



# THE OBSERVER

## East Valley Astronomy Club



The Complex Tail of Comet Lovejoy  
APOD January 21, 2015 Velimir Popov & Emill Ivanov

### EVAC This Month *by Claude Haynes*

DaVinci is coming. The Phoenix Art Museum has a display of the Leonardo da Vinci Codex Leicester (Less-ter) from January 24 to April 12. The Codex was purchased in 1994 by Bill Gates for over thirty million dollars. It is displayed once each year, so this is probably a "once in a lifetime" chance to see it. The folio is 18 double sided pages in Italian, with notes on why fossils are found on mountaintops (da Vinci believed they were once lake beds), the movement of water, and that earth-shine on a new moon is caused by the reflection of the sun off the Earth's oceans (he

also believed that the glow of the moon was caused by reflection of the moon's waters – can't get them all right). The exhibit includes art work from the time of da Vinci, and art influenced by his writings and observations. A special lecture will be held Wednesday, March 18 at 7:00pm by Dr. Donald Olson of Texas State University. He will discuss using astronomy calculations to determine the date, time and place Monet painted the cliffs of "Etretat Sunset". Some of you may remember Sky and Telescope articles by this group of researchers.

### UPCOMING EVENTS:

- Public Star Party - February 13*
- Local Star Party - February 14*
- EVAC Monthly Meeting- February 20*
- Deep Sky Party - February 21*
- Check out all of the upcoming club events in the Calendars on page 9*

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# Evac This Month

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It gets even better that Wednesday is a no admission charge day at the museum, so the exhibition and talk are free. More information at <http://www.phxart.org/event/77eb556d-e63d-c504-345f-f0064f940a20>

Our next meeting (and for the rest of the year) is back at the library on February 20 at 7:30pm, and will feature Michael Smith with a presentation titled "How distant can we see? Our optical horizon". Thanks again to Richard and Jimmy for the great January presentation on

## If It's Clear...

*by Fulton Wright, Jr. Prescott Astronomy Club*

February 2015

If it's clear for January 2015  
by Fulton Wright, Jr.  
Prescott Astronomy Club

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is 1/2 degree or 30 arc-minutes in diameter. All times are Mountain Standard Time.

On the evening of Sunday, February 1, starting at 8:13 PM, an interesting sequence of events happens with Jupiter's moons. Io's shadow leaves Jupiter, closely followed by Io moving from in front of the planet. Io moves toward nearby Europa which begins to move into Jupiter's shadow. By 8:35 PM Io has completely covered and uncovered Europa and Europa has moved completely into Jupiter's shadow and is invisible. At 12:54 AM (Monday) Europa has emerged on the other side of Jupiter and is completely covered by Ganymede for a couple of minutes. Starting about 2:10 AM Ganymede and its shadow move onto Jupiter.

On Tuesday, February 3, at 6:09 PM (7 minutes after sunset), the full Moon rises, spoiling any chance of seeing faint fuzzies for the night.

On Saturday, February 7, Io and its shadow enter Jupiter at 1:22 AM and exit at 3:39 PM. Europa and its shadow enter Jupiter at 4:37 AM and exit at 7:32 AM just as Jupiter sets and the Sun has risen. This is the time of Jupiter's opposition, so the satellite almost covers its own shadow.

their Speckle Interferometry research at Kitt Peak.

Practice on those Messier objects. The Marathon is March 21 at the Hovatter Road site. Check the Saguaro website for more information: [www.saguaroastro.org](http://www.saguaroastro.org).

Clear skies

Claude

On Wednesday, February 11, the Moon is at last quarter phase and rises at 1:23 AM (Thursday).

On Wednesday, February 18, it is new Moon and you have all night to hunt for faint fuzzies.

On Friday, February 20, about 7:00 PM, look for Venus (magnitude -4), Mars (magnitude 1), and the thin crescent Moon near each other, low in the west. Venus and Mars are even closer the next day, but the Moon has moved on. This is also the time that Algol (Beta Persei) is at its minimum (magnitude 3.4). After about an hour it rises slowly to magnitude 2.1.

On Wednesday, February 25, the Moon is at first quarter phase and sets at 1:55 AM (Thursday).

On the night of Thursday, February 26, you can see some events with Jupiter's moons. Most of these events take about 10 minutes to happen. Here is the schedule of start times:

07:17 PM Io moves in front of Ganymede (0.4 magnitude drop).

08:18 PM Europa emerges from Jupiter's shadow (rise to magnitude 5.8).

08:31 PM Io's shadow falls on Ganymede (1.0 magnitude drop).

09:28 PM Callisto's shadow falls on Ganymede (0.6 magnitude drop).

01:02 AM (Friday) Callisto's shadow falls on Io (0.2 magnitude drop).

