrain.

C) The Ritchey-Chretien uses more extreme hyperbolic curves for both the primary and secondary mirrors. As a result, the RC can be fully corrected for coma and most other aberrations and can have a very large field of view which is well suited to photography. The curves for both mir-

rors are much more difficult to make so that most RC type telescopes are very large professional instruments found in the larger observatories. This type is generally for photographic use and is rarely used for visual observation.

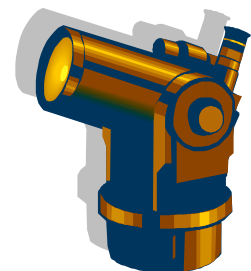
All three types can be further improved by the use of corrective lenses near the focal plane. These can reduce coma and/or flatten the curvature of the focal plane. This last is important to allow a flat field that is in focus across a film surface or CCD when the telescope is used for photography.

All of the Cassegrain types require very careful baffling to keep stray light out of the field of view at the focal plane.

The next article will describe the Schmidt and Maksutov Cassegrain types.

**In his continuing series on the structure and design of various optical systems for astronomical telescopes Jarvis Krumbein details the variations on the Cassegrain optical configuration.**

**Regular attendees at our General Meeting will recall the presentation Jarvis gave on the subject of reflective optics a few months ago and we are delighted to be able to reproduce that lecture, with more detail, here in our newsletter.**



## November Schedule of Events

- November 2nd:**  
 General Meeting at UPS, Thompson Hall, Room 130. Presentation will be given by Professor Bernie Bates. 7:30 PM.
- November 5th:**  
 TAS Outreach at Margaret McKinney Elementary in Olympia. Contact Joe Witherspoon to volunteer and for details. 7:30PM
- November 6th:**  
 Public Night at Pierce College, Sunrise Building. Program will be 'Winter Sky Splendors'. 7:30PM
- November 9th:**  
 TAS Outreach at Bush Middle School in Tumwater. Contact Joe Witherspoon to volunteer and for details. 6:30PM
- November 12th:**  
 Student Observing Night.
- November 16th:**  
 Trustees Meeting. 7:30PM
- November 19th:**  
 Student Meeting. Room 203 Cascade Building, Pierce College. 7:00PM
- November 20th:**  
 TAS Outreach at Steilacoom Library. Contact Joe Witherspoon to volunteer and for details. 1:00PM  
 Public Night at Pierce College, Sunrise Building. Program will be 'Telescopes and Binoculars'. 7:30PM

## September General Meeting Minutes

by Sion Heaney

The September Meeting Show and Tell was lead by Gwen Grace who provided a slideshow presentation of her visit to the Whipple Observatory in Southern Arizona.

The main program was given by Chuck Jacobson on the construction of his 8" refractor. He attended the Telescope Makers Workshop in Bellingham a while ago and set about

constructing an f15 scope using 2 8" blanks left over from the class. In addressing the achromatic issues he optimized the optics for the green spectrum whilst trying to bring the red and blue peaks, close to the focal point for a sharper focus. When optimized like this there should be no coma or spherical aberration.

During the grinding of the

lens Chuck constructed mounts for the blanks with plaster of paris and ceramic tiles for gluing. The curve of the lens was verified with a spherometer and performed Foucault and Ronchi tests to determine the quality of the lenses.

For the telescope tube itself, Chuck used an aluminum irrigation pipe.

# November 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 7:30PM General Meeting	3	4 ☾	5 7:30PM TAS Outreach	6 7:30PM Public Night
7	8	9 6:30PM TAS Outreach	10	11	12 ● Student Observing Night	13
14	15	16 7:30PM Trustees Meeting	17	18 ☽	19 7:00 PM Student Meeting	20 1:00PM TAS Outreach 7:30PM Public Night
21	22	23	24	25	26 ○	27
28	29	30				

### October General Meeting Minutes

The meeting opened with nominations for the Board of Trustees. Further nominations will be taken in November.

Matt detailed the increase in membership dues as a result in increased costs to the Society for insurance and Astronomical League dues.

The Christmas Party will be held at Stortini's Res-

taurant in Puyallup but more information is to come.

