The Awards ceremony was held this year at the Winter Solstice Dinner on December 21st. The recipients were TAAS members who have shown exceptional abilities in upholding the goals and outreach programs for which TAAS is so well-known. The Isengard and Dobson recipients were chosen not only for their exceptional skills, but for years of dedicated service to TAAS.

• Special thanks to Dave Brown for his skill and hard work in bringing order to our accounts and developing a data base and accounting system that has helped TAAS achieve a firm financial footing. Thanks Dave!

• Any one who knew of the hard work and organizational skills that Karen Keese put forth to make the Dark Skies Conference such a success knows that she deserved recognition as an exceptional TAAS member. Keep it up, Karen!

• And many thanks to Alison Schuler for her generous support of TAAS and for making sure that we always make the correct legal decisions.

Service Awards:
Dave Brown, Karen Keese and Alison Schuler.

Messier Certificates:
Nancy Davis and Larry Cash.
Students have asked me the sort of astronomer I would choose to be – the area that I find most fascinating – if I were not standing in the front of a classroom creating clouds of chalk dust. Easy: galactic evolution. I would want to explore cycles of birth and death at the grandest scale. How do the lights finally all go out, when galaxies can no longer assemble the right mix of stuff to allow generations of stars to succeed one another? What processes predominate when the universe is a dozen or so times its current age? (Admittedly, the universe might itself blink out before its galaxies are absolutely hoary with age.)

I am quite certain that astrophysics impels the fusion of all the diverse fields of physics. For example, it appears that understanding black holes will require the reconciliation of quantum mechanics and relativity. Questions which are posed as one contemplates galaxies, whose lives are played out in a hundred-or-so billion years and which encompass the lives of a hundred-or-so billion stars, are the questions which tie together the diverse disciplines within astrophysics. Plausibly, galactic evolution is to astrophysics as astrophysics is to physics. Then too, the mastery of all that science would imply that I possess a mind of astonishing brilliance! The students’ “What if...?” questions serve their purpose, but I come to earth one more, and consider the existence of TAAS, and its evolution and cycles.

The life of TAAS-as-a-whole reflects the lives of its members. Adults choose to join organizations for a number of reasons, and remain members for the pleasure that membership affords. In a year of serving as president, I have come to appreciate that our pleasure as members derives largely from fellowship and opportunities for personal growth. Fun with a purpose, if you will. I cannot guess the number of ways that we find opportunities to grow within TAAS, but I suspect that the usual paths are learning and service. We both serve and learn when we share our love of astronomy with the public, either at schools, Chaco Canyon, the UNM observatory, or Oak Flats. Service and learning are combined as we work like navvies at GNTO, and do all of the myriad administrative tasks that this organization requires. We take pride together as we see what sacrifice can accomplish, and this enhances the joy of TAAS fellowship.

This has been a very good year for TAAS. There is money in the bank, and our list of accomplishments is impressive. I have explored what it means to be president, and have wrestled with understanding the “cost to benefits ratio” that describes every individual within TAAS, but most particularly those who do the work that is required to make TAAS function. As in all such organizations, most members are deprived of the pleasure of doing the small share of the work that is their entitlement, a share that provides the experience of ownership, or “buy-in”.

At the same time, a disproportionately large amount of work is done by a small number of people, amounting to an unfair burden. This has been and will continue to be an important riddle, and every Board of Directors will be engaged in uncovering the equations and finding their solutions. Here too the past year has witnessed real progress. Board appointments have become less the “life sentences” that should inspire real terror: we will begin to see more recycling of our human resources. As Chris, Dan, Karen, Neil, Barry and David depart from the Board, they take with them their extremely important roles, such as publicist, editor, corporate grants magnet and more. This process of “decentralizing” the work from the decision-making leadership body is vital to organizational health and vitality throughout TAAS. With the departure of Chris, Dan, Karen, Neil, Barry and David go as well my profound thanks and appreciation for all that they have done as TAAS Directors.

I am excited at the prospects for the coming year. We will have many opportunities to expand and refine TAAS’ vision, and there will be challenges that will enable us to grow. Perhaps I will master the intricacies of using e-mail.

