



Desert Skies

Tucson Amateur Astronomy Association

Volume XLVIV, Number 9

September, 2003



Astronomically significant sites at Machu Picchu

Cover Photo: The Inca Ruins at Machu Picchu. Image copyright Shannon Nace at Lonely Planet Images.

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Membership in the TAAA

Annual Dues

Individual membership.....	\$ 23
Family.....	\$ 28
Senior (over 60) membership.....	\$ 21
Senior Family (at least one over 60).....	\$ 26
Student membership (over 18 years old).....	\$ 15

Family Membership includes two adults plus minor children. Persons under 18 may join at a special Reduced Family Membership rate (\$15/yr) upon parental or guardian acknowledgement of participation in TAAA activities. Call the Treasurer to request the required form.

Options (add to above membership rates)

Tucson society of the Astronomical League (TAL) dues\$	3.50
Sky & Telescope Magazine.....	\$ 32.95
Astronomy Magazine.....	\$ 29.00
Postage for New Member Pack.....	\$ 3.50

Donations are accepted for any of the TAAA funds: SA-IDA/Light Pollution, TIMPA, Education, 30" Telescope & Land, or General Fund.

Renewal Information

- Membership expires the last day of the month indicated on your mailing label. You will receive a renewal notice when they are due.
- TAAA members may join the Tucson society of the Astronomical League (TAL). TAL expiration will match your TAAA expiration.
- Discounted Sky & Telescope or Astronomy magazine subscriptions are available to members and can be started or renewed at anytime. Only single year subscriptions are accepted. Allow at least 3 months for processing. Subscriptions must be sent through the TAAA. Do not send money directly to the magazines. To change an individual subscription to the group rate, send the above subscription amounts and your magazine renewal notice to the TAAA treasurer.

- To ensure proper credit to your account, please include a note explaining what you are paying for. Credit cards are not accepted. Write one check or money order for dues plus any options or donations. Make it payable to TAAA and send to:

Tucson Amateur Astronomy Association
PO BOX 41254 Tucson, AZ 85717

Mailing Address or Email Changes - Send changes to the above address or email the treasurer.

TAAA Mission Statement - We are a resource for anyone interested in astronomy. It is our mission to nurture a person's natural curiosity about the night sky. By giving people a knowledge and understanding of astronomy, we enhance their enjoyment of the sun, moon, and stars. Through our public activities and school evening observing sessions, we bring astronomy to persons of all ages. Our regular meetings and observing sessions offer members a forum to meet others with similar interests and experiences and to learn from one another.

Desert Skies Publishing Guidelines - All articles, announcements, news, etc. must be submitted by the newsletter deadline noted above. Materials received after that date will appear in the next issue. The editor retains all submissions unless prior arrangements are made. Partial page submissions should be submitted in Word compatible files via e-mail or on a floppy disk. Full-page articles, artwork, and photos can be submitted camera ready. All material copyright Tucson Amateur Astronomy Association or specific author. No reproduction without permission, all rights reserved. We will not publish slanderous or libelous material! Send submissions to:

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President's Message

The monsoons are winding down. Some of us have been lucky enough to see Mars almost every night because we've been missed by the rains. Some of us have been lucky enough to get well rained on. At any rate, get out to look at Mars whenever possible. There may be some dust clouding our view, but there's still great polar detail and many other features are visible.

Congratulations to the Lunar and Planetary Lab in securing the \$325 M contract for the Phoenix project. I'm sure Roger Tanner is elated.

The Anniversary party is shaping up nicely—details at the September meeting. We will also have an outing to Mt. Graham to the LBT site. Be sure you can handle the 10,700 ft. elevation. Check the newsletter and our meet-

ing for more information. Steve Peterson will run the next board meeting, as I will be out of town.

Clear skies,

Thom Peck

Meeting Information and Calendar of Events

TAAA MEETING DATE: Friday, Sept. 5 at the Steward Observatory Auditorium – Room N210

BEGINNERS LECTURE: 6:30 pm

Title: 2003-4 Star Party Update

Speaker: Steve Marten

Steve will review the Star Party line-up for the remainder of this year and 2004 and how they are scheduled. Included will be the reminders on the best place to set-up an event if you are early (teacher/coordinator request, sprinklers, lighting, proximity and hazards), TAAA guidelines for weather cancellations and reminders on what to bring and what kids like best.

GENERAL MEETING: 7:30 pm

Title: The Layout of the Incaic suyus at the Machu Picchu Citadel

Speaker: Raymond E. White, Ph.D. Steward Observatory

It is well-known that the Incas of Ecuador and Perú subdivided not only their entire empire into four sections, called suyus, but also every one of the cities, towns, village, and hamlets in a self-similar way. In fact, the Incas called their own empire tawantisuyu, or "the land of the four suyus." The suyus cover differing amounts of area and are arranged in the following, clockwise, manner (the directions are approximate):

- a. Antisuyu—from north to east northeast;
- b. Collasuyu—the smallest suyu; from east-northeast to southeast;
- c. Cuntisuyu—the largest suyu; from southeast to southwest;
- d. Chinchayasuyu—from southwest to north.

Dr. Raymond E. White has made several research trips to Machu Picchu over the last 20 or so years investigating astronomical aspects of the Inca culture. In March 2002, using GPS instruments, he and his colleagues made a series of positional measurements of all of the astronomically significant sites within the Citadel. The discovery of

certain ground monuments, their existence provided by clues on the "Intihuatana Stone," is pivotal in the layout of the suyus. Using Albert Bumstead's site map of the Citadel (Bingham's cartographer: Bingham 1938), the results of these positional measurements will be applied to the suyu problem. Finally, Dr. White will show a probable layout and orientation of the suyus within the Citadel.

Dr. White received his Ph.D. in astronomy from the University of Illinois, Urbana, IL in 1967. He first came to the University of Arizona in 1964 as an astronomy instructor, eventually becoming a tenured lecturer/professor. He was the assistant director of Steward Observatory from 1972 to 1974. In 1999, he retired and is now a Professor Emeritus and Astronomer Emeritus at the Astronomy Department and Steward Observatory. In addition to archaeoastronomy (Incan, Celtic and other cultures), his astronomical research also includes RR Lyrae type variable stars. Refreshments will follow the lecture.

