Skylights

Newsletter of the Astronomical Society of Northern New England

AUG 2016

Member of NASA's

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 August

By Bernie Reim

The month of August is named for Augustus Caesar. The first day of this month marks the halfway point of our summer. The days are now continuing to get shorter even as the nights are getting longer again, which is great for seeing and enjoying more of the wonders of the night sky.

There will be several very interesting events this month. Mars will catch up with Saturn and line up with Antares for a nice show and then Venus will catch up with Jupiter for a much closer conjunction on the 27th. The famous Perseid meteor shower will peak on the 11th and 12th and it should be a much better show than usual thanks to Jupiter. The Juno mission is already getting great pictures of Jupiter and there is only one year to go to the next great total solar eclipse and the first one to completely cross our country in about 100 years.

The month starts with 3 planets lined up in a straight line 27 degrees long in the evening sky just after sunset. We haven't had any bright planets low in the western evening sky for a while, so this will be a nice change and you don't even have to get up early. Jupiter is the highest one, then Mercury is next, and then Venus is just over the horizon 20 minutes after sunset. You may need binoculars to see Venus that low. Also notice that it is right next to Regulus now, the brightest star in Leo and the 21st brightest star in the whole sky.

Then keep watching this trio as the slender waxing crescent moon slides right under Mercury on Thursday evening the 4th and then passes directly under Jupiter the next evening. By the middle of the month Mercury will get within 4 degrees of Jupiter. Venus will keep catching up with Jupiter all month long and will be less than half a degree apart on Saturday the 27th. That will be the closest conjunction of any planets for us this year. They will be even closer together in the southern part of South America as these two brightest planets will blend together when viewed without binoculars.

The famous Christmas star may have been a double or triple conjunction of bright planets.

When watching Jupiter carefully this month as those other planets appear to get close to it, remember that we just achieved a remarkable feat of engineering by getting Juno safely to exactly where it had to go to begin its highly dangerous elliptical orbits around this energetic planet in October. Going way beyond threading a tiny cosmic needle, they got even closer to the exact spot at the exact time than the New Horizons mission to Pluto, which is 8 times farther away at about 4 billion miles. Its Juno cam already took some great pictures including the first real time movie of the four large Galilean Moons orbiting this giant planet like a miniature solar system. Galileo inferred that is what was going on 407 years ago, but now we are actually there and can see it happening from a few thousand miles away instead of half a billion miles away.

Try to appreciate the great size and power of the king of our planets. At ten earth diameters across, Jupiter is 318 times heavier

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than the earth and it spins around in only 10 hours. If you could see its intense magnetosphere, Jupiter would cover one full degree of the sky, which is twice the width of the full moon or sun in our sky. That is 120 times bigger than the visible part of this planet. Jupiter may look totally calm and serene at this great distance, but nothing could be farther from the truth about this fantastic and violently spinning monster. To quote Scott Bolton, the chief scientist on the Juno mission, "it gravity is like a giant slingshot, slinging rocks, dust, electrons, whole comets. Anything that gets close to it becomes its weapon."

Juno is definitely a suicide mission, but first it should discover many unknown answers about Jupiter including if it even has a solid core and much more about the nature of its powerful magnetosphere. It could even solve the greatest mystery of all in the solar system, exactly how Jupiter and the other planets formed and in turn how exoplanets formed in other solar systems.

The billion-dollar Juno probe has 9 highly sophisticated scientific instruments which will give us the raw data to interpret to arrive at answers to the long-standing questions. Its electronic brain is shielded by titanium so that it won't get destroyed too quickly. Juno should be able to complete about 35 orbits over the next 2 years before we purposely crash it into the planet to avoid contaminating any of its moons that may harbor some life forms.

Then continue to travel a little father east along the ecliptic and you will encounter some equally unique but less violent planets, Mars and Saturn. By the 23rd of this month, Mars will have caught up with Saturn and will form a straight line with the orange giant star named Antares in Scorpius. Golden Saturn will be the highest one, then orange Mars, and then Antares, which is about 3 times fainter than Mars, even though it really is one of the largest stars in our whole galaxy at 700 times the size of our sun.

