## The Skyscraper

## Vol. 34 no. 3

The monthly publication of


Amateur Astronomical Society of Rhode Island

47 Peeptoad Road North Scituate, RI 02857
www.theskyscrapers.org
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Dave Huestis
$\mathbf{1}^{\text {st }}$ Vice President
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$\mathbf{2}^{\text {nd }}$ Vice President
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Editor
Jim Hendrickson

See back page for directions to Seagrave Observatory.

## Submissions

Please submit items for the newsletter by March 15 to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or email to jim@distantgalaxy.com

## Email subscriptions:

To receive The Skyscraper by email, send email with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.
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# The Skyscraper <br> March 2007 

March Meeting with F. Peter Schloerb<br>Friday, March 2nd at North Scituate Community Center

## The Large Millimeter Telescope

Dr. Peter Schloerb of the University of Masachusetts will present a summary of the Large Millimeter Telescope (LMT) Project and its scientific potential. The LMT is a 50 m diameter radio telescope designed for operation at wavelengths between 1 and 4 millimeters. At these wavelengths, the principle sources of radiation are thermal emission from dense, star forming, interstellar gas and dust. The large size of the LMT will enable observations of these clouds in distant galaxies at the earliest stages of galaxy formation and provide important clues about the history of star formation and galaxy evolution in the Universe.

Directions to the Community Center: From Seagrave Observatory: North Scituate Community Center is the first building on the right side going south on Rt. 116, after the intersection of Rt. 6 Bypass (also Rt. 101) and Rt. 116, in N. Scituate. Famous Pizza is on the corner of that intersection. Parking is across the street from the Community Center.

|  | MARCH 2007 |  |
| :---: | :---: | :---: |
| $2_{\text {FRIDAX }}^{2}$ | 7:30PM | March Meeting <br> North Scituate Community Center |
| $3_{\text {Saturday }}$ | $\begin{aligned} & \text { 5:30PM } \\ & \overline{\mathrm{P}} \\ & \text { 8:00P } \end{aligned}$ | Lunar Eclipse Observing Tasca Field, weather permitting |
|  | 8:00Рм | Public Observing Night Seagrave Observatory, weather permitting |
| $10$ | 7:00Рм | Public Observing Night Seagrave Observatory, weather permitting |
| $17$ | 8:00Рм | Public Observing Night \& Messier Marathon Seagrave Observatory, weather permitting |
| $24$ | 8:00Рм | Public Observing Night Seagrave Observatory, weather permitting |
| $31$ <br> SATURDAY | 8:00Pm | Public Observing Night Seagrave Observatory, weather permitting |

## In This Issue

President's Message ..... 2
Dave Huestis
Total Lunar Eclipse at ..... 2
MoonriseInvitation to Observethe Prime Time LunarEclipseDave Huestis
Gallery3
Bob Napier John Kocur
Even Solar Sails Need4
a Mast
Patrick L Barry
Constitution \& Bylaws ..... 5
February Meeting ..... 7
Notes
Mercedes Rivero-Hudec
Treasurer's Report7

## President's Message

Dave Huestis, President

As I write this announcement we were once again in a deep freeze with snow and ice on the ground.

Should we have to cancel the March meeting due to weather conditions, check your favorite Rhode Island radio station for a cancellation notice.

In addition, for those of you who have email, should I have to cancel a meeting, I will send an email as soon as I make the go/no go decision.

Please remember that our March meeting will be held at the North Scituate Community Center.

Dr. Peter Schloerb, Department of Astronomy, UMASS at Amherst, will present a summary of the Large Millimeter Telescope (LMT) Project and its scientific potential for providing important clues about the history of star formation and galaxy evolution in the Universe.

Dr. Schloerb's lecture will begin at 7:30 pm, followed by a refreshments break and then our business meeting.

## Invitation to Observe the Prime Time Lunar Eclipse

Dave Huestis

Want to watch a great celestial event without having to wait until late at night or during the wee hours of the morning? Skyscrapers, Inc., the Amateur Astronomical Society of Rhode Island has a special astronomical party for you.

You are cordially invited to the Tasca Soccer Field in North Scituate, adjacent to the McDonalds on Route 6, to view the total lunar eclipse on Saturday March 3. Skyscrapers members will be on hand with a variety of telescopes, both large and small, so you can catch a close-up view of the Moon as it gradually passes through the Earth's shadow.

Why Tasca Soccer Field and not Seagrave Observatory? Our eastern tree-line prevents us from observing most of this event.

People should arrive at Tasca Field around $5: 30 \mathrm{pm}$. That's when the Moon rises, already in eclipse. However, you can come anytime, depending upon which phase of the eclipse you wish to observe (see specific times in accompanying article).

We will wrap things up at Tasca Field at around 8:00 pm.