BOARD OF DIRECTORS MEETING: Wednesday, Sept. 10, 7:00 pm at Steward Observatory Conference Room N305

STAR PARTIES AND EVENTS:

- Sept 11 - Astrophoto SIG
- Sept 12, 13 - Flandrau Mars Viewing
- Sept 19 - ACS American Cancer Society Star Party
- Sept 20 - Mt Lemmon BBQ and Star Party
- Sept 20 - Kitt Peak BBQ and Star Party
- Sept 20 - TAAA Star Party at TIMPA
- Sept 27 - TAAA Star Party at Las Cienegas
- Sept 29 - Sonoran Science Academy Star Party
- Sept 30 - Desert View High School Star Party

NEWSLETTER SCHEDULE: Deadline for articles: Sat, Sept. 20. Printing: Mon, Sept. 22. Folding Party: Tues, Sept. 23. Mailing: Wed, Sept. 24. The newsletter is mailed at least one week prior to the following month's General Meeting.

Club News

Member News

We welcome the most recent members to join the TAAA: Mark Bowling, David and Lupe Ferree, C Ron Fetzer, Dennis Hahn, Katie Moore, Kathryn Paul, Ronald Price, and Johan Warell and Christina Johamsson. Glad to have all of you join! New members should be sure to pick up a new members pack at a meeting. Hope you'll make it to our star parties or meetings so we can all get to know you. (Updated membership lists are available to any member at most regular meetings, so pick one up if you need it.)

Calendars for 2004

Calendars for 2004 will be sold at regular meetings beginning in September. We have selected the Deep Space Mysteries calendar this year, which is published by Kalmbach Publishing (Astronomy Magazine). The cost is \$10 each (~\$2 off the regular selling price), or \$9 each for more than one. This calendar has daily information about astronomical events, both historical and observational... plus space for adding important events you need to remember. Each month features a full-color astronomical image of a deep sky object. May's image is of "The Mice" (NGC4676). Almost every object in the image is another distant galaxy. June features a stunningly colorful image of the Eagle Nebula (M16).

Proceeds from the sale of these calendars will be used appropriately as decided by the board. Thank you to all who support the TAAA through the purchase of the yearly calendars.

Magazine Subscription Changes

Astronomy magazine has instituted a two-year subscription rate for club members with an even better price break! One year remains at \$29, but a two-year subscription can be had for \$55.

Sky & Telescope announced a \$3 increase in their subscription rate, up to \$32.95. This is effective immediately. This is still \$10 less than the regular subscription rate.

As a reminder, TAAA members who subscribe to Sky & Telescope are entitled to a 10% discount off orders with Sky Publishing. When ordering, be sure to mention you are a club subscriber and that you belong to the Tucson Amateur Astronomy Association. If you order online, enter our club name in the appropriate box in the "My Account" page (not "My Profile") to automatically receive the discount on your orders.

Astro-Photo Special Interest Group

11 September, 7pm

China Rose, NE corner Speedway/Rosemont

As the monsoons wind down, come check out what our TAAA astrophotographers have been doing during the summer. There have been a plethora of web cam images shown the last meeting or two, so there should be some prime images of Mars, and usually a surprise or two. Come enjoy some pretty pictures over some Chinese food. See you there.

Mt Graham LBT Tour

Saturday, 13 September

Through the good graces of Steward Observatory Astronomer John Hill, we are being treated to a tour of the LBT facility on Mt Graham. He is the project scientist and is THE person you would want to lead a tour. Note that this is an all-day event - it is about 3.5 hours each way to the observatory and we will be spending about 2 hours on the mountain. Note also that the LBT site is still a construction site and is NOT child-safe. Members with small children should make other arrangements or have them on a very short leash. The site is also at 10,500 feet elevation and even healthy people may take some time to get used to the thin air. If you have health problems that may be aggravated by elevation, think twice about attending.

Ok, with that behind us, here is what we've got going. We looked into a bus to take all 50 of the allowed attendees up at once. At about \$20 per person, it looked like it might happen, but Dr. Hill warned us that buses have difficulty with mountain grades, and the 9 miles of dirt road, as well as maneuvering problems at the observatory site scuttled that plan. There are space restrictions at the site, so there is no way around the requirement to carpool, at least on the trip up the mountain, if not from Tucson. We need to get down to 10-15 vehicles, which should be possible from the 50 members allowed to go. Meeting places for ride sharing will be provided at signup.

As we are only allowed 50 attendees, demand will likely exceed the supply of spaces. The fairest way to determine attendance will be by lottery, names to be drawn at the September meeting on the 5th. Those not getting on the September tour will be on the next tour, which we will work to schedule as soon as possible. The advantage of a later tour is that the telescope will be nearing completion and will be in a more advanced state of construction. Attendance will be limited to TAAA members only - and you must be a member in good standing as of the August meeting. We will check to verify! There will be a signup sheet at the September meeting where you will sign the list and put your name on a ticket that will be drawn at random during the break, until the 50 spaces are filled! We'll also have an alternate list of 10 in case anyone pulls out before the 13th. If you have a good excuse not to attend the September meeting, I will take your names and the number in your party for

Club News (cont.)

entry into the lottery. You can e-mail me between the 1st and 5th of September at ketelsen@as.arizona.edu for inclusion. Successful lottery winners will be given schedule and meeting locations at the meeting. Feel free to contact me if you have questions or concerns regarding your attendance to this event. Hopefully this will be a rewarding experience for all and it will become a regularly scheduled event for us.

Dean Ketelsen

Mt Lemmon BBQ and Star Party September 20

TAAA members are invited to a BBQ and star party at the Steward Observatory Mt Lemmon Observatory on Saturday, September 20th. Arrive anytime after 4pm. Bring your own food, beverage, utensils, and telescope. The TAAA is providing the BBQ grills and charcoal for members use between 5 and 6pm. We have permission to set up our telescopes inside the observatory complex near the 40" and 60" telescopes. Plan to use battery power to run your telescope. Depending on the number of vehicles you may be asked to set up your scope and then park your car away from the telescope field. The 40" telescope will be open between 4 and 6 pm for members to see. There are plans to put the TAAA 30" mirror in the 40" telescope. We need to leave the observatory complex by 2 am.

Gary Rosenbaum, TAAA member and Steward Observatory Senior Instrumentation Specialist, will be operating the 60" telescope equipped with an eyepiece and everyone is invited to look through the scope. For safety concerns, there will be a limit on the number of people permitted in the dome while observing. If you have special requests for objects you want to see keep in mind the 60" has an f/16 focal ratio with a focal length of 24384 mm. A Tele Vue 55mm Plossl eyepiece gives a 0.1 degree field of view (6.5 arc minutes) with a magnification of 443x. The lowest magnifications work best unless the seeing is absolutely superb.

