

Northwest Skies

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

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73 Years of Amateur Astronomy in the Pacific Northwest

January—February 2004

The President's Message

by Matt Flood

Welcome to the New Year, 2004, from the Tacoma Astronomical Society. At this time of year it is natural to look back at 2003 to see where we were as well as look forward to 2004 to see where we are going. Meeting the challenge of our mission, to foster awareness and opportunities for spreading and learning astronomy, is a constant balancing act of what we would like to be able to do and what we can do given our resources. I think we get a pretty good rate of return for both our dollars and our time. Let's hope we can continue to do so.

Last year saw many challenges for our club. Our difficult post-PGO reality was the biggest change in my years with the club. Thankfully Pierce College has worked out nicely for us. The college seems to enjoy our presence and has made every effort to give us all the help they can. On the horizon at Pierce College is a new science building to include a planetarium and possibly, within the foreseeable future, a separate observatory. Also 2003 saw the return of Astronomy Fair, our new website, our special Mars nights, many new friends, the loss of some old friends, and the

continuing of some of our old favorites, such as Table Mountain Star Party, the Puyallup Fair, our regular Star Parties, Outreach Programs, Student Programs, the Christmas Party and more.

Quite a lot looking back. Just how did we do it all? We did it by having dedicated, hard-working members who like to share their love of astronomy with others. Thank you all.

This year we will be just as challenging. Some new highlights; Astronomy Fair II, the return of the Club Member Nights, one Saturday a month for viewing at Pierce College and display/information booth in an indoor public location for Astronomy Day, April 24th.

One of our annual highlights is the Christmas Party. Christmas Party 2003 was lots of fun. I think everyone had a good time and I know everyone had really full bellies after all the excellent food. Thanks to all who helped out with cooking, setup, clean up and more. The party is also our Board of Trustees meeting to elect 2004 officers. The election went as follows; 2004 offi-

cers are President: Matt Flood, Vice-President: Bob Isaacs, Secretary: Joan Koch, Treasurer: Dave Sherrod. Congratulations all! You can see a photograph of our new officers taken at the party on page 6 of the newsletter. Also the yearly awards were given out as follows; Student Astronomer of the Year: Dan Gifford, Adult Astronomer of the Year: Joe Witherspoon, and Presidents Award: Sion Heaney. Congratulations to you all for your outstanding contributions to our club and our communities.

Some quick notes for the upcoming year. We will continue to have General Meeting presentations on astrophotography, as many of our members show a great deal of interest and talent in this field. Jarvis Krumbain returns on March 2nd and Marvin Nauman on April 6th presenting astrophotography and auroras respectively.

Membership renewal notices will be sent in the mail this year which should make the process faster and more efficient. Please respond when you receive your renewal notice.

Thank you and clear skies!

Northwest Skies is a bi-monthly publication of the Tacoma Astronomical Society. All opinions expressed in this newsletter are those of the contributors and not necessarily those of the Tacoma Astronomical Society. Personal advertising is accepted without charge from members in good standing.

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

editor@tas-online.org

***In this edition,
Bert Brown
discusses the
most elusive of
the four known
forces in the
Universe and
current
attempts to
directly detect
it.***

People to Contact

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

www.tas-online.org

Our mailing address is:

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

President	Matt Flood	253.564.3302
Vice-President	Bob Isaacs	253.874.2432
Secretary	Joan Koch	253.535.1252
Treasurer	Dave Sherrod	253.875.1063
Newsletter Editor	Síon Heaney	253.460.0599
Program Director	Matt Flood	253.564.3302
Information Officer	Tami Heaney	253.460.0599
Historian	Matt Flood	253.564.3302

What's Up In Astronomy

by Bert Brown

A couple of years ago we had some articles about Einstein's theories of relativity. The General Theory, first published in 1916, is basically a theory of gravity, and one of its predictions was that there ought to be gravity waves. At first, this seems obvious; classically, gravity forces have the same dependence on distance as does electricity, an inverse-square law for statics. And we know it is easy to get electrical waves; just make electrons oscillate in an antenna. But the problem for gravity is its absurdly small strength; the gravity force between two protons is about 10 to the 36th power times smaller than the electrical force. Yes, the gravity force between you and me changes a little as we pass each other in the hallway, but it is deucedly hard to detect.