Sion gave an overview of the website upgrade and detailed the offer of discounting hosting made to members of the society by ThinkHost.com.

Show and Tell included Jerry Armstrong's demonstration of lunar libration, Chuck Jacobson's

by Sion Heaney

astrophotography and Dave Armstrong's details on the design of his new scope.

The presentation was given by Alice Few on the work she has been doing with the Telescopes In Education program for the Student Group. The TIE program provide internet access and control to an observatory in the Chilean Andes.

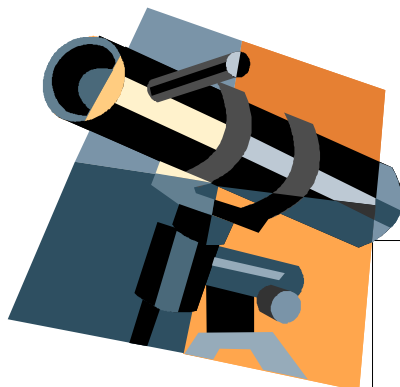
### December Schedule of Events

- **December 4th:** Public Night at Pierce College, Sunrise Building. Program will be 'The Christmas Star'. 7:30PM
- **December 4th:** TAS Outreach at Maplewood Elementary in Puyallup. Contact Joe Witherspoon to volunteer and for details. 7:30PM
- **December 7th:** General Meeting at UPS, Thompson Hall, Room 130. Presentation will be given by Steve Mackey on 'The Star of Bethlehem'. 7:30 PM.
- **December 10th:** Student Observing Night at Pierce College, Observing Hill, 7:30PM
- **December 11th:** TAS Christmas Party, Stortini's Restaurant in Puyallup. 6:30PM
- **December 18th:** Public Night at Pierce College, Sunrise Building. Program will be 'The Christmas Star'. 7:30PM

# December 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4 ☾ 7:30PM Public Night 7:30PM TAS Outreach
5	6	7 7:30PM General Meeting	8	9	10 Student Observing Night	11 ● Christmas Party
12	13	14	15	16	17	18 ☽ 7:30PM Public Night
19	20	21	22	23	24	25
26 ○	27	28	29	30	31	

## Northwest Skies



### First Class

If undelivered, please return to

Tacoma Astronomical Society  
c/o The Newsletter Editor  
8218 North 9th Street  
Tacoma, WA 98406

Phone: 253-460-0599  
Email: [editor@tas-online.org](mailto:editor@tas-online.org)

### We need your articles.

If you are interested in contributing an article or would like to make a suggestion as to what you'd like to read in **Northwest Skies** then please do contact the Editor. We are always in need of contributions.

Deadline for submitting articles for inclusion in the next edition of **Northwest Skies** is the last Thursday of the month before publishing.

We're on the web!  
[WWW.TAS-ONLINE.ORG](http://WWW.TAS-ONLINE.ORG)

## The Year In Review

by Sion Heaney

As we draw towards December it is worthwhile reflecting on significant events of the past year. Following last year's success, the popularity of the Astronomy Fair continues. This was a team effort by many members including Matt Flood, Ken Slavens, Alice Few, Joe Witherspoon, Bob Isaacs and Bill Briggs. Also, thanks to Leo Romo, Matt Flood and Dave Armstrong, we have a new booth for the new location at the Puyallup Fair Hobby Hall.

For putting on a great picnic thanks go to Gwen

Grace for the TAS Table Mountain Picnic and, with Joan Koch, for the party last month wishing Don Tucker a safe deployment in Iraq.

An essential part of the Society's activities is the Student and Outreach Programs. Alice Few, Ken Slavens and Carl Tankersley have worked hard over the year with the Student Program. Kudos goes to Joe Witherspoon, Dave Armstrong and Ken Board for their work on the TAS Outreach program. We also had a number of field trips. A tour of Sirius Optics and

a field trip to the Bonney Lake Skystone were certainly memorable. We hope to have even more of those in 2005.

There have been many people who have helped and participated in the activities of the society this year. In fact, too many to list individually here but, if you are a member of the Tacoma Astronomical Society, then count yourself amongst those who continue to make this a great astronomical society to belong to.

Thank you one and all.