Directions: From Tanque Verde Road, turn north onto the Mt Lemmon Catalina Highway. Stay on the Catalina

Highway until you reach Ski Valley Road. Pay attention to speed limits and watch for bicyclists - please be careful. Turn right onto the Ski Valley Road at milepost 24.7. Zero your odometer here. Continue up the mountain beyond the Ski Valley parking lot to a locked gate (3.2 miles). For the day of the star party only, we will place a combination padlock on this gate. The combination is 2001. Enter the combination then squeeze the padlock to open it. Lock the gate after you go through. Continue to the observatory complex, another 0.1 miles, then turn right on either the first or second road and go up to the top of the small hill to the main telescope field.

Many of the mountain recreation areas remain closed as of this writing. Check with the Santa Catalina Ranger Station Sabino Canyon office at 749-8700 for trail and picnic area closures if you are planning to make this a full day on the mountain.

For more information contact Gary Rosenbaum (579-0185, garyr90@earthlink.net).

TAAA Fall Star-B-Cue at Kitt Peak
September 20 (Saturday)

The TAAA has scheduled a star party and pot-luck barbecue at the picnic grounds up on Kitt Peak on Saturday, 9/20, starting at 4:00 pm. A maximum of 70 TAAA Members and families will be allowed to participate. The ramada gas-fired barbecue grill will be fired up starting at 4:30 pm and members are invited to cook their dinners between 4:30 and 6:30 pm. Bring a dish to share with other members. The grill will be turned off at 6:30 pm. Telescope observing will commence after sundown and will be concluded by 11:30 pm. All members must be heading down the mountain by midnight. Be prepared for cool temperatures.

There will be a sign-up sheet with the school star party sign-up sheets on the table at the back of the lecture hall at the start of the Sept. 5th meeting. Because of the popularity of this event, attendance will be initially limited to TAAA Members and their immediate family members only. If, after all TAAA Members have had an opportunity

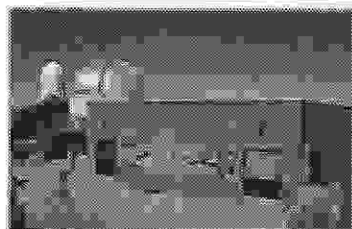
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Club News (cont.)

to sign up, there are any openings or cancellations, the attendance of guests will be considered. If you are unable to attend the May meeting, phone and e-mail reservation requests will be taken on a first come, first serve basis after 9:00 am Saturday, 9/6. Contact Steve Peterson at 762-8211 or via e-mail at <swpeterson@theriver.com>.

It is very important for all attendees to abide by the rules established by Kitt Peak and respect the facility. Adherence to the rules will help to continue TAAA activities on Kitt Peak in the future.

1. No vehicles are allowed above the picnic grounds after 4:00 pm.
2. Only the ramada gas-fired barbecue grill is permitted for cooking food at the picnic grounds. No open fires or use of the personal barbecue grills is permitted.
3. All trash must be placed in the garbage receptacles.
4. Use of cellular phones and radio walkie-talkies is prohibited.
5. No alcoholic beverages are permitted.
6. When leaving the picnic grounds after dark, if possible, use your parking lights until you have reached the main road and are headed downhill after exiting the picnic area.

50th Anniversary Celebration

As some of you may know, TAAA will not be having a holiday party this year. That's because on January 23, 2004, there will be a **50th Anniversary Banquet** at Hidden Valley Inn. Yes, the club is turning 50! Plans for the big birthday party are really shaping up. Watch for details in next month's *Desert Skies*.

Can You Solve the Mystery?

The 50th Anniversary committee is trying to locate past Presidents of the club. If you can help us locate Tom Caudell and/or Dennis Nendza, please contact Sheila Conrad at (520) 529-1750. And, does anyone know the whereabouts of Jim Christy?

Astronomers and Teachers needed for Project ASTRO - Year Eight!

It is time to recruit new teachers and astronomers for Year 8 of Project ASTRO! Please pass the word along to veteran astronomer partners as well as new astronomer partners and teachers who have not participated in Project ASTRO before.

The Educational Outreach Office at the National Optical Astronomy Observatory (NOAO) is now accepting applications from TEACHERS (grades 3 -- 9) and ASTRONOMERS (professional, amateur, and students) who wish to take part in Project ASTRO's eighth year in Tucson. This program forms partnerships between scientists and

teachers and provides training, materials, and support for teaching astronomy through hands-on classroom activities. Partnerships will take place this coming academic year (2003/2004) and the training workshop is scheduled for October 3-4, 2003. The free workshop includes an evening at the Kitt Peak Visitor Center 20" and 16" telescopes; hands-on, inquiry-based activities from the resource book, *Universe in the Classroom* and interdisciplinary activities from the book *Moon Journals: Art, Writing and Inquiry through Focused Nature Study*. These books and accompanying classroom activity kits are supplied at no cost to participants as well. During the school year, a minimum of 4 classroom visits per year is all that is required of the astronomer partner.

Applications will be accepted through September 26. Consider applying as a teacher or astronomer partner (a degree in astronomy is NOT required) and get involved in this worthwhile science education program. For more information about Project ASTRO and applications, visit this web page, <http://www.noao.edu/education/astrotucson.html>, or contact Connie Walker at cwalker@noao.edu or 318-8535.

Further Details:

Involvement in Project ASTRO is a way to get children curious about science and possibly develop their interest into future careers. Your help in recruiting or participating could also enhance a teacher's content knowledge and perhaps confidence-level in teaching astronomy. Testimonials supporting the Project ASTRO program can be viewed at http://www.noao.edu/education/astro_testimonials.jpg

For those new to the program, Project ASTRO-Tucson is an educational outreach program hosted by the National Optical Astronomy Observatory (NOAO), which forms partnerships between teachers (grades 3 - 9) and astronomers (professional, amateur, and students). We have had seven successful years of Project ASTRO. To date, Project ASTRO astronomers and teachers have reached nearly 18,000 students throughout Arizona. Ten years ago, Project ASTRO started by the Astronomical Society of the Pacific in San Francisco. Since then it has expanded into a national program. Project ASTRO-Tucson is one of a dozen Project ASTRO sites nationwide. Visit http://www.noao.edu/education/astro_poster.jpg for a composite of photos and key elements describing Project ASTRO-Tucson, http://www.noao.edu/education/astrogram/news_04_03.pdf for the latest news about the Project ASTRO-Tucson program and http://www.astrosociety.org/education/astro/project_astro.html for the Project ASTRO national website.

Our eighth training workshop will be held in Tucson October 3 and 4, 2003 at no charge to the participants. At the two-day workshop, the new educator/astronomer partners or teams learn to work together to present hands-on activities. During the workshop and throughout the year resources (including solar telescopes, an encyclopedia of proven hands-on activities, and supplies

Club News (cont.)

for the activities) are given out or lent out at no charge. A sample workshop agenda can be found at http://www.noao.edu/education/astro_agenda.pdf. After the workshop the partners will work together in classrooms or community centers to bring science, using astronomy, to children and their families. Besides the workshop, a minimum of 4 classroom visits per year is all that is required of the new teacher/astronomer partnership.