# The Backyard Astronomer

by Bill Dellinges (February 2015)

## Winter DSO Overload

Yikes! Where to begin? So many Deep Sky Objects and so little time. The Winter Hexagon offers a plethora of star clusters, nebulae and double stars but not too many galaxies of any consequence due to the winter Milky Way blocking the view of those "Island Universes." Let's point out highlights offered by what I call the Big Five: Orion, Gemini, Canis Major, Taurus, and Auriga.

**Orion:** The crown jewel of winter skies must be M42, the Orion Nebula. It's probably the best example of an emission nebula seen from the northern hemisphere. M42 looks intriguing in any telescope. Even the naked eye can see that the middle star in the sword is nebulous. Look for the tight knot of four stars at the heart of nebula - the Trapezium. They are responsible for stimulating the nebula to shine. If seeing permits, increase the magnification and look for the fifth and sixth E and F components of the Trapezium. They are dimmer than the main four stars. The E component is fairly easy to pick out, but the F star requires good seeing. Look for mottling in the ethereal tendrils of the nebula's gas clouds. Try observing in the entire Sword in binoculars, for the view reveals the three stars, seen by the naked eye, are actually three separate complexes comprised of M42 and two loose open star clusters, one above and below the nebula. It's a scene to take one's breath away. There is an unusual star cluster located where Orion's right elbow would be. NGC 2169 resembles the number 37 and is sometimes called the 37 Cluster. Telescopes with reverse images will show the 37 backwards, but it's still fun to see. The Head of Orion is often overlooked. A wide field telescope or binocular will show the several stars to be the sparse open star cluster, Collinder 69. Orion contains many double stars, two of which beg for your attention. Rigel at magnitude 0.3 is the brightest star in Orion and has a 6.8 magnitude 9.8" (arc seconds) companion. Almost any telescope should split it at about 100x, but Rigel's brightness can make resolving its companion difficult if the seeing is bad. Fourth magnitude Sigma Orionis is just below Alnitak, the eastern most Belt star. It is not to be missed. It's a quadruple star arranged nearly in a straight line reminiscent of Jupiter and three of its moons. It might take 100x to separate the magnitude 10.3 C component from the brighter 3.8 magnitude A star. In the same field, for no extra charge, you should also see the triple star Struve 761 north of Sigma.

**Gemini:** NGC 2392, the Eskimo Nebula, is one of the best planetary nebula in the sky and can be found two degrees southeast of Wasat (Delta Gem.). It has a tenth magnitude central star that's easy to resolve in a modest backyard telescope. An OIII filter enhances the nebula but causes the central star to disappear. Because most planetary nebulae have small angular diameters, high powers of 100x and up are required to see these celestial ghosts well. Castor is Gemini's second brightest after Pollux and a beautiful close double star. The stars are magnitude 1.9 and 2.9 with a separation of 3.8" and should easily be resolvable at 100x. Though mainly appreciated as a double, there is a third 9.8 magnitude star 71 arc seconds away at position angle (PA) 164 degrees. Can you find it? All three stars are spectroscopic doubles, thus it's a six star system. M35 near Castor's "foot" is a stunningly beautiful open star cluster. They don't get much better than this specimen. For a challenge, try to spot the more remote NGC 2158, a small faint cluster about half a degree southwest of M35. At first you'll think you've discovered a comet. But 200x will reveal its stellar nature and you'll calm down.

**Canis Major:** Home of the night sky's brightest star, Sirius (-1.44). Less than four degrees due south of this blazing beacon resides M41, another fine open star cluster. It's a tad large at 40' (arc minutes) so use low power. Somewhat off the beaten path, four degrees northeast of Wezen (Delta C. Maj.), is an interesting star cluster not to be missed. NGC 2362 is a cute little star cluster set apart by being a host to Tau Canis Majoris, a blue magnitude 4.4 supergiant and triple star. Surprisingly, it's not difficult to find Tau's companions amongst the background stars of the cluster. The 11th magnitude stars share a similar PA, 80 and 90 degrees. Separation is 8.2" and 14.5".

**Taurus:** How can you not shout out PLEIADES ("Glitter like a swarm of fireflies tangled in a silver braid", Tennyson) when thinking Taurus? What other star cluster is so close to us, 378 light years, that you can resolve it with the naked eye? OK, the Face of the Bull, the Hyades, is also a star cluster only 120 light years away and also resolvable without optical aid. While both are beauties in their own right, the Pleiades is a more compact grouping and steal the show from the Hyades. To appreciate them at their best, use a midsized tripod mounted binocular like a 10x70 or 20x80 on the Pleiades and a 7x50 on the Hyades. M1, the Crab Nebula, gets a lot of press but is disappointing visually in telescopes under 12" of aperture. Stephen O'Meara

## The Backyard Astronomer

*Continued from page 3*

recommends NGC 1807/17 as two star clusters that can fit in a one degree field. They were quite unique at 90x in my 11" with its 0.9 degree field of view.

