



THE OBSERVER

East Valley Astronomy Club



Simeis 188 in Stars, Dust and Gas
 Image Credit & Copyright: Dieter Willasch (Astro-Cabinet)

UPCOMING EVENTS:

- Public Party - June 9*
- EVAC Monthly Meeting - June 16*
- Local Star Party - June 17*
- Deep Sky Party - June 24*
- Check out all of the upcoming club events in the Calendars on page 14.*

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EVAC This Month by Don Wrigley

This month's meeting will be a very special one, so I urge all members to read this message carefully. The meeting will begin one half hour earlier than usual: beginning at 7:00 PM instead of 7:30 PM. It is the night of our (now) annual summer solstice "Star-B-Que", so if you are planning to attend, you needn't worry about eating supper before hand. Also, we will not be having the usual pre-meeting dinner at the Golden Corral with our guest speaker, because we are having the Star-

B-Que and we are not having a guest speaker. Instead, we will be having an auction and estate sale, beginning at about 8:00 PM. You can find the details of the auction and sale as well as the time schedule and all the rules pertaining to the sale on our club website. Just go to the home page and click on the highlighted section that says "Estate Sale Items and Rules" or click on ([Link](#)).

Don Wrigley

If It's Clear...

by *Fulton Wright, Jr. Prescott Astronomy Club*

June 2017

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. All times are Mountain Standard Time.

For the comet hunters among you, check out the article in the June 2017 issue of Astronomy Magazine, p. 42. Also check out the June 13 entry in this article.

On Thursday, June 1, at 8:00 PM the Moon just misses Roe Leonis. Starting at 10:16 PM, you can observe a double shadow transit on Jupiter. Here is the schedule:
10:16 PM Europa moves in front of the planet.
11:38 PM Io moves in front of the planet.
12:29 AM (Friday) Europa's shadow falls on the planet (1 shadow).
12:42 AM Io's shadow falls on the planet (2 shadows).
12:44 AM Europa appears at the edge of the planet.
01:48 AM Io appears at the edge of the planet.
02:29 AM Jupiter sets (with both shadows on it).

On Saturday, June 3, you can observe a double shadow transit on Jupiter. Io is already in front of the planet. Ganymede has already passed the planet. The Moon is near Jupiter while all this is happening. Here is the schedule:
07:10 PM Io's shadow falls on the planet (1 shadow).
07:16 PM Ganymede's shadow falls on the planet (2 shadows).
07:39 PM Sunset.
08:10 PM You might be able to spot the planet.
08:16 PM Io appears at the edge of the planet.
09:18 PM Io's shadow leaves the planet (1 shadow).
09:29 PM Ganymede's shadow leaves the planet.
09:55 PM The red spot transits (crosses the meridian of) the planet.

On Thursday, June 8, the full Moon rises at 7:01 PM, spoiling the whole night for faint fuzzy observation.

On Saturday, June 10, at 11:18 PM we almost have a double shadow transit on Jupiter as Io's shadow leaves at the same time that Ganymede's falls on the planet.

On the night of Sunday, June 11, all of Saturn's bright

moons are on the west (IAU, terrestrial) side of the planet.

On Tuesday, June 13, at 11:10 PM, The 6.7 magnitude comet, C/2015 V2 (Johnson), passes within 20 arc-seconds of the 6.2 magnitude star, HR 5394 (SAO 120436). (Remember, estimates of comet brightness are just guesses.) You should be able to detect motion of the comet in just a few minutes.

On Wednesday, June 14, Saturn reaches opposition, which means it will be visible all night.

On Friday night, June 16, the third quarter phase Moon rises at 12:43 AM (Saturday).

On Saturday, June 17, you can see a number of events with Jupiter's moons. Here is the schedule:
09:48 PM Io moves in front of the planet.
09:53 PM Europa moves behind the planet.
10:17 PM Ganymede moves in front of the planet.
11:00 PM Io's shadow falls on the planet.
11:58 PM Io moves from in front of the planet.
12:45 AM (Sunday) Ganymede moves from in front of the planet.
01:07 AM Io's shadow leaves the planet.
01:26 AM Jupiter sets.