Consider applying as a teacher partner (or if applicable, an astronomer) to get involved in this worthwhile science education program. Join the "A" Team! A workshop brochure can be found at http://www.noao.edu/education/astrogram/fall2003_workshop.pdf, the teacher application at http://www.noao.edu/education/tea_app_2002.pdf and the astronomer application at http://www.noao.edu/education/astronomerapp_2003.pdf. Applications can be sent to:

Connie Walker, Ph.D.
Senior Science Education Specialist and Astronomer
National Optical Astronomy Observatory
950 N. Cherry Ave, Tucson, AZ 85719

Phone: 520-318-8535 Fax: 520-318-8451
Email: cwalker@noao.edu
<http://www.noao.edu/education/noaoeo.html>

Constellation Reports

Chris Lancaster has regularly submitted a constellation report every month for a number of years now. He has informed me that all of the constellations of the northern hemisphere have now been discussed! *Desert Skies* would like to thank Chris for all his hard work in preparing these articles.

Loan Program Coordinator Needed

The TAA now has a need for a responsible member to coordinate loaning of association equipment (telescopes, etc.) Qualified and interested members should contact Ken Wheelock or Ray Toscano.

Items of Interest

WEBSITES: TRIPS ON THE INTERNET SUPER-SKYWAY

By Rik Hill

Barsoom!

By the time you get this Mars will be at opposition or very close, VERY CLOSE. Every amateur astronomer, regardless of specialty, should take some time to observe our little red neighbor at this special time in our mutual histories. As most know, it will not be this close to us again for a long, long time.

A good place to start in your exploration of Mars is at the A.L.P.O. Mars Section web page:
<http://www.lpl.arizona.edu/~rhill/alpo/mars.html>

Here you will find a rich assortment of links to educate and hopefully inspire you. Many of the world's amateur Mars observers have some of their images posted at:
<http://www.lpl.arizona.edu/~rhill/alpo/mars.html>

MarsNet is another good resource on the web. They bill themselves as "Linking the Amateur and Professional Mars Observing Communities" and are a wealth of information:
<http://astrosun.tn.cornell.edu/marsnet/mnhome.html>

But, as said above, the real excitement at this opposition is the close proximity our two planets will attain on August 27-28. You can watch the countdown to that time, and even watch for the exact moment when we start to separate again by going to the "Mars Approach and Opposition Real-time Distance Calculator":
<http://www.physics.emory.edu/astronomy/mars/>

This is a very nice web tool that is continually counting down the distance between us. You can even see it change in seconds! What will it look like as soon as it changes and begins to count up?!

If you plan to observe Mars, or have a favorite feature you want to observe you will likely find the Solar System Simulator at JPL very handy:
<http://space.jpl.nasa.gov/>

I have used this for 3 apparitions now and found it very helpful. It has the ability to show you any major body in the solar system from any other major body. It's very addictive and you may spend a lot of time playing with this web page.

Perhaps you've made an observation and you want to better understand what it is you saw or recorded. The best place I know of for that is "Take a Look at Mars" at:
<http://elvis.rowan.edu/marswatch/cgi-bin/marsview.cgi>

Here, as with the Simulator above, you input your UT date/time and it will show you what Mars looked like at that time. But the difference is that you can put a grid on the planet and

Lastly, you may have heard, but Tucson is going to be the Mars capitol of our country. Two teams at the Lunar & Planetary Lab were just awarded a large grant to send several instruments to Mars in 2007. Read more at:
<http://marsweb.jpl.nasa.gov/newsroom/pressreleases/20030804a.html>

The name for the program is Phoenix, which of course now means that Phoenix is in Tucson, but that's o.k.

Items of Interest (cont.)

because we're going to send Phoenix to Mars!

As always, if you know of a particularly good website you would like mentioned here, drop me a line at: rhill@lpl.arizona.edu

A Special Evening at Kitt Peak With David Levy and Carolyn Shoemaker

Renowned comet hunter David Levy and special guest Carolyn Shoemaker will host an evening under the stars on Kitt Peak Saturday, September 13 from 3:00 to 10:00 pm to commemorate the Galileo spacecraft, which will undertake its final mission - a plunge through Jupiter's atmosphere - on September 21. Join David and Carolyn for a fun and informative evening:

3:00 to 4:00	Arrival and Solar viewing
4:00 to 5:00	Lecture by David about Galileo and Comet Shoemaker-Levy 9
5:00 to 6:00	Bar-be-cue dinner
6:15	Sunset viewing
7:00 to 8:00	Questions and answers with David and Carolyn
8:00 to 9:30	Telescope viewing with David and Carolyn
10:00	Guests depart Kitt Peak

Call 318-8726 to make reservations. The cost is \$15.00 for adults, \$10.00 for kids 12 and under. A \$10.00 deposit is required to hold a reservation and is non-refundable for cancellations less than 48 hours prior to the event.

NASA'S FIRST SCOUT MISSION SELECTED FOR 2007 MARS LAUNCH

Dolores Beasley/Donald Savage Headquarters, Washington
Press release

NASA today selected Phoenix, an innovative and relatively low cost mission, to study the red planet, as the first Mars Scout mission. The Phoenix lander mission is scheduled for launch in 2007.

The 2007 Scout mission joins a growing list of spacecraft aimed at exploring Mars. It also represents NASA's first fully competed opportunity for a dedicated science-driven mission.

"I am excited about the prospect of this compelling mission and its expected impact to our understanding of Mars. I look forward to a successful definition phase, so that it can be confirmed for implementation," said Dr. Ed Weiler, Associate Administrator for Space Science at NASA Headquarters, Washington. Weiler selected this mission from a group of four candidate missions following a competition over the past year. "This first Scout mission will explore the red planet in a unique way, and may mark the beginning of a line of innovative, competitively selected and lower-cost missions in the Mars Exploration

Program," he said.

Phoenix, designed to land in the high northern latitudes of Mars, will follow up on Mars Odyssey's spectacular discovery of near-surface water ice in such regions. It will land in terrain suspected of harboring as much as 80 percent water ice by volume within one foot of the surface, and conduct the first subsurface analysis of ice-bearing materials on another planet.//

The Phoenix lander includes an instrument suite designed to completely characterize the accessible ice, soil, rock, and local atmosphere using state-of-the-art methods. Included in the instrument payload are microscopic imaging systems capable of examining materials at scales down to 10 nanometers (i.e., 1000 times less than the width of a human hair), while others will investigate whether organic molecules are contained in ice or soil samples.