Afterwards you are invited back to Seagrave Observatory on Peeptoad Road in North Scituate for more star and planet gazing. There you can observe through any of our four main telescopes. Saturn will be the primary target of observation, along with a few double stars. Unfortunately the Full Moon will blot out all but the brightest galaxies and star clusters. The Observatory will remain open until 10:00 pm.

Our members may also bring their own telescopes and binoculars to share the view with you. Parking is limited at the Observatory, so plan accordingly. Once our parking lot is full, we will have to turn folks away. No parking is permitted on Peeptoad Road.

Hope you can attend. Visit the Skyscrapers web site at http://www.theskyscrapers.org for further information, including any cancellation notice should the weather prevent us from observing this prime time lunar eclipse.

## Total Lunar Eclipse at Moonrise

Dave Huestis

Would you like to watch an interesting astronomical event without having to wait until the middle of the night? Well, on March 3 at supper time you'll be able to observe a total eclipse of the Moon. This eclipse occurs on a Saturday evening, so if the weather cooperates you can easily set aside a little time to enjoy this show. While we will not see the event in its entirety, all things considered, I think we are favorably positioned to get a unique view from the mid-totality phase to the end of the eclipse.

Why don't we see the eclipse from start to finish? Though a lunar eclipse can be seen over a large area of the Earth's surface, one obviously needs to have the Moon visible. Unfortunately the eclipse begins at $3: 17 \mathrm{pm}$ (EST) when the Moon is still well below our eastern horizon. We really don't miss much of the show because the Moon is then only entering the Earth's faint shadow called the penumbra, which is often difficult to detect in its early stages anyway.

Only as the Moon slides deeper into the
penumbral shadow would a keen-eyed observer see a subtle shading of the lunar surface. Just prior to the Moon entering the Earth's dark umbral shadow should one notice that the moonlight looks somewhat subdued.

Again, we here in Rhode Island will not see the beginning of the dark umbral phase which begins at 4:30 pm, because the Moon will still be an hour away from rising. When the Moon finally rises above the eastern horizon at 5:30 pm, you'll see a very small percentage of the lunar surface still illuminated. Since the Moon will be very low in the sky, an unobstructed view toward the east will be a necessity. Totality will begin a mere fourteen minutes later at 5:44 pm as the Earth's shadow completely envelopes the Moon. And it should look somewhat strange. Why? The Sun sets at 5:36 pm, only eight minutes before totality begins, so the sky will still be very bright.

Totality continues for one hour and 14 minutes. The Moon will continue its rise into a darker sky as twilight deepens, so evidence of the eclipse should become more noticeable. Totality will be at its midpoint at $6: 21 \mathrm{pm}$, and will end at $6: 58 \mathrm{pm}$. It will be interesting to see what colors the lunar surface will display and if the Moon will completely disappear from the sky at mid-eclipse.

As the Earth, Moon and Sun move out of alignment, sunlight will once again illuminate the lunar surface. This event occurs at $6: 58 \mathrm{pm}$. For the next hour and four minutes you can watch as the

Earth's dark umbral shadow gradually uncovers the Moon. This phase ends at 8:12 pm.

From then until 9:26 pm the Earth's light penumbral shadow will progress over the lunar surface until it leaves it. In a dark sky you may be able to detect this shadow soon after the partial phase completes. Thereafter the remaining phase will hardly be noticeable at all as the Moon begins to return to full brightness.

If you have binoculars or a telescope, now will be the time to put them to good use. The more optical aid an observer uses, the more detail one will discern. Even if you don't have access to expensive equipment don't despair. Mother Nature provided you with a pair of the most valuable observing tools -- your eyes! Use them to follow the progress of this beautiful event.

If the weather is favorable make every effort to observe this beautiful celestial show. The next one in August is even less favorable for us in New England, for it occurs at moonset! So make the best of this upcoming opportunity.

Good luck, keep your eyes to the skies.
And don't forget that the Vernal Equinox (Spring) occurs on March 20 at 8:07 pm EDT (Eastern Daylight time).

And remember, Seagrave Observatory is also open every Saturday night for your viewing pleasure, weather permitting of course. Visit us at http:/ / www. theskyscrapers.org for information.

## Gallery



Left: Venus \& Mercury over the Mt. Hope Bridge, February 4. Photo by Bob Napier. Right: Moon \& Venus, February 19, Minolta Z1, ISO 400 4/10's of a second $f / 3.2$. Photo by John Kocur.

# 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 su-per-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


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 $2 \mathrm{~m}(6 \mathrm{ft})$ long. The Space Technology 8 mission will test the SAILMAST, which is 20 times longer.