The most famous of all the meteor showers, the Perseids, peak every August. Caused by Comet Swift-Tuttle, you can usually expect about 60 meteors per hour. This year we may get double that or even more, due to a recently discovered influence of Jupiter's strong gravity on part of this comet's debris field. Swift-Tuttle last returned in 1992, but there were also much better counts than usual every 12 years before and after that date. It takes Jupiter nearly 12 years to orbit the sun, which coincides perfectly. The last one was in 2004 and we are due for the next one this year. The moon will be waxing gibbous, but it will set around 1 am. That is the best time to watch a meteor shower anyway, because then we are on the side of the earth that is turning directly into the meteors, similar to looking out your front car window when driving into a snowstorm instead of looking out your back window. So get out and enjoy this amazing display of nature's silent fireworks and try to take some photographs to preserve this exciting event.

The next total solar eclipse over this country is exactly one year now, August 21, 2017. It is not too early to start planning for it and booking reservations, but I will give you many more details and updates before then. There was also a very interesting total solar eclipse across this country over 100 years ago on July 29 of 1878. The two paths will cross in Wyoming, near Yellowstone National Park and the Grand Tetons. Famous people like Thomas Edison and astronomers like Asaph Hall who discovered the moons of Mars were there along with others like Henry Draper, James Watson, and Maria Mitchell from Nantucket, who was the first female professional astronomer in this country and discovered a comet in 1847.

August 2. New moon is at 4:44 p.m. EDT.

August 3. The Messenger Spacecraft was launched to Mercury on this day in 2004.

August 4. The Phoenix mission was launched to Mars on this day in 2007.

August 5. The moon will be directly below Jupiter tonight.

August 6. The Curiosity Rover was launched to Mars on this day in 2012.

August 10. First quarter moon is at 2:21 p.m.

August 11. The Perseid meteor shower peaks tonight into the 12th. You could expect twice as many meteors as usual, up to 150 per hour.

August 12. Asaph Hall discovered Deimos on this day in 1877. He would discover Phobos, the larger moon of Mars at 14 miles across just 6 days later.

August 17. On this day in 2006 Voyager 1 reached 100 a.u. into the solar system or over twice the distance to Pluto. It reached the heliopause at about 123 a.u. 7 years later in 2013.

August 18. Full moon is at 5:26 p.m. This is also known as the Grain, Green Corn, or Sturgeon Moon.

August 23. Mars forms a vertical line with Saturn and Antares tonight.

August 25. On this day in 2003, the Spitzer infrared space telescope was launched.

August 27. Venus and Jupiter have an extremely close conjunction of less than a half degree.

Moon Phases

Aug 2
New

Aug 10
First Quarter

Aug 18
Full

Aug 24
Last Quarter

Moon Data

Aug 4
Venus 3° north of Moon

Mercury 0.6° north of Moon

Aug 5
Jupiter 0.2° north of Moon

Aug 9
Moon at apogee

Aug 11
Mars 8° south of Moon

Aug 12
Saturn 4° south of Moon

Aug 19
Neptune 1.1° south of Moon

Aug 21
Moon at perigee

Aug 22
Uranus 3° north of Moon

Submitted by Glenn Chaple

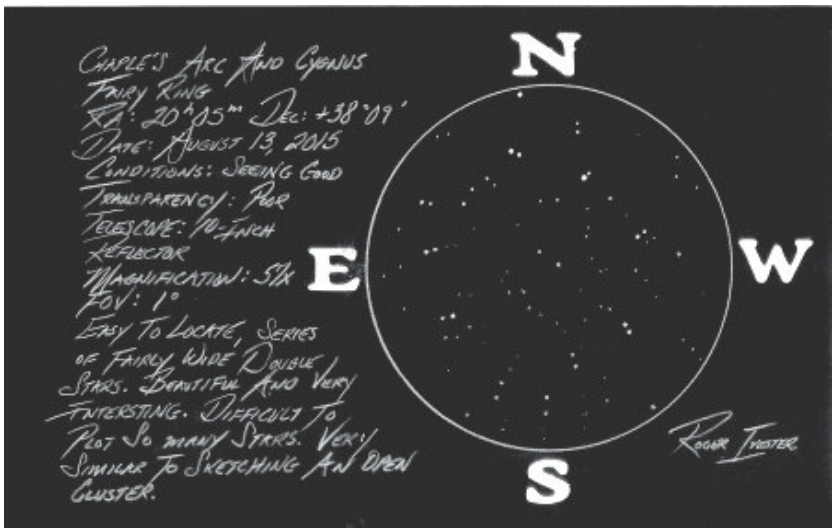
Las Vegas Astronomical Society
www.lvastronomy.org

