

# East Valley Astronomy Club

February 2000

[www.eastvalleyastronomy.org](http://www.eastvalleyastronomy.org)

Scottsdale, Arizona

## President's Message

By Silvio Jaconelli

First, the good news! There has been a great deal of interest stimulated over the recent developments concerning new members; you may recall that we have introduced two new programs.

The first is a beginners' class held at the homes of experienced members for complete beginners to cover topics such as star charts, equipment, and elementary observing techniques. I have already had a few at my house and I feel that these have gone extremely well. The other development is a 'mentoring program' where we are attempting to match beginners with a little more experience with an experienced 'mentor' who will spend one-on-one time together, probably in the field observing together. This mentoring has been going on in the past, though very much on an informal basis - I am now trying to formalize the process to make it available to everyone.

Now the bad news! I just cannot find enough experienced members to volunteer their time to make these two programs work. There are a lot of beginners already signed up, and we need more help from our experienced members to avoid letting down the new folks. The existing volunteers are the same members who are already giving a lot of their time on other club business, so I would request that 'fresh blood' contact me at work (602-244-4699) to help out. I have a particular need for someone from the north-east valley (north Scottsdale). Help!!

We had our first Board Meeting with the new Board in early January; we covered many topics and a brief report will be found elsewhere in this newsletter. Also completed was the club Budget for 2000, and DeeAnn will present this at the February meeting.

And a short note on the weather at (what some people refer to as) the the start of new millenium -

this has been the worst winter observing weather that I can recall. There have been no cold, clear, crisp nights with excellent transparency that I normally look forward to for observing galaxies and nebulae. Instead we have had very mild weather accompanied by high clouds - good lunar/planetary observing weather; fortunately, Jupiter and Saturn have been ideally placed for observing, so that has been some consolation. I just hope that we get a few good winter storms (I don't like the storms, but I do like the weather that follows them).

We had a full house at the January 19th ASU planetarium show - this was an excellent evening. Thanks to Chuck for organizing this!

That's all for now. Until next month .....

### EVAC & Other Events: 2000

	New Moon	Meet	Local	Deep Sky	Other
Jan	6 <sup>th</sup>	12 <sup>th</sup>	1 <sup>st</sup> , 29 <sup>th</sup>	8 <sup>th</sup>	1/9 Beg. Lab  1/10 Board Mtg. 1/19 Planet. Show 1/20 Lunar Eclipse
Feb	5 <sup>th</sup>	9 <sup>th</sup>	26 <sup>th</sup>	5 <sup>th</sup>	
Mar	6 <sup>th</sup>	8 <sup>th</sup>	25 <sup>th</sup>	4 <sup>th</sup>	Texas Star Party
Apr	4 <sup>th</sup>	12 <sup>th</sup>	29 <sup>th</sup>	1 <sup>st</sup>	Messier Marathon
May	3 <sup>rd</sup>	10 <sup>th</sup>	27 <sup>th</sup>	6 <sup>th</sup>	5/13 Kitt Peak Tour
Jun	2 <sup>nd</sup>	14 <sup>th</sup>	24 <sup>th</sup>	3 <sup>rd</sup>	6/3 - 6/10 Grand Canyon Star Party
July	1 <sup>st</sup> , 30 <sup>th</sup>	12 <sup>th</sup>	22 <sup>nd</sup>	1 <sup>st</sup> , 29 <sup>th</sup>	Universe '00
Aug	29 <sup>th</sup>	9 <sup>th</sup>	19 <sup>th</sup>	26 <sup>th</sup>	Stellafane
Sep	27 <sup>th</sup>	13 <sup>th</sup>	23 <sup>rd</sup>	30 <sup>th</sup>	N.AZ Star Party
Oct	27 <sup>th</sup>	11 <sup>th</sup>	21 <sup>st</sup>	NA	10/7 Lowell Tour 10/28 All-AZ Star Party
Nov	25 <sup>th</sup>	8 <sup>th</sup>	18 <sup>th</sup>	NA	Elections
Dec	25 <sup>th</sup>	13 <sup>th</sup>	16 <sup>th</sup>	23 <sup>rd</sup>	Christmas Party

# EVAC Meeting Highlights

By Don Wrigley

January 12, 2000.

Call to Order: President Silvio Jaconelli called the meeting to order at 7:31 p.m. with approximately 80 people in attendance, including 7 guests.

Silvio discussed the following upcoming events:

- January 20 - Lunar Eclipse star party at Florence Junction
- Sunday Jan 23 - Beginners session at Silvio's house
- Saturday Jan 29 - Local star party at Florence Jct.

Silvio briefly explained the new Show and Tell guidelines as outlined in last months newsletter.

VP Chuck Crawford gave an update and details for various upcoming activities including the A.S.U. planetarium visit for Jan 19th, the Kitt Peak trip, the VLA trip to New Mexico, and the Texas Star Party. Sign up sheets were made available for those interested in attending any of the events.

Main Speaker: The main speaker was veteran deep sky observer Tom Polakis who offered many useful tips for getting the most out of your deep sky sessions. His first piece of advice was to make the most of the equipment you have. He gave examples of amateurs who make outstanding observations using telescopes with 8 inches of aperture or less. Star charts, filters, observing guides, and various sundries such as sketching equipment, stepladders, equipment boxes and warm clothing were discussed in detail.