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 ${ }^{\circledR}$ 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.
The name of this Society shall be "Skyscrapers, Inc. (Amateur Astronomical Society of Rhode Island)."
The object of this Society shall be to educate the general public and membership on matters pertaining to astronomy. It shall be an educational, nonprofit organization.

## Article III: Legal Status

This Society is incorporated as a non-business
corporation under the laws of the State of Rhode Island.
§1 Membership in this Society shall be of five
classes: Junior, Senior, Contributing, Senior Citizen and
Honorary.
§2 An applicant for junior, senior, contributing or form of application together with dues as specified in Article I, Section 2, of the By-Laws, shall be proposed by an existing member, and shall become a member upon of the Society.
§3 Junior members shall be between 13 and 17 years of age both inclusive, and upon reaching 18 years of age shall automatically become senior members without payment of additional dues for the dues year in which this occurs. Junior members shall be entitled to all the privileges of senior members except those of voting and holding sfice. have the privilege of voting and holding office. Senior members must be 18 years of age or older; senior citizen members must be 65 years of age or older.
§5 Contributing members shall be senior members who pay the additional dues prescribed by the By-Laws. They shall be entitled to all the privileges of senior members. §6 Honorary membership may be conferred upon any person for unusual and outstanding accomplishment in science. It may be conferred upon a non-member
for outstanding contribution to the Society. Honorary for outstanding contribution to the Society. Honorary present at any Annual Meeting, the name having been proposed at a previous regular meeting of the Society. An honorary member shall have all the privileges of a senior member except those of voting and holding office.

Article II: Officers
§1 The regular term of all Officers, Members-at-Large and Junior Trustee shall commence at the adjournment of the May meeting.
\$2 The President may at any time appoint such additional officers, chairmen and committees as may be required. The terms of all of these (except, as appropriate, special committees) shall expire with the term of the appointing President. The President shall be, ex officio, a
§3 In the absence of the President the First VicePresident shall assume his duties. In the absence of both, second Vice-President shall assume the duties of the
President.
§4 The President shall:
1 Preside over all regular monthly meetings and Executive Committee meetings.

2 Establish an operating budget, with the assistance of the Executive Committee, for approval by the members of the Society, per Article X of the Constitution.
3 Oversee the

3 Oversee the business and legal responsibilities of the Society.

4 Be the official spokesperson
\$5 The 1st Vice President shall:
1Provide programs for monthly meetings.
general public the activities of the Society.

1 Act as the Chairperson of the AstroAssembly Committee.
2 Submit
2 Submit a proposed operating budget for
AstroAssembly to the Executive Committee prior to the Annual Meeting.

3 Have the authority to direct the Treasurer to of AstroAssembly, providing said expenses have been given prior approval by the Society, per the approved operating budget, as defined by Article
X of the Constitution, or by motions approved by X of the Constitution, or by motions approved by
the members of the Society at any regular monthly 4 meeting.

4 Submit a report of all expenses and income from AstroAssembly at the December monthly meeting.
§7 The Secretary shall:

## February Meeting Notes <br> Mercedes Rivero-Hudec, Secretary

February 2, 2007, North Scituate Community Center

Featured speaker: Our guest speaker was Dr. Stephen Schneider from the University of Massachusetts (Amherst). Dr. Schneider's seminar, entitled "Dark Matters," gave an insight about the universe's budget: about $73 \%$ of the universe consists of dark energy, $23 \%$ of dark matter and the rest is distributed among stars, planets, neutrinos and other baryonic matter. Dr. Schneider and his students have conducted research on low-surface brightness galaxies at the Arecibo Observatory in Puerto Rico. He concluded his presentation by posing an intriguing question: "Where is all this prettydark matter hiding?"

Business meeting: The business meeting was called to order by President Huestis at 9:15 p.m.

Secretary's report: Amendments to the January 2007's report were presented and accepted.

Treasurer's report: Al Schenck recommended to those members who receive S\&T to renew their magazine subscription at the time they renew their Skyscrapers' membership, as it may be easier to process both at the same time. He also encouraged members to apply for the treasurer's position and offered to assist the new treasurer.

Trustees' report: Trustee Bob Horton reported the following: gravel spread on the driveway, inventory about two-thirds complete, relocation of the dome postponed due to weather, late March clean-up (looking for volunteers). Also, looking to form an Observatory Committee and organize other activities, e.g. CCD photography - Bob Napier has agreed to offer more workshops on the topic. - Please, contact the Trustees if you have keys to the observatory. - Weather: if is cold and windy (e.g. 60 mph gusts) the observatory will be closed - please, heed those warnings.

Librarian's report: Nothing to report (Dave Huestis on behalf of Tracey Haley).

Historian's report: Dave Huestis: nothing to report; reminded the membership about

the 75th anniversary's banquet on May 5. - Steve Hubbard brought an original support piece for the Clark's dome; the piece will be on display.