Sky Object of the Month – August 2016

(Courtesy LVAS Observer's Challenge*)

Chaple's Arc/Fairy Ring–Asterism in Cygnus (Magnitude 7, Size 22')

This striking arc-shaped arrangement of four double stars was found by amateur astronomer Glenn Chaple during a search for the pair h1470 (one of the four) with a 3-inch reflecting telescope. He eventually reported the group in the September, 1980, issue of *Deep Sky Monthly,* and a reader dubbed it "Chaple's Arc." The group was independently found by Utah amateur Kim Hyatt, who was also looking for h1470. With a 10-inch scope, he added several fainter pairs that, with the Arc, formed a ghostly ring. He christened it the "Fairy Ring" and reported it to his friend Brent Watson. Watson included the Fairy Ring in his booklet *Finder Charts of Overlooked Objects*. Today, the asterism bears both names.



Sketch by LVAS member Roger Ivester

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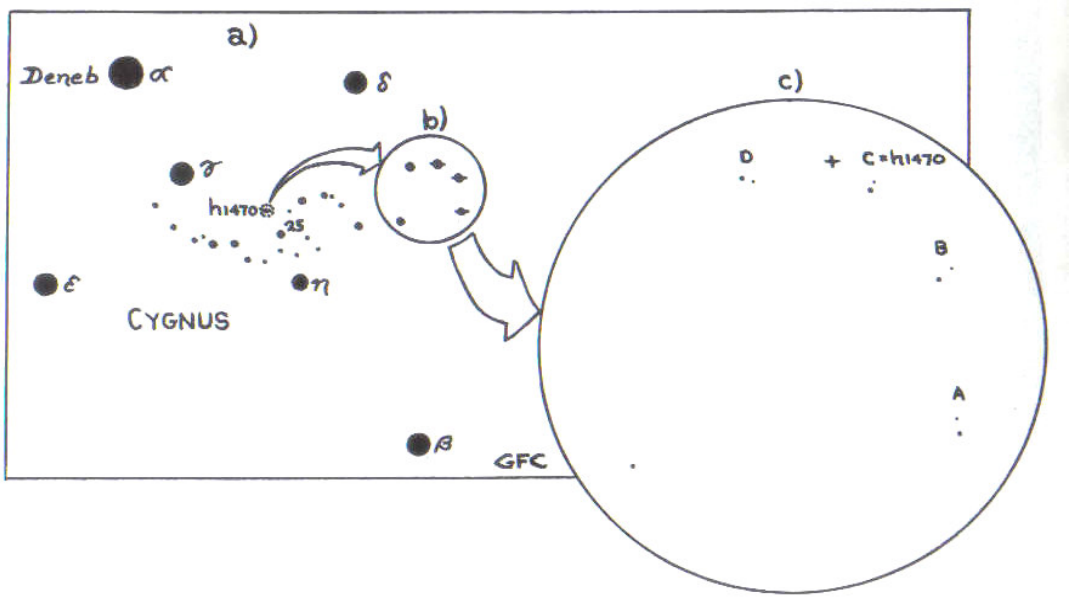
Image by Rick Kazmierki



Sketch and chart by Glenn Chaple (From Deep Sky Monthly, September, 1980)

***The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, the LVAS will be happy to include them in our monthly summary. If you would like to contribute material, submit your observing notes, sketches, and/or images to either Roger Ivester (rogerivester@me.com) or Fred Rayworth (fred@fredrayworth.com). To find out more about the LVAS Observer's Challenge or access past reports, log on to lvastronomy.com/observing-challenge.**

Principal Meteor Showers in 2016

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

The latest issue of the Space Place Newsletter: News and Notes for Formal and Informal Educators can be found at: http://spaceplace.nasa.gov/en/educators .

Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents.

Check out our great sites for kids:

The Space Place website (http://spaceplace.nasa.gov)

The *SciJinks Weather Laboratory* at http://**scijinks.gov**

NASA Climate Kids at http://**climate.nasa.gov/kids**

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.
Just let our club member, David Bianchi, know.

This article is provided by NASA Space Place.
With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit **spaceplace.nasa.gov** to explore space and Earth science!

