THE GALACTIC GAZETTE

THE NEWSLETTER OF

The Astronomical Society of Southern New England

"To Educate and Inspire"

http://assne.org

Next Meeting

January 14, 2012 7 p.m.

Carpenter Museum
4 Locust Ave.
Rehoboth, Mass.

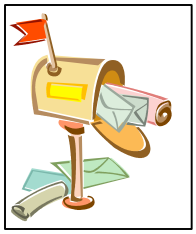
Doors Open at 6 p.m.

Club Officers for 2012-2013

Bruce DiDucca	President
Bob Sikes	Vice President
George Huftalen	Treasurer
Spence Blakely	Secretary

This month's feature

TBA



Letters to ASSNE

To submit your comments or questions of general interest about ASSNE or to learn more about our public outreach programs, please send an email to ASSNE Secretary.

Please direct personal club-related business or concerns to the appropriate club officer.

Our Last Meeting Recap

We had our annual holiday potluck, along with a raffel of astro goodies. The current slate of club officers were also voted in for another two-year term.

ASSNE Members' News & Announcements

Content may be edited for clarity,

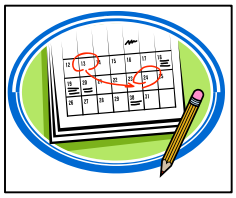
2012 Dues

Please see the membership application/dues form at the end of this newsletter.

The February and future newsletters will be emailed to members in good standing. Please be sure to set your spam filters to pass through email with ASSNE in the subject line.

ASSNE members' advice and help

Galileo's Gabfest



Calendar of Events

Your support at these events is greatly appreciated. Even if you don't own a scope, you are always welcome to drop by to lend a hand and show your enthusiasm. You may be surprised at how much fun you can have.

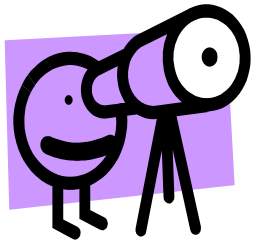
Details of events added as they become available. Also see the cool Online ASSNE Calendar.

2012

Date TBA Winter Pardon Gray Event-

Other events

TBA



Observing Reports and Members' Astro Images

Observing is often more enjoyable if it is a shared experience. Everyone benefits from the exchange of knowledge, tips, and camaraderie. Several ASSNE members observe regularly and send out emailed invitations to those requesting them. If you would like to receive such invitations from someone living near you, please contact a club officer.

Visitors to this site who just want to see what it's all about should also contact an officer.

Informal Observing Sessions

Current Observing Reports

The Imager's Studio

For Sale and Wanted

ASSNE Trading Post

Club Loaner Telescopes

The following telescopes and accessories are available to qualifying members for one-month loans. If you are interested, contact Bruce DiDucca beforehand, so he can arrange to have the one you want at the meeting.

For more information about an item or to check availability, go to Loaner Equipment. *ASSNE thanks the generous donors.*

✯ Meade 8-inch LX-200 GPS Schmidt-Cassegrain (donated by Frank Gosland)

✯ Meade 80 mm, f/5, refractor

✯ Edmund Astroscan rich-field reflector.

✯ Coronado PST solar telescope

✯ Meade Digi Eyepiece (donated by Paul Faria)

✯ Astrovid Stellacam (donated by Wayne Prado)

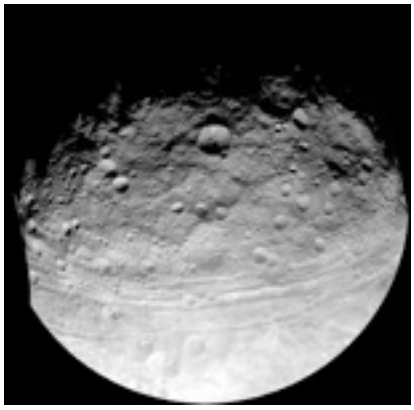
✯ Laser collimator (donated by Ed Couture)

NASA's Space Place

Dawn Takes a Closer Look

By Dr. Marc Rayman

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.