Nominations Committee: Bob Napier still looking for nominations for second vicepresident, treasurer and secretary. He described the 2nd VP position and Bob Horton commented on how rewarding it is to run AstroAssembly.

Old business: The pending motion to admit Fred Baumgartner, Chris Chapman, Kathy Cyr, Frank Dubeau, Robert Forgiel, David Hintz, Dale Klatzker, Lucine Reinbold and George Strayer into membership was passed.

New business: The following new applicant was introduced to the membership: Ed Haskel. He will be voted in next month under old business.

Good of the organization: Glenn Jackson announced that about 10 members are needed to help on March 3 to observe the lunar eclipse; Tracey Haley is getting permits to set up at the Tasca soccer field near McDonald's. Glenn would also like to conduct a Messier marathon on March 17 at the observatory. - Jack Szelka is organizing a trip to southern Arizona, May 12-19. Please, sign up if you are interested; need about 20 people. • Girl Scouts - Apple Valley have requested Skyscrapers participation at their hands-on workshop to be held on May 20 at Bryant University. • Bob Napier let us know about Yahoo's mailing lists; he also announced that David Levy had a minor stroke and that full recovery is expected. • Dolores Rinaldi mentioned that the propane tank and port-ajohn may need to be serviced. Rick Arnold will check into that.

President's announcements: Next meeting on March 2, at the Community Center. - Star party on March 23 in Burrillville; need about 12 scopes, 200-300 people expected to attend; will send more info.

Adjournment: Thebusiness meetingwas adjourned at 10:05 p.m.

## Treasurer's Report

Al Schenck, Treasurer
April 1, 2006 - Feb 15, 2007

| INFLOWS |  |
| :---: | :---: |
| Uncategorized | 0.00 |
| astroincome |  |
| Astroad | 90.00 |
| astrobanquet | 1,615.00 |
| astrogrille | 328.15 |
| astroraffle | 1,176.00 |
| astroregistration | 1,978.00 |
| TOTAL astroincome | 5,187.15 |
| Bookincome | 750.00 |
| cookoutinc | 441.00 |
| donation |  |
| Collationdonation | 37.00 |
| Other donation | 152.57 |
| TOTAL donation | 189.57 |
| dues |  |
| Contributing | 1,096.00 |
| Family | 1,050.00 |
| Senior | 181.00 |
| Other dues | 2,080.00 |
| TOTAL dues | 4,407.00 |
| Interest Inc | 55.27 |
| magincome |  |
| Astronomymaginc | 335.95 |
| skytelmagincome | 494.25 |
| TOTAL magincome | 830.20 |
| magsales | 221.00 |
| Starparty | 463.00 |
| TOTAL INFLOWS | 12,544.19 |
| OUTFLOWS |  |
| Anniversaryexp | 100.00 |
| astroexp |  |
| Astrocater | 1,170.00 |
| astrogrillexp | 129.69 |
| Astroprinting | 136.21 |
| Astroreception | 259.78 |
| Astrorefund | 34.00 |
| Astrorestroom | 110.00 |
| Astroshuttle | 25.00 |
| Astrosupplies | 148.00 |
| Hallrental | 150.00 |
| Raffle | 5.00 |
| Tentrental | 500.00 |
| TOTAL astroexp | 2,667.68 |
| bldgandgrounds | 140.00 |
| Bookexp | 802.50 |
| Clarkproject | 300.00 |
| clubsubscription | 60.00 |
| collation | 293.51 |
| Cookoutexp | 503.13 |
| Corporationfee | 20.00 |
| Discretionary | 25.00 |
| Insurance |  |
| Other Insurance | 2,322.00 |
| TOTAL Insurance | 2,322.00 |
| membersubscriptions |  |
| Astronomymagexp | 306.00 |
| Skytelexp | 560.15 |
| Other membersubscriptions | 34.00 |
| TOTAL membersubscriptions | 900.15 |
| Newsletter | 8.58 |
| Portajohn | 100.00 |
| Postage and Delivery | 13.26 |
| Stevebellfunction | 99.59 |
| Trusteexp | 200.00 |
| Utilities |  |
| Electric | 142.62 |
| Propane | 49.86 |
| TOTAL Utilities | 192.48 |
| TOTAL OUTFLOWS | 8,747.88 |
| OVERALL TOTAL | 3,796.31 |

## Directions to Seagrave Memorial Observatory

## From the Providence area:

Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

## From Coventry/West Warwick area:

Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

## From Southern Rhode Island:

Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

## From Northern Rhode Island:

Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

## From Connecticut:

- Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
- Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.


## From Massachusetts:

Take Interstate 295 South (off Interstate 95 in Attleboro.) Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.


## 47 Peeptoad Road

North Scituate, RI 02857