On Wednesday, June 21, the Sun reaches the Summer Solstice (in the Northern hemisphere), so we have shortest (but perhaps the warmest) night of the year.

On Friday, June 23, it is new Moon, and you have all night to hunt for faint fuzzies.

On Saturday, June 24, at 8:19 PM, just when you can find Jupiter in the twilight, Io emerges from the face of Jupiter. Io's shadow is in the middle of Jupiter, and the satellite Europa is North (right above) it. They both exit about 9:30 PM. Europa's shadow lands on the planet about 10 minutes later. It's on the planet till midnight.

On Friday night, June 30, At 7:45 PM the Moon just misses Porrima (Gamma Virginis). The first quarter Moon sets at 12:40 AM (Saturday).

The Lonely Dragon

Stargazers look east to watch stuff rise. They look west to see them set. They look south to see how far down in declination they can go. But now I ask you to do the unthinkable and face north. For there lies Draco the Dragon, approaching the meridian by midmonth. In Greek mythology, Hera, Queen of the Heavens and hubby to Zeus, King of the Gods, kept a beautiful garden which included trees that produced golden apples. Hera commissioned Laden, a fearsome dragon with a hundred heads, to protect the trees from theft. As fate would have it, one of Hercules' Twelve Labors was to steal the Golden Apples as penance for killing his children in a fit of madness. Hercules managed to kill the Dragon and get away with the apples.

Draco is a constellation of faint stars wandering all over the place, reminiscent of Eridanus and Hydra. But that makes it even more challenging to identify the sinuous track of its stars across the firmament. Since Draco is a long and winding constellation, it's best to start at one end or the other to make any sense of it. Each end has a marker or signpost you can use to start your journey. One is obvious, the other not so much. The former is a trapezoid of stars not far from Vega in the northeast. The four stars represent the head of the beast. It's interesting to note their magnitudes are 2.2, 2.8, 3.75 and 4.9 - a handy reference to use in judging other stars' approximate magnitudes of 2 through 5. From there, the Dragon's body plunges down between Cepheus and Ursa Minor, making a U-turn back up and around the Bowl of the Little Dipper and terminating at Lambda Draconis, the tip of Draco's tail. The other "marker" star is Thuban (mag 3.7), third from the last star in the tail. This was Earth's North Pole star around 2800 BC during the building of the pyramids. Precession, a wobbling of Earth's axis of rotation, has since moved the north celestial pole (NCP) to the area of Polaris, currently 40' away from the NCP. To identify Thuban, draw a line connecting the two end stars of the Little Dipper's Bowl. Perpendicular to that line, move in a direction away from the Bowl. Ten degrees out (one fist at arm's length) you'll find Thuban. Say hello to the ancient Egyptian's North Star.

At magnitude 2.2, Eltanin (Gamma Draconis) is the brightest star in Draco and the brightest of the four stars in the Dragon's Head. It's main claim to fame is the discovery of

the aberration of starlight by English astronomer James Bradley 1728. He was studying the star looking for any parallax it might exhibit. He found no parallax but noticed Eltanin exhibited a 20.5 arc second shift in its position (as did other stars in the area). He correctly concluded the star's shift was due to the finite speed of light and Earth's motion around the Sun. The dimmest star in Draco's head is Kuma (Nu Draconis, SAO 30447). It's a striking equal magnitude double star, like cat's eyes in a dark alley. The AB pair both shine at magnitude 4.9 and are separated by 63.4" (arc seconds). They're easily split even in an 8x50 finder.

Perhaps the best known object in Draco is NGC 6543, the Cat's Eye Nebula, one of the finest examples of a planetary nebula in the night skies. Planetary nebulae are small in telescopes because of their great distances and thus require high magnification to appreciate. In an 11" SCT at 90x, the planetary looks like a very small ball and sports an obvious magnitude 9.5 central star (CS). Interestingly, while higher power enlarges the image, the CS gets dimmer. At 233x, the CS is only seen with averted vision. At 280x, the CS is invisible but the larger image shows the previously round nebula now taking on a distinct oblong shape. In the same 90x, 0.9 degree field is the tiny triple star Bird 3. The components are magnitude 10.3, 11.4 and 10.5, separations 20.1" and 9.7". The stars are in a unique short straight line (no SAO#, RA 17h 53m, +67°).