Tom strongly encourages observers, both experienced and new, to take notes of their observations. Such notes should include an estimate of the size of the object and its position angle if it is elongated. More advanced observing would involve sketching the object and its star field.

Such notes provide a valuable record of your work and are found to be well worth the effort when you review them months or even years later.  
Good Job Tom!

Show and Tell: Laurice Dee gave a slide presentation on the Mars Polar Lander. Tom Harvey talked about GPS as it relates to amateur astronomy. Win Pendleton showed the video Powers of Ten.

The meeting ended at 9:37 p.m. with refreshments and cookies being served at the front table.

## Vice President's Messages

By Charles Crawford

### February Speaker

Dr. George Coyne, Director of the Vatican Observatory on Mt. Graham, will be our February speaker. His topic for the evening will be "The Vatican Observatory East (Rome) and West (Arizona): Why does it exist? What does it do?" Dr. Coyne is also an adjunct professor at the University of Arizona. His research interests rest with, among other areas, the polarimetric studies of the interstellar medium, stars with extended atmospheres and Seyfert galaxies, which are a group of very small and unusually bright star like centers. (Polarimetry is the technique of measuring or analyzing the polarization of light). Most recently he has been studying the polarization produced in cataclysmic variables, or interacting binary star systems that give off sudden bursts of intense energy and dust about young stars.

Dr. Coyne is an active member of the international Astronomical Union, the American Astronomical Society, the Astronomical Society of the Pacific, the American Physical Society, and the Optical Society of America.

### Dinner with the Speakers

Beginning with the February meeting members are invited to attend a pre meeting dinner with our guest speaker for the evening. These will be ongoing throughout the year dictated by the interest in them of course. They will be held at the Black-eyed Pea located on Indian Bend Road across from the Pavilions fountain and just north of Circuit City. Directions: Two exits north of Chaparral, exit and go west less than two blocks. It is located to your left (south).

Dinner will start at 6:00 pm. RESERVATIONS are necessary each time and a signup sheet will be provided at each proceeding meeting. I.e.: For March the signup will be during the February meeting and so on. If you do not attend a meeting you may contact me at 480-985-8824 or <mailto:astroc@mindspring.com> and I will sign you up.

Dinner prices are menu items and reasonable (\$ 5.99 - 10.99).

### Upcoming Trips

Members are asked to indicate their interest in a trip that can be planned, most likely via caravan instead of bus, to the Very Large Array 60 miles east of Socorro, NM (one day) or (two day) with a trip to Apache Point Observatory and the National Solar Observatory at Sunspot, NM. Those who wish just the one day trip would be grouped together and return to Phoenix. Those who wish the two day trip would also be grouped together, stay overnight (location to be determined) and return the next day. Most likely this will be scheduled for early June.

There will be a signup sheet at the February meeting for members to indicate their trip interests or you may contact me at 480-985-8824 or [astroc@mindspring.com](mailto:astroc@mindspring.com).

February 9 will be the deadline as planning must start after that date.

### March Speaker

Our tentative guest speaker for March will be Dr. Gary Huss of the ASU Geology Department. His topic will be "meteorites and what they can tell us about the origin and history of the solar system".

## A Call for Newsletter Articles

By Silvio Jaconelli

With such a varied membership, there is much that we have to offer through our newsletter. Our newsletter seeks articles from you on astronomy related topics, regardless of the experience level of the author; in fact, some of the most memorable articles that I have read have been written by beginners to the hobby.

Topics would include (though not limited to):

- Observing reports
- Favorite piece of equipment
- Suggestions
- Items for sale
- Items you wish to buy
- Questions that you have that need answered
- In short - anything!!!

No special effort is required - just write down exactly what you would say if you were talking at a star party or other club event. Address your article to Martin Bonadio at <mailto:mabastro@aol.com>

## Board Meeting Minutes

By Martin Bonadio

The EVAC board members met on Monday, January 10<sup>th</sup> at Stan Ferris's home. Thank you Stan for hosting this meeting.

The purpose of the meeting was to review club business and vote on several topics. Below is a briefing of these topics:

- The year 2000 Budget was presented by Dee Ann Zacher and passed unanimously. It was agreed that a potluck picnic would be retained – as long as there was no cost to the club.
- Beginners classes will be held in an effort to make new members and beginners feel welcome, help them to learn the sky, and enjoy the hobby. A 1<sup>st</sup> class was held at Silvio Jaconelli's home as a trial and went great!
- Tom Mozdzen will take over the handling of the club incorporation status. This is due to be renewed in April.
- Tom Mozdzen will contact appropriate parties to renew club insurance.
- Ken Levy will take on the task at club meetings of welcoming new members to the club and making sure they are connected to people that can help them if necessary.
- EVAC will begin reimbursing SAC for Messier Marathon awards that are won by EVAC members.
- Adopt a highway will proceed as always – this year on March 18<sup>th</sup> and November 4<sup>th</sup>.
- Ken Levy will handle refreshments at each month's general meeting.

- Ken Levy will organize new member packets. Dee Ann Zacher and Martin Bonadio will ensure that members received them.
- Guest speakers will be offered a dinner which the club will pay for. General membership will be invited but will pay for their own food.
- A new membership form was created and agreed upon by the board.
- Dee Ann Zacher requested that a club PO box be obtained instead of using her home address. The club agreed with this suggestion.

