

March 2007

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<http://www.starastronomy.org>



March's Meeting

The next S*T*A*R club meeting will be 8 PM Thursday March 1, 2007 at King of Kings Lutheran Church, 250 Harmony Rd. in Middletown.

Our program will be "Motions of the Earth and Moon by S*T*A*R's very own David Britz.

Editor's Note: Lunar

Eclipse!

First I should say the obvious: don't miss the lunar eclipse! Occuring on Saturday, this is the first eclipse since the Red Sox won the World Series.

I am going to have to pass the baton of the Spectrogram once again at the end of this year, as I will be going off to college. It's quite simple and not very time consuming; you can put together the Spectrogram in as little as half an hour to an hour each month if your schedule is tight. Please email me if you're interested. In the meantime, I'll finish out the rest of this year's articles.

March Issue

The deadline for the next edition of the Spectrogram is Wednesday, March 28th. Please email any contributions to Daniel_handlin@hths.mcvsd.org. As always, any and all contributions are welcome!



Discovery at ISS
Image Courtesy NASA

Calendar

Sep 7, 2006 - - Clif Ascraft -
"Restoring the Tuthill
Telescope"

5 Oct, 2006 - Dr. Kenneth
Kremer - "Exploring Mars and
the Search for Life"

2 Nov, 2006 - Dr. Sebastien
Lepine - "The Search for
Nearby Stars"

7 Dec, 2006 - Kevin Kilkenny -
"New Horizons' Journey to
Pluto"

4 Jan, 2007 - Daniel Kirby -
"Pirates of the Solar System
Caribbean"

1 Feb, 2007 - Gavin Warnes -
"Collimating your Telescope"

1 Mar, 2007 - David Britz -
"Motions of the Earth and
Moon"

5 Apr, 2007 - Dr. Eric Lerner-
"The Big Bang Never
Happened"

3 May, 2007 - TBD

7 Jun, 2007 - AGM Business
Meeting

Image Courtesy NASA





The ISS in 2002
Image courtesy NASA



Earthrise from an Apollo spacecraft
Image courtesy NASA

President's Column

By Steve Walters

March is at hand! That means warmer nights and the big event of the year, the Messier Marathon! This year, S*T*A*R members will gather at Coyle Field the evening of Mar 17 (sat) to have an all night run at observing nearly all the Messier objects. Sunset is at 7:07 p.m. but consider coming a little early so you can set up in advance in a spot with a good low western horizon. Bring some snacks and good clothing to stay warm. If you've never done this, come on down and give it a try, it's a really fun event. If you can't stay all night, drop in for a few early objects and then head for the barn. But do come by even if it's just for a little while. Watch our discussion board under the "Observing Plans" heading for details.

With spring just around the corner, that means NEAF (the North East Astronomy Forum) is also not far away. This year, NEAF will be held on April 28 and 29 (sat and sun). There are always a lot of interesting new products to see at NEAF. This year there is (again) an imaging conference the two days prior to NEAF so if you're interested in getting started or if you're an old hand, consider going to this part of the event. You can get more info at <http://www.rocklandastronomy.com/neaf.htm>

On a personal note, I've been very busy with my new OutHaus observatory up at the Pocono Palace and also with my software product, CCDNavigator. This month, I finally got my AO (Adaptive Optics) until working properly with the control software. This has been a major problem as I've been at this since November. Clouds and wind have prevented any really good imaging sessions but I've been staying at the Palace every month for one to two weeks. Also, I'm picking up a new wide-field telescope, the Takahashi Epsilon 180, a 7" hyperbolic astrograph.

Our March program will be on the motions of the Earth and Moon. S*T*A*R's own David Britz will be presenting this and I know we'll all learn something new.

See you out there! Clear Skies!

Steve...

February Meeting Notes

By Steve Fedor

The February 1, 2007 meeting of S*T*A*R Astronomy began at 8:05 pm. The meeting was attended by approximately 29 members and non-members. Vice President Gavin Warnes began by welcoming first time attendees.

