

STARSCAN

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Astronomical Society*



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RENT-A-SCOPE: An Easy-Chair Lease on the Universe

2004 New Beginnings

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RENT-A-SCOPE: An Easy-Chair Lease On The Universe

By Al Kelly

Arnie Rosner is a very nice fellow. I was exchanging e-mails with him on some astronomy topic or another when he mentioned that he had gone into the telescope renting business. I expressed ignorance, so he guided me to his web-site (<http://www.arnierosner.com/are/index.htm>) and offered to set aside some time for me to check out his remote imaging systems. This was far too good an opportunity to let pass; however, having never operated an imaging system remotely, my expectations were not high. I know that the capabilities available to some amateur budgets are truly amazing, but I expected very lethargic imaging response and all sorts of difficulties on basic imaging issues, such as centering, focus, and tracking. Boy, was I wrong!

Arnie has two highly capable (and expensive) imaging systems on line. The telescopes are 12" Takahashis, one a Mewlon (a 3572mm FL Dall-Kirkham optical design) and the other an FRC (a 2340mm FL Richey-Chretien optical design). They reside on Software Bisque's Paramount GT1100s and ME mounts, with highly accurate "go to" and tracking capabilities. The Mewlon is equipped with an FLI IMG1024 "Dream Machine" CCD camera, while the FRC carries an anti-blooming SBIG ST8E CCD camera. Both have automatic filter wheels, auto-focusing, and auto-guiding via guide scope mounted ST7 and ST8 CCD cameras.

The most amazing part of the whole operation to me was the easy and responsive user interface via the internet. I'm sure it helped that I used broadband internet access via cable modem, but dial-up access should work just as well, just slower. After Arnie provided me a user name

and password, here's how it went:

1. I fired up Internet Explorer and went to the link for the telescope (I used the Mewlon first) and logged on. I was greeted by a screen with a star chart which asked (among other things) for the name of the object to be centered.

2. I typed in NGC 925 and was immediately told that the scope was slewing to the selected object. In about 20 seconds I was told that the object was centered and the scope had settled.

3. I went to the field for entering an exposure time, entered 3 seconds and checked the block for "centering image".

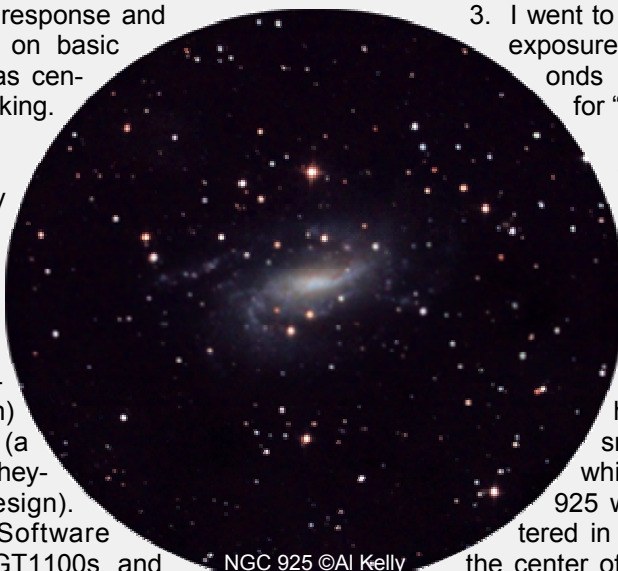
4. I clicked on "Take Image" and was greeted a few seconds later by a binned image (i.e., adjacent pixels added together in a multiple "binning" arrangement to allow high sensitivity and small, fast downloads) which showed that NGC 925 was almost exactly centered in the frame. Clicking on

the center of NGC 925 caused it to be shifted to the center of the frame and another picture to be displayed showing that this had happened...magic!

5. I then clicked on "Turn Color On" and "Set Up L/RGB Images". A table popped up, where I entered the exposures times and number of exposures through each filter, clear, red, green, and blue. I saved these settings and clicked on "Return to Sky Chart", where clicking on "Take Image" started the automatic acquisition of the entire image set...more magic!

Within a few hours, Arnie had sent me an e-mail

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NGC 925 ©Al Kelly



L/RGB color composite of NGC 520 in Pisces. Made from images taken 11/25/03 with a 12" Takahashi RC and ST8E CCD camera.

Fifteen 120-second unfiltered sub-exposures, five 180-second sub-exposures in red, four 180-second sub-exposures in green, and six 180-second sub-exposures in blue were processed in AIP4WIN.