You might want to visit two interesting nearby stellar groupings. Kemble 2 (18h 35m+72°23') is a 20' asterism that looks like a miniature version of Cassiopeia. A 16x70 binocular swept it up easily just one degree southeast of Chi Draconis. Tiny in the binocular, it almost filled the 0.9 degree field of the 11" SCT at 90X. The best view was in a 70mm, F 6.8 scope at 26x. Back to binos! Four degrees due east of Chi Draconis lies Psi Draconis (31 Draconis, Struve 2241), a beautiful wide double star (Data: AB Mags 4.6, 5.6, Sep 30", Pa 15°, SAO 8890). It resides on the southern end of a nice large field of background stars, like a huge sparse open cluster. The 16x70 binocular's four degree field accommodated all the gems - a wonderful sight.

A nice triple for your consideration is 16-17 Draconis. Directions: Follow a line drawn from Gamma and Beta Draconis in the Dragon's Head west about two of their lengths to a pair of stars separable in an 8x50 finder. They are the AC pair. The AB pair can be split with an 85mm refractor at 143x or a SCT at 127x (better view at 165x). Data: AB Mags 5.4, 6.4, Sep 3.2", Pa 108°. AC Mags 5.1, 5.5, Sep 90.2", Pa 194°, SAO 30012. Picking out component B is somewhat challenging but worth the effort when you finally spy that little jewel.

The Backyard Astronomer

by Bill Dellinges (June 2017)

Draco is a circumpolar constellation from mid-latitudes in the U.S. and thus available for observation most of the year except in winter when she slinks below Polaris and

loses some luster from sky glow. Nevertheless, there she is, destined to circle the northern climes of the heavenly vault for eternity. Won't you give the Dragoness a look?

ASU Summer Class on Solar System Astronomy

by Tom Mozdzen ASU PHD Astrophysics Graduate Student

I would like to alert astronomy fans to a relatively recent on-line class offering from ASU that is completely free. ASU has partnered with EdX to offer a Massively On-line Open Class (MOOC) titled "Introduction to Solar Systems Astronomy." I have been a teaching assistant (TA) for this class for the last two semesters and have been impressed by the vast introductory material that this class has to offer. The class is offered 3 times a year (March, June, and October) and only lasts 7 weeks. However, once you sign up for the class, under current policies, you will have access to the material even when the class is over (except for quiz #2 and the final exam).

Sign up before the summer class starts June 12th:

[Course Signup](#)

Every semester, thousands of people from around the world sign up for the class, but most are from the US. Most audit the class, but some take it with the intention of getting 4 hours of university credit. To get credit, one must: 1) get their identity verified (\$49 fee); 2) take one quiz and one final exam at home using a web-cam and "on-line proctoring software"; 3) get a final grade of 70% or higher; and 4) pay \$600 anytime after receiving your grade and before one year after completing the class. If someone tried for the credit, but didn't get the 70% score, they would just be out the \$49 identity verification fee. If you only audit, you pay \$0.00 because you do not need to have your identity verified.

Class Organization:

The class material is released one week at a time to keep everyone focused on the same material. If you take the class for credit, you have to complete homework, lab exercises, and any quizzes by the close of the week. If you audit the class, you can wait to do any of the graded material later as your grade will not be recorded anyway. But even for the people auditing, they will see new material open up at a rate of once per week.

Each week there are two focus areas each of which consist

of between three and five ~15-minute lectures (most by Professor Frank Timmes), one memory-fact/concept exercise (fancy flash cards) consisting of 25 questions, and a 12 question multiple choice homework section (3 chances to get the correct answer out of 4 choices).

Each week there is a 10 question exercise called a "lab" where they give you numerical information and you are to find the correct equation on the "All the math" one page document, plug the numbers into the equation, convert your answer to the correct units (e.g. if your answer is in days and the question asks for the answer in hours, multiply by 24), and submit your answer (again 3 tries for each question). Again, if you audit the class, you can choose to do everything available or to do nothing at all.