## Kitt Peak Prepay and Deadline

By Chuck Crawford

### JUST A REMINDER

If you have already signed up or haven't already done so. Signups for the Kitt Peak tour need to prepay so we can get a count on the number and size of bus to charter ASAP. The deadline for this is on or before February 9, our next meeting. Sorry but we can only count those who have paid prior to charter due to the cost of the bus.

At Kitt there is a \$ 2.00 donation per person and there is also a gift shop. We will be allowed on the floor of the WIYN, the 4 M and McMath Solar telescopes and our guide will be the director of the outreach program along with our ASU astronomer friends. We now have a go for liftoff! We will be stopping on the way down for brunch, lunch, whatever and on the way back for dinner.

We will leave the far-east part of the east parking lot of Scottsdale CC at 8:00am sharp on May 13, 2000. You may park your car in that same area and do not leave any valuables visible.

The cost is \$ 20 per person. You may pay at the meeting on February 9 or send a check prior to that date, made out to EVAC with the note on it Kitt Tour, to:

Charles Crawford  
6024 E. McKellips Road  
# 4-321  
Mesa, AZ 85215

## Millennium Adopt- A-Highway Cleanup

By Sam Herchak

It's time to get started on those New Years resolutions, by picking up some trash! The Club has its semiannual cleanup of the EVAC Mile scheduled for Saturday, March 18th at 8:00 AM. Our task is to pick up trash from the shoulder of the highway to the right-of-way fence (State crews are responsible for the median dividing the highway).

Look for the sign up sheet at the monthly meeting. With 8 volunteers, we can finish by noon. Meet at Florence Junction (intersection of Highway 60 and 89) on the north side in the far west corner of the parking lot (closest to the radio tower). There will be a lunch afterwards. Come out, get some exercise, and get to know each other in the daylight.

Hopefully, we'll have some first-timers. They need to know: Participants must be at least 12 years old and work in groups facing oncoming traffic. Dress appropriately; long pants, sturdy shoes/boots, long sleeves and/or sun-block, hat, and heavy GLOVES. Safety vests to be worn will be provided. Please bring some water too, as you'll work up a sweat.

Pick up bags and other litter with caution-it could contain hazardous material, be hiding a snake, etc. A stick with a nail or hook is recommended to use instead of your hands, while a large bucket cuts down trips to the trash bags. Few large objects are found out there, but if lifting one, keep your back as straight as possible, the object close to your body, and let your legs and arms do the work.

Don't let anything surprise you-our fellow citizens dispose of everything imaginable along our roadsides. If anything looks odd or is really heavy, leave it alone! Note it's location and we'll notify the State about it afterwards. When a trash bag becomes full, place it on the very edge of the pavement, not in the pullout lane.

As with any government program, there are a few requirements to complete before starting. One is a briefing from the cleanup coordinator. The second is to sign the usual waiver for the State saying participants won't sue if something happens. The forms are kept on file so one signature covers you for all future cleanups.

Contact me at 480-924-5981 if you can help or have questions. Thank you.

# If It's clear...

By Fulton Wright, Jr.

Prescott Astronomy Club

**February 2000**

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find data.

On Tuesday, February 1, about 7:30 PM you can see an asteroid near a star. With a small telescope look 10 degrees above the southeast horizon for magnitude 3 Xi Puppis. Then look 1 degree west (and  $\frac{3}{4}$  degree south of the open cluster M93) for a magnitude 5.5 star. The asteroid 2 Pallas (magnitude 7.5) is 3 arcminutes north of that star.

On Wednesday, February 2, about 6:30 AM you can see the Moon and Venus near each other. With your unaided eye or binoculars look about 10 degrees above the east horizon for these two objects less than a degree apart.

On Thursday, February 3, about 7 PM you can see two of Jupiter's satellites near each other. With a small or medium sized telescope look 60 degrees above the southwest horizon for Jupiter. Io and Europa are only 3 arcseconds apart. Both are headed behind the planet. Io disappears about 8:30 PM, Europa half an hour later.

On Friday, February 4, at 10:32 PM you can see a convenient minimum of Algol. About 3 hours before (7:30 PM) with your unaided eye, notice how bright Beta Persei (Algol) is compared to other Perseus stars. Then at 10:30 PM notice that it has dropped from magnitude 2.1 to 3.4.

On Tuesday, February 8, from dusk till midnight, you can see an asteroid near a star. With a medium sized telescope look for the star pi 2 Orionis (magnitude 4). The asteroid 6 Hebe (magnitude 10) will pass 5 arcminutes to the west of it during the night. Sky and Telescope, Feb. 2000, p.95 incorrectly gives Feb. 3 as the date for this event.

On Friday, February 11, at 9:07 PM you can see the Moon occult a magnitude 4 star. With a small telescope look 40 degrees above the west horizon for the almost half moon and Mu Ceti. Other places in Arizona shouldn't be more than a few minutes different from the time in Prescott given above.

On Saturday, February 12, in the evening you can see several events of Jupiter's moons. Here is the schedule:

- 8:23 PM Io appears from Jupiter's shadow
- 8:52 PM Europa's shadow falls on Jupiter
- 8:59 PM Europa itself moves from in front of Jupiter
- 9:56 PM Ganymede moves in front of Jupiter

On Monday, February 14 at about 6:50 PM you can see Mercury at its best. With binoculars look about 10 degrees above the west horizon for the magnitude -0.5 planet. You should also be able to see it a few days before or after this date.

