

Skylights

Newsletter of the Astronomical Society of Northern New England



JAN 2020



Member of NASA's
Night Sky Network



Astronomical League

ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) To have fun sharing our knowledge and interest with others.
- 2) To provide basic education in astronomy and related sciences to all who are interested.
- 3) To promote the science of Astronomy.

What's Up In January

By *Bernie Reim*

The month of January is named for the Roman god Janus. He is the god of beginnings and endings, transitions and passages. He is depicted as having two faces, looking forwards and backwards at the same time.

This is the first full month of winter and we will probably have plenty of long and cold nights this month to enjoy the sparkling stars spread out all over the sky. The stars always seem brighter in winter because the air holds less humidity when it is colder. Most of the brightest stars in the winter sky are all arranged nicely in a rough hexagon, appropriately called the Winter Hexagon.

This entire hexagon is now above the southeastern horizon by 8 pm. Once you can identify the 8 bright stars in this hexagon consisting of 6 constellations and learn their distances from Earth, you can obtain a better three-dimensional view of this part of the sky along with getting a history lesson thrown in as a bonus.

We will start our little tour of the winter sky at the top of this hexagon with a star named Capella in the constellation of Auriga the Charioteer. At zero magnitude, this is actually a double star, each one of which is about 10 times the diameter of the sun. You can think of it as the "cap on the sky". Capella is about 42 light years away. That means the light that we see now from this star left there in 1978, just 6 years after our last moon landing in December of 1972.

Then we will travel clockwise to Aldebaran in Taurus the Bull. This orange giant star's name means "the follower" since it appears to be following the Pleiades star cluster across the sky. It is located 65 light years away and its diameter is about 40 times larger than our sun. That means if you could place Aldebaran in our sky it would cover fully 20 degrees of our sky, which is more than one tenth of our entire 180 degree horizon. Our sun and full moon only half

a degree of our sky. The light you see from Aldebaran left there 10 years after WWII ended and just 2 years before humans launched the first satellite on October 4 of 1957, beginning the space age and the space race.

Then we will continue on to the next bright star, Rigel, which marks the left knee of Orion the mighty hunter. This is an extremely powerful blue super giant star that is 74 times the diameter of our sun, but it is only a few million years old. It is burning through its vast reserves of hydrogen fuel at a prodigious rate to maintain its perfect balance of the fusion force driving all the energy outwards and the force of gravity holding the star together due to the mass of all the hydrogen and helium gas that makes up the star. Rigel is the farthest away of any of the Winter Hexagon stars that we are traveling to tonight. It is 864 light years away. That is an easy number to remember because the diameter of our sun is 864,000 miles. So its light left there around the year 1156, less than 100 years after the famous Battle of

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What's Up "Continued from page 1"

Hastings in 1066 when William the Conqueror defeated King Harold ending the Anglo-Saxon period and beginning Norman rule. There was also a recorded sighting of Halley's Comet in 1066 which is depicted on the Bayeux Tapestry which tells the story of this epic battle that changed the course of history.

Now we will continue to the brightest star in the whole sky and the closest one to us in this hexagon. That is a star named Sirius in Canis Major, the large hunting dog of Orion. It shines at magnitude minus 1.4 and is located only 8.8 light years away. So its light just left there in 2011, one year before the year 2012 which marked the end of a great cycle of the "long count" of the Mayan calendar, causing many people to predict the end of the world. Sirius also has a companion star, a white dwarf star called Sirius B, which orbits around Sirius in an elliptical orbit every 50 years. It will be far enough away from Sirius now until 2035 to be able to discern it in a good amateur telescope. It is fully 10,000 times fainter than Sirius and it is only the size of the earth since a white dwarf is what every average star like our sun will turn into after it explodes as a planetary nebula.

We then continue to the faintest of these 8 stars, which is Procyon in Canis Minor. Procyon is the second closest star at 12 light years away. So its light left there when the great financial crash took place which reverberated around much of the world. Procyon also has a much fainter white dwarf star orbiting around it every 40 years.