Upon final descent, an innovative camera system will photograph the Phoenix landing site just before it touches down in late 2008. A powerful robotic arm will dig down into the soil and ice-rich ground as deep as 3.3 feet, while imaging with a camera mounted on the arm itself.

Principal Investigator, Dr. Peter Smith of the University of Arizona, Tucson, Ariz., leads the Phoenix mission in a partnership with NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., and Lockheed Martin Space Systems, Denver. In addition, the Canadian Space Agency is contributing a meteorological package that includes a lidar sensor to study polar climate.

"NASA's Mars Exploration Program continues its exciting, science-driven exploration of Mars by extending the quest for evidence of life using new vantage points, and by measuring the previously un-measurable," said Dr. Jim Garvin, the Mars Scout Program Scientist at NASA Headquarters. "Phoenix exemplifies this approach by seeking clues about habitats by landing a remarkable laboratory in known ice-rich polar regions", Garvin added.

The Mars Scout program is designed to complement major missions being planned as part of NASA's Mars Exploration Program, as well as those under development by foreign space agencies, within a total mission cost cap of \$325 million. The Mars Scout Program is managed by JPL for NASA's Office of Space Science, Washington.

For information about NASA and space science on the Internet, visit:
<http://www.nasa.gov>

For Information about NASA's Mars Exploration Program on the Internet, visit:
<http://mars.jpl.nasa.gov/>

Star Parties & Events

Mars Public Viewing at Flandrau

Sept. 12 & 13

Here's two more chances to show the general public Mars, Uranus, and the waning gibbous moon on the UofA mall with the folks at Flandrau Science Center. The UA football team is playing at home on Saturday, Sept. 13, giving TAAA and Flandrau volunteers the opportunity to have a star party for 10,000 +. Join Flandrau Science Center on Friday, Sept. 12 and Saturday Sept. 13 from 7:15 p.m. (setup) to 10:30 p.m., weather permitting. Parking on the grassy portion of the mall near or at the observing area will be only allowed with permission, in advance. Because of the monsoon weather and coordination needed, Flandrau Science Center is requesting volunteers please call or e-mail Mike Terenzoni at Flandrau (miket@ns.arizona.edu, or phone 621-3646). A sign up sheet will be available at the September meeting.

ACS American Cancer Society Star Party Central

Friday, 9/19/2003 11pm to midnight! No. of Scopes: 4

All TAAA members are invited to the American Cancer Society "Relay for Life Stars at Midnight" at TEP Park including 4 scopes. A donation will be collected for each view of Mars! Please come out for the fun and to support the fight against cancer, a disease that has touched nearly every family. In addition to astronomy a number of fun activities and events will be held beginning in early evening. Report to TEP Park main gate at 10:15pm where Steve Marten, Star Party Coordinator for this event, will provide further directions onto the field. Set-Up Time is 10:30pm and observing will be from 11pm to midnight (park lights will be dimmed at that time). Moon Phase: (no moon during formal viewing period- Last quarter rises around midnight).

TAAA Fall Star-B-Cue at Kitt Peak Mt Lemmon BBQ and Star Party

September 20 (Saturday)

See article in the Club News section.

TAAA Star Party at TIMPA

Saturday, 9/20/03

Come on out and enjoy the summer skies! TIMPA star parties are great for both beginners and experienced observers. Our novice members can get help with observing issues or equipment problems, as there are many experienced members there who would be happy to help. If you don't own a telescope, come anyways, because there are lots of telescopes set up and everyone is invited to look through them. This is a great way to check out different telescope designs before you make that all-important decision to buy. There is no scheduled talk for this activity, just come out and enjoy. We'll do our best to get you the answers you need. If you have friends or relatives who are curious about amateur

astronomy, feel free to bring them along. The TIMPA site features a large parking area, and full restroom facilities. Directions to the TIMPA site are located on the outside flap of this newsletter.

TAAA Star Party at Las Cienegas (Empire Ranch)

Saturday, 9/27/03

Las Cienegas (formerly Empire Ranch) has been our normal dark-sky observing site for quite a number of years. Please try to arrive before sunset. Stay as long as you like, but let everyone know when you are ready to leave; someone may be taking astrophotos. Bring a telescope if you have one, but you don't need one to attend. Any member would be glad to let you look through their telescope. There are no restroom facilities at the site, so be prepared. At 4000 feet, it will be cooler than the Tucson area. Also, be prepared for a possible rain shower, as the monsoon season is underway. Attendees should park their vehicles either perpendicular to the airstrip facing toward the center of the strip, or parallel to the airstrip along either side facing west. That way, when you are ready to leave, you will not have to back up and turn on your bright white backup lights. See the directions to Las Cienegas on the outside flap of this newsletter.

Desert View High Star Party

Tuesday, 9/30/2003

Southeast

No. of Scopes: 5

Desert View High Star Party will again be held at 4101 E. Valencia Road. Come out for a fun night with the crescent moon hovering over Antares in the west and Mars (and Uranus) to the southeast. From Speedway and Alvernon, proceed south and continue past I-10 and Benson Hwy. At Valencia turn left (east) and continue about 1/2 mile to school on left (north) side of street (on Valencia between Alvernon and I-10. Set-up will be in the grassy field north of the school. Enter through the east parking lot and drive north past the dumpsters and mobile home on the east end of the building. Contact person Jim Treat can be reached at 545.5210 or email jimt@susd12.org. Set-Up Time: 6:30 pm. Observing will be from 7:00 pm to 8:30 pm. Sunset: 6:11 Dark Sky: 7:31 Moon Phase: Crescent.

Sonoran Science Academy Star Party Northwest

Monday, 9/29/2003

No. of Scopes: 4

Sonoran Science Academy will be hosting Exploring Mars and the Night Sky at 2255 W Ina Rd. Go west on Ina and turn left (south) onto LaCholla; take first right (west) into the Academy parking lot viewing will be on the basketball court. Contact person Carrie Adair can be reached at email carrieis@yahoo.com. Pizza & coke will be available for TAAA volunteers! Set-Up Time: 7:00 pm. Observing will be from 7:30 pm to 9:00 pm. Sunset: 6:11 Dark Sky: 4:33 Moon Phase: Crescent.