On Tuesday, February 15 at about 8:00 PM you can see an asteroid near a star. With a small telescope look 60 degrees above the south horizon for magnitude 4.5 Pi 1 Orionis. 6 Hebe (magnitude 10) is about 2 Arcminutes northwest of it. (A magnitude 9 star is west and a little south of Pi 1.)

On Thursday, February 17 at 7:56 PM you can see the moon occult a magnitude 4 star. With a small telescope look 40 degrees above the east horizon for the almost full moon and Delta Cancri. Other places in Arizona shouldn't be more than a few minutes different from the time in Prescott given above.

On Tuesday, February 22 at about 6:15 AM you can see two planets near each other. With a small telescope look for magnitude -4 Venus (easy to see) 5 degrees above the east southeast horizon. Magnitude 8 Neptune (hard to see) is half a degree above it.

On Wednesday, February 23 after midnight (really February 24) you can see the southeast (planetary) part of the moon at its best. Libration tips that part of the moon toward us. A day before or after is also a good time to look.

# Backyard Observing

By Silvio Jaconelli

This is the second article on Messier observing from my light-polluted suburban backyard. You may recall that I have challenged myself to observing around 15 Messier objects each month using a 6" telescope - quite a challenge!! To make the challenge even more difficult, the weather this year has refused to co-operate - instead of the cold, crisp, low humidity winter nights of high transparency, we have been experiencing very mild weather accompanied by high cirrus (and sometimes thicker) clouds. So get out a star chart, binoculars, and your telescope, and let's all embark on month 2 of the Messier backyard challenge!

Last month I tackled 18 objects, spotted 15, which left 3 objects (- all very extended, low surface brightness targets) that I could not pick up. This month, it just so happens that most of the Messier objects rising in the east are fairly obvious open star clusters. The dimmest ones are no dimmer than 7th magnitude, and are all visible in 7x50 binoculars. So picking all of these up should be relatively easy, even for beginners. And I found that low power was best for all of these - 40 power or so worked best for me.

**M41, M46, M47, M50 & M93:** These open clusters are all within 10 degrees of Sirius, and range in magnitude from 4 to 6. It took me less than 20 minutes to track down these 5. For a challenge, go back to M46 and see if you can spot the tiny planetary nebula NGC2438 embedded in the cluster. My 6" was able to make it out, but that was only because I knew where to look for it - it was just a tiny faint haze around one of the stars in the cluster. From the desert at high power, it is really obvious at 200 power.

For a further challenge here, there is a very small faint open cluster - NGC2423 - just one degree north of M4, which is an easy object from dark skies. So from a dark sky and with a really large field of view eyepiece, we can actually fit in four objects here - the two Messier open clusters, the smaller NGC open cluster, and the planetary nebula. Really neat!!!

**M52 and M103:** These two open clusters are in Cassiopeia, and both are 7th magnitude. M52 is real easy - this one took me just a few minutes.

M103 was a real challenge and was the most difficult object of the evening because it is situated right next

to NGC663, which is far more conspicuous. It took me 15 (frustrating) minutes to confirm M103 - the best technique is to find the (obvious) NGC663 in the finder scope (or binoculars), center that in the eyepiece, and then to go a few degrees to the southwest to (the very faint) M103. Another way to get to M103 is to look for it almost halfway between NGC663 and Ruchbah or Delta Cassiopeia, the bright star that forms one of the points of the "W" of Cassiopeia.

**M35:** This is the famous 5th magnitude open cluster at the foot of Gemini (the Castor side !). Its very easy to pick out with binoculars and naked eye from a dark site. It took just one minute to pick it up. For an added challenge, look for faint open cluster NGC2158 just at the north-east edge of a wide field eyepiece, looking like a faint smoky wisp in my 6".

**M48:** This is a 6th magnitude open cluster in Canis Minor. Again, its visible in binoculars and taking just a few minutes to pick it up.

**M44:** This is the famous Beehive cluster in Cancer, also known as Praesepe. It is 3rd magnitude and easily naked eye from a dark sky site. Cancer is a faint constellation (we are now leaving the bright winter constellations of Orion, Canis Major, Canis Minor, etc. !!) and finding the finder stars in town rather than the cluster is the challenge here - once you know where the two finder stars - Gamma and Delta Cancrri - are, the rest is easy; the cluster is just one degree west of the midpoint between these two stars !! This one took me just 2 minutes.

**M67:** This is another open cluster in Cancer, this one being at the foot of the constellation a few degrees west of Alpha Cancrri. A lot tougher than M44, being 7th magnitude, but the proximity to Alpha Cancrri made it easy to find. This one took me just two minutes.

At this point, I decided to call my session to an end despite the fact that I had picked up only 11 easy targets in just about an hour. The next batch of Messier objects that will be rising in the east will be faint galaxies in Leo and Ursa Major. These will be a real challenge with a 6" from a suburban backyard, so I may move up to either an 8" or a 10" for these. I also intend to wait for an evening of low humidity and high transparency, so if anyone is replicating this backyard challenge my advice is not wait for the next issue of the newsletter to tackle these galaxies - get out there on the next clear, transparent Moonless night and see what you can do. And use the largest aperture that you have.