I leave the warmth of the stove, my chair and book, and go out into the cold night. My little lamp that shows my way and leaves me dark is swinging in my hand. The house windows shine above me, and below a single light gleams in the barn where an hour ago I left a ewe in labor. Beyond is the grand sweep of Heaven’s stars. As I walk between them in the deep night, the lights of house and barn also are stars; my own small light is an unsteady star. I come to earth on the barn floor where the ewe’s lambs have been born. ...
Special Interest Groups (SIGs)

For maps and details to all of these schools, please visit our web site at www.taas.org, or contact Sammy Lockwood at 275-0258, sam@samlockwood.com

Wrap-up report: Griegos Elementary 11/12 - High thin clouds, and the return of Saturn to school parties highlighted this night, that had great turnout both from TAAS, and the school.


2003 School Parties

January 28 - Sierra Vista Elementary
February 12 - Monte Vista Elementary with Carolyn Shoemaker (Scopes Only)
February 25 - Manzano Day School
March 11 - Collet Park Elem.
April 1 - Bandelier Elementary
April 8 - Truman Middle School

Photos by Sammy Lockwood

Desert Sunset Star Party

May 1-4, 2003

The Desert Sunset Star Party (DSSP) is one of the newest amateur astronomer star parties in the US, scheduled for May 1-4, 2003 at the Kartchner Caverns State Park in Benson, AZ. Additional information and registration forms are now on our website: http://chartmarker.tripod.com/sunset.htm.

We invite you all to come and enjoy the dark southern Arizona skies and the many attractions in this area.

In the late afternoons as we wait for dinner, we will have a few of the seasoned amateurs and professionals demonstrating specialized techniques. We will have a swap meet on Saturday afternoon followed by a contest for your homemade innovative astronomy gadget.

After dinner, attendees can listen to speakers at the amphitheater while we wait for the Sun to set. We still have openings for speakers - please contact us if you are interested. We should have a good selection of door prizes donated from some local businesses and other vendors we have contacted in our star party travels.

During the days, we are encouraging attendees to visit places like Kitt Peak, the UA Mirror Lab and Flandrau Planetarium, the Pima Air and Space Museum and Titan Missile Silo, and of course the many non-astronomy related sites such as the Arizona Sonora Desert Museum, Old Tombstone and much more. Check our Day Trip links for details. (If you plan to tour Kartchner Caverns (advanced registration is required for this very popular tour) you can access the Cavern tours through our Day Trip links.)

Chart Markers and More
Pat and Arleen Heimann
http://chartmarker.tripod.com

The 2003 TAAS School Star Party season continues this month with a great list of local schools, and a special event with Carolyn Shoemaker.

On Tuesday, January 28, join us at Sierra Vista Elementary for our first visit to this west side school. Docents for indoor demonstrations and outdoor telescopes are needed.

On Wednesday night, February 12, Monte Vista Elementary will host a special speaking engagement with noted astrogeologist Carolyn Shoemaker. As part of this event, TAAS will hold a “scopes only” school party. Please join us to meet Dr Shoemaker, and share the sky with kids.

Finally on Tuesday, February 25, TAAS travels to Manzano Day School for our first visit to this downtown private school. Teachers and staff at this school have even trained on our starlab equipment, so that they could use it before our visit.

Dale Murray demonstrates the properties of light and spectrum to the group.

Larry Cash shows the sky to kids at Griegos Elementary
February 2003

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<td>• Full Moon @06:51</td>
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Election of 2003 TAAS Officers

PLEASE READ THIS VERY IMPORTANT MESSAGE FROM THE BOARD OF DIRECTORS:

Please mark your calendar now for our first general meeting of 2003, on Saturday, January 18. This is our annual membership meeting and is the meeting where you will elect officers for the 2003 Board of Directors. It is VERY IMPORTANT that every member possible attend this meeting, because we must have a quorum of 20% of the full membership (those with voting privileges) in order to validate an election. The meeting will be held at Regener Hall on the University of New Mexico campus in Albuquerque, New Mexico, and will commence at 7:00 P.M.

If for any reason you will not be able to attend this very important meeting, please either: 1) request a Proxy Ballot from our Treasurer at TAAS, PO Box 50581, Albuquerque, New Mexico, 87181-0581 or treasurer@taas.org, or 2) copy the form on page 12 of this newsletter. Mail the completed form to the TAAS Treasurer at the address above.

The Nominating Committee of Barry Spletzer, Judy Stanley, and Karen Keese is pleased to present the following candidates for TAAS officership in 2003. The Committee is confident that these individuals will carry on the work of our Society with intelligence, good judgment, enthusiasm, and dedication to our mission of public astronomy outreach.