During the 7 weeks – other learning opportunities:

I. Currently there are three projects to complete, which come with instructions, – 1) make a pin hole camera and estimate the diameter of the sun; 2) observe the properties of the craters you make in a dish of flour when you throw/drop a doughball on it; and 3) make some observations of the night sky and describe what you noticed in one paragraph and post it on the discussion board. You get to give yourself a grade based upon some suggested guidelines – honor system.

II. Three quizzes and one final exam. This time you only get one chance to select the correct multiple choice answer.

III. Each week a discussion board is started for the topics of that week. The teaching staff will answer anyone's question(s) within 24 hrs usually within 1 hour.

IV. Twice a semester the teaching staff will host a 1 hour chat where people send in questions they would like to be answered. They may also post questions in real time for the discussion. If there are not too many questions sub-

ASU Summer Class on Solar System Astronomy

submitted, the staff will usually give a short talk on an interesting subject. The current class syllabus (subject to change) can be found here with more precise details:

[Course Syllabus](#)

Give it a go, you'll have fun! Sign up can be found here:

[Course Signup](#)

Find Out What's Happening – Join EVAC-Announce List

If you would like to receive email announcements about EVAC meetings and activities please join the EVAC–Announce mailing list. Click on the link below to subscribe. Enter your full email address in the box titled User Options and press OK. You will receive a confirmation email. Your privacy is respected by EVAC and we will never sell your email address, or use it for non-club relevant solicitations. This mailing list is designed for communication from EVAC, and does not enable users to respond to the message. If you wish to contact club officers, please use the list on the Contact-Us tab. To subscribe to the EVAC – Announce mail group click: <http://www.freelists.org/list/evac-announce>

To unsubscribe use the same link, enter your email address and select

Looking for that perfect weekend activity?

Why not resolve to getting involved?

Contact Claude Haynes to join the staff at GRCO

Email: grco@evaconline.org

Robert Woodruff

Colorado resident
Visited East Valley

Sister requested EVAC assist with
sale of telescope equipment
following Bob's death



Items from the estate of Robert Woodruff



iOptron Mini Tower
Includes carrying case
Minimum Bid = \$300



Lunt LS60T Ha
Tilt Tuned Solar Scope
Includes carrying case
TeleVue Sol Spotter
(no eyepiece)
Minimum Bid = \$800



Questar Duplex
Telescope w/ Mount
(some damage to
leather case)
Minimum Bid = \$2,000



**8" Celestron OTA
Celestron CGEM
w/ travel cases
Minimum Bid = \$1,000**



**Hubble Optics
16" Ultralight
w/ light shroud
Minimum Bid = \$1,000**



**20mm/40mm x 100
Binocular w/ case
(may be Barska)
Minimum Bid = \$300**



**Orion Resolux
15x70 Binocular
with case
Minimum Bid = \$75**



**Celestron
20x80 Binocular
with case
Minimum Bid = \$60**



**5 inch Celestron
Mount with Wedge
with LED finder
Minimum Bid = \$150**



**5 inch Celestron
Mount with Wedge
Minimum Bid = \$100**



**Observing
Chair
Minimum Bid = \$40**

Many Other Items

- 90 mm Celestron Maksutov Telescope (.96 eyepieces)
- Tasco Binocular
- Bell & Howell Zoom Binocular
- Numerous Tripods
- Celestron Sky Scout
- Books and Observing Aids
- Table Top Telescopes (Meade and Pentax)
- Tube Rings
- Jason 90mm Telescope w/ wooden case (1970 Retro Model)
- Eyepieces
- Filters
- Diagonals, and MORE!