# EVAC Property Resources

By Rick Scott

I'm the new club properties manager and I want you to know that your club has a nice selection of books and articles for loan to members. There hasn't been an inventory taken that I'm aware of, so I'm making one and here is the list I have so far. All of these are available in the box I bring to the club meetings. We have a second box that I'm starting to organize, it's mostly past EVAC and some SAC newsletters, some past *Astronomy* and *Sky & Telescope* magazines, and a few different sets of slides. There is also some miscellaneous stuff I need to figure out how to list.

Your club also has two 6" f/8 Dobsonian telescopes for loan. The eyepieces aren't the best, but they're OK, especially if you don't have any telescope at all. Come by and browse the books at the meetings and let me know if you want to borrow the telescopes. I can be reached by phone at (480) 821-5721 or by email at [rmscott@home.net](mailto:rmscott@home.net).

If anyone has some club property on loan (or knows someone who does) that is not on this list, please contact me so I can add it to the inventory.

## Books

- Outlines of Astronomy by Sir John F. W. Herschel
- The Star Guide - A Unique System for Identifying the Brightest Stars in the Night Sky by Steven L. Beyer
- Astronomy with a Small Telescope by James Muirden
- The X-Ray Universe by Wallace Tucker, Riccardo Giacconi
- Turn Left at Orion by Guy Consolmagno, Dan M. Davis
- The Golden Book of Astronomy - A child's Introduction to the Wonders of Space by Rose Wyler, Gerald Ames
- Burnham's Celestial Handbook (Vol. 1,2 & 3) by Robert Burnham, Jr.
- Lightweight Giants - Affordable Astronomy at Last! By Steven Overholt
- Atoms of Silence by Hubert Reeves
- The Universe Around Us by Sir James Jeans
- The Monument of Mars - A City on the Edge of Forever by Richard C. Hoagland

- Whitney's Star Finder by Charles A. Whitney
- Introductory Astronomy & Astrophysics by Michael Zeilik, Elske v. P. Smith
- Black Holes and Baby Universes by Stephen Hawking
- Astronomy: Structure of the Universe by A. E. Roy, D. Clark
- A Field Guide to the Stars and Planets by Donald H. Menzel
- Prehistoric Astronomy in the Southwest by J. McKim Malville, Claudia Putnam
- The Astronomer's Universe by Herbert Friedman
- Mathematical Astronomy with a Pocket Calculator by Aubrey Jones
- The Revised New General Catalogue of Nonstellar Astronomical Objects by Jack W. Sulentic, William G. Tifft
- How to Make a Telescope by Jean Texereau
- Aliens in the Sky by John G. Fuller
- Universe Guide to Stars and Planets by Ian Ridpath, Wil Tirion
- New Handbook of the Heavens by Hubert J. Bernhard, Dorothy A. Bennett, Hugh S. Rice
- Einstein - The Life and Times by Ronald W. Clark
- All About Telescopes by Sam Brown

## Articles

- Grinding, Polishing and Figuring Thin Telescope Mirrors (from Telescope Making #12, #13, and #16 by Bob Kestner
- Radio Astronomy Info by Mike Sargeant
- On the Composition of the Neutron Star by Gordon McKay
- Focus and Collimation: How Critical (Sky & Telescope) by Roger Sinnott
- Collimating Your Telescope (Sky & Telescope) by Alan M. MacRoberts
- Updating Newtonian Collimation (Telescope Making #22) by D. Eric Allen
- Auto collimation the Easy Way (Amateur Astronomy) by Jak Loewenstein

## Proceedings

- ASTROCON '96 Proceedings - Astronomy Around the Clock by Astronomical League
- Optical and Infrared Telescopes for the 1990's (Vol I & II) by Kitt Peak National Observatory Conference

# NASA News

## (A special article on the Chandra Telescope)

Compiled by Tom Mozdzen

Jan. 14 — by Alan Boyle – MSNBC In the first formal scientific findings from NASA's Chandra X-Ray Observatory, astronomers are adding to their menagerie of black holes and other violent phenomena. Among the exhibits unveiled Friday: the quiet black hole that may lie at the center of our own galaxy ... the coolest black hole ever detected, found in a neighboring galaxy ... a supernova spewing the stuff of life ... and showers of starbursts.

THE \$1.5 BILLION X-ray telescope, named after Indian-American astrophysicist Subrahmanyan Chandrasekhar, is designed to observe explosive events such as black holes and supernovae from an eccentric orbit high above Earth's atmosphere, which filters out the cosmic X-rays.

Chandra was sent into orbit last July during a space shuttle mission, and the first images were released just a month later. But this week's presentations at the winter meeting of the American Astronomical Society in Atlanta represent the first formal presentations based on the telescope's observations.

During a preview on Thursday, during the winter meeting of the American Astronomical Society in Atlanta, researchers released data about [faint X-ray sources](#) that could represent black holes on the edge of the observable universe. The windfall of wonders continued during Friday's presentations:

### OUR GALAXY'S BLACK HOLE

Scientists believe that most galaxies, including our own Milky Way, are anchored by a central black hole — a collapsed region so dense that nothing, not even light, can escape its gravitational pull. However, that doesn't mean there's nothing going on around the black hole. In fact, the energy generated by matter swirling into the hole generally translates into powerful X-ray emissions.

That posed a puzzle for astronomers: Despite 25 years of searching, they were never able to detect the X-ray source associated with what's thought to be the Milky Way's central black hole. Until now.