But how about violent astronomical events, like supernovae or collapsing stars? Yes, there is a pulsar with another star rotating around it, probably another neutron star, which may be radiating gravity waves; the orbital period is slowly decreasing, at a rate consistent with the loss of energy by gravity radiation. But we have not detected the waves directly.

The current attempts to detect gravity waves use a device similar to, but much larger than, a Michelson interferometer--invented by A. A. Michelson late in the 19th century, and used by him to try to detect the earth's motion through the "ether" and to measure the speed of light. The device uses interference between light beams which have different paths--producing "fringes", like the ones seen

by telescope builders in checking the accuracy of their mirrors. The relevant experiments were designed by scientists from the Massachusetts and California Institutes of Technology--MIT and Caltech--and are called "LIGO", for Laser Interferometer Gravitational-Wave Observatory. One setup is at Hanford, in this state, and another is in Louisiana. The Hanford facility consists of two long tubes, 4 feet in diameter and 2.5 miles long, at right angles to each other. A control room at their apex contains a precision laser and a beam splitter. The laser beams undergo multiple reflections from mirrors at each end of the tubes. A gravity wave should alter the lengths of the tubes, and cause an interference pattern from the combined beams to change slightly. Photodiodes would then

convert the light patterns into electrical signals. But the expected changes in length would be smaller than the diameter of a proton, so the device has to be extremely sensitive. Indeed, spurious "noise" such as rush-hour traffic in nearby Richland, and water waves hitting the Washington Coast during a storm, can be detected. (Ordinary seismographs can also pick up the storm wave signals.) False signals need to be identified and discarded by comparing the Hanford results with those from Louisiana at the same time.

Scientists from Washington State University (Pullman) have joined the LIGO groups at Hanford, which now include scientists from all over the world. The project is largely funded by a nearly \$400 million grant from the National Science

Foundation.

Recently another similar project has been developed by a France-Italy collaboration, and is located near Pisa in Italy--the city famous for its leaning tower, and as the home town of Galileo--who conducted early gravity experiments there. This new project, called "Virgo", would help establish the direction of any detected signals by triangulation measurements in conjunction with the American results. So far, no gravity waves have been detected, but as techniques are refined there is hope they will be.

So what is to be gained from all this? The gravity force is one of four known basic forces in the universe...but its theory has yet to be successfully integrated into the theories of the

other three (electromagnetic; weak and strong nuclear forces). And gravity waves are not hindered by matter as much as electromagnetic waves are, so this may help us learn something about the earliest history of the universe. And the universe's expansion rates for distant galaxies seem to be greater than what the Hubble law would indicate--is there another force afoot? Or can this be explained by Einstein's work? And what about the "dark matter"? The gravity wave research may help us decide some of these things.

Sources

A Search through Space and Time, Jeff Wolfe, Washington State Magazine, Fall 2003, pp 16-17.

Virgo Gears Up to Wait for Gravitational Waves, Toni Feder, Physics Today, September 2003, pp 31-32.

Help Using Your Equipment

The current listing of Tacoma Astronomical Society volunteers is given below. If you need assistance or advice regarding astronomical equipment such as questions regarding operating or purchasing a telescope these volunteers can help. Please remember that they are unpaid volunteers and limit your calls to the hours between 7:00PM and 9:00PM. If you wish to become a TAS volunteer, please contact Sion Heaney.

Al George
253.531.1171

Dave Armstrong
425.277.2175

Sion Heaney
253.460.0599

TAS Outreach Program

Our Outreach Program is very active within the community and a very important part of our activities provided by the general membership to the community at large. Each month we have several star parties scheduled and usually weather permitting. However, we always find ourselves struggling to have volunteers from the TAS general membership help out. The following are summaries of some our recent star parties and what one might expect.