Dark Skies for September 2003

DARK SKIES (no twilight, no moonlight) for Tucson in 24-hour MST: 18-6pm, 20-8pm, 22-10pm, 0-12am
RISE, SET, VISIBILITY for sun and bright planets: rise for morning object, set for evening object

Su/Mo 31/ 1	21:33 - 4:34	Th/Fr 11/12	- - -	Su/Mo 21/22	19:44 - 2:19
Mo/Tu 1/ 2	22:11 - 4:35	Fr/Sa 12/13	19:57 - 19:57	Mo/Tu 22/23	19:42 - 3:24
Tu/We 2/ 3	22:53 - 4:36	Sa/Su 13/14	19:55 - 20:24	Tu/We 23/24	19:41 - 4:30
We/Th 3/ 4	23:42 - 4:37			We/Th 24/25	19:40 - 4:52
Th/Fr 4/ 5	0:39 - 4:37	Su/Mo 14/15	19:54 - 20:53	Th/Fr 25/26	19:38 - 4:53
Fr/Sa 5/ 6	1:40 - 4:38	Mo/Tu 15/16	19:52 - 21:24	Fr/Sa 26/27	19:37 - 4:54
Sa/Su 6/ 7	2:46 - 4:39	Tu/We 16/17	19:51 - 21:59	Sa/Su 27/28	19:35 - 4:54
		We/Th 17/18	19:50 - 22:39		
Su/Mo 7/ 8	3:51 - 4:40	Th/Fr 18/19	19:48 - 23:25	Su/Mo 28/29	20:08 - 4:55
Mo/Tu 8/ 9	- - -	Fr/Sa 19/20	19:47 - 0:17	Mo/Tu 29/30	20:50 - 4:56
Tu/We 9/10	Full Moon	Sa/Su 20/21	19:45 - 1:16	Tu/We 30/ 1	21:38 - 4:56
We/Th 10/11	- - -			We/Th 1/ 2	22:33 - 4:57

Weekend	Sun	Sun	Mercury	Venus	Mars	Jupiter	Saturn	Vi=Visibility	
Sa/Su	Set	Rise	Set Vi	Set Vi	Set Vi	Rise Vi	Rise Vi		
30/31	18:49	5:56	19:22 -	19:03 -	5:41 -3	5:25 9	1:28 0	-3	brilliant
6/ 7	18:40	6:01	Rise -	18:59 8	5:05 -3	5:04 5	1:04 0	0	conspicuous
13/14	18:31	6:05	5:38 -	18:54 7	4:32 -2	4:44 2	0:39 0	3	moderate
20/21	18:22	6:09	4:57 5	18:49 6	4:01 -2	4:23 1	0:13 0	6	naked eye limit
27/28	18:12	6:14	4:51 3	18:45 6	3:33 -2	4:03 0	23:47 0	9	binoculars limit

By Erich Karkoschka

TAAA Board of Directors Meeting - August 13, 2003

The Board: absent: A. Cooper

Members present: Sheila Conrad, Ellen Finney, Steve Marten, Nora Toscano

President's Call to Order: 7:03PM

1. Agenda changes
2. Announcements: a) Projector purchase; b) Laptop computer donation; c) Website being updated by Dean Salmon.
3. Star Party schedule acknowledged; Thom needs one more scope for Aug. 23 (Kitt Peak), and the Toscanos volunteer.
4. Treasurer's Report: a rise in the investment account; Bill suggests using the General Fund to pay for the projector; Ed motions for same, seconded by Terri and unanimously passes; a motion from Terri for the TAAA to acquire a credit card, seconded by Ed and passes unanimously; a proposal from Terri to pay for the annual accounting, put in motion by Ed, seconded by Thom, and passes unanimously. A descriptive inventory of club equipment will be performed and used to update the Treasurer's database. Our investment rep. will appear at the Sept. Board meeting. The expense of a paper newsletter is recognized.
5. School Star Party Program: Program Coordinator Steve Marten has tracked party frequency (78 events last "season") and will ask some schools to consider hosting during less busy months; proposes a Sept. Beginners' Lecture explaining participation; proposes recognition for Star Party Program dedicated volunteers; all proposals agreed to by the Board and under advisement. The Board applauds Steve's commitment to the program.
6. TAAA 50th Anniversary Party: Party Planner Sheila Conrad updates the Board: a) David Levy is emcee; b) speaker is Brother Guy Consolmagno (Vatican Observ.); c) color scheme of blue & white; d) invite past Presidents; e) menu, dessert, and balloon purchases discussed; f) T-shirt design ideas selected; Sheila proposes club pay for dinners of past Pres. & their spouses, motioned by Ray, and passes 5-2; Ken motions for a ticket price of \$25, seconded by Ed and passes unanimously; Sheila will inquire about a coat room at *The Hidden Valley Inn* for Jan. 23rd; club may provide light background music; Terri provides Sheila with the deposit check as the contract is signed. The Board applauds Sheila's (and Twyla Peck's) work.
7. TAAA Telescope Loan Program: Ray proposes and is approved to buy Bob's Knobs for the scope; Ray will update the on-board firmware; Ray proposes a new inventory (see #4 above) of club equipment; also proposes development of a Loan Policy, which Ed volunteers and is approved to do; a newsletter article requesting a Loan Program Coordinator will be run; post-inventory equipment location(s) discussed. The Board applauds Ray's work organizing the TIMPA storage and scope assessment.
8. YAHOO Email list server: new Board members to be added to the posting list; an alternate forum open to current members will be set up.

TAAA Board of Directors Meeting - August 13, 2003 (cont.)

9. Investment option exploration is proposed by Thom, more info in two (2) months.
10. Old Business: LBT tour, lecture topics (including a lecture on buying one's first scope), lunar scheduling, and volunteers' risk coverage are shelved until next month.
11. Board decides to meet at 6:30 on Sept. 10 to help close old business, etc.