This full view of the giant asteroid Vesta was taken by NASA's Dawn spacecraft, as part of a rotation characterization sequence on July 24, 2011, at a distance of 5,200 kilometers (3,200 miles). Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.

Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change.

These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit to-

ward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth.

Keep up with Dawn's progress by following the Chief Engineer's (yours truly's) journal at http://dawn.jpl.nasa.gov/mission/journal.asp. And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at http://spaceplace.nasa.gov/story-prof-starr.

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

AAVSO Writers' Bureau

Welcome to the AAVSO Writers' Bureau Blog. Here we have collected, from our talented and gracious partners, some of the finest content available on the Internet each month. These writers have given explicit permission for these articles to be reprinted on other web sites and newsletters.

WHO REALLY DISCOVERED THE EXPANDING UNIVERSE?

Jennifer Ouellette, Discovery News Space

Astronomer Edwin Hubble's landmark paper on the rate of expansion of the universe was published in 1929, overturning the long-held belief among scientists that the universe was static and unchanging.

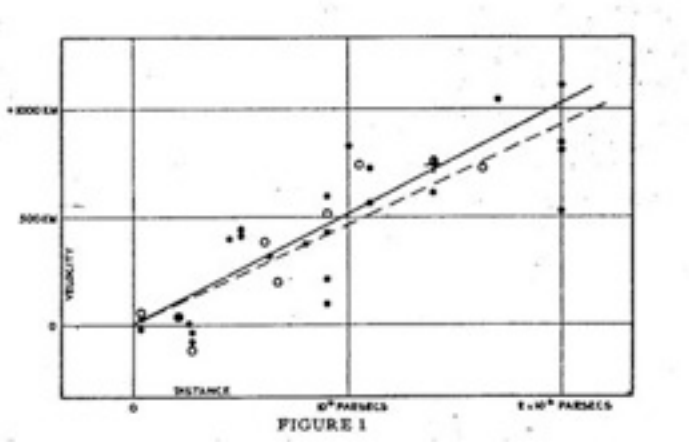


FIGURE 1

That's why the Hubble Constant (the number that describes the rate of expansion) is named after him, not to mention the Hubble Space Telescope.

Less well known is that Hubble might not have been the first the person to make this momentous discovery.SCIENCE CHANNEL VIDEO: Dark Flow

A Belgian priest and cosmologist named Georges Lemaitrepublished a paper reaching very similar conclusions two years earlier. It's a contentious issue among cosmologists, needless to say.

The problem was, Lemaitre's paper was in French, and appeared in a rather obscure journal: Annals of the Brussels Scientific Society. This limited its distribution throughout the scientific community (at least initially).

Yet even when his paper was finally translated and broadly disseminated, certain key elements went missing, sparking rumors that prominent scientists -- Sir Arthur Eddington, perhaps, or even Hubble himself -- had deliberately "censored" Lemaitre's paper to ensure Hubble's scientific legacy.

PHOTOS: Hubble Logs Millionth Observation

What happened? The answer might lie in a new article in Nature by cosmologist and author Mario Livio.

It's a long, complicated story, but here's the CliffsNotes version...

In the late 1920s, astronomer Edwin Hubble was studying distant galaxies at the Carnegie Observatories in Pasadena, home of the spanking new 100-inch Hooker telescope on Mount Wilson.

PHOTOS: Hubble's Best

He measured the brightness of so-called Cepheid variable stars -- a type of periodically pulsing star -- based on the "Period-Luminosity Relation" discovered by Henrietta Swan Leavitt. Basically, if you know how long it takes for the star to go from bright to dim, this will tell you how bright it actually is. And once you know that, you have a means of measuring distance.