President – Ray Collins
Vice President – Dale Murray
Secretary – Elizabeth Burki
Treasurer – Dave Brown

STARDATE
J.D. Palmer
Albuquerque, NM-KUNM 89.9 FM airs STARDATE nightly @ 7 P.M. (weekends @ 6 P.M.). It is a 2 or 3 minute short radio piece about astronomy. Subjects include: that night’s sky; cosmology; astro-history; new astro discoveries. Produced by the folks @ McDonald Observatory. See: http://www.stardate.org

Need Rain? Too Much Blue Sky?

***Schedule a Star Party with TAAS***
• Safe and Effective
• Environmental
• Guaranteed Results
• Contact Sammy

The Official Newsletter of The Albuquerque Astronomical Society
**March 2003**

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**Notes**

**January 18, 2003**

TAAS General Meeting

Regener Hall, UNM

7:00P.M.

2003 Election of Officers

**AMATEUR TELESCOPE**

**ATM Workshop**

Ray Collins/Mike Pendley

atm@taas.org

The Amateur Telescope Making Workshop meets the first and third Wednesdays of each month at Valley High School, 1505 Candelaria—the north side of Candelaria, just west of 12th street. The meetings begin at 7 P.M. and are in Building E, Room #3.


** GNTO = General Nathan Twining. Observatory - premium observing night. **

** GNTO Training = GNTO observing and training. **

** UNM = University of New Mexico Observatory. Call the TAAS hotline @254-8227, or the UNM hotline @ 277-1446 to confirm, or unmandiator@taas.org. **

** ACSA = Albuquerque Coffee Shop Astronomers. Contact Sammy Lockwood for information or visit www.taas.org and select sidewalk astronomy. **

** ATM = Amateur Telescope Making. Call Michael Pendley for information @ 296-0549, or atm@taas.org. **

** PandA = UNM Physics and Astronomy. Corner of Lomas and Yale. **
Minutes of The Board of Directors Meeting

David Blair

The possibility of a statewide conference of astronomical societies was also discussed.

Retrospect

The 23 November General Meeting—headlined by Paul Krehbiel—inspired a board discussion on trends that General Meetings might take. A consensus felt that greater participation of TAAS members as speakers would be a favorable trend. An equipment show and tell—perhaps around September to correspond to potential holiday shopping for first telescopes—was one suggestion. A program discussing activities and opportunities at GNTO was another.

The Elena Gallegos star party on 6 December brought about an equal number of docents and visitors. The night was very cold, but significant viewing was possible.

Prospect

Saturday evening, 21 December, was set for the Solstice Potluck dinner. The venue, as in recent years, was to be Heights Cumberland Church.

Committees

Pete reported that the GNTO Committee met 12 December. Committee members agreed to cover running GNTO events so that no one person would be burdened with all events. A recent work party rebalanced and lubricated the Isengard telescope.

Committee members also discussed remaining funding for the Intel grant and for Lyman Sandy donations—discussion that centered on refurbishing drive motors. Work on the dome roof is planned for February and March and the screen saver project is moving along with release planned in the spring.

Education and Grants committees made no reports this month.

Old Business

The 2003 calendar was corrected to delete the 31 May Oak Flat event. The Board also switched its 15 May Board Meeting to 13 May to free Board members to observe the 15 May total eclipse of the moon. The Board also noted that the General Meeting of 8 November also fell on a total lunar eclipse evening. No action was taken concerning that date, but the Board left open the possibility of rescheduling or scheduling an observing event for that General Meeting.

Ray set January 4 (first choice) and January 3 (second choice) as dates on which he would try to set up a meeting for pursuing TAAS participation in the development of the La Semilla lands.

New Business

The Board discussed donations policy with respect to issuing valuations for tax purposes. David cautioned against falling into a pattern of over-valuing donations. Ray reported that Monty Williams of the Astronomical Society of New South Wales, Australia, had suggested, via John Sefick, a collaboration between Societies. Ray suggested an exchange of newsletters as a first step. Ray noted that this was the final meeting of the current Board. He invited each member to reflect on the past year and on the direction of TAAS.

The Board adjourned for the year at 9:00 P.M.
Frisbees in Space

Dr. Tony Phillips

When Pete Rossoni was a kid he loved to throw Frisbees. Most kids do—it’s pure fun. But in Pete’s case it was serious business. He didn’t know it, but he was practicing for his future career in space exploration.