**Auriga:** As I pointed out in last month's column, the showcase objects in Auriga are M36, 37, 38, three pretty open

star clusters fairly close to one another, each with its own personality. Give them a try and pick one as your favorite! These are just a few of the more popular targets in winter's Big Five constellations. After checking them out, consider going after their other heavenly assets.

**\*FULL MOON ON FEBRUARY 3 AT 18:09**

**LAST QUARTER MOON ON FEBRUARY 11 AT 22:50**

**NEW MOON ON FEBRUARY 18 AT 18:47**

**FIRST QUARTER MOON ON FEBRUARY 25 AT 12:14**

***Looking for that perfect weekend activity?***

***Why not resolve to getting involved?***

***Contact Dave Coshow to join the staff at GRCO***

***Email: [grco@evaonline.org](mailto:grco@evaonline.org)***



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Selling my 14.5" f5.2 Dobsonian with 2" diagonal, asking \$2200, need to sell because it has become too much for me to handle. I am the original owner and built it from an AstroSystems TeleKit in 2000. The mirror is by the late Pierre Schwaar. Scope has been well maintained and comes with equatorial platform and XP4 Sky Commander.

This sale includes Telrad, filter slide with UHC and OIII filters, transport box for mirror, shroud, scope coat and other goodies too numerous to mention.

This sale DOES NOT include eyepieces so supply your own. Will NOT ship but willing to meet approximately half-way.

I plan on having it at the 2015 All Arizona Messer Marathon for those interested.

For more information e-mail me at [acrayon@cox.net](mailto:acrayon@cox.net)

# Upcoming Meetings

February 20

March 20

April 17

May 15

June 19

July 17

August 21

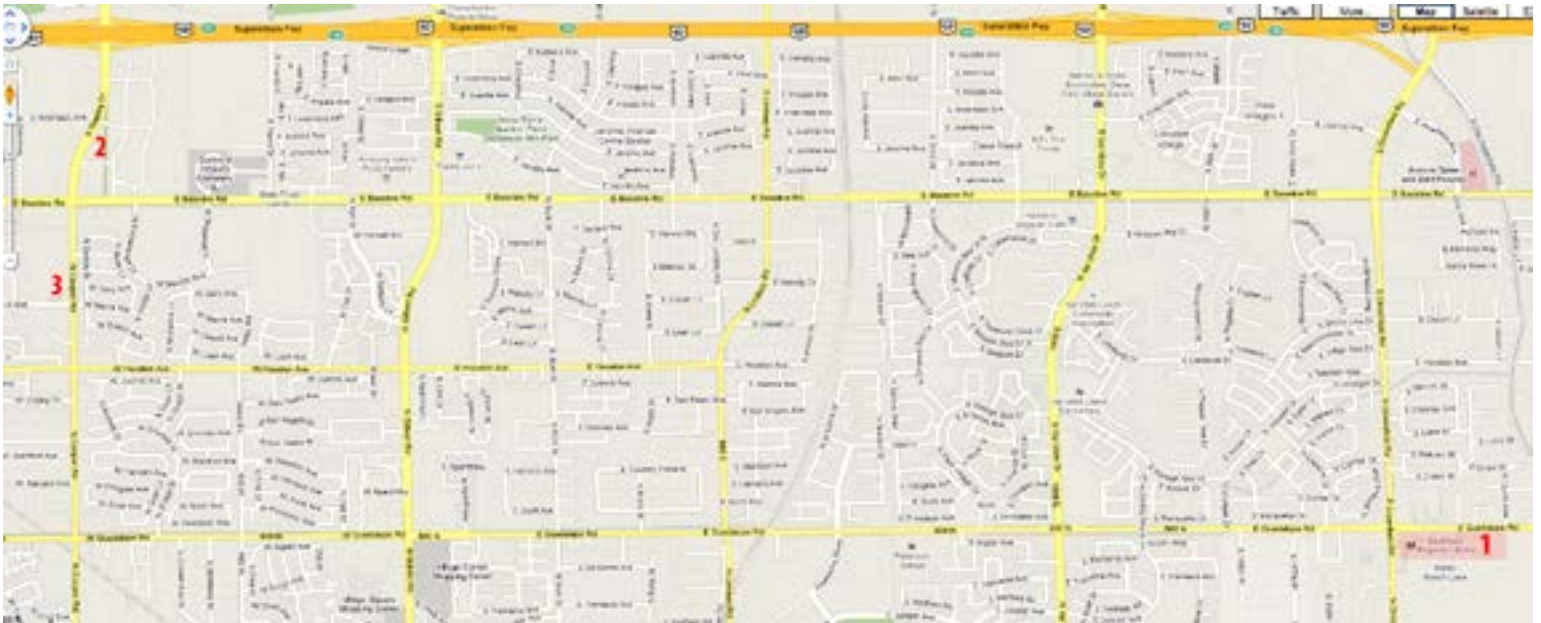
September 16

The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30 pm.