Now we only have two stars left to complete our hexagonal tour, Castor and Pollux in Gemini the Twins. In mythology, they are the sons of Zeus, Pollux is the immortal twin and Castor is the mortal one. We get to Pollux first. It is a red giant star located 34 light years away. That means its light left there in 1986, which was the year of the extremely unfortunate explosion of the Challenger Space Shuttle. Castor is actually a 6-star system located 51 light years away. So its light left there exactly when humans first landed on the moon in 1969.

So by simply circumnavigating this huge geometric shape in our sky and understanding something about the unique natures and distances to these stars we also get a world history lesson extending back nearly a millennium.

The other highlights this month include Venus climbing higher into our evening sky, two asteroids at their best, and one of the best meteor showers that you have probably never seen.

Venus starts the year 25 degrees above the horizon at sunset and setting 2 ¾ hours after the sun and it will finish this month 34 degrees above the horizon and setting 3 ½ hours after sunset. It will also get closer and brighter and less illumined by the sun as it catches up with Earth in its faster orbit around the sun.

We lost Jupiter and Saturn last month. Now Jupiter will show up again in the morning sky by the second week of this month and then Saturn will reappear in the morning sky by the end of January.

Two bright asteroids, 5 Astraea and 511 Davida, will reach opposition this month. 5 Astraea is 74 miles across and will reach 8.9 magnitude in Gemini in the Winter Hexagon on the 21st. Then 511 Davida is about 180 miles across and will reach opposition in Cancer, just to the east of Gemini on the 15th. You would need good binoculars or a small telescope to see them.

The best meteor shower that most people never heard of occurs every January 4th. These are called the Quadrantids, named after an extinct constellation, Quadrans Muralis. The radiant is in the Northeastern sky just below the Dippers and above Hercules. You could see over 100 meteors per hour this year since the moon will not interfere. Its peak is very narrow, only 6 hours or so, and the weather is not usually clear and it is usually very cold, so that is why most people have never seen this shower. This year we are perfectly placed here on the east coast to intercept this very narrow peak. It will be at its best between 2 and 6 am on Saturday morning the 4th. Try to get some photographs of this amazing shower if it is clear this morning.

Jan.1. On this day in 1801 Mr. Piazzi discovered the first and largest asteroid, Ceres, which is 600 miles in diameter.

Jan.2. First quarter moon is at 11:47 p.m.

Jan.4. The Quadrantids peak between 2 and 6 am this morning. Mars is in the morning sky near Antares in Scorpius 45 minutes before sunrise.

Jan.5. Earth is at perihelion, or closest to the sun today at 91.4 million miles.

Jan.7. On this day in 1610 Galileo discovered 3 moons of Jupiter, Callisto, Io, and Europa. He would discover Ganymede, the largest moon in the whole solar system at 3200 miles in diameter 6 days later. The nearly full moon passes close to Aldebaran in Taurus tonight.

Jan.8. Stephen Hawking was born on this day in 1942.

Jan.10. Full moon is at 2:22 p.m. EST. This is also called the Ice or Wolf moon.

Jan.17. Last quarter moon is at 8 a.m.

Jan.19. New Horizons was launched to Pluto on this day in 2006. It got to Pluto 9 years later on July 14, 2015.

Jan.24. New moon is at 4:43 p.m.

Jan.28. The waxing crescent moon passes near Venus this evening half an hour after sunset.