© Al Kelly

(Continued from page 3)

with a link to the zip file containing all my images. All I had left to do was download the file, download some calibration frames (darks and flats), and process the images into a beautiful color composite image. Since that time I have taken a few more images with his systems (*NGC 1232 on cover and NGC 520 above*), including remote activation of the auto-guiding capability, which is so easy that it only requires about 5 mouse clicks. The system has never failed to function well and Arnie's oversight assures that the acquired images are available for download very rapidly.

If you are well-heeled and want to take the occasional mountaintop astro-image, but have trouble getting away, you may find Rent-a-Scope right up your alley. Thousands of dollars on equipment and travel costs could go into immediate, high-quality imaging. Those of us less touched by trickle down, but sharing a common imaging interest with others, may find that a few bucks apiece will rent the desired time and equipment necessary for the image(s). Either way, anyone who finds Rent-a-Scope attractive will be amazed by the flexible and friendly user interface.

Right: Takahashi FRC-300 at Rent-A-Scope

Be sure to visit Al's web site at:
<http://www.ghg.net/akelly/>



2004 New Beginnings

New Officers

The new year brings what I consider some exciting changes to our club. We have a new president, Bob Taylor, and a new vice president, David Haviland.

Bob Taylor is a gifted glass pusher, an inventive telescope maker, and patient mentor. He has faithfully served this club as a speaker, Starscan editor, and vice president.

David Haviland has stepped up and volunteered to be our vice president. David's enthusiasm and love of astronomy will benefit our club in 2004 and in the future.

We wish our best to Bob and David. As with every new administration they will bring fresh ideas to our club.

We want to thank Ed Malewitz, our outgoing president, for another two years of great service to JSCAS. We also want to thank Bob Taylor who has served as the Starscan Editor for the last 2 years. In addition, Bob served as our vice president during 2003.

A special tribute goes to Randy Moore who has faithfully served as club secretary for longer than I've been a member. Randy had the unenviable job of getting our newsletter printed, distributed, and mailed. Effective this new year, Randy has stepped down from that post.

New Starscan

Now that Bob has become president, I have volunteered to once again be the editor of the Starscan. Recent developments at NASA have forced JSCAS to move to a paperless newsletter. NASA will no longer be printing the newsletter for distribution. Since very few newsletters were being mailed out, the decision was made to drop

the hardcopy and go strictly to an electronic version.

With every cloud comes a silver lining. Doing away with the hardcopy gains us the following benefits:

- **No Page Limit**

Our hardcopy newsletter was limited to 7 pages + distribution list to keep the postage charges to a single stamp. With that restriction removed, the newsletter can be as long as it takes to publish your articles, pictures, and events.

- **Color Pictures Will Be In Color.**

That may sound strange, but details were always lost when the pictures in MS Word were reproduced in black and white. Beginning this month, a Member's Gallery of digital images will become a regular feature of the newsletter.

- **New Look**

Microsoft Publisher will now be used to assemble the newsletter. Publisher allows us to be more creative with our layout and have a more artistic design. The actual document posted on the web site will continue to be in Adobe's pdf format.

The deadline for new articles continues to be the 25th of the month. Send contributions to lestেকে@swbell.net. Be sure to put Starscan in the subject so your message will be correctly routed.

New Logo

2004 also brings a change to the JSCAS logo. We still have our beloved logo of the space shuttle on a Texas flag background. However, we have added a star. As Triple Nickel, in his proposal

to enhance the logo, stated "The current logo is supposed to represent a space shuttle backed by the Texas flag. The current logo is supposed to represent an astronomical society. I feel the current logo is missing a 'Star' for both representations. The current logo is missing the star in the



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blue field that truly represents the Texas flag with its lone star. We are an astronomical society and we should have at least one star on our logo, don't you think? But why change this now? I have been in several conversations with many long time members, and the addition of the star is not a new idea. It appears the omission of the star came from a past member who has since passed on. There was no good reason for the omission; it was just not put in. We have recently lost one of our members, Dr. Dave Brown, during the crash of the space shuttle Columbia. Now Dave wouldn't want us to change things just for him, but I feel we could think of the addition of the missing star as a small tribute to not only Dave, but to the whole crew of Columbia."

Ken Lester



JSCAS 2003 Solstice Party

Sunrise on 2001 Winter Solstice at Sylvan Rodriguez Park. Photo by Ken Lester

The JSCAS Winter Solstice meeting was held at hand through the skin all the way down to the the Center for Advanced Space Studies on Fri- nucleus of an atom. It was an excellent film and day, December 12th. There was a nice turnout of current and past members despite the torrential rain. our thanks to Richard for bringing it.