Grown-up Pete Rossoni is now an engineer at NASA’s Goddard Space Flight Center. His main project there is figuring out how to hurl spacecraft into orbit Frisbee-style.

The spacecraft are small—about the size of birthday cakes. “This wouldn’t work with big satellites or heavy space ships like the shuttle,” notes Rossoni. But a cake-sized “nanosatellite” is just right.

Nanosatellites—nanosats for short—are an exciting new idea in space exploration. Ordinary satellites tend to be heavy and expensive to launch. The cost alone is a deterrent to space research. Nanosats, on the other hand, can travel on a budget. For example, a Delta 4 rocket delivering a communications satellite to orbit could also carry a few nanosats piggyback-style with little extra effort or expense.

“Once the nanosats reach space, however, they have to separate from their ride,” says Rossoni. And that’s where Frisbee tossing comes in.

Rossoni has designed a device that can fling a nanosat off the back of its host rocket. “It’s a lot like throwing a Frisbee,” he explains. “The basic mechanics are the same. You need to impart the spin and release it cleanly—all in about a tenth of a second.” (The spinning motion is important because it allows the science magnetometer to measure the surrounding field and lets sunlight to play across all of the nanosat’s solar panels.)

The ST5 nanosats are designed to study Earth’s magnetosphere—a magnetic bubble that surrounds our planet and protects us from the solar wind. But their primary goal, notes Rossoni, is to test the technology of miniature satellites.

“We haven’t done anything like this before,” says Rossoni. Soon, however, the concept will be tested. A trio of nanosats is slated for launch in 2004 on the back of a rocket yet to be determined. The name of the mission, which is managed by JPL’s New Millennium Program, is Space Technology 5 (ST5).

Can groups of nanosats maintain formation as they fly through space? Will their internal systems—miniaturized versions of full-sized satellite components—satisfy the demands of both the harsh space environment and critical science measurements? Is Frisbee-tossing as much fun in orbit as it is on Earth? ST5 will provide the answers. Read about ST5 at http://nmp.nasa.gov/st5. Budding young astronomers can learn more at http://spaceplace.nasa.gov/st5/st5_tortillas1.htm
Our most recent GNTO event was an observing session on December 28th, when sixteen folks enjoyed excellent conditions early in the evening. We had at least seven telescopes in operation, counting the Isengard 16-inch and the Celestron 11-inch. The Celestron was fitted with our ST-9E CCD camera, and promising images were acquired by several different people.

Our observing group included guests from Michigan and Minnesota. John Adolph and his son-in-law, Andrew Mcdowel were the Minnesota contingent, and they brought a really nicely designed observatory on a trailer. The trailer is a unique design that offers both storage space for the telescope equipment as well as an observatory dome that folds upward out of the top of the trailer. John had designed and built the trailer from scratch, and I would not be surprised to see it featured in a Sky and Telescope project article soon. The tripod legs extend downward to the ground under the trailer, so that the mount is rock solid, even when people are moving around in the trailer. Although clouds moved in around ten o’clock that evening, the opportunity to check out John’s observatory-on-a-trailer made the trip well worth the drive.

An impromptu observing session occurred on New Year’s eve, when Jeff Bender, Jody Forster and Gordon Pegue took advantage of clear skies to collect some photons. Jeff had posted a notice to the TAAS-L listserv earlier that day, so we all had notice of the opportunity.

Our listserv is perfect for spur-of-the-moment announcements, updates on school star parties, notices about our Backyard Astronomy program, Sidewalk astronomy encounters, and general astronomy talk. If you are not a TAAS-L subscriber, you need to join! Instructions can be found on our web site, or contact me for details. The web site instructions are on our first page, just scroll down and look for the section “Get Online with TAAS E-mail List Server”

We are still in fund raising mode to pay off our new equipment that we have purchased from John Seck. To help us with this task, John has donated a number of multimedia CDs, which are in the Video CD (VCD) format. These are being offered for free with a $20 donation to help us pay for the equipment purchase. John describes these CDs as “An astronomical audio-visual presentation for planetarium and classroom use”. They feature a series of astronomical object CCD images, which are animated using pan and zoom effects and accompanied by a narrative and music sound track.

There are two versions, “Cosmic Images” and “Modern Astronomy at Chaco Canyon”. Both CDs have similar image content. “Cosmic Images” has a somewhat longer run-time (42 min), while “Modern Astronomy at Chaco Canyon”, (30 1/2 min) uses many of the same images and narrative, along with a few Chaco Canyon images and a 3 3/4 minute introductory section on Chaco Canyon. I will have copies available at our January general meeting.