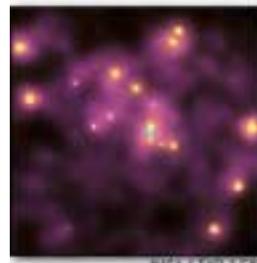
Chandra, which is 20 times more powerful than previous X-ray telescopes, picked up faint X-ray emissions from the exact location of a radio source known as Sagittarius A\*, the point 26,000 light-years away that scientists believe represents the galactic black hole. The report came from researchers at Pennsylvania State University and the University of California at Los Angeles.

Researchers said the faintness of the X-rays surprised them, considering how massive the black hole appears to be.

"The 2-million-solar-mass black hole is very quiet," said Penn State's Gordon Garmire. "The X-rays are puny, really nothing remarkable. That is a real puzzle."

The team's lead scientist, Penn State's Frederick Baganoff, said in a statement that "there must be something unusual about the environment around this black hole that affects how it is fed and how the gravitational energy released from the in-falling matter is converted into the X-ray light that we see."

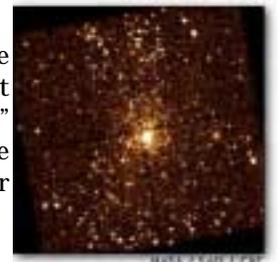
### ANDROMEDA'S COOL CENTER



Another surprise was found in the 30-million-solar-mass black hole at the center of Andromeda, a sister spiral galaxy to the Milky Way 2 million light-years away. (Each light-year equals 6 trillion miles or 10 trillion kilometers.)

The black hole is thought to be 30 million times the mass of our sun. But the gas swirling into it is heated to a few million degrees Fahrenheit. In contrast, a typical X-ray star in the Andromeda Galaxy has a temperature of several tens of millions of degrees.

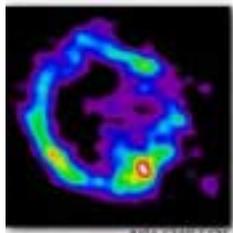
"I think it really is the coolest black hole ever, at least the coolest I've ever seen," Stephen Murray of the Harvard-Smithsonian Center for Astrophysics told reporters.



The standard models developed for super-massive black holes can't explain those temperatures — along with the fact that the black hole's radio emissions are fainter than expected —. Researchers said one possibility is that the gas

boils in a way that slows down its swirl into the black hole. In any case, the new results indicate that new theoretical models will have to be developed. "Black holes seem to come in a wide variety of patterns," Murray observed.

### 'FOUNTAINS OF LIFE'



Chandra researchers also picked up something interesting about a ring of gas known as E0102-72, which represents the leftovers of a supernova explosion that occurred 1,000 years earlier.

Spectral analysis of the X-rays coming from the ring, which is nearly 200,000 light-years away in another neighboring galaxy called the Small Magellanic Cloud, turned up streams of oxygen and other elements moving outward at more than 2 million miles an hour. That expansion energy would be enough to power the sun for 3 billion years, the researchers said.

"These might be called the fountains of life, because it was the explosion of such supernova that provided the oxygen on Earth," said Claude Canizares, Massachusetts Institute of Technology astronomer and a member of the Chandra science team. His colleagues in the research included Kathryn Flanagan, David Davis and John Houck of MIT.

During most of their lives, stars convert hydrogen and helium into heavier elements, unleashing thermonuclear energy in the process. But in their final days, the stars run out of fusion fuel and collapse — resulting in the creation of a black hole or the explosive power of a supernova. The shock waves from the explosion that resulted in E0102-72 heated gas to about 10 million degrees, creating X-rays which can be viewed by Chandra. The telescope's spectrometer can separate those X-rays by wavelength, resulting in the spectral signatures of each element within the glowing gas.

This gives you a fingerprint, or a bar code, of the elements," said Canizares. His data showed clear signals for iron, neon, magnesium and silicon, along with oxygen in vast amounts.

"There are roughly 10 solar masses (mass equal to 10 suns) of oxygen," said Canizares. "That would be enough oxygen for about 10 solar systems." Astronomers believe that chemical elements expelled into the universe from supernovae join clouds of gas and dust that eventually create new stars and

planets. Such a process is thought to have given Earth and its sister planets their chemical elements.

### STARBURSTS GALORE



Chandra can pick up the signatures of stars that emit X-rays, as well as black holes and supernovae — and researchers said they found a bonanza of such objects 11 million light-years away in the core of M82, the starburst galaxy closest to our own.

Scientists believe that most galaxies were starbursts when the universe was young. M82's starburst is thought to have been caused by a near-collision about 100 million years ago with a large spiral galaxy called M81.

In the disk of our own Milky Way Galaxy, stars form and die in a relatively calm fashion like burning embers in a campfire," astrophysicist Richard Griffiths of Carnegie Mellon University said in a written statement. "But in a starburst galaxy, star birth and death are more like explosions in a fireworks factory."

Chandra was able to see much more detail than previous space-based observatories, indicating that the galactic core was a seething cauldron with hundreds of supernovae, neutron stars and black holes. The X-ray telescope detected a powerful galactic wind blowing gas as hot as 100 million degrees into space. Griffiths said there was a "chimney-like structure at the base of the galactic wind, which may help us understand how metal-rich starburst gas is dispersed into intergalactic space."

Another bounty of nearly 1,000 faint X-ray-emitting stars were found in the Orion Nebula, a star-forming region just 1,500 light-years from Earth.