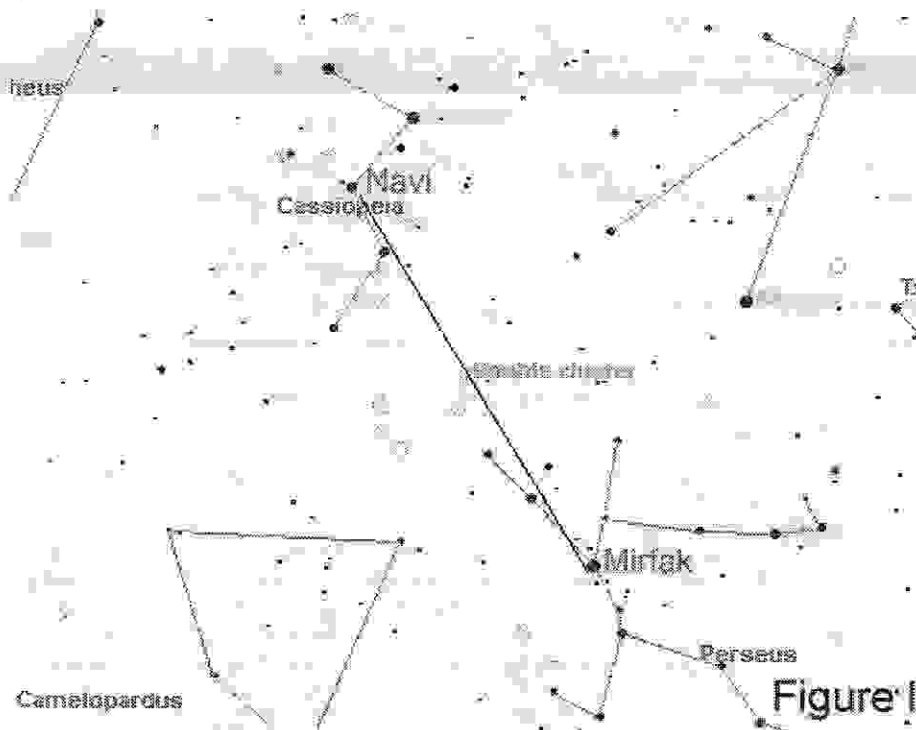
Adjourned: 9:26PM

Respectfully Submitted,
Ken Wheelock, Secretary

Object of the Month by Alfredo Garcia, Jr.

Wow! Can you believe it! Here we are at September 03 already! Where has the year gone? I hope you got out and observed Mars last month. It was truly an observing experience and continues to be so even into September! With a change of seasons right around the corner, there are some very interesting objects to observe. This month's OTM is a member of our Milky Way Galaxy that belongs to the class of objects known as open star clusters.

Open clusters are physically related groups of stars held together by that powerful, governing force of the universe known as gravity. They are believed to originate from large cosmic gas and dust clouds in the galaxy and orbit the galaxy through the disk. Most open clusters have only a short life as a cluster. As they drift along in space, some members escape the cluster due to velocity changes in mutual closer encounters; tidal forces in the galactic gravitational field; and encounters with field stars and interstellar clouds crossing their way. On average, an open cluster has spread most of its member stars along its path after several 100 million years and only few of them have an age counted by billions of years.



There are many fine examples of open star clusters in our galaxy and this cluster is one that is visible though not resolvable by the unaided eye. It also has the uniqueness of being composed of two clusters. The object is of course none other than the beautiful Double Cluster or NGC 884 and NGC 869. The Double Cluster lies within the boundaries of Perseus. It is one of my favorite clusters that mark the onset of Fall and it is well placed for observation this time of the year. This cluster is also referred to as Chi and h Persei.

The Double Cluster was first cataloged in 130 B.C. by the Greek astronomer Hipparchos. The estimated distance to cluster duo is about 7,650 light-years and each is about 18 arcminutes in size. Together they span over 60 arcminutes (or two Full Moon widths) in apparent size in the sky. Their centers are separated by about 27 arcminutes and together they have over 600 observable stars. The clusters have an integrated visual magnitude of 3.5 and can be

easily observed and resolved with just about any size telescope or pair of binoculars.

The best time to observe the Double Cluster is during periods when the Moon is not visible. If you go out observing (from the Tucson area) in early or late September at about 10:00 PM, you will find the clusters at an altitude of about 25 degrees to about 45 degrees above the northeast horizon respectively. If you use setting circles or have an automated go-to telescope, you can find it at RA 02hr 21min and DEC +57deg 08min.

You can also easily "starhop" to the Double Cluster by using the stars of both the constellations Perseus and Cassiopeia. Once you find the "W"-shaped asterism that Cassiopeia is noted for, just look about halfway between the a line connecting the star, Navi (center star of the "W") to the brightest star in Perseus's known as Mirfak and there you will find the soft

Object of the Month by Alfredo Garcia, Jr. (cont.)

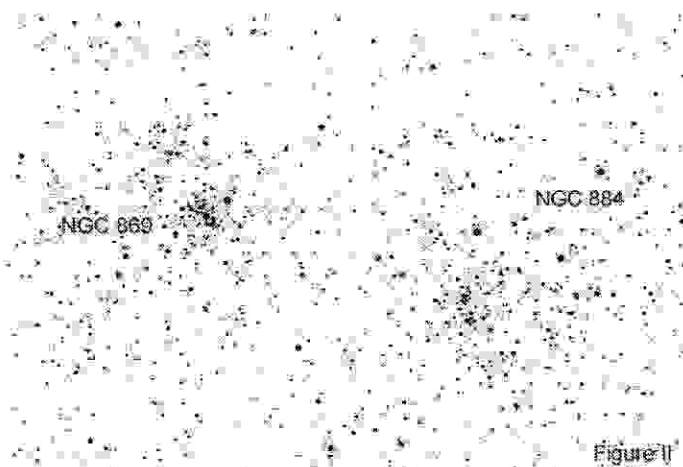


Figure II

blur in the sky that is the Double Cluster (see Figure I).

The Double Cluster presents remarkable view through even the smallest of telescopes. In addition to being a great visual object, it is also one of the best and easiest objects to astrophotograph or CCD image. The image at Figure II is typical of the results that can be achieved with a little time and effort. I highly recommend it as a first object to wide-field astrophotograph or CCD image for those of you attempting your first imaging adventures. Good luck!

Constellation Report by Chris Lancaster

Sculptor

The Sculptor

The French astronomer Nicolas-Louis de Lacaille is given credit for establishing this constellation, which contains only a scattering of dim stars. His original name was L'Atelier du Sculpteur, the Sculptor's Workshop. Currently, only the sculptor remains. The constellation's southern boundary is about 19 degrees above the horizon, and it reaches the meridian close to midnight during the middle days of September. You can find Sculptor east of Pisces Austrinus (marked by the bright 1st magnitude star Fomalhaut), and southwest of Cetus, the whale.

Although Sculptor does not set itself apart by having bright stars, it contains a wealth of very exciting deep sky objects. A good one to start with is NGC253. This edge-on galaxy sits high in the constellation near its border with Cetus. So