June 16 - SW Regional Library, Gilbert

- EVAC- Meeting 7 – 7:45pm
- Review Items 7:45 – 8pm
- 8pm – Auction begins
 - You must be present, or send authorized bidder
- Estate Sale follows auction
 - Items will be on tables with an accompanying price card
 - Select items you want – take card to cashier to check out
 - 15 minutes after start of Estate Sale – remaining item prices are negotiable
 - See EVAC representative to negotiate price

Rules

- Auction – you must be present, or send designated bidder
 - Minimum price set by EVAC Board – if not met, item will remain unsold
- All sales are AS IS and final – equipment is used
- Estate Sale items are offered with initial price set
 - If you want it, grab it – prices are well below retail
- Negotiation on prices will begin 15 minutes after Estate Sale begins
 - No reasonable offer refused
- **EVERYTHING MUST GO!**
 - Items should be paid for and removed that evening
 - Please bring ID for larger purchases

Classified Ads

For Sale

12.5 inch, f/5, homemade dobsonian telescope. Included is an 80 mm finder scope, {sorry, no telrad}, scopestuff crayford focuser, astro systems spider vane and secondary holder, I built the rocker box out of a discarded mahogany desk. Gives good views up to about 200 power. The mirror and cell separate easy from the 58 inch X 18 inch fiberglass OTA for transport. \$200.00 or best offer. Where else can you buy a good 12.5 Inch dobsonian for less than \$200.00?

If you're interested, call me and we can get together sometime and do some viewing.
David C. Hatch EVAC Properties Director
480-371-7934



FIRST QUARTER MOON ON JUNE 1 AT 08:42

FULL MOON ON JUNE 9 AT 09:10

LAST QUARTER MOON ON JUNE 17 AT 07:33

NEW MOON ON JUNE 23 AT 22:31

FIRST QUARTER MOON ON JUNE 30 AT 20:51

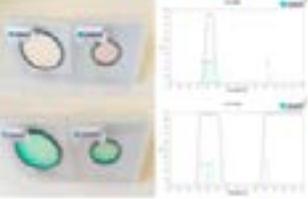


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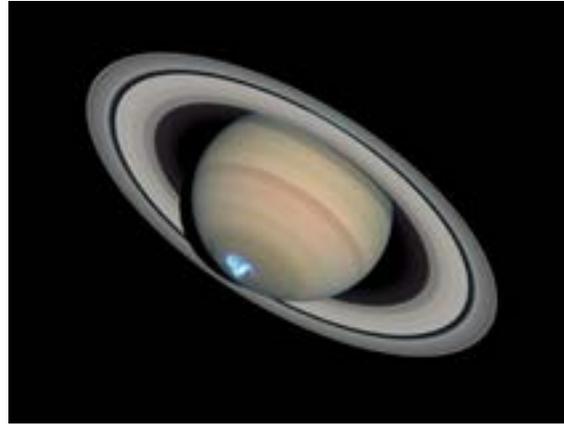
as research
 Apache-Sitgreaves Research Center Inc.
 Apache-Sitgreaves.org