Our next training session is on January 25th. We will provide instruction on GNTO equipment use, ranging from the Level I - Isengard Telescope, to Level II - computer interface, through the Level III - CCD training. We plan to do the Level III instruction using the Losmandy mount and Celestron optical tube assembly. The Level II software interface training will apply both to the Isengard and the Losmandy/C-11 configuration, since both use TheSky software. With the software interface established, you can see where the telescope is pointing on the sky chart on the computer screen, and you can also use the computer to guide or slew to any of the objects in the software database. We will pass out laminated GNTO Glove Box Guides to all who attend our training. These handy guides are well worth the trip alone! We like to get the Level I training started before sundown, which is at 5:28 P.M. on the 25th, so training will begin at 5:00 P.M. Please plan to attend, if only for a “refresher” instruction session.

Our next GNTO event following the training session is our observing session on February 1st. If folks plan to be at GNTO the preceding evening (Friday, January 31st), we will post a notice to TAAS-L listserv. February 1st promises to be a good night since it falls on the evening of the new moon, and we have some great equipment on hand for you to use.

GNTO committee meetings are open to all interested TAAS members and our next scheduled meeting is February 6th. As usual, this meeting is on Thursday, 9 days before the TAAS general meeting. Our new meeting location will be JB’s Restaurant on the southeast corner of San Mateo and Montgomery and the meeting starts at 6:30 P.M. If you have questions about access and availability of GNTO, please contact me (Pete Schman, gnfo@taas.org, home phone: 873-1517, work phone: 277-0020.) I hope to see you soon at our observatory.
Donations to TAAS

TAAS General Fund: Las Placitas Association

Membership Services

- Membership Inquiries
- Events Information
- Volunteer Opportunities

Contact Neil Goldberg at membership@taas.org
505/798-1958

- Membership Dues
- Magazine Subscriptions
- Address/E-mail Changes

Contact Dave Brown at treasurer@taas.org
505/275-9126
PO Box 50581 Albuquerque, NM 87181-0581

UNM Report

Jay Harden, UNM Campus Observatory coordinator
unn_coord@taas.org

13 Dec: We had the usual clouds. No visitors. Mark and I left around 8:00.


27 Dec: A good viewing night. We had 8 viewers on a cold night and they were serious. The most serious was a 9 year old girl from Panama City, Fl. It was her first experience with a telescope and Mark gave her a first class introduction to astronomy. She can’t wait until she returns this summer. Docents: Becky, Mark, Brock & Jay. Mark and I left after 10:30.

New IDA Student Award

During the IDA’s annual spring meeting, we will be presenting awards for educational work that has been done concerning light pollution, by school students worldwide.

The awards are given in honor of George and Edythe Taylor. George was a well known, long-time lighting engineer who won honors from the Illuminating Engineering Society of North America (IESNA) for his contributions to the field. He was always interested in and supportive of education.

Submissions will be judged in three grade ranges: Kindergarten to 6th, 7th to 9th, and 10th to 12th. Winners receive a monetary award. Submissions are due by February 7, 2003. For more information, visit http://www.darksky.org/education/award.html.

Monthly Membership Report

(November, 2002)

Dave Brown, treasurer@taas.org

Membership Current Past Change
Regular 222 219 3
Family 64 63 1
Educational 17 17 0
Total Paid 303 299 4
Honorary 4 4 0
Complimentary 11 11 0
Total Members 318 314 4

Definition of the Month

Quark - An elementary entity that has not been directly observed but is considered a constituent of protons, neutrons, and other hadrons. So what’s a hadron? A hadron is any particle that interacts with the strong nuclear force. There are two groups, baryons (‘heavy ones”) and mesons. Got that!

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Observer’s Page

From the Ivory Basement

5. Nothing is as Clear as it Seemed

Barry Spletzer

I’ll cover two topics this month, the first deals with why we need an eyepiece at all and what it buys us. The second is an examination of some of the factors that make our images more fuzzy blobs than sharp points.

Last time, I discussed the basic elements of refraction, leading up to an explanation of eyepieces. In short, I explained how a lens can concentrate a group of parallel rays to a single point. This is identical to the behavior of a parabolic mirror. In earlier articles I showed that this ability is the essence of forming an image. Based on this, it is easy to see that, in a refracting telescope, the main (objective) lens performs exactly the same function as the primary mirror in a reflecting telescope. What is much less clear is how the same type of optical system (a lens) works as an eyepiece, that is, it allows us to view the image very close-up. An even more basic question arises, why do we even need an eyepiece? Why can’t we look directly at the image?