All are welcome to attend the pre-meeting dinner at 5:30 pm. We meet at Old Country Buffet, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, just south of US60.

***Visitors are always welcome!***



**2**

**Old Country Buffet**  
1855 S. Stapley Drive  
Mesa, Az. 85204

**1**

**Southeast Regional Library**  
775 N. Greenfield Road  
Gilbert, Az. 85234





## FEBRUARY 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
8	9	10	11	<b>12</b>	<b>13</b>	<b>14</b>
15	16	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
22	23	<b>24</b>	<b>25</b>	<b>26</b>	27	28

**Feb 4** - Payne Junior High

**Feb 5** - Navarrete Elementary

**Feb 6** - Wilson Elementary

**Feb 7** - City of Chandler Star Party

**Feb 12** - C.O. Greenfield School

**Feb 13** - Public Star Party

**Feb 14** - Local Star Party

**Feb 17** - Carol Rae Ranch Elementary

**Feb 18** - Kyrene Middle School

**Feb 19** - Knox Elementary

**Feb 20** - EVAC Monthly Meeting

**Feb 21** - Deep Sky Star Party

**Feb 24** - Concordia Charter School

**Feb 25** - CGCC Star Party

**Feb 26** - Sousa Elementary School

## MARCH 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	<b>5</b>	6	7
8	9	10	<b>11</b>	11	<b>13</b>	<b>14</b>
15	16	17	<b>18</b>	19	<b>20</b>	<b>21</b>
22	23	24	25	26	27	28
29	30	31				

**Mar 5** - Redbird Elementary

**Mar 11** - Sequoia STRIVE

**Mar 13** - Public Star Party

**Mar 14** - Local Star Party

**Mar 18** - Celestial Sleuth: Using Astronomy to Date Monet's Etretat, Sunset

**Mar 20** - EVAC Monthly Meeting

**Mar 21** - 2015 Messier Marathon

# East Valley Astronomy Club -- 2013 Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

**IMPORTANT:** All memberships expire on December 31 of each year.

Select one of the following:

- New Member
  Renewal
  Change of Address

**New Member Dues** (dues are prorated, select according to the month you are joining the club):

- |   |   |
|---|---|
| <input type="checkbox"/> <b>\$30.00 Individual</b> January through March  | <input type="checkbox"/> <b>\$22.50 Individual</b> April through June       |
| <input type="checkbox"/> <b>\$35.00 Family</b> January through March      | <input type="checkbox"/> <b>\$26.25 Family</b> April through June           |
| <input type="checkbox"/> <b>\$15.00 Individual</b> July through September | <input type="checkbox"/> <b>\$37.50 Individual</b> October through December |
| <input type="checkbox"/> <b>\$17.50 Family</b> July through September     | <input type="checkbox"/> <b>\$43.75 Family</b> October through December     |
- Includes dues for the following year*

**Renewal** (current members only):

- \$30.00 Individual**
 **\$35.00 Family**

**Name Badges:**

- \$10.00** Each (including postage) Quantity: \_\_\_\_\_

Name to imprint: \_\_\_\_\_

**Total amount enclosed:**

*Please make check or money order payable to EVAC*

- Payment was remitted separately using PayPal
  Payment was remitted separately using my financial institution's online bill payment feature

Name:

Phone:

Address:

Email:

City, State, Zip:

- Publish email address on website

URL:

How would you like to receive your monthly newsletter? (choose one option):

- Electronic delivery (PDF) *Included with membership*
 US Mail **Please add \$10 to the total payment**

**Areas of Interest** (check all that apply):

- |  |   |
|--|---|
| <input type="checkbox"/> General Observing   | <input type="checkbox"/> Cosmology        |
| <input type="checkbox"/> Lunar Observing     | <input type="checkbox"/> Telescope Making |
| <input type="checkbox"/> Planetary Observing | <input type="checkbox"/> Astrophotography |
| <input type="checkbox"/> Deep Sky Observing  | <input type="checkbox"/> Other            |

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop?  Yes  No

How did you discover East Valley Astronomy Club?

**PO Box 2202**  
**Mesa, AZ 85214-2202**  
[www.evaconline.org](http://www.evaconline.org)

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

*The Observer is the official publication of the East Valley Astronomy Club. It is published monthly and made available electronically as an Adobe PDF document the first week of the month. Printed copies are available at the monthly meeting. Mailed copies are available to members for a slight surcharge to offset printing and mailing expenses.*

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East Valley Astronomy Club  
PO Box 2202  
Mesa, Az. 85214-2202

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