So Hubble was able to deduce the relative distance of the galaxies. He combined those observations with data collected in 1912 by Vesto Slipher. Slipher is usually credited with being the first to notice that the light the galaxies emitted had a pronounced “shift” toward the red end of the electromagnetic spectrum, indicating that they were moving away from earth.

BIG PIC: Hubble Stares Deep into Dust-Choked Galaxy

Next Hubble plotted the velocity (indicated by the redshift) against relative distance, to get the graph at the top of this post. To a casual observer, it might seem like a random number of points scattered about, with some clustering hinting at a possible pattern.

But Hubble wasn't a casual observer, he was a frickin' genius. He looked at that graph and drew a straight line through all those data points. As telescope resolutions improved over the ensuing decades, Hubble's half-intuitive leap proved correct. Plot the same data today, and the points will fall neatly along the line Hubble drew.

In mathematical terms, that straight line indicates a linear function. That is, the redshift of distant galaxies increased as a linear function of their distance. Hubble reasoned (correctly) that the longer the light has been traveling, the more time there has been for space to expand, and hence the greater the red shift of the light's wavelength.

NEWS: Galaxies That Don't Recycle Live Hard, Die Young

So he proposed a law: the greater the distance between any two galaxies, the greater their relative speed of separation. Based on that law, he arrived at an inescapable conclusion: the cosmos was still expanding. And that, of course, changed everything in the field of cosmology.

Now back to Lemaitre.

The academic quibbling usually hinges on whether Lemaitre fully derived Hubble's law on his own from actual observational data, or limited his analysis to theoretical predictions. Lemaitre did rely on data, it turns out -- the same redshift data from Slipher's observations, combined with estimates of galaxy distances inferred from Hubble's own observations, published in 1926. And he also correctly concluded that this meant the universe was expanding, not static.

Sean Carroll wrote about this over at Cosmic Variance back in 2007:

> Lemaitre didn't have very good data (and what he did was partly from Hubble, I gather). And for whatever reason, he did not plot velocity vs. distance. Instead, he seems to have taken the average velocity (which was known since the work of Vesto Slipher to be nonzero) and divided by some estimated average distance! If Hubble's Law — the linear relation between velocity and distance — is true, that will correctly get you Hubble's constant, but it's definitely not enough to establish Hubble's Law. If you have derived the law theoretically from the principles of general relativity applied to an expanding universe, and are convinced you are correct, maybe all you care about is fixing the value of the one free parameter in your model. But I think it's still correct to say that credit for Hubble's Law goes to Hubble — although it's equally correct to remind people of the crucial role that Lemaitre played in the development of modern cosmology.

Eventually, of course, Lemaitre's crucial role was recognized: among others, Eddington published a long commentary on the work in 1930, calling it "brilliant." Thanks to Eddington, Lemaitre's original paper was translated and published again in 1931.

Oddly, however, some of his original calculations -- the ones that specifically related to the Hubble Constant -- were omitted. When this was discovered in 1982, speculation ran

rampant, as science historians debated whether the omission had been deliberate, to preserve Hubble's claim to the discovery, or merely done in error.

Now Livio has weighed in on the controversy with the results of his own investigation in the matter in the Nov. 10th issue ofNature. He sifted through hundreds of letters preserved by the Royal Astronomical Society, along with minutes from the society's meetings and other archival materials.

And he found that, far from being a pro-Hubble conspiracy, Lemaitre himself omitted the passages. Lemaitre admitted as much in two "smoking gun letters" unearthed by Livio, writing in one:

"I did not find advisable to reprint the provisional discussion of radial velocities which is clearly of no actual interest, and also the geometrical note, which could be replaced by a small bibliography of ancient and new papers on the subject."

So there was no conspiracy, it seems. Lemaitre apparently recognized that while his own contributions were important, and deserving of recognition, Hubble was the one who deserves credit for Hubble's Law.