Gavin announced the need for all members to pay their dues. At the moment S*T*A*R has only 49 paid members which is not enough to keep the club financially sound.

At 9:10 the meeting became a lesson and demonstration in the art of aligning your mirrors. All aspects of collimation were discussed and demonstrated. Many thanks to those members who brought their scopes and/ or collimation tools.

Doug Berger presented the monthly dark intervals and talked of the upcoming Messier Marathon. Details can be found on the discussion board under "Events and Observing Plans."

SIG's

Beginners: Nancy McGuire reported that she unfortunately doesn't have time to continue chairing the beginners SIG. She suggested people contact Stephen Scaravella who

observes almost every clear night from his driveway and is always happy to have some company.

ATM: Gordon Waite announced a few more mirrors had been completed with great results.

Outreach: Dennis O'Leary announced flyers are available for library distribution.

Events and Announcements

-Larry Campbell announced that he would like assistance at a star party to be held at the Village School in Holmdel on Feb 20. This event usually is attended by 500 people.

-Randy Walton announced the availability of Club apparel and items with the club logo. He also discussed the passing of Dr. Eric Zimmerman who was the director of the Novis Planetarium.

-Ken Legal announced he'd like help at a star party at Eisenhower Elementary school in Sayreville on 5/18. This will be an all night camp out event with free food for the astronomers. No rain date is scheduled.

The 50/50 was drawn. The meeting was adjourned. No observing took place afterwards due to cloudy skies.

Collimation Night at S*T*A*R

By Steve Fedor



The Feb 1st, 2007 meeting of S*T*A*R Astronomy was dedicated to all aspects of collimation. Many members brought their scopes and collimators for demonstration. Here VP Gavin Warnes begins the night with an overview of the “how and why” of aligning your mirrors. Afterwards he gave out free collimation plugs and provided a tester for checking the collimation of your collimator.

The meeting was attended by 29 members and non-members. Some were getting their first lesson in collimation while the old pros were happy to pass along their knowledge.

Just about any collimator you could think of was there. From Howie Glatter, to Orion, to Cat's Eye to Cheshire. Unfortunately the cloudy skies didn't permit star testing of the collimation. A plethora of photos follow.



New members Christopher and Stacy getting their first glimpse through a Cheshire on their Galileo reflector.



Rob is looking on as Ned, Ken and Stephen “Scopehead” check out the collimation on his Orion IntelliScope dob. By the way, Rob says the Orion DSC's are quite accurate.





Mike and Gordon chatting with Stephen R. while Gavin's 15 inch Obsession sits in the background waiting for someone to come collimate it.



Ken making sure his alignment is textbook perfect while Scopehead talks of his upcoming trip to Chiefland.



New member Ned gets a lesson in collimation from Gavin and Randy. The scope here is Ned's home brew. He also owns a 17.5 inch Discovery dob.



Charles and Jay looking over Art's pipe mounted reflector.

Even Solar Sails Need a Mast

By Patrick L. Barry

Like the explorers of centuries past who set sail for new lands, humans may someday sail across deep space to visit other stars. Only it won't be wind pushing their sails, but the slight pressure of sunlight.

Solar sails, as they're called, hold great promise for providing propulsion in space without the need for heavy propellant. But building a solar sail will be hard; to make the most of sunlight's tiny push, the sail must be as large as several football fields, yet weigh next to nothing. Creating a super-lightweight material for the sail itself is tricky enough, but how do you build a "mast" for that sail that's equally light and strong?

Enter SAILMAST, a program to build and test-fly a mast light enough for future solar sails. With support from NASA's In-Space Propulsion Program to mature the technology and perform ground demonstrator tests, SAILMAST's engineers were ready to produce a truss suitable for validation in space that's 40 meters (about 130 feet) long, yet weighs only 1.4 kilograms (about 3 pounds)!

In spite of its light weight, this truss is surprisingly rigid. "It's a revelation when people come in and actually play with one of the demo versions—it's like, whoa, this is really strong!" says Michael McEachen, principal investigator for SAILMAST at ATK Space Systems in Goleta, California.