The meeting opened in the Great Room with lots of great food. After everyone had a chance to eat and visit, the meeting moved into the auditorium.

Richard Nugent showed a great film from 1977 demonstrating the powers of 10. Starting with a 1 meter square centered on a young couple having a picnic in a park in Chicago, the film expands the visible area every 10 seconds by a factor of 10. The outward progression ends when our Milky Way galaxy is but



a speck among other galaxies. At that point galaxies appear as mere points of light. The view then begins to collapse at a rate of a factor of 10 every 2 seconds, until we are

once again viewing that young couple in the park. The film then begins a reduction in area by a factor of ten. Going from the surface of a



Triple and Karen Nickel then gave us a show of the latest in club fashions. They modeled a jacket, hat, and shirts (with and without a pocket). The JSCAS line of fashions is relatively inexpensive, has a minimum order of 1, and has a fast delivery time. Our special

thanks to Triple for finding this new vendor who is so anxious to be of assistance to JSCAS. Contact Triple to place your order.

Triple also unveiled the enhanced logo proposed in the December Starscan. Some very positive

discussion included an explanation by Ed Malewitz that the star was omitted from the original logo because of financial considerations. The star was going to increase



the cost to produce the logos. The proposed new logo was put to a vote and was carried

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unanimously. Once again our thanks go to Triple for his efforts toward this exciting change.

Tradition has it that the solstice party is not only a social event, but also a time to honor those who have given so much of their time and effort in keeping our club going. Certificates of achievement were given to the following very special people:

Randy Moore — for his years of service as Club Secretary and Starscan Distributor

Triple Nickel — for his informative and entertaining novice program and as our ambassador to Canada

Bob Taylor — for his excellent work as Starscan Editor and his service as vice president

Hernan Contreras — for his entertaining Astronomical Oddities

Richard Nugent — for his many informative Unusual Targets

Charles Hudson, John Gorduk, and Drell Setzer — for their many thought provoking challenges

Bob Hammond — for his efforts to Darken the Night Skies

Chris Randall — for his tireless efforts in maintaining the JSCAS web site and list server

Ken Lester — for his Star Party Support and On-line Starscan

Lisa Lester — for being our Star Party Chair Extraordinaire

Ken and Sheila Steele, Randy and Dolly Brewer, Ron Rosenwald, and Eleta Malewitz — for their contribution to the success of JSCAS star parties, School Presentations and Astronomy Day

John Erickson, Drell Setzer, and John Gorduk — for their contribution to the suc-

cess of JSCAS star parties

Rodney Rocha—for his contribution to the success of Astronomy Day

Not to be left out, president elect Bob

Taylor presented outgoing president Ed Malewitz with a special certificate of appreciation along with some parting goodies to keep him warm: bibbers, hat, and hot thermos and cups. In his acceptance speech, Ed gave credit

where the real credit was due, to Eleta, for all her help.

Chris Randall handed out observing certificates to those who completed

the requirements at the Fort McKavett Star Party in October.

Of course, no solstice party would be complete without lots of door prizes. The last couple of years, it's been our tradition that everybody gets a door prize! This year's give-a-way was special because our sneaky vice-president elect, David Haviland, together with Ed, managed a special "door prize" for Connie who was celebrating her birthday. She's now the proud owner of a new Telrad. The door prize came complete with a certificate honoring her many trips around the Sun. At the conclusion of the meeting she was presented with a beautiful astronomically decorated birthday cake.



ANNOUNCEMENT

Eleta Malewitz

The Space Road Show will have free space memorabilia appraisals from 10:00 AM - 3:00 PM daily, January 12 and 13 at the Space Store.

JSCAS Star Parties for 2004

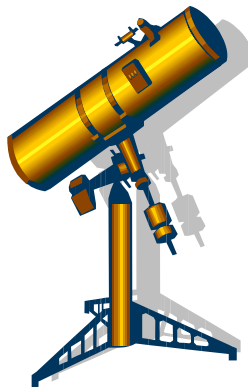
2004 promises to be an exciting time for star parties. The last several years, our December Moody Gardens star party conflicted with their Festival of Lights. This year, we have rescheduled that star party for November.