In November a Star Party for Pioneer Junior High was canceled because of weather. During this time of year, weather always plays a big factor in actual star gazing. However, we do provide plenty of indoor activities too. A class on the Solar System was given to the Astronomy class at Cascade Christian High School. The teacher said that the school was getting a couple eight inch Dobsonians and may need some help in setting up and using them. The TAS website and contact

numbers were left with the teacher.

December events included two Star Parties and one class. An introduction to Astronomy class was given to students at Parkland Lutheran School on the 2nd of December. On the 8th of December members of TAS conducted a Star Party at the school from 6:00 PM to 8:00 PM. Joe Witherspoon and Ed Miller gave a class on the Phases of

Continued on back page



Snacks for the General Meeting

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

January

Lisa Schmidt
Erin Flood

February

Tami Heaney
Sion Heaney

Thank you for making our meetings more enjoyable.



Club Field Trip to Sirius Optics

by Bob Isaacs



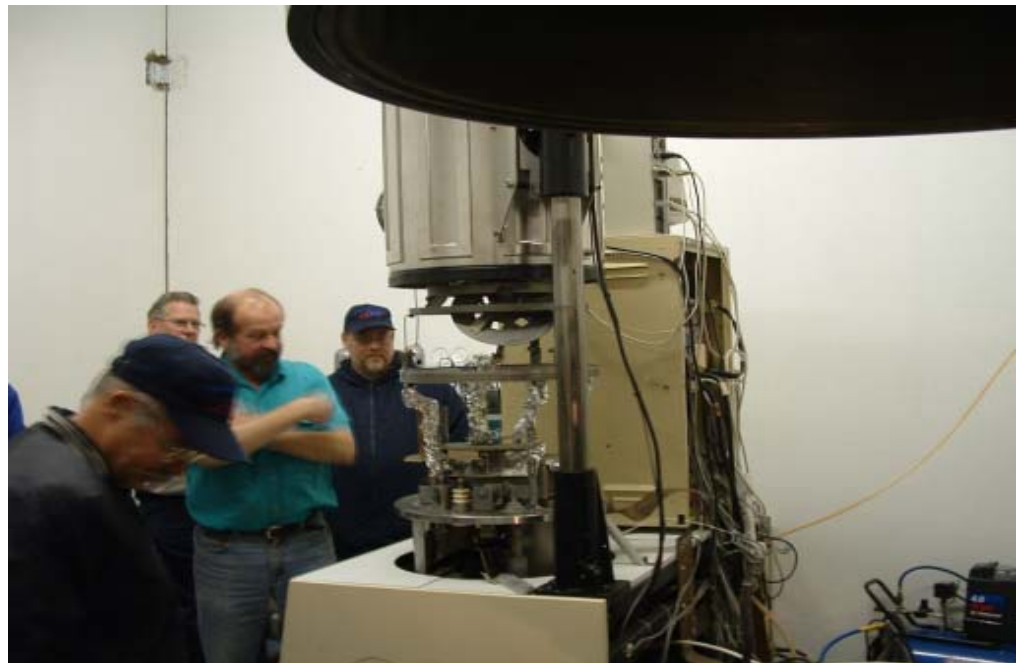
Bill Briggs, Dave Armstrong, Dave Potter, Jarvis Krumbain and Dick Carrier arrive at Sirius Optics Inc. in Kirk-

land. On Nov. 22, 14 members of TAS and their guests went on a field trip to Sirius Optics in Kirkland. At 10:15 our convoy set out from UPS. At 11:00, Jarvis Krumbain, Chuck Jacobson, Bill Briggs, Matt Flood, Charles Tenesch, Dan & Dave Gifford, Dick Carrier, Dave Potter, Joe Witherspoon, Dave Armstrong, Tom

bein, Chuck Jacobson, Bill Briggs, Matt Flood, Charles Tenesch, Dan & Dave Gifford, Dick Carrier, Dave Potter, Joe Witherspoon, Dave Armstrong, Tom

Robinette from the Boeing Astronomical Society, Bob Isaacs and Pete Isaacs met at Sirius Optics.

