

# SJAA EPHemeris

## An Eclipse Over Zambia: A Triple Diamond Ring Ceremony

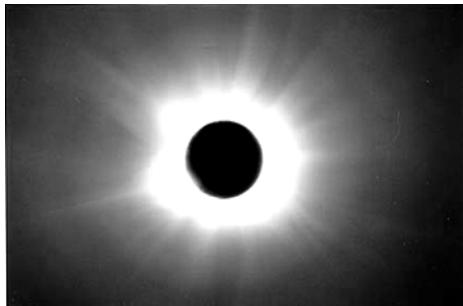
Ernie Piini

June 21, 2001 (Winter Solstice in the Southern Hemisphere) Lusaka, Zambia, Central Africa Latitude: 15° 08' 01" South; Longitude: 28° 26' 11" E

On a narrow road along an embankment overlooking a large pond on the Karubwe farm, eleven members of the "migrant travelers" group set up their telescopes and other recording equipment in anticipation of viewing the first total solar eclipse of the twenty-first century. Ably led by Madelyn Dovano of Los Gatos, California, this expedition met at this scenic site on the eastern edge of Chisamba, a few miles northeast of Lusaka, the capitol city of Zambia.

The group experienced an unusual three days of cloudless skies leading up to this first eclipse of the new millennium. The moon nibbled its first bite of the eastern edge of the sun at 1:41:57 p.m., signaling first contact.

Our site along the side of a blue pond provided an exciting, unobstructed view of the shadow of the moon as it approached from the west. The moon shadow, always exciting, was best viewed later when we saw the video



The sun's corona during the June 21, 2001 total solar eclipse as viewed near Lusaka, Zambia, Central Africa, (Lat: 15°, 08', 01"S; Long: 28°, 26', 11" E). The 