Venus and Jupiter prepare for their close-up this August

By Ethan Siegel

As Earth speeds along in its annual journey around the Sun, it consistently overtakes the slower-orbiting outer planets, while the inner worlds catch up to and pass Earth periodically. Sometime after an outer world—particularly a slow-moving gas giant—gets passed by Earth, it appears to migrate closer and closer to the Sun, eventually appearing to slip behind it from our perspective. If you've been watching Jupiter this year, it's been doing exactly that, moving consistently from east to west and closer to the Sun ever since May 9th.

On the other hand, the inner worlds pass by Earth. They speed away from us, then slip behind the Sun from west to east, re-emerging in Earth's evening skies to the east of the Sun. Of all the planets visible from Earth, the two brightest are Venus and Jupiter, which experience a conjunction from our perspective only about once per year. Normally, Venus and Jupiter will appear separated by approximately 0.5º to 3º at closest approach. This is due to the fact that the Solar System's planets don't all orbit in the same perfect, two-dimensional plane.

But this summer, as Venus emerges from behind the Sun and begins catching up to Earth, Jupiter falls back toward the Sun, from Earth's perspective, at the same time. On August 27th, all three planets—Earth, Venus and Jupiter—will make nearly a perfectly straight line.

As a result, Venus and Jupiter, at 9:48 PM Universal time, will appear separated by only 4 arc-minutes, the closest conjunction of naked eye planets since the Venus/Saturn conjunction in 2006. Seen right next to one another, it's startling how much brighter Venus appears than Jupiter; at magnitude -3.80, Venus appears some *eight times brighter than* Jupiter, which is at magnitude -1.53.

Look to the western skies immediately after sunset on August 27th, and the two brightest planets of all—brighter than all the stars—will make a dazzling duo in the twilight sky. As soon as the sun is below the horizon, the pair will be about two fists (at arm's length) to the left of the sun's disappearance and about one fist above a flat horizon. You may need binoculars to find them initially and to separate them. Through a telescope, a large, gibbous Venus will appear no more distant from Jupiter than Callisto, its farthest Galilean satellite.

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As a bonus, Mercury is nearby as well. At just 5º below and left of the Venus/Jupiter pair, Mercury achieved a distant conjunction with Venus less than 24 hours prior. In 2065, Venus will actually occult Jupiter, passing in front of the planet's disk. Until then, the only comparably close conjunctions between these two worlds occur in 2039 and 2056, meaning this one is worth some special effort—including traveling to get clear skies and a good horizon—to see!