We were met by Al Misiuk and shown around the shop. He had 2 vacuum chambers. One could handle mirrors up to 16" and the other, still being installed, will be able to handle mirrors up to 24" in diameter. The vacuum chambers operated 1 billionth of an atmosphere, or 10^{-15} tors of pressure. He first demonstrated this by producing a solar filter for us. He placed a glass element in a carousel at the top of the chamber and the coating material at the bottom. He closed the chamber and started the vacuum pump which dropped the pressure to a millionth of an



Al Misiuk of Sirius Optics Ltd presents one of the vacuum chambers used for the coating process. The vacuum chamber is shown here raised to reveal the inner mechanisms.

atmosphere. This took about 10 to 15 minutes. He then opened a cryogenic tank liquid helium which cooled the remaining air molecules and cause them to literally drop out of the bottom of the chamber. When the electron beam was directed at the coating material, it vaporized and traveled to the top of the chamber at hundreds of miles an hour. A sensor at the side of the chamber measured the thickness of the coating on the filter. Everything else in the chamber was covered in foil for easy cleaning. After just a few minutes the filter was ready. He then placed the filter in a spectrometer to measure the light frequency transmission.

After the demonstration, Al offered to clean my mirror. We discovered that my



Spectrometer used for determining light absorption of coatings.

mirror was oxidized and he offered to recoat it. I agreed to have a silver coating put on my mirror. After de-coating my mirror, he placed it in the chamber and started the pump. We all went to lunch at this time waiting for the pressure to drop. At 1:30 we proceeded to coat the mirror with one coat of silver and 2 coats of quartz

for protection. This gives the mirror a reflectivity of 98% compared to about 85% with the berel coating it had before.

Al then shared some astrophotos he had taken with his web-cam. We said our thank-you's and left around 2:30.



Bob Isaacs shows off his newly coated mirror, courtesy of Al Misiuk of Sirius Optics Ltd.



Observing Hill

Maintenance

As the Tacoma Astronomical Society becomes the key user of the Observing Hill at Pierce College it is vital that we should also participate in the care of the site.

Please help by volunteering to clear the site and cutting the grass prior to events.

Contact Matt Flood if you would like to assist in the upkeep of our observing site.

Thank you.

In the last edition Bob Isaacs gave a summary of the visit TAS made to Sirius Optics.

In this edition we have included some of the slides shown at the General Meeting and a more detailed description of the visit.

January Schedule of Events

- January 3rd:**
 Star Party at City of Des Moines.
 7:30 PM
- January 6th:**
 General Meeting at UPS, Thompson Hall, Room 130. Presentation will be given by Carl Zambuto on Reflector Optics.
 7:30 PM
- January 13th:**
 Star Party at Gray Middle School.
- January 17th:**
 Public Night at Pierce College, Sunrise Building. Program will be 'Space Exploration'.
 7:30PM
- January 20th:**
 Trustees Meeting.
 7:00PM
- January 20th:**
 Star Party for The Puyallup Cub Scouts at North Hill Puyallup.
 6:30 PM.
- January 21st:**
 Club Member Night at Pierce College, Sunrise Building.
 7:30 PM
- January 22nd:**
 Star Party at Spanaway Elementary School. Details on the website and from Ken Board.
- January 23rd:**
 Student Meeting at Pierce College, Cascade Building, Room 203.
 7:00PM
- January 31st:** Public Night at Pierce College, Sunrise Building. Program will be 'Space Exploration'.
 7:30PM



The 2004 Club Officers, left to right, Bob Isaacs (Vice-President), Dave Sherrod (Treasurer), Joan Koch (Secretary) and Matt Flood (President).

January 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3 7:30PM Star Party
4	5	6 7:30PM General Meeting	7 ○	8	9	10
11	12	13 7:30PM Star Party	14	15 ☾	16	17 7:30PM Public Night
18	19	20 7:00PM Trustees Meeting	21 ● 7:30PM TAS Club Member	22 5:30PM Star Party	23 7:00PM Student Meeting	24
25	26	27	28	29 ☽	30	31 7:30PM Public Night

December General Meeting Minutes

Matt announced that the sign up sheets for cookies for meetings in 2004 was on the desk. He also had directions to his house for the Christmas Party on December 6, 2003. Matt also said that we need tables and chairs for the Christmas Party.