SAILMAST will fly aboard NASA's Space Technology 8 (ST8) mission, scheduled to launch in February 2009. The mission is part of NASA's New Millennium Program, which flight tests cutting-edge technologies so that they can be used reliably for future space exploration. While actually flying to nearby stars is probably decades away, solar sails may come in handy close to home. Engineers are eyeing this technology for "solar sentinels," spacecraft that orbit the Sun to provide early warning of solar flares.

Once in space, ST8 will slowly deploy SAILMAST by uncoiling it. The truss consists of three very thin, 40-meter-long rods connected by short cross-members. The engineers used high-strength graphite for these structural members so that they could make them very thin and light.

The key question is how straight SAILMAST will be after it deploys in space. The smaller the curve of the mast the more load it can support. "That's really why we need to fly it in space, to see how straight it is when it's floating weightlessly," McEachen says.

It's an important step toward building a sail for the space-mariners of the future.

Find out more about SAILMAST at nmp.nasa.gov/st8. Kids can visit spaceplace.nasa.gov/en/kids/st8/sailmast to see how SAILMAST is like a Slinky® toy in space.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Caption:
SAILMAST is the thin triangular truss in front of the picture. It is attached to a section of a silver foil solar sail section shown here in a laboratory test. The mast in the picture is 2m (6 ft) long. The Space Technology 8 mission will test the SAILMAST, which is 20 times longer.

Light Pollution Update

By John Batinsey

The NJ Chapter of the Illuminating Engineering Society of North America (IES) will hold their March meeting in Eatontown, NJ. The IES is recognized as the foremost authority on effective outdoor lighting.

This "legitimacy" is recognized by local and government organizations when they are made aware of IES recommendations. Anyone designing outdoor lighting systems, whether in government or the private sector, should be familiar with current IES guidelines. Sadly, this is often not the case.

Meredith Nole, President of the New Jersey IES, contacted me and wanted to know more about how Eatontown has been able to effectively regulate outdoor lighting fully based on IES recommendations. I met with Ms. Nole and Steven Myers, who handles education for the NJ IES, and explained our method of making the process of controlling light pollution (LP) work. As a result, I have been asked to speak at their March 20, membership meeting which will be held at the Eatontown Borough Hall.

The Light Pollution Section of STAR now contains various tools to help control LP. If you haven't yet done so, please read the two page intro. The list of "Tools" that follows briefly explains the contents of each Tool and how you can make use of such information.

Remember, LP affects everyone. This is the most persuasive argument for controlling LP. It's time to write the type of protest letters exhibited in the LP Section.

Science Corner: Fusion Power Research

By Daniel Handlin

I'm going to digress a little bit this month and say a few words about fusion power research.

Fusion is the combination of two lighter nuclei into one heavier one (as occurs in the Sun). If the fusing nuclei are lighter than iron-56, the resulting heavier nucleus is less massive than the sum of the masses of the two lighter nuclei. The resulting mass differences is converted to energy via Einstein's famous $E=mc^2$. Since fusion powers all normal stars, fusion power is often referred to as "harnessing as star".

Since the 1950s, scientists have pursued experimental fusion reactors in the hopes of providing electricity. Lyman Spitzer (he of the space telescope) at Princeton conducted the first influential fusion research in the United States at Princeton with his "stellarator" device under a project code-named Project Matterhorn. Spitzer's work grew into the modern

Princeton Plasma Physics Laboratory (PPPL), perhaps the most well-known fusion research center in the United States or, indeed, the world.

Scientists have pursued two separate tracks in fusion research: magnetic confinement and inertial confinement. Magnetic confinement uses magnetic fields to confine the charged plasma in a torus or other geometry so that it cannot escape the chamber and lose energy. The stellarator design was a magnetic confinement device; it since has been mostly superseded (for the moment) by a device with a different magnetic geometry, called a tokamak. Tokamak fusion research is the furthest along of fusion power research concepts. The spherical torus is another magnetic confinement concept. Currently, fusion power is still on the level of test reactors to study plasma physics; generally these need a net energy input to heat the plasma and only operate for times up to about a second. The next major step in fusion research, a tokamak called ITER, is an internationally sponsored reactor to be built in France and scheduled to come online by 2016. ITER is supposed to be a bridge between today's experimental physics reactors and tomorrow's fusion power plants (the follow-on to ITER is to be a demonstration power plant called DEMO). ITER will produce a net power gain and will operate for many minutes, though it will not produce any electricity. ITER and most of the future reactors on the drawing board use a deuterium-tritium fuel mix.