If you think about what our eye requires to make an image, things start to make some sense. Looking at a distant object, parallel rays from the object enter our eye and are converted to an image. From each point on the distant object, parallel rays enter from a slightly different angle giving us the point by point construction of the image. In short, the lens and acts as a simple lens that I explained last time. The top of figure 1 shows this (it looks suspiciously like many of my other figures of focussed rays).

As the object being viewed gets closer to our eye, the light rays diverge instead of being parallel. Our eye adjusts for this by increasing the curvature of the eye lens to bend the incoming rays more and by increasing the distance between the lens and the retina. The middle portion of the figure shows this. As the object gets even closer (see the bottom portion of the figure), the rays eventually diverge too steeply for our eye to adjust. In this case the rays no longer focus on the retina but give a big blurry spot. This is why as you bring in object closer and closer to your face, it eventually becomes fuzzy to the point that you cannot focus.

At a distance of less than about 10 inches, eyes with normal vision will not focus. To see the detail available in a telescope’s image, we need to look at the image very closely, typically 1/4 inch to 2 inches. For comfortable viewing, we need to take the steeply diverging rays from the telescope image and convert them to parallel rays. Figure 2 shows a schematic of a complete refracting telescope with an eyepiece and the observer’s eye. The parallel rays enter the objective and converge at the focal point. Passing through the focal point, the rays diverge and enter the eyepiece. With the eyepiece positioned to achieve focus, it converts the diverging rays into a bundle of parallel rays. The parallel rays enter the eye and are focused on the retina, giving a point image. This is the basic principle of a both simple reflectors and refractors. The drawing of a reflector is somewhat more complicated since mirrors cause the ray bundles to cross over each other but the principle is the same.

I keep promising to get into an explanation of why such a range of eyepieces exists in both size and cost. One more topic (and probably a few more ramblings and tangents) must be covered first. This is the concept of image aberrations. Up until now, all my figures and discussions revolve around focussing light to a precise point. It is true that an ideal mirror will focus light to a point but only if the light approaches the mirror directly along the axis. Light from any other direction will focus into a blurry spot. How blurry the spot is depends on the size and focal length of the mirror and on how far from the centerline the image is. To give you some idea of the size of this effect, I made some plots of the images for some typical conditions. These are shown in Figure 3. The plots show what a star the figure requires considerable explanation.
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At the center of the figure are three concentric circles. The inner two circles represent the view through a wide field 1-1/4 inch and 2 inch eyepieces. Across the center of the circles are a row of small dots representing the position of four stars in the field of view. One is almost in the center; one is halfway between the center and the right edge of the 1-1/4 inch field; one is near the right edge of the 1-1/4 inch field; and one is near the left edge of the two inch field. Just below center and to the right is a dot labeled “Jupiter.” This is a properly scaled dot for Jupiter in the wide field eyepieces for this focal length mirror. Around the outside of the figure are several fuzzy comet shaped blobs. These are simulations of the star images (also called blur spots) at different positions in the field. The third and largest circle is Jupiter again but this time it is drawn at the same scale as the blur spots. In short, the dots inside the eyepiece fields show the position and size of the actual objects and the large circle and blur spots outside are enlarged scale drawings of these objects.

As I mentioned before, if a star is exactly in the center of field, the image will come to a sharp point (this ignores other effects such as diffraction which I will not discuss here). As the image is farther and farther from the center, it gets more and more blurry. The two blur spots in the upper left corner of the figure show a star image only one millimeter from the center. For the six inch mirror the spot is essentially a small circle. For the 10 inch mirror the spot is somewhat larger and slightly elongated. Compared to the size of Jupiter’s disk, the spots are still very small. In the upper right are the blur spots for a position about halfway from the center towards the edge. Both spots are somewhat larger and the spot for the 10 inch mirror is much larger than that for the six inch. In the bottom half of the figure are the blur spots for the points near the edge of the 1 1/4 inch and 2 inch fields. Here the spots are large and actually have some structure.