Lisa Schmidt needs a more orders for jackets and embroidered items before she can order them.

Tom Gwilym gave a talk on Astrophotography and using programs like Registax and Photoshop.

Chuck Jacobs brought in some more of his beautiful pictures of Jupiter and Saturn and discussed how he produced the pictures.

Bob Isaacs talked about the recent trip by Club members to Sirius Optics in Kirkland. Bob said that there is a possibility that another field trip can be planned for early in the new year. If anyone is interested please contact Bob Isaacs.

Marv Nalan presented pictures of the auroras in Alaska. Seems that there is a tour every year

by Joan Koch

that goes up into the country side to a hot springs where the seeing is very good.

Joe Witherspoon announced that on December 5 there will be a weather permitting Star Party at Daffodil Elementary School in Sumner. If the weather doesn't cooperate there will also be a static display. Joe also said that on 12/8 at 6 pm there will be a weather permitting start party at Parkland Lutheran School. The school is located on 123rd St. and Pacific Ave. There are directions on the Web page.

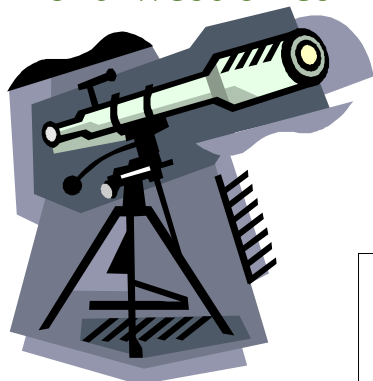
February Schedule of Events

- February 3rd:**
 General Meeting at UPS, Thompson Hall, Room 130. Presentation will be given by Bob Matthews on *Refractor Optics*.
 7:30 PM
- February 7th:**
 Star Party at City of Des Moines.
 7:30 PM
- February 14th:**
 Public Night at Pierce College, Sunrise Building. Program will be 'Hawaiian Observatory' by Dave Armstrong.
 7:30PM
- February 17th:**
 Trustees Meeting.
 7:00PM
- February 21st:**
 Club Member Night at Pierce College, Sunrise Building.
 7:30 PM
- February 27th:**
 Student Meeting at Pierce College, Cascade Building, Room 203.
 7:00PM
- February 28th:**
 Public Night at Pierce College, Sunrise Building. Program will be 'Hawaiian Observatory' by Dave Armstrong.
 7:30PM

February 2004

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

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

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

Continued from page 3

the Moon to about 60 students, siblings, parents and teachers. Younger students continued to make craters in flour and cocoa long after the class was over. TAS members Ed Lofquist, James Collins and his son, Dave Potter, Ken Board and John Pettit set up their telescopes and binoculars. After the class it was like the charge of the light brigade out to the telescopes, A second rush to look through a telescope happened when Jon Pettit centered on Saturn in his telescope.

On Friday the 5th of November TAS members Ed Miller, Ed Lofquist, James Collins and his son, and

John Pettit went to the Daffodil Valley Elementary School's Science Fair. The weather did not allow viewing so the telescopes were brought inside. Amongst other indoor activities, Ed Miller explained the use of the planispheres to the students.

There are several upcoming events for January and it would be wonderful to expand our core membership who volunteer for these programs.

- January 3rd Star Party at The City of Des Moines (weather permitting) starting at 7:30PM
- January 13th class at Gray Middle School
- January 20th Star Party

for The Puyallup Cub Scouts at North Hill Puyallup starting at 6:30PM.

- January 22nd Star Party at Spanaway Elementary School starting at 7:30PM
- February 7th Star Party at The City of Des Moines (weather permitting) starting at 7:30PM

The Outreach Program is always very active and is in need of help from the membership. If you are free on any of the dates listed above and would like to help out you would be more than welcome. You can contact Joe Witherspoon at (253) 537-1217 or by e-mail at x-ray796@comcast.net