Moon Phases

Jan 2
First Quarter

Jan 10
Full

Jan 17
Last Quarter

Jan 24
New

Moon Data

Jan 1
Moon at apogee

Jan 4
Uranus 5° north
of Moon

Jan 13
Moon at perigee

Jan 20
Mars 2° south
of Moon

Jan 22
Jupiter 0.4° north
of Moon

Pluto 0.6° north
of Moon

Jan 28
Venus 4° north
of Moon

Neptune 4° north
of Moon

Jan 29
Moon at apogee

[Editor: I'm using Glenn's December 2019 Observer's Challenge for January]

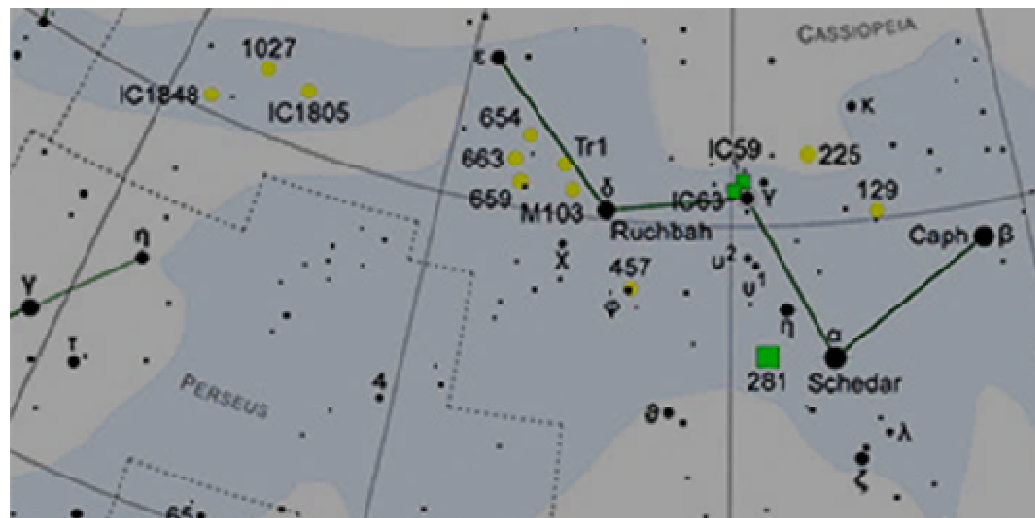
OBSERVER'S CHALLENGE* –January, 2019

by Glenn Chaple

IC 1805 – Emission Nebula in Cassiopeia (Mag: 6.5; Size: 1.5° X 1.5°)

Last month's Observer's Challenge, the planetary nebula NGC 246 in Cetus, tested our observing skills because its light is spread over a relatively large area. We continue that scenario with IC 1805, the "Heart Nebula" in Cassiopeia. Notes in Sanner and Kepple's *Night Sky Observer's Guide* describe this 1.5 by 1.5 degree nebula as "not visible" in 8-10 inch scopes and "very faint through a UHC filter" with 12-14 inch instruments. Despite this discouraging assessment, it might be an interesting challenge for large binoculars in a dark sky area or a rich-field telescope like an Edmund Astroscan fitted with a low power eyepiece and a UHC filter.

At the heart of the "Heart" is the source of its illumination – the open cluster Melotte 15. A young stellar group (its age is estimated to be 1.5 million years), Melotte 15 is dominated by O-type stars, some as much as 50 times the mass of the sun. According to Sanner and Kepple, the cluster is visible in scopes as small as 2-3 inches. Nebula and cluster lie some 7500 light years away.



Freestarcharts.com

**The purpose of the Observer's Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester (rogerivester@me.com). To access past reports, log on to rogerivester.com/category/observers-challenge-reports-complete.*