"We've detected X-rays from so many fantastic objects, such as very young massive stars, and stars so small that they may evolve into brown dwarfs," Garmire said. "Chandra's superb angular resolution has resolved this dense cluster of stars with arc-second accuracy and unsurpassed sensitivity."

## LED Flashlights

By Jim Kline

I found two good web sites that explain how to make your own Red LED Flashlight. I built one for \$12 using these plans and getting parts at [RADIOHACK.COM](http://RADIOHACK.COM). It was fun and easy.

<http://www.intelligentchild.com/flashlight/>

<http://www.skypub.com/tips/projects/redlight.html>

## VLA and Apache Point Tours?

By Chuck Crawford

### INDICATE YOUR INTEREST!

Would the membership be interested in a trip in late June to the Very Large Array 60 miles east of Socorro, NM? This could involve a day trip or we could plan an overnight trip and continue on down to Apache Point Observatory at Sunspot, NM and the National Solar Observatory nearby. Please indicate any interest either by signing up at the January meeting or contact me direct at [astroc@ionet.net](mailto:astroc@ionet.net) or 480-985-8824. Depending upon the interest I will work on the details. Also depending upon the numbers this could be a bus tour or a caravan type tour.

## Deep Sky Project (A Book Review, Sort Of)

By Steve Bell

Those of you at the January EVAC meeting heard Tom Polakis mention the now defunct magazine Deep Sky. I am lucky enough to have a few years' back issues (I wish I had them all!). The magazine was devoted to deep sky observing and photography and served its intended audience very well.

I was in the Astronomy Shop on my lunch hour, browsing books, when I came across a paperback I had somehow overlooked. It is published by Kalmbach (Astronomy Magazine) and consists of several Deep Sky article reprints, edited by Dave Eicher. It also includes two articles by EVAC's famous author, Tom Polakis. The book is Galaxies and the Universe, An Observing Guide from Deep Sky Magazine. Overall, the book contains reprints of

fourteen Deep Sky articles, all concerning galaxy observation. The observations included in the articles range from moderate to difficult, but many of the objects are observable with medium aperture telescopes (8"). One of the articles is on globular clusters in M31. If I ever get that "bigger scope project" started (at least 12.5"), I may try this one.

This book makes a beautiful source and inspiration for deep sky observing projects, especially once you've logged the Messier list and one of the NGC lists such as the SAC 110 or EVAC 200. I really liked this book (as I did Deep Sky) and suggest that everyone take a look at it. It is pure observing, and, with a price of \$14.95, you can't go wrong.

## RTM Conference

By Tom Mozdzen

The 32nd Annual RTMC (Riverside Telescope Makers Conference) will be held Friday, 26 May 2000 through Monday, 29 May 2000 (Memorial Day weekend). It will be held at the Y.M.C.A. Camp Oakes (eight miles east of Big Bear City on Highway 38 at Lake Williams Road - that's between mileposts 44 and 45). This location is about 50 miles northeast of Riverside in the San Bernardino mountains. Follow Highway 38 east and north off Interstate 10 in Redlands. A map will be mailed with your registration confirmation. <http://www.rtmc-inc.org/>

## For Sale

10" F/7 lunar/planetary reflector optical tube assembly only. Sonotube. Excellent optics (Schwaar primary mirror, quartz secondary mirror), 2" focuser. \$700. Silvio at 602-244-4699 (daytime).

## Wanted

A Telrad finder that is in excellent condition. Base not required. I will pay up to \$25. Silvio at 602-244-4699 (daytime).



# East Valley Astronomy Club

## Membership Form

Please complete the information on the form and return to the address below along with a check payable to EVAC for the appropriate dues amount. Allow 3 mos. Lead time for magazine renewals. See below:

Dee Ann Zacher  
 EVAC Treasurer  
 2143 E. Farmdale Ave  
 Mesa, Arizona 85204  
 (480) 545-8769

Enclosed:  
 \_\_\_ \$20 Annual  
 \_\_\_ \$10 July—Dec  
 \_\_\_ \$30 *Sky & Telescope*  
 \_\_\_ \$29 *Astronomy Magazine*  
 \_\_\_ \$ 7 EVAC Nametag  
 \_\_\_ Total

Circle: New Member    Renewal

*Please Print* (indicate confidential information)

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Phone \_\_\_\_\_  
 Email \_\_\_\_\_  
 URL http:// \_\_\_\_\_  
 Newsletter Mailed or Electronically Delivered? \_\_\_\_\_

How did you hear about EVAC? \_\_\_\_\_

Major areas of interest (circle): General observing; Lunar/Planetary;  
 Deep Sky; Telescope making; Astrophotography; CCD/Computer;  
 Archaeoastronomy; Other: \_\_\_\_\_

### EVAC on the Internet

EVAC Homepage: [www.eastvalleyastronomy.org](http://www.eastvalleyastronomy.org)

#### E-mail Mailing Lists

**EVAC-mls** is a mailing list for club announcements and quick notification of astronomical events.

To join, send E-mail with the "Subject: subscribe" to [EVAC-mls-request@psiaz.com](mailto:EVAC-mls-request@psiaz.com)

**EVAC-Board** is for EVAC business. All club members are welcome to participate.

To join, send E-mail with the "Subject: subscribe" to [EVAC-Board-request@psiaz.com](mailto:EVAC-Board-request@psiaz.com)

**AZ-Observing** is a fairly general mailing list about observing in Arizona. Included are star party information, who is going, as well as the latest observations and astronomical events.