With Astronomy Day at the George scheduled for the weekend closest to the new Moon in October, our Fall Ft. McKavett Star Party was moved to the weekend before Astronomy Day. There will be some interference from the Moon the first couple of nights, but by Saturday night the Moon won't rise until nearly 4 am.

In the star party chart, all planetary data is for the first day of a multiple day star party.

The picture appearing in "In This Issue" was taken at last years Mars event at Challenger 7 Park.

Lisa Lester

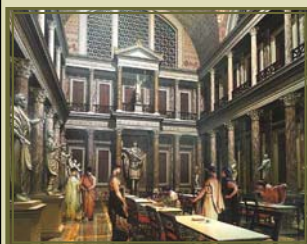


Event	Date	Sun		Moon		Jupiter		Saturn		Mars		Venus	
		Set	Illum.	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
2004													
Challenger 7	Jan 24	17:49	11%	09:28	20:59	21:11	09:40	15:42	05:37	11:09	00:00	09:18	20:49
Moody Gardens	Feb 21	18:11	3%	07:57	19:42	19:08	07:43	13:45	03:42	10:11	23:33	08:55	21:31
Fort McKavett	Mar 18 - 21	18:28	5%	05:20	16:27	17:06	05:51	12:03	01:59	09:24	23:10	08:31	22:04
Haak Winery	Apr 17	19:46	3%	05:57	18:16	15:56	04:45	11:11	01:07	09:39	23:43	09:08	23:26
Moody Gardens	Apr 24	19:50	24%	10:02	-----	15:27	04:17	10:46	00:42	09:30	23:36	09:00	23:23
Challenger 7	May 08	19:59	78%	-----	09:50	14:31	03:21	09:56	23:52	09:13	23:20	08:36	23:01
Texas Star Party	May 16 - 23	20:04	5%	04:58	18:02	14:01	02:50	09:28	23:24	09:04	23:11	08:13	22:35
Moody Gardens	June 19	20:20	4%	07:36	22:14	12:00	00:44	07:33	21:27	08:31	22:22	05:20	18:56
Challenger 7	Sep 18	19:19	20%	11:07	21:57	07:19	19:33	02:24	16:07	07:03	19:22	03:49	17:08
Fort McKavett	Oct 7 - 10	18:56	37%	00:54	15:27	06:22	18:25	01:16	14:57	06:44	18:37	04:15	17:05
Astronomy Day at the George Observatory	Oct 16	18:46	9%	10:04	20:38	05:56	17:55	00:42	14:24	06:35	18:18	04:28	17:02
Moody Gardens	Nov 6	17:28	34%	00:34	14:11	03:53	15:45	22:22	12:03	05:16	16:35	04:01	15:52
Haak Winery	Nov 13	17:24	0%	06:43	17:29	03:34	15:24	21:58	11:39	05:11	16:23	04:10	15:49



ISCAS Archives

For those members who did not obtain the first installment of the Starscan Archives, it's not too late. This installment was originally made available in 2001 and contains all newsletters that could be found from August 1977 through December 2000. The CD also contains some flyers and other documents dating back to 1984.



ISCAS Archives II

The second installment of the Starscan Archives is now ready. This installment covers all Starscan issues from January 2001 through December 2003.

All files are in Adobe's Portable Document Format (.pdf). For your convenience, Adobe's Acrobat Reader is furnished on both CDs. If you are able to read the on-line version of the Starscan, then Reader has already been installed on your computer.

The cost of each CD is \$3.00. Add \$2.00 to cover mailing expenses if you would like the CD mailed (within the US).

Call Ken Lester at 281-479-1102 to place your order.

Stop Light Pollution Now

International Dark-Sky Association (IDA)

"To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting."

Stand up with other amateur astronomers and join today. <http://www.darksky.org>

Current Events

A New Space Race?

The Chinese have set their sights on the Moon. With the successful launch and flight of the Shenzhou-5 manned spacecraft, China has its first space hero, Yang Liwei. Liwei, 38, orbited Earth 14 times on October 15th and 16th. This successful flight is the beginning of China's efforts to explore the Moon.

China hopes to launch a 2-ton lunar probe by 2007. The unmanned probe will be named "Chang'e" after a Chinese folklore fairy who flew to the Moon. Chang'e will do three dimensional mapping of the Moon. It will also measure the density of the lunar soil.

China hopes to land an unmanned lunar probe by 2010. Ultimately they hope to have a manned flight to the Moon by 2020.