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Constellation-guide.com

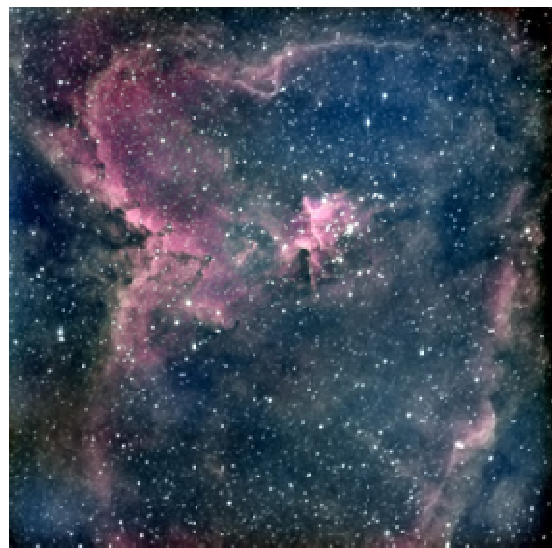
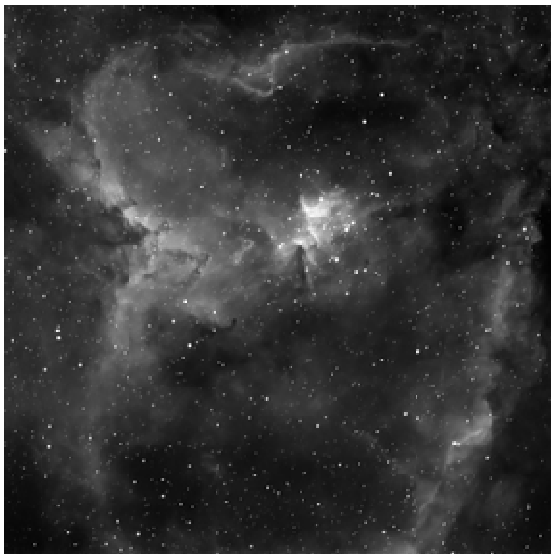


Image by Doug Paul (ATMoB) Canon 80D, 400mm f2.8 lens, ISO800,
120X2m = 4 hrs (over 2 nights), 1/6 scale North is up

“Continued on page 5”



Editor: I submitted the above Photo of the Heart & Soul Nebula (taken by Paul Kursewicz).
Canon Powershot SX50 HS: FL 136mm, ISO 1600, 20 x 4 minute exp.



Images by Mario Motta (AAVSO) North is up

(left) B&W image of IC 1805 (the Heart Nebula): An H alpha image taken through my 6-inch refractor in 2015 for wide field. And has 7, 20 min subs, so 2 hours 20 min of H alpha.

(right) Color Image of IC 1805: This was combined with 1 hour each of Oxygen 2 filter and Sulfur filter, for the color image.

Principal Meteor Showers in 2020

January 4
Quadrantids

April 22
Lyrids

May 6
Eta Aquarids

July 30
Delta Aquarids

August 12
Perseids

October 9
Draconid

October 21
Orionids

November 9
Taurids

November 18
Leonids

November 26
Andromedids

December 14
Geminids

December 22
Ursids

*Note: Dates are
for maximum*

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 12 for prices) are payable to the treasurer during November for the upcoming year. New members who join during or after the month of July shall pay half the annual fee, for the balance of the year. Checks should be made payable to the Astronomical Society of Northern New England (A.S.N.N.E). If you would like to mail in your dues, use the form on page 12.

A Member who has not paid current dues by the January meeting will be dropped from membership, (essentially a two-month grace period.) Notice of this action shall be given to the Member by the Treasurer. Reinstatement shall be by payment of currently due dues.

Our Club has Merchandise for Sale at: www.cafepress.com/asnne



*ALL money raised goes to our operating fund.
Any design can be put on any item.*

Contact David Bianchi dadsnorlax@yahoo.com for further details.

RED ALERT – Downward Pointing Lasers

NASA is planning to use (or is already using) downward pointing lasers which are mounted on their spacecrafts. For those of us who look at the night sky through a telescope, or a pair of binoculars, this is a potential hazard. If a laser beam enters our instrument at the very time we are viewing, eye injury or blindness could occur. Contact physicist, Dr. Jennifer Inman, jennifer.a.inman@nasa.gov and tell her your concerns about this perilous issue. Why should we have to live in fear each time we look into a telescope or a pair of binoculars? This is unacceptable!