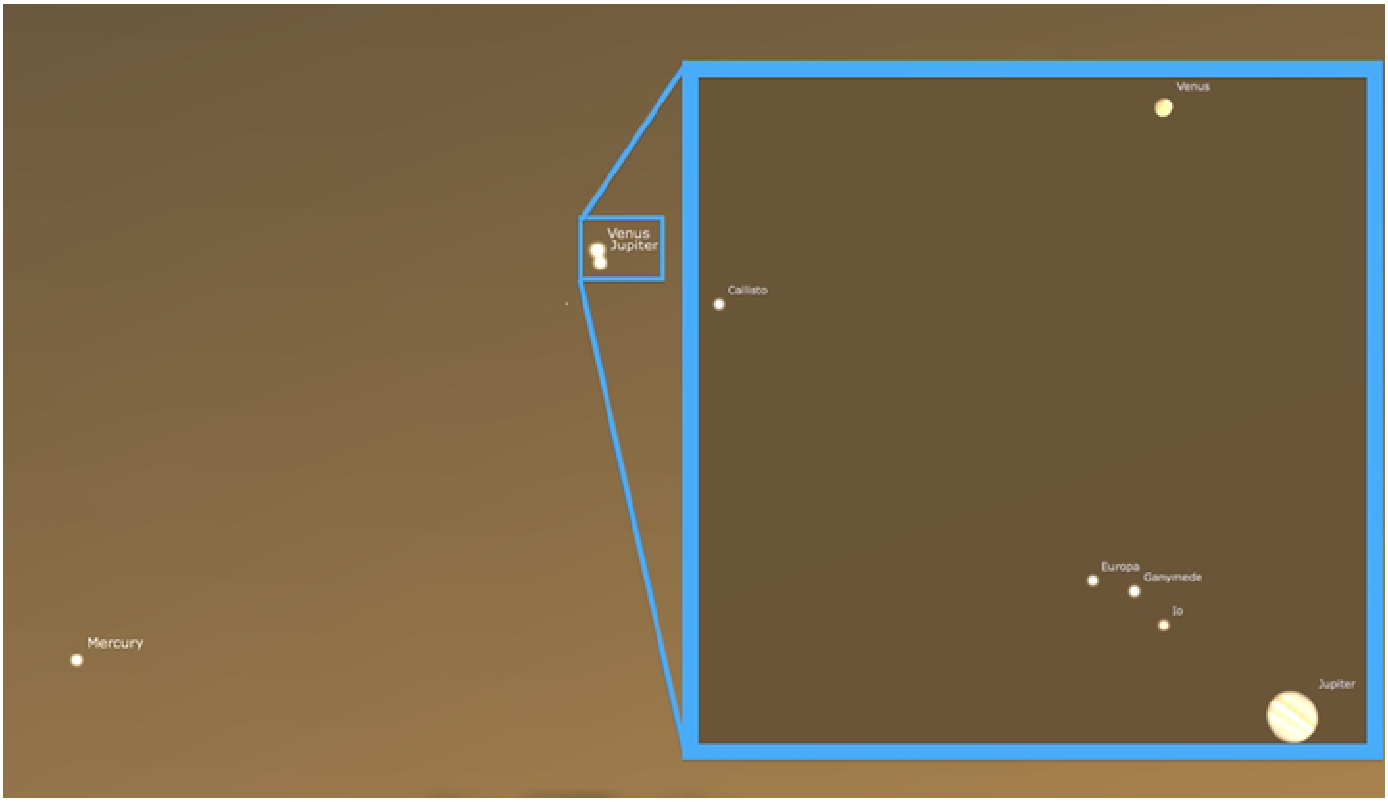

Image credit: E. Siegel, created with Stellarium, of a small section of the western skies as they will appear this August 27th just after sunset from the United States, with Venus and Jupiter separated by less than 6 arc-minutes as shown. Inset shows Venus and Jupiter as they'll appear through a very good amateur telescope, in the same field of view.

To teach kids more about Venus and Jupiter, visit the NASA Space Place webpages titled "All About Venus" [http://spaceplace.nasa.gov/all-about-venus/en/] and "All About Jupiter" [http://spaceplace.nasa.gov/all-about-jupiter/en/].

Jupiter and Saturn

Submitted by Jeff Green

Taken with a Nikon D7000 DSLR at ISO 100

Both images were taken at prime focus through the club's Ziess refractor on 7-3-16. Jeff brought the original shots into Adobe Lightroom and processed them there for exposure and sharpening. He then pushed the saturation and some sharpening; so a little enhanced. Stacked the two Jupiter shots--one for the moons and one for plant to show in single image. A 4th moon can just be seen to Jupiter's right about the 5 o'clock position and a diameter away (might need to zoom in).

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Star Party at Starfied Observatory on 7-3-16

Photos Submitted by Editor

Jeff Green (above) — person who built our new club website with design help from Nan Musgrave.

Nan brought friends and relatives. And for some it was their first time looking through a telescope.

We also had fireworks all through the night being the 3rd of July.

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I used a camera and tripod to capture this 30 sec exposure. Bottom left is the Ziess which is in front of the constellation Cepheus. To its right is a jet passing through the field of view. To the jet's right is a bright star, Deneb the head of the Northern Cross. To the lower right is Delphinus the Dolphen, above that is Sagitta the Arrow, above that is the Coat Hanger. Near the center is the bright star Vega in the constellation Lyra, the Harp. It along with Deneb and Altair (bright star bottom right edge), form the Summer triangle. And going from lower left to middle right is the Milky Way.

Club Meeting & Star Party Dates

Date	Subject	Location
August 5th	**ASNNE Club Meeting:** **Meeting Agenda** Picnic and observing session (weather permitting) at Starfield Observatory. Start time 6:30 PM. Bring your own food and beverage. Gas grills will be HOT. All dessert donations will be appreciatively eaten! If rained out, just a regular August meeting at The New School (TNS). Guest speaker/topic - TBD. Regular agenda: Bernie Reim - What's Up. Members Astro shorts - ie, news, events, questions. Where's Pluto - Update on the New Horizons Mission and "Planet" status. Days to close approach.	Starfield Observatory, West Kennebunk, Me.
August 26th	Club/Public Star Party (*Check List-serve / website for updates or cancellations*)	Starfield Observatory, West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunck [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 Starfield Observatory [Alewive 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

2016 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_____