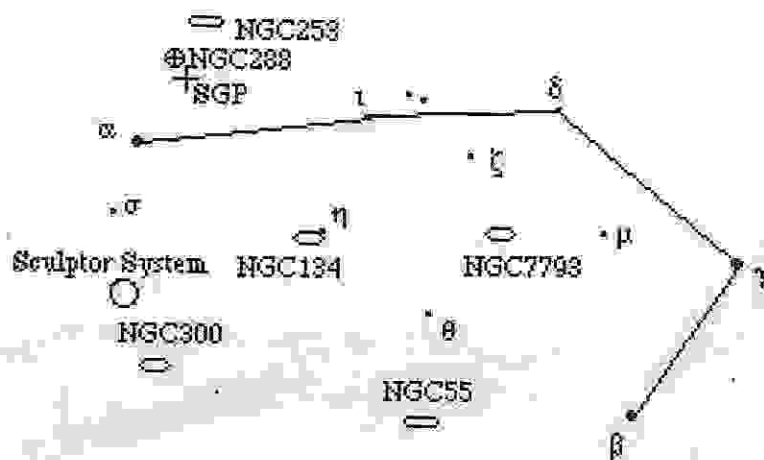
Desert Skies Classified

For Sale	Olympus OM 2000 camera with spot metering (only 1 year old). Includes 35-700 zoom lens and 80-200 zoom lens. Asking \$225 for both. Also, a complete computer system. Details at www.galaxies.com/pc Phone 520 250-0407. [09/03]
For Sale	12" F4.5 truss-tube dobsonian telescope, 1 1/2" rack & pinion focuser. Includes 25mm eyepiece, 2x barlow, LED finder. Asking \$800. Gary Vecere, 409-0113 [10/03]
Wanted	Looking for up to five individuals who would be interested in think tanking, developing, finding funding for and implementing a totally new kind of public observatory. To be operated as a for profit business. Will cost 12 million to build if funded 100% and will generate about 1 million per year in after expenses revenue. Can also be franchised nationally, then internationally. This will not be a paid position until fruition and will require much of your personal time to develop to that point. Thereafter, the rewards would be great. If interested please contact Jim at: starmen100@cox.net and use "Universe City" in the heading. [10/03]
For Sale	JMI NGC-Max Digital Setting Circles (Modified with current Tangent Instruments Firmware). Includes: NGC-Max computer, 2ea 4,096 step encoders, encoder cables, user documentation and database listings, Asking \$225.00 or best offer. Contact Jim Waters 480-554-8789 or mailto:james.t.waters@intel.com [11/03]
For Sale	8", F/6 Skywatcher Dob with 50mm finder and 26mm eyepiece. Excellent condition and used very little. Very good optics and construction. \$300. Call Frank at 520-743-0018 or E-mail me at fcathell@aol.com . [11/03]
For Sale	University Optics 2.5" diagonal mount. \$10 rhill@lpl.arizona.edu or call Rik at 721-0123. [12/03]

Your ad will run for 4 months unless specified. Month and year of last appearance is last item of ad. For additions or changes to this list, call George Barber at 822-2392 or e-mail at barbergj@flash.net.

Constellation Report by Chris Lancaster (cont.)

impressive is this system that it is often referred to as simply the Sculptor Galaxy, and the 19th century Danish astronomer J. L. E. Dreyer effusively described it as "very remarkable! Very, very bright, very, very large. . ." Indeed, when you point your telescope, no matter what size, at this bright galaxy, you'll see a magnitude 7.1 giant measuring 25'x 5', which is nearly half a full moon in length. Large telescopes will have no difficulty seeing some of the clumps of dust littering its tight spiral arms and bright knots of dense stars. To find NGC253, you can start with magnitude 2 Diphda (Beta Ceti) which is the southernmost bright star in the tail of Cetus, and move 7.5 degrees south and then 1.5 degrees east, or dial up coordinates RA 00h 47.6m Dec -25d 17' 00". Either way, this galaxy should be readily apparent in either your finder scope or binoculars. There are few examples of a better, more easy to see edge on galaxy than NGC253. It is also one of the nearest galaxies at about 9 million light years.



A mere 1.7 degrees southeast of the Sculptor Galaxy is what could be called the Sculptor Globular Cluster because this cluster, NGC288, is very bright and impressive as well. Measuring a wide 14' in diameter and glowing at magnitude 8.1, this globular is also within the grasp of any backyard scope. Small instruments will show a soft glow, and large scopes will have no trouble resolving many of the stars of this loose cluster, which range from magnitude 12 to 16. Look to RA 00h 52.8m Dec -26d

35' 00" for this cluster. As a side note, the south galactic pole (SGP) is less than a degree southwest of this globular cluster.

On par with NGC253 is another edge-on galaxy, but it is very low in the sky. It makes its transit across the meridian exactly at 1 am on September 1st, midnight on September 15th, and 11 pm at the end of the month, and these would be the best times to observe this galaxy since it will be the highest in the sky and away from the dust and atmospheric turbulence that will hamper the view. This galaxy is irregular in nature. It shows a mottled structure with uneven brightness across its length. Its western half is brighter than its eastern part, and in fact is sometimes given two designations—NGC55 for the western clump, and IC1537 for the dimmer, eastern clump. Dimmer clouds of stars intervene between these two bright features. This is also a very nearby galaxy, a member of the Sculptor group, residing only about 8 million light years away. NGC55 is 4 degrees south of magnitude 5.2 Theta Sculptoris, or RA 00h 14.9m Dec -39d 11' 00".

Another galaxy well within small backyard scopes is NGC300, which sits at RA 00h 54.9m Dec -37d 41' 00". This one is a face-on spiral, which means that its magnitude 9.0 light is spread out across a large area of about 20' in diameter, making its surface brightness low. Most telescopes will show only its brighter nucleus, but large scopes will begin to bring out some of the brighter knots of stars in its arms. NGC300 is 1.7 degrees northwest of Zeta Sculptoris.

NGC134 is a worthy target due to its being easy to find. It sits about half a degree east southeast of a magnitude 4.6 star, Eta Sculptoris. It's a rather bright magnitude 11.1 galaxy of a 8.4'x 2.0' size. This is another galaxy nearly edge-on to our view also with mottled features in its spiral arms. NGC134 is situated at RA 00h 30.3m Dec -33d 14.7s.

Another in the long list of galaxies in Sculptor is NGC7793, a magnitude 9.6 face-on spiral with many tight spiral arms. It's a decent size at 9.4'x 6.3' located 3.7 degrees east of magnitude 5.3 Mu Sculptoris, or RA 23h 57.8m Dec -32d 35.4s.

An intriguing object, though beyond the grasp of most equipment other than long exposure images through large telescopes, lies halfway between Sigma Sculptoris and NGC300. It is identified as the Sculptor system, and is an extremely faint, sparsely populated dwarf elliptical galaxy that is a member of the local group. There are several other examples of this type of galaxy, such as the Fornax system and other systems in Leo, Draco, and Ursa Minor. All are nearby and would be invisible at much farther distances. This particular collection of stars covers a vast area of the sky—about 75', and is one of the intrinsically faintest galaxies in the heavens. It shines with a total luminosity of only 3 million suns. The earliest photographs of the Sculptor System showed such an elusive image of the galaxy that it was thought to be a photographic anomaly. Later, more modern images began to show stars within the galaxy.

For a dim constellation, Sculptor contains many fantastic objects. The skies should be reliably clear toward the end of September to allow study of what Sculptor has to offer.