According to CNN, aides to President George W. Bush say that he may call for a return to the Moon by



**When we return,
what will we find ?**

the US. It was reported that White House Press Secretary Scott McClellan stated that there are no immediate plans for any policy announcements in the near future. For now, it looks like China is definitely going. We will just have to wait and see if the US wants to enter the race.

Unexplained Noises on the International Space Station

Astronaut Mike Foale and cosmonaut Alexander

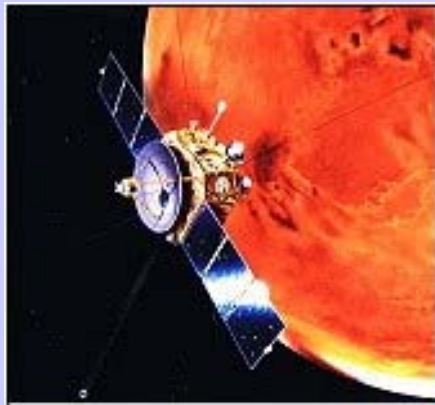
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Kaleri had their breakfast chores interrupted with a metallic crunching sound. According to Foale, "It sounded like a metal tin can kind of being expanded and compressed". A check of all systems showed all systems normal. A visual examination inside and out (using the video camera on the 57 foot robotic arm) showed no damage. An unnamed Russian source attributed the noise to space debris. The US Department of Defense refuted that, saying that it found nothing on a collision course with the station.

No "Hope" for Nozomi

Japan has given up hope that their Mars mission could be resurrected. The final efforts to put Nozomi

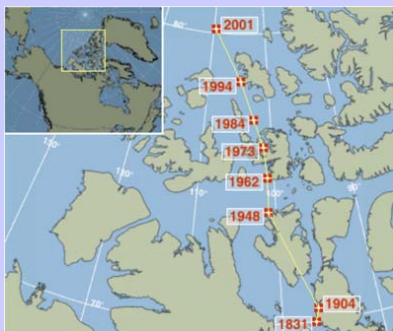


back on course failed. Early malfunctions had altered its trajectory and attempts to put the spacecraft back on course used up its fuel supply. Its mission was

to orbit Mars, and determine if it has a magnetic field. Nozomi translates as "hope".

Earth's Magnetic Field

According to a report by CNN (March 20, 2002 www.cnn.com), Larry Newitt of the Geological Survey of Canada reports that the north magnetic pole could leave Canada as early as 2004 and eventually end up in Siberia. The magnetic pole has always drifted, but the rate of drift has accelerated



within the last few years. The current rate averages between 10 and 40 km per year.

In an article dated December 12, 2003, CNN reports that within the last 150 years, the strength of Earth's magnetic field has diminished by ten percent. Scientists speculate that there is a remote possibility that this is an indicator that the magnetic field may com-

pletely collapse and later reverse polarity. Jeremy Bloxham of Harvard University states that at the current rate of decline, the field could disappear in 1,500 to 2,000 years. The last reversal of Earth's magnetic field was 780,000 years ago.

SpaceShipOne Breaks Sound Barrier

According to the December 17th press release from Scaled Composites, the White Knight turbojet launch aircraft carried their research rocket plane, SpaceShipOne, to an altitude of 48,000 feet where SpaceShipOne was released. SpaceShipOne Test Pilot, Brian Binnie then flew the ship to a stable, 0.55 mach gliding flight condition, started a pull-up, and fired its hybrid rocket motor. Nine seconds later, SpaceShipOne broke the sound barrier and continued its steep powered ascent. The climb was very aggressive, accelerating forward at more than 3-g while pulling upward at more than 2.5-g. At motor shutdown, 15 seconds after ignition, SpaceShipOne was climbing at a 60-degree angle and flying near 1.2 Mach (930 mph). Brian then continued the maneuver to a vertical climb, achieving zero speed at an altitude of 68,000 feet. He then configured the ship in its high-drag "feathered" shape to simulate the condition it will experience when it enters the atmosphere after a space flight. At apogee, SpaceShipOne was in near-weightless conditions, emulating the characteristics it will later encounter during the planned space flights in which it will be at zero-g for more than three minutes. After descending in feathered flight for about a minute, Brian reconfigured the ship to its conventional glider shape and flew a 12-minute glide to landing. The landing was not without incident as the left landing gear retracted at touchdown causing the ship to leave the runway. Damage from the landing incident was minor and repairable. There were no injuries.

Scaled Composites' goal is to demonstrate that non-government manned space flight operations are not only feasible, but can be done at very low costs. Aviation designer, Burt Rutan, is developing SpaceShipOne to fly to altitudes of 62 miles above Earth. At



that altitude the flights would be sub-orbital: high enough to be in space but not fast enough to be in orbit.