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Spot the Young Stars of the Hyades and Pleiades

By David Prosper

Orion is the last of a trio of striking star patterns to rise during the late fall and early winter months, preceded by the diminutive Pleiades and larger Hyades in Taurus. All three are easily spotted rising in the east in early January evenings, and are textbook examples of stars in different stages of development.

As discussed in last month's Notes, the famous Orion Nebula (M42), found in Orion's "Sword," is a celestial nursery full of newly-born "baby stars" and still-incubating "protostars," surrounded by the gas from which they were born. Next to Orion we find the Hyades, in Taurus, with their distinctive "V" shape. The Hyades are young but mature stars, hundreds of millions of years old and widely dispersed. Imagine them as "young adult" stars venturing out from their hometown into their new galactic apartments. Bright orange Aldebaran stands out in this group, but is not actually a member; it just happens to be in between us and the Hyades. Traveling from Orion to the Hyades we then find the small, almost dipper-shaped Pleiades star cluster (M45). These are "teenage stars," younger than the Hyades, but older than the newborn stars of the Orion Nebula. These bright young stars are still relatively close together, but have dispersed their birth cocoon of stellar gas, like teenagers venturing around the neighborhood with friends and wearing their own clothes, but still remaining close to home - for now. Astronomers have studied this trio in great detail in order to learn more about stellar evolution.

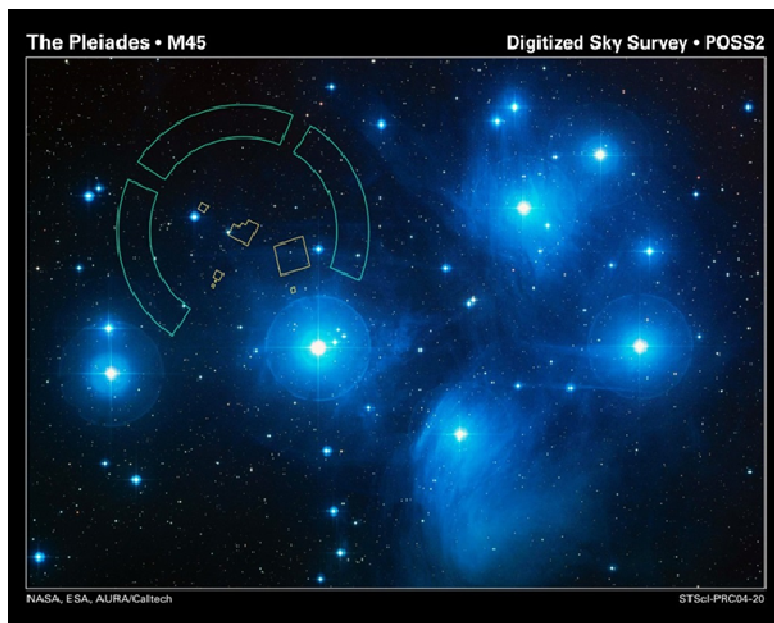
Figuring the exact distance of the Pleiades from Earth is an interesting problem in astrometry, the study of the exact positions of stars in space. Knowing their exact distance away is a necessary step in determining many other facts about the Pleiades. The European Space Agency's Hipparcos satellite determined their distance to about 392 light years away, around 43 light years closer than previous estimates. However, subsequent measurements by NASA's Hubble Space Telescope indicated a distance of 440 light years, much closer to pre-Hipparcos estimates. Then, using a powerful technique called Very Long Baseline Interferometry (VLBI), which combines the power of radio telescopes from around the world, the distance of the Pleiades was calculated to 443 light years. The ESA's Gaia satellite, a successor to Hipparcos, recently released its first two sets of data, which among other findings show the distance close to the values found by Hubble and VLBI, possibly settling the long-running "Pleiades Controversy" and helping firm up the foundation for follow-up studies about the nature of the stars of the Pleiades.