To join, send E-mail with the "Subject: subscribe" to [AZ-Observing-request@psiaz.com](mailto:AZ-Observing-request@psiaz.com)

Although EVAC is a private club not open to the public, we do encourage potential new members to initially join us at our club meetings and/or star parties to help them determine the suitability of the club to meet their needs.

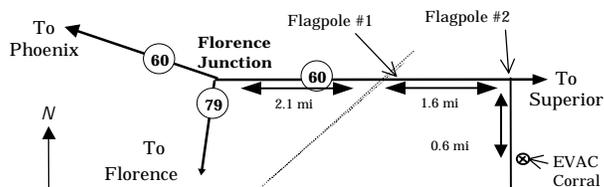
### EVAC Star Parties

#### Local Star Party: Florence Junction Site

General Information: The Florence Junction site is the official site for the East Valley Astronomy Club's Local Star Party, typically held on the Saturday closest to Last Quarter Moon. Florence Junction offers reasonably dark skies within a short drive of most east Valley locations. (Report gunfire or illegal activity: 800/352-3796; Land use permit number: 26-104528.)

Location: N 33° 14' 40" W 111° 20' 16"

How To Get There: Take US 60 east to Florence Junction. Go past Florence Junction. 2.1 mi past FJ are railroad tracks, and on the right will be a flagpole. Do not turn there. Continue on for another 1.6 miles until you find the second flagpole on the right. This is your turn. Turn right, and continue on the dirt road for 0.6 miles. The corral is on the left right before a gas-line sign.

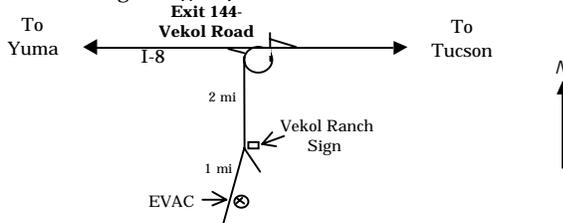


#### Deep Sky Star Party: Vekol Road Site

General Information: The Vekol Road site is the official site for the East Valley Astronomy Club's Deep Sky Star Party, typically held on the Saturday closest to New Moon. Vekol Road offers dark skies despite prominent skyglow from Phoenix to the north. The site is within 1½ hours drive time from most east Valley locations.

Location: N 32° 47' 55" W 112° 15' 15"

How to Get There: Take I-10 south and exit onto Maricopa Road. Continue through the town of Maricopa to SR 84, about 25 miles from I-10. Turn right on SR 84, after about 5 miles the road merges with I-8. Continue west and exit I-8 at Vekol Road—Exit 144. Turn left and cross the highway overpass. Before looping back onto I-8 take the dirt road to the left. Go south for 2 miles. At the Vekol Ranch sign bear right and continue south for another mile until reaching a large, open area on the left.



## East Valley Astronomy Club—2000

Scottsdale, Arizona

EVAC Homepage—<http://www.eastvalleyastronomy.org>

### EVAC Officers

#### PRESIDENT

Silvio Jaconelli  
(480) 926-8529

#### VICE-PRESIDENT

Chuck Crawford  
(480) 735-8042

#### TREASURER

Dee Ann Zacher  
(480) 545-8769

#### SECRETARY

Tom Mozdzen  
(480) 497-5703

#### PROPERTIES

Rick Scott  
(480) 821-5721

**Membership & Subscriptions:** \$20 per year, renewed in December. Reduced rates to *Sky & Telescope* and *Astronomy* available. Contact Dee Ann Zacher.

Email—<mailto:dazacher@uswest.net>

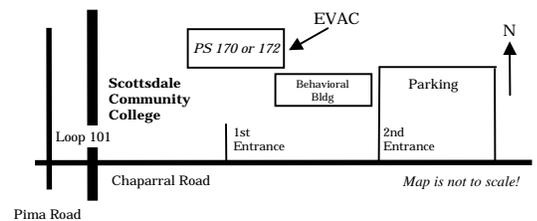
**Club Meetings:** Second Wednesday of every month at the Scottsdale Community College, 7:30 pm. Normally Room PS 170 or 172 in the Physical Sciences Building. See map below.

**Newsletter and Address Changes:** Contact Martin Bonadio 921 North Kingston Street, Gilbert, AZ 85233, 480/926-4900. [mabastro@aol.com](mailto:mabastro@aol.com). Contributions may be edited. The Newsletter is mailed out the week before the monthly Club meeting. An electronic version available in Adobe PDF format in lieu of a printed copy. Please contact Martin with your delivery preferences.

**EVAC Library:** The library contains a good assortment of books, downloaded imagery, and helpful guides. Contact Rick Scott for complete details, 480-821-5721

**Book Discounts:** Great savings through Kalmbach and Sky Publishing. Contact Dee Ann Zacher, club treasurer.

**EVAC Party Line:** Let other members know in advance if you plan to attend a scheduled observing session. Contact Stan Ferris, 480/831-7307.



**East Valley  
Astronomy Club**

**Martin Bonadio, Editor**

**921 North Kingston St. Gilbert, AZ 85233**

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**Reminder: Next EVAC Meeting is on Wednesday,  
February 9<sup>th</sup>, 2000!!**