Above Image: courtesy of Scaled Composites. SpaceShipOne (left), White Knight (right), and the Moon Flight 41L/09G on Nov 19, 2003

Member's Gallery



M 51

In Canes Venatici
©Randy Brewer

Taken at Fort McKavett on March 16th, 2002 using a
FCT-150 @ F/7 (LRGB = 60:20:20:20) color was Bin 3.

Sunspots ©Ken Lester

Taken from Deer Park on October 21, 2003. 8" Star-
hopper reflector and Canon Powershot A40



October 21, 2003
8" Reflector at 81x
Canon Powershot A40



The Pleiades (M45; open cluster)
©Glenn Ray



This photo was taken on October 29, 2000, at Fort McKavett State Historical Park in west-central Texas (el. 2170'). Pentax LX 35mm; 400mm f/5.6; single 45-minute exposure; Kodak Supra 400 (unhypered); manually guided.

M92 (in Hercules)
©Al Kelly



L/RGB image made from images taken with a Starlight Express MX916 and a 17.5" f4.5 Newtonian on 7/26/03 from Friendswood, Texas, using Schuler RGcBc filters. Four 240-second unfiltered subexposures, three 240-second subexposures in red, three 240-second subexposures in green, and three 240-second subexposures in blue were self-guided in Astroart and processed in AIP4WIN.



Ya Know.....

Bob Taylor

Our organization (term used loosely) has operated for decades without structured funding, a constitution, by-laws, a charter or any other regulating document typically found in associations that do "what we do". I've found that only the hint of a public star party will turn out an eager gathering of our members in an effort to share "what we do". Money needed for a brick at the McDonald Observatory or a new flag at Fort McKavett just shows up. I've also found that miraculously, door prizes appear at each meeting absent any structured funding to provide such things.

Back when our club hosted the telescope making sessions, many personal hours were donated in an effort to help others acquire instruments of their own. Our "astronomy vacations" at Fort McKavett have thrilled countless residents in the area by revealing their own backyards to them (I wonder if they realize the value of a dark sky so close to home).

The diversity of our members seems to fade when we gather at meetings and star parties as our common interest in astronomy lets us focus on "what we do": educate others and our own. Oh sure, we fool around now and then, but in the end, after every meeting and star party, somebody walks away a bit smarter.

Look in worldwide publications and you'll see the work of some of our members, not for financial gain but for the excitement of sharing their interest. I'm not sure there is a real definition of "what we do"; still, we continue to put forth the effort. With this New Year comes a variety of meeting presentations and star parties certain to enlighten and entertain. Stay tuned!!!

8" f10 Celestron SCT,
wooden tripod, Polaris
RQ mount with Meade
Autostar drive.

For Sale - \$1000

Included accessories:

- ◆ Cedar wood scope box
- ◆ Dew shield
- ◆ Battery and charger for Autostar
- ◆ Laminated alignment star listings
- ◆ Finderscope

A modified webcam and cables may be available if someone is interested.

Eyepieces and Telrad not included.

Contact Ron Rosenwald at:
rgrosenwald@yahoo.com

Note from Ron: "As much as the electronics are cool, I am getting back to basics for observing. The only electronic stuff I will use is my tracking platform that Chuck helped me with. I want to get back to star-hopping again. I like to spend my time observing and sketching."

Note: The original Celestron drive was replaced with a Meade Autostar by Steve Bedair in Longview, Texas. Visit Steve's website for details of the retrofit. <http://www.bedair.org/>



It's About Time !

The times of various events, particularly astronomical and weather phenomena, are often given in *Universal Time* (abbreviated **UT**) which is sometimes referred to, now colloquially, as *Greenwich Mean Time* (abbreviated **GMT**). The two terms are often used loosely to refer to time kept on the Greenwich meridian (longitude zero), five hours ahead of Eastern Standard Time. Times given in UT are almost always given in terms of a 24-hour clock. Thus, 14:42 (often written simply 1442) is 2:42 p.m., and 21:17 (2117) is 9:17 p.m. Sometimes a Z is appended to a time to indicate UT, as in 0935Z.