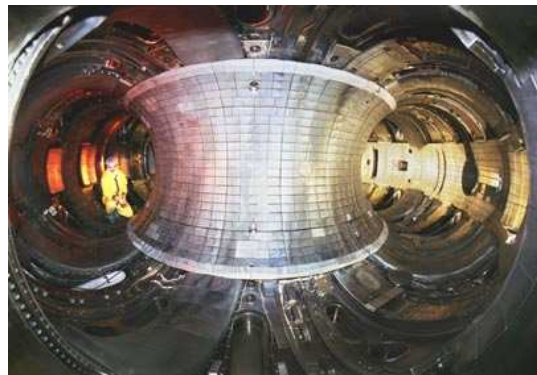
The other approach, inertial confinement, is to heat a small pellet of deuterium-tritium fuel with an extremely powerful laser, so that the pellet implodes to up to 30 times its normal density, causing a chain fusion reaction that releases energy (similar to a thermonuclear bomb on a very small scale). A famous laser called Nova operated in the 1980s and 1990s; for a few nanoseconds Nova delivered more power than all the power plants in the United States. However, a major problem encountered with Nova was asymmetry in the energy delivery to the target; the next major inertial research facility, called NIF (National Ignition Facility), will address this problem. NIF is a huge laser to be built at Lawrence Livermore National Laboratories, which is scheduled to come online in 2009-2010 and is designed to achieve ignition- a self-sustaining fusion reaction, the 'holy grail' of fusion research which has not yet been reached in magnetic confinement designs.

While fusion research is extremely promising, it has, much like space research, been subject to unbelievable levels of budget cuts and delays. ITER, for example, was first conceived almost 20 years ago. Fusion research has slowed significantly in the last few years due to lack of budget. This is unfortunate, as fusion is by far the most promising power source within the range of any conceivable medium-to-long-term technology. It combines the advantages of renewable energy sources like wind and solar (almost unlimited energy, as the deuterium fuel can be extracted from seawater) and of nuclear and coal energy (extremely high power density). It also avoids the disadvantages of both kinds of systems:

unlike wind and solar it is weather-independent and can generate power in very small areas; unlike coal and nuclear, it releases no greenhouse emissions or sulfur (which can cause acid rain), cannot meltdown, and does not pose a significant waste or proliferation risk. It is sad that such a promising energy source finds itself at the whim of short-sighted politicians (as do many worthwhile science projects).

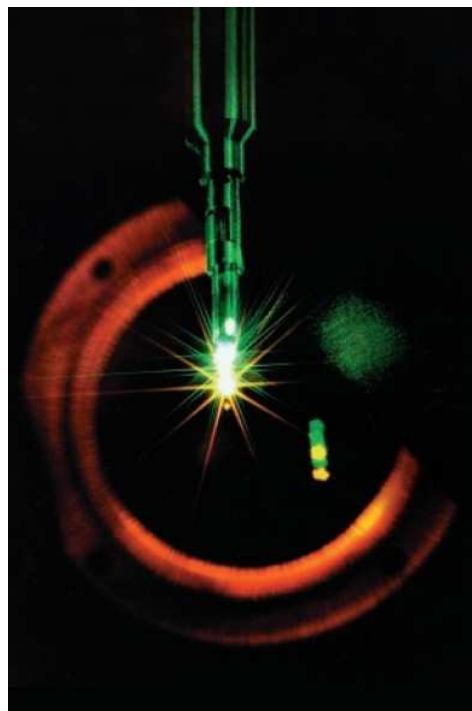
Let your congressmen and senators know: support fusion research.