All the large spots shown here looks something like a comet. If you look through telescope with a wide field eyepiece (say a 26 mm or more 1-1/4 Plossl) and place a star near the edge of the field, you’ll see that the stars have this comet like appearance. As the star gets farther from the center of the field, the size of the “comet” grows rapidly. Further, the f-number (that is the focal length divided by the diameter) of the telescope greatly effects the size of the spot. While short focal length telescopes are more compact and easier to handle and transport, they have a significant disadvantage of much larger blur spots and thus fuzzier images. This is an important consideration in choosing a telescope. This is also a major reason why telescopes with f-numbers numbers lower than 4.5 are relatively rare. One minor consolation for the very large blur spots is that the long tail of the comet is quite dim so that the entire blur spot is not usually visible. One final point, the comets always point towards the center of the field.

The whole issue blur spots is the primary reason why telescope collimation is important. On a poorly collimated telescope, the sharpest images produced by your mirror may not even be in the field of view. Instead all you see are these little fuzzy “comets.” Next time, I’ll talk about collimation or how to align your telescope to take advantage of the sharpest images.

Figure 3: Blur spots of images created by 45-inch focal length mirrors
Greetings of the New Year!

Jupiter and its four impressive satellites present various interesting phenomena — observable with virtually any telescope or decent well-supported binoculars. Jupiter is so immense, there are almost always interactions — occultations and such — taking place between it and one or more of these four satellites. On the other hand, the satellites being so much smaller, interactions between satellites are much rarer, depending various things lining up just right.

But those just-right line-ups are now in place, so several of these rare satellite interactions will be occurring over the next two months. Essentially, these interactions are of two types. One type is eclipses, in which one satellite casts its shadow onto another. However, these are generally partial eclipses, resulting only in a slight dimming of the eclipsed satellite — fairly subtle to observe and not particularly interesting.

The more interesting events are the Occultations and Transits, when one of the satellites “runs into” another, one passing in front of the other, as seen from Earth. Unfortunately, statistics being what they are, many of these occur with Jupiter below our horizon, while others occur at pretty miserable times like three in the morning. Despite this, however, there are nine such events observable by us, weather permitting, at pretty reasonable hours over the next two months.

### Date  Begin Time  End Time  Event

- **Jan 13**  10:15 11:37  Europa “kisses” Io — This one is different from the rest, as one satellite will approach the other, come into (apparent) contact, and then move away, but not switch sides — ie, it will not pass the other, but move away in the same direction from which it approached. (In all the rest one satellite will appear to pass the other.)
- **Jan 17**  9:50 10:12  Callisto partially occults Europa — Europa will not be hidden completely.
- **Feb 2**   10:06 10:12  Callisto totally occults Europa — For about a minute-and-a-quarter, at the middle of the event, Europa will be completely hidden.
- **Feb 4**  9:04 9:07  Europa partially occults Io — Io will not be hidden completely.
- **Feb 10**  7:28 7:40  Europa transits Ganymede — For about two-and-a-half minutes, at the middle of the event, all of Europa will be between us and Ganymede.
- **Feb 11**  11:12 11:14  Europa partially occults Io — Io will not be hidden completely.
- **Feb 16**  7:48 7:52  Io partially occults Europa — Europa will not be hidden completely.
- **Feb 17**  10:29 10:40  Europa transits Ganymede — For almost three minutes at the middle of the event, all of Europa will be between us and Ganymede.
- **Feb 23**  9:47 9:50  Io partially occults Europa — Europa will not be hidden completely.

Most heavenly happenings move so slowly as to defy perception. Events like the above offer a splendid, albeit rare, opportunity to actually see “The Clockwork of the Universe” in action. Enjoy!

This article is part of a series published by Barry Gordon entitled Placitas Area Residents Who Appreciate the Night Skies.

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**PROXY BALLOT**

I, ____________________________________________, a full member with voting privileges of The Albuquerque Astronomical Society, hereby authorize Ray Collins to cast my vote at the January 18, 2003 annual meeting of The Albuquerque Astronomical Society or any subsequent date to which this meeting is rescheduled. This Proxy Vote shall apply to all matters that come before said meeting, including but not limited to the electing of officers for the corporation.

Signed: ___________________________________________  Date: __________________________

(Please print your name in the first blank, and sign and date this form before submitting it.)
Editor’s Note

Please note that the deadline for the March 2003 issue of The Sidereal Times will be Friday, January 31st, as the finished manuscript must be at the printers on Monday, February 3rd so that you will receive it by the following Saturday. My e-mail address is editor@taas.org.

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(not to scale)