When a precision of one second or better is needed, however, it is necessary to be more specific about the exact meaning of UT. For that purpose different designations of Universal Time have been adopted. In astronomical and navigational usage, UT often refers to a specific time called UT1, which is a measure of the rotation angle of the Earth as observed astronomically. It is affected by small variations in the rotation of the Earth, and can differ slightly from the civil time on the Greenwich meridian. Times which may be labeled "Universal Time" or "UT" in data provided by the Astronomical Applications Department of the U.S. Naval Observatory (for example, in the annual almanacs) conform to this definition.

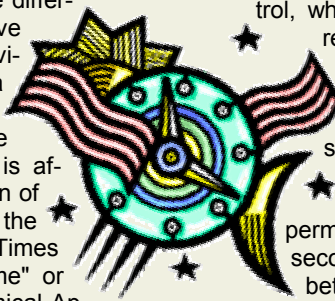
However, in the most common civil usage, UT refers to a time scale called *Coordinated Universal Time* (abbreviated **UTC**), which is the basis for the worldwide system of civil time. This time scale is kept by time laboratories around the world, including the U.S. Naval Observatory, and is determined using highly precise atomic clocks. The International Bureau of Weights and Measures makes use of data from the timing laboratories to provide the international standard UTC which is accurate to approximately a nanosecond (billionth of a second) per day. The length of a UTC second is defined in terms of an atomic transition of the element cesium under specific conditions, and is not directly related to any astronomical phenomena.

UTC is the time distributed by standard radio stations that broadcast time, such as WWV and WWVH. It can also be obtained readily from the Global Positioning

System (GPS) satellites. The difference between UTC and UT1 is made available electronically and broadcast so that navigators can obtain UT1. UTC is the basis for civil standard time in the U.S. and its territories. Standard time within U.S. time zones is an integral number of hours offset from UTC.

UTC is equivalent to the civil time for Iceland, Liberia, Morocco, Senegal, Ghana, Mali, Mauritania, and several other countries. During the winter months, UTC is also the civil time scale for the United Kingdom and Ireland.

One can think of UT1 as being a time determined by the rotation of the Earth, over which we have no control, whereas UTC is a human invention. It is relatively easy to manufacture highly precise clocks that keep UTC, while the only "clock" keeping UT1 precisely is the Earth itself. Nevertheless, it is desirable that our civil time scale not be very different from the Earth's time, so, by international agreement, UTC is not permitted to differ from UT1 by more than 0.9 second. When it appears that the difference between the two kinds of time may approach this limit, a one-second change called a "leap second" is introduced into UTC. This occurs on average about once every year to a year and a half.



For more information on time, time scales, and accurate clocks, see the U.S. Naval Observatory Time Service Department web pages. Related information can be found on the pages of the National Institute of Standards and Technology (NIST).

Historical Note

Greenwich Mean Time is a widely used historical term, but one that has been used in several ways. Because of the ambiguity, its use is no longer recommended in technical contexts.

Prior to 1925, in astronomical and nautical almanacs, a day of Greenwich Mean Time began at *noon*. This reckoning of Greenwich Mean Time is now called

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Greenwich Mean Astronomical Time, and is no longer used. Persons using old editions of the almanacs for historical research should be aware of the previous convention.

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**Astronomical Applications Department of the
U.S. Naval Observatory web site:**
<http://aa.usno.navy.mil>

So what time is it? Central Standard Time is –6 hours from UTC. Central Daylight (savings) Time is –5 hours from UTC. In those portions of the United States which observe daylight saving time, it is in effect from the first Sunday in April to the last Sunday of October.

Visual Observing

By Chris Randall

Solar System Objects: Summary for 15 January 04

Object	Constellation	Mag	% Ill	Rise Time	Transient	Set Time	Note
Sun	Sagittarius	-26.7	100	07:16	12:29	17:42	
Moon	Libra	Bright	39	00:40	06:29	12:17	
Mercury	Sagittarius	-0.2	61	05:39	10:49	15:58	
Venus	Aquarius	-4.0	80	09:26	14:59	20:36	
Mars	Pisces	0.5	88	11:30	17:49	00:12	
Jupiter	Leo	-2.3	99	21:49	04:04	10:18	
Saturn	Gemini	0.4	100	16:21	23:21	06:17	
Uranus	Aquarius	5.9	100	09:20	14:54	20:32	
Neptune	Capricornus	8.0	100	08:19	13:41	19:06	
Pluto	Serpens	13.9	99	04:38	10:06	15:34	
Ceres	Gemini	6.9	99	16:38	00:03	07:24	Asteroid #1
Amphitrite	Taurus	9.8	97	13:11	20:29	13:11	Asteroid #29
Pallas	Cetus	9.2	96	13:07	18:26	23:41	Asteroid #2
Hebe	Canis Minor	8.7	99	17:38	00:09	06:35	Asteroid #6
Eunomia	Sextans	9.4	98	20:20	02:35	08:49	Asteroid #15
Linear C/2002 T7	Pisces	8.0	92	10:31	17:23	00:19	Comet

Bright Sky Objects:

Mel 25 (Hyades) – Open cluster in Taurus, magnitude 0.5, size 330'.