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Upcoming Meetings

June 16

July 21

September 15

October 27

November 17

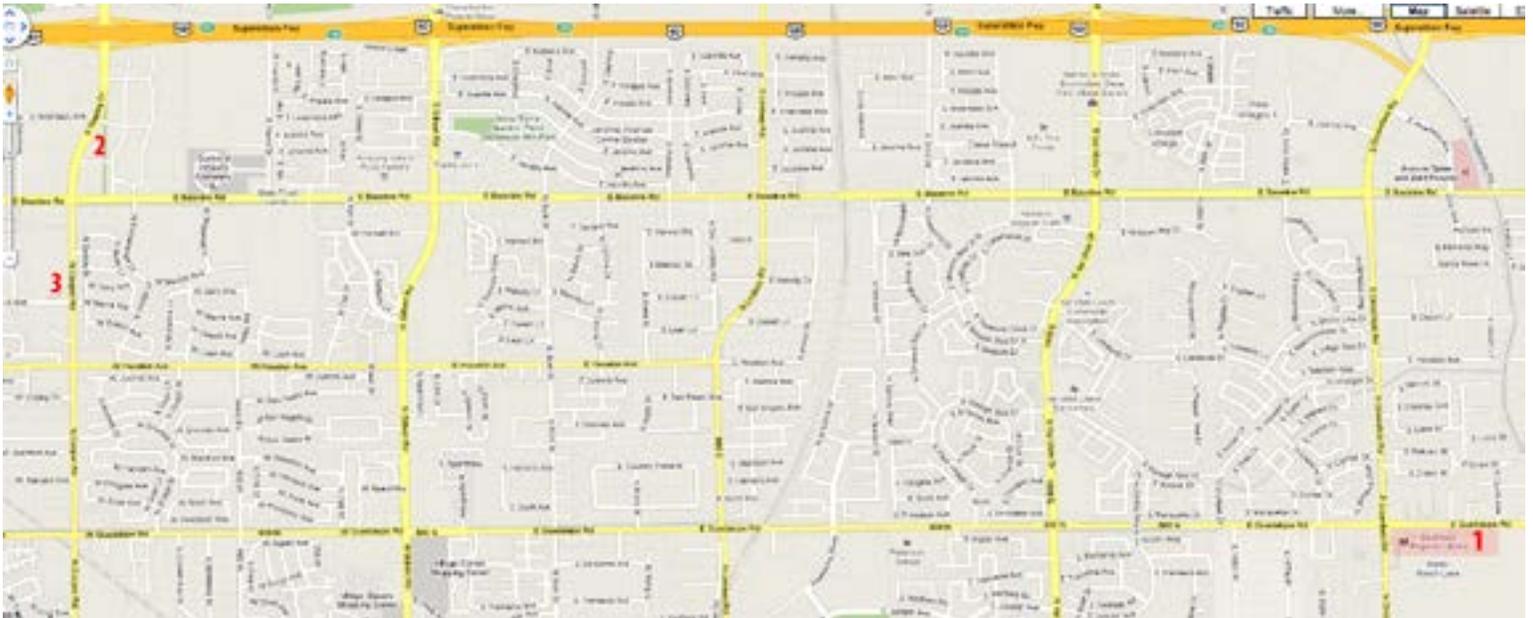
December 15

January 19

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.

Visitors are always welcome!



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



JUNE 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

June 9 - Public Star Party

June 17 - Local Star Party

June 16 - EVAC Monthly Meeting

June 24 - Deep Sky Party

JULY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	29	20	21	22	23
24	25	26	27	28	29	30

July 8 - Public Star Party

July 16 - Local Star Party

July 15 - EVAC Monthly Meeting

July 23 - Deep Sky Star Party

East Valley Astronomy Club -- 2017 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:		
<input type="checkbox"/> New Member	<input type="checkbox"/> Renewal	<input type="checkbox"/> Change of Address
New Member Dues (dues are prorated, select according to the month you are joining the club):		
<input type="checkbox"/> \$30.00 Individual January through March	<input type="checkbox"/> \$22.50 Individual April through June	
<input type="checkbox"/> \$35.00 Family January through March	<input type="checkbox"/> \$26.25 Family April through June	
<input type="checkbox"/> \$15.00 Individual July through September	<input type="checkbox"/> \$37.50 Individual October through December	
<input type="checkbox"/> \$17.50 Family July through September	<input type="checkbox"/> \$43.75 Family October through December	
<i>Includes dues for the following year</i>		

Renewal (current members only):
<input type="checkbox"/> \$30.00 Individual <input type="checkbox"/> \$35.00 Family

Name Badges:
<input type="checkbox"/> \$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: <input style="width: 95%;" type="text"/>	Phone: <input style="width: 95%;" type="text"/>
Address: <input style="width: 95%;" type="text"/>	Email: <input style="width: 95%;" type="text"/>
City, State, Zip: <input style="width: 95%;" type="text"/>	<input type="checkbox"/> Publish email address on website
	URL: <input style="width: 95%;" type="text"/>

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.

<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	
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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

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.

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www.evaonline.org

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

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Webmaster: Marty Pieczonka

SkyWatch Coordinator: Claude Haynes

Observatory Manager: Claude Haynes

Robert Woodruff

Colorado resident
Visited East Valley

Sister requested EVAC assist with
sale of telescope equipment
following Bob's death



Items from the estate of Robert Woodruff



iOptron Mini Tower
Includes carrying case
Minimum Bid = \$300



Lunt LS60T Ha
Tilt Tuned Solar Scope
Includes carrying case
TeleVue Sol Spotter
(no eyepiece)
Minimum Bid = \$800



Questar Duplex
Telescope w/ Mount
(some damage to
leather case)
Minimum Bid = \$2,000