"Lemaitre's letter also provides an interesting insight into the scientific psychology of some of the scientists of the 1920s," Livio writes. "Lemaitre was not at all obsessed with establishing priority for his original discovery. Given that Hubble's results had already been published in 1929 he saw no point in repeating his more tentative earlier finding again in 1931."

Astro Links

FOR KIDS: Distant ‘Goldilocks’ world

Prime Time

MEMBERSHIP APPLICATION
for the
ASTRONOMICAL SOCIETY OF SOUTHERN NEW ENGLAND, INC. (ASSNE)

c/o George Huftalen, Treasurer
231 Metacom Avenue, Warren RI 02885
401.245.6471
assne_treasurer@fullchannel.net

The Astronomical Society of Southern New England, Inc. is an amateur astronomy club organized as a nonprofit corporation. ASSNE is composed of members who share a common interest in astronomy, science, and space. Since being founded in January, 1995**,** our mission has been to educate and inspire our members and the general public. We provide schools and other public venues with educational programs that may foster an awareness of astronomy and an appreciation of the night sky. Our annual Rehoboth Skies event, held each October, is a wonderful opportunity to share our knowledge and enthusiasm with the public. We also organize member star parties as well as tours to events and places having relevant astronomical presentations or programs.

At our monthly meetings, members may participate in discussions and presentations given by members or by guest speakers, witness demonstrations, and observe the heavens with other members after meetings.

ASSNE has a constitution and a set of bylaws, so that all members may become aware of the workings and direction of the club. This club was formed to promote the following goals: ◆Educate members and the general public in the various aspects of astronomy
◆Allow members to come together and share their astronomical interests with others
◆Encourage amateur participation in astronomical observing programs and research
◆Organize, administer, and fund astronomy educational programs within the community

Our motto: To Educate and Inspire

Membership (be it family or individual) is $20/year. Membership fees shall be pro-rated for new members by quarter, with no fee to be charged for the quarter in which the member/family joins. (For example, a family joining in April would pay $15 instead of $20. And an individual joining in November would pay $5.)

Your dues also entitle you to club discounts on subscriptions to Sky & Telescope Magazine, reduced membership dues for the Astronomical League, and access to the assets of ASSNE, which include books, videos, and free “loaner” telescopes. Be sure to get your S&T discount coupon from George at the next meeting.

Our monthly newsletter and other information about us can be found on the Internet at http://www.assne.org**.** To save costs, the preferred method of communicating with members (apart from our meetings) is through the web using the club bulletin board at http://assne.org/board , or by e-mail (please no broadcast emails or BCC’s). Interested members and nonmembers who do not have Internet access may elect to receive a paper version of our newsletter, which will be prepared and mailed for the cost of doing so.

APPLICATION FOR ASSNE MEMBERSHIP

Please complete member info:

Date: _____

Member(s) Name: _____

Address: _____

_____

Telephone: (_____) _____ E-mail:_____

Please check membership type as appropriate: (includes emailed monthly newsletter)

___ Single $20.00/yr ___ Donor $30/yr

___ Family $20.00/yr ___ Supporting $50/yr

If a mailed newsletter is wanted, please check below

___ Please mail the newsletter to me (Additional $12/year for costs)

Please check if optional membership is wanted

___ discounted Astronomical League membership $7.50/yr

$_____ TOTAL AMOUNT PAID

ASSNE meets on the 2nd Saturday of every month, but members observe together informally throughout the month whenever the sky is clear. Would you like to receive invitations to observe with those members who regularly issue invitations to observe at their homes? (Even if you don't make it, you'll be emailed a copy of the night's observing log.)

___Yes ___No

If paying by check, please make it payable to ASSNE, Inc. And if mailing, please mail to:

ASSNE
c/o George Huftalen
231 Metacom Ave.
Warren, RI 02885

Or pay dues by PayPal: Go to www.PayPal.com, and follow the instructions. The address to use for dues or other ASSNE payments is assne_treasurer@fullchannel.net