NGC 1977 – Open cluster with nebulosity in Orion, magnitude 4.2, size 20'.

NGC 2099 (M37) – Open cluster in Auriga, magnitude 5.6, size 23'.

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IC 405 (Flaming Star, C-31) – Nebula in Auriga, magnitude 6, size 30'x19'.

Deep Sky Objects:

NGC 1499 (California) - Nebula in Perseus, magnitude ~5, size 160' x 40'.

NGC 1904 (M-79) – Globular Cluster in Lepus, magnitude 8, size 9.6'.

NGC 1952 (M-1 Crab) – Super Nova Remnant in Taurus, magnitude 8.4, size 6'x4'.

NGC 1964 - Galaxy in Lepus, magnitude 11.5, size 5.6' x 2.1'

Chris' Don't Miss Picks:

Hitting below Orion's belt (chart page 17):

There are many more objects to look at than M-42 the Great Orion Nebula in this region. Go to a dark site and look around. Here are just a few of the objects in the area. See what you can see with your eyes.

If you can't get to a dark site, look at the numerous images sites on the internet and see if you can locate these objects in photographs. Don't forget about the Trapezium. It is much more than four stars. Look at this great web resource from Jerry Lodriguss. The Trapezium page from his *Catching the Light* web site can be found at http://www.astropix.com/HTML/B_WINTER/TRAPEZ.HTM.

Object	Type	Object	Type
NGC 1975 + 1973 (SH2-279)	BN	NGC 1982 (M 43)	BN
NGC 1976 (M 42)	BN	NGC 1999 (IC 427 + 428)	BN
NGC 1976	Open	IC 420	BN
NGC 1977	Open	IC 430 + 429	BN
NGC 1980	Open	Iota Ori	Dbl star
NGC 1981 (Cr 73)	Open	Trapezium	Multi star



M/RGB composite of star cluster M37 (Auriga) made in QCOLOR by combining images taken on 2/19/98 with a C-8 at f5.6. The unfiltered, red, green and blue exposures were stacked totals of 2 minutes, 2 minutes, 4.5 minutes, and 6.75 minutes, respectively.

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January Meeting Agenda

January 9th. Center for Advanced Space Studies/Lunar Planetary Institute, 3600 Bay Area Blvd. (at Middlebrook Drive).

- | | |
|------|--|
| 7:30 | Meeting start and welcome |
| 7:40 | Presentation — Eileen Stansbury — Genesis and Stardust Mission Updates |
| 8:30 | Break |
| 8:45 | Calendar review, presentations, and awards |
| 8:50 | Star Party Announcements, Lisa Lester |
| 9:10 | Deep Sky Observing, Chris Randall |
| 9:30 | Astronomical Oddities, Hernan Contreras |
| 9:40 | Charlie's Challenge, Charles Hudson |
| 9:50 | Door Prizes |

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to **6 P.M. January 25th**.

The most convenient way to submit articles or a Calendar of Events is by electronic mail; however, computer diskettes or CDs will also be accepted. All articles should include author's name and phone number. Also include any picture credits. The recommended format is Microsoft Word. Text files will also be accepted.

Submitter bears all responsibility for the publishing of any e-mail addresses in the article on the World Wide Web.

Editor's electronic address is: lesteke@swbell.net. Be sure to include the word Starscan in the subject line for proper routing of your message.

Starscan Staff

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	Ken Steele

Cover Image by Al Kelly

L/RGB color composite of NGC 1232 in Eridanus. Made from images taken by Al Kelly on 11/26/03 with a 12" Takahashi Mewlon and FLI CCD camera. The scope is an automated, remotely operable instrument located near Cloudcroft, NM. It is owned by Arnie Rosner, who lets users operate it through his Rent-A-Scope business (see <http://www.arnierosner.com/are/index.htm>). Ten 180-second unfiltered sub-exposures, five 180-second sub-exposures in red, four 180-second sub-exposures in green, and five 180-second sub-exposures in blue were processed in AIP4WIN.