You can learn more about the Pleiades in the Universe Discovery Guide at bit.ly/UDGMarch , and find out about missions helping to measure our universe at nasa.gov.

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Caption: Locate Orion rising in the east after sunset to find the Orion Nebula in the “Sword,” below the famous “Belt” of three bright stars. Then, look above Orion to find both the Hyades and the Pleiades. Binoculars will bring out lots of extra stars and details in all three objects, but you can even spot them with your unaided eye!



Caption: Close-up of the Pleiades, with the field of view of Hubble’s Fine Guidance Sensors overlaid in the top left, which helped refine the distance to the cluster. The circumference of the field of view of these sensors is roughly the size of the full Moon. (Credit: [NASA](#), [ESA](#) and AURA/Caltech)

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

The Bubble Nebula & M52

Specs: RAW, f/3.5, FL 1200mm, 6 x 2 minutes, ISO 2000, 10-23-19



The **Bubble Nebula** (NGC 7635) is an emission nebula located in the constellation Cassiopeia. It can be found about 35 arc minutes from the Open Cluster M52. That is the same distance that “The Airplane Asterism” is from M52 which I featured in last month’s newsletter. In fact, those four bright stars to the far left of M52 form the cockpit of the Airplane. The **Bubble Nebula** was discovered by William Herschel in 1787. It was nicknamed the **Bubble Nebula** because of its shape, looking like a “soap bubble” floating in the midst of a denser molecular cloud. The bubble lies at a distance of about 9,000 light years from Earth. It was created by a strong stellar wind from its central star, a young massive hot Wolf-Rayet star (having a radius 15 times that of the Sun and is 398,000 times more luminous) that shed its material to form the **Bubble Nebula**. The bubble has an apparent magnitude of 10 and is about 10 light years in diameter. The central star has a magnitude of 8.71. To actually see the **Bubble Nebula** a telescope of 8-inches in diameter or more is needed.

2019 Christmas Party / Pot Luck



Club Meeting & Star Party Dates

Date	Subject	Location
<u>Jan 3</u>	<p><u>ASNNE Club Meeting:</u></p> <p>Business Meeting 6:30 PM Beginners Class 7:00 - 7:30 PM (TBD) Regular Meeting 7:30-9:30 PM</p> <p>Guest speaker/topic - TBD</p> <p>Bernie Reim - What's UP</p> <p>Astro Shorts: (news, stories, reports, questions, photos)</p>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	<p>Last month was the club's Christmas Party / Pot Luck get together. As usual the food and the company was delightful. Carl asked a Question: What do you think about bringing in an Astrologer to talk to us about Astrology? There were mixed reactions but no one said no.</p>	
<u>TBD</u>	Club/Public Star Party: TBD	Talmage Observatory at Starfield West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunk [38 York Street (Rt1) Kennebunk, ME]

For directions to The New School you can use this link to the ASNNE NSN page and then click on "get directions" from the meeting location. Enter your starting location to generate a road map with complete directions. It works great. http://nightsky.jpl.nasa.gov/club-view.cfm?Club_ID=137

Directions to Talmage Observatory at Starfield [Alewife Road, Kennebunk, ME]

From North:

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

From South:

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join **ASNNE**, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website: <http://www.asnne.org>



Astronomical Society of Northern New England
 P.O. Box 1338
 Kennebunk, ME 04043-1338

2020 Membership Registration Form

(Print, fill out and mail to address above)

Name(s for family): _____

Address: _____

City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):

Individual \$35 _____ Family \$ 40 _____ Student under 21 years of age \$10 _____ Donation _____

Total Enclosed _____

Tell us about yourself:

1. Experience level: Beginner _____ Some Experience _____ Advanced _____

2. Do you own any equipment? (Y/N) And if so, what types?

3. Do you have any special interests in Astronomy?

4. What do you hope to gain by joining ASNNE?

5. How could ASNNE best help you pursue your interest in Astronomy?

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes _____ No _____

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes _____ No _____