The Princeton Plasma Physics Laboratory website is a good place to start learning more: <http://www.pppl.gov/>



The Tokamak Fusion Test Reactor, a former PPPL research project.

(Image from PPPL)



The Nova laser causes one of its target pellets to implode

(Image from Wikipedia)

Moon Phases



March Celestial Events

By J. Randolph Walton (Randy)

	8		
		22:43	New Moon
Tue	20	20:07	Spring Equinox
Sat	24	01:25	Jupiter Rises
		05:15	Mars Rises
		05:20	Saturn Sets
		06:00	Mercury Rises
		06:57	Sunrise
		10:17	Moon Rise
		19:16	Sunset
		22:10	Venus Sets
Sun	25	11:16	Moon Rise
		14:16	First Quarter Moon
Sat	31	01:00	Jupiter Rises
		04:53	Saturn Sets
		05:05	Mars Rises
		05:55	Mercury Rises
		06:46	Sunrise
		17:41	Moon Rise
		19:23	Sunset
		22:25	Venus Sets

Day	Date	Time (LMT)	Event
Thu	1	15:42	Moon Rise
		20:00	Moon 0.7 Deg. N of Saturn
Sat	3	17:44	Total lunar eclipse begins
		17:48	Moon Rise
		17:54	Sunset
		18:17	Full Moon
		18:55	59 Leonis Occultation by Moon ends
		18:57	Total lunar eclipse ends
Tue	6	17:57	Sunset
		19:25	Zodiacal Light in W after evening twilight for next two weeks
Sat	10	01:20	Jupiter Rises
		04:40	Mars Rises
		05:14	Mercury Rises
		05:15	Saturn Sets
		06:20	Sunrise
		09:07	Moon Set
		18:01	Sunset
		20:40	Venus Sets
Sun	11	02:00	Daylight Saving Time begins
		10:48	Moon Set
		23:54	Last Quarter Moon
Sat	17	01:50	Jupiter Rises
		05:30	Mars Rises
		05:50	Saturn Sets
		07:09	Sunrise
		17:37	Moon Set
		19:09	Sunset
		21:55	Venus Sets
Sun	18	18:55	Moon Set

Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a monstrous 25" Dobsonian Obsession reflector – which YOU can gain access to as a S*T*A*R member! Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the King of Kings Lutheran Church, 250 Harmony Rd. in Middletown. Meeting generally consist of lectures and discussion by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships: () Individual...\$25
(-) Family...\$35

Name _____

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Make checks payable to: STAR
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Box 863, Red Bank, NJ 07701

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
M 81 & M 82	Galaxies	Ursa Major	09h55m34.1s	+69°03'59"	7.8
NGC 3511	Galaxy	Crater	11h03m23.7s	-23°05'11"	11.5
Spindle	Galaxy	Sextans	10h05m14.1s	-07°43'07"	10.1
Ghost of Jupiter/Eye	Planetary Nebula	Hydra	10h24m46.1s	-18°38'32"	8.6
NGC 2903	Galaxy	Leo	09h32m09.7s	+21°30'03"	9.6
M 95	Galaxy	Leo	10h44m00.0s	+11°41'57"	10.5
M 96	Galaxy	Leo	10h46m48.1s	+11°48'54"	10.1
The Leo I Dwarf	Galaxy	Leo	10h08m30.6s	+12°18'07"	11.2
Markarian 421	Galaxy	Ursa Major	11h04m27.4s	+38°12'34"	14.8
NGC 3395	Galaxy	Leo Minor	10h49m52.4s	+32°58'35"	12.4
NGC 2818/A	Planetary Nebula in Open Cluster	Pyxis	09h16m01.5s	-36°36'37"	13.0
PHL 1811	Quasar	Cap	21h55m01.6s	-09°22'24"	13.8?
Focus On the Twin Quasar	Quasar	Ursa Major	10h01m20.8s	+55°53'54"	17.0
Hickson 44	Galaxy Group	Leo	10h18m00.4s	+21°48'44"	10.0
Abell 33	Planetary Nebula	Hydra	09h39m09.2s	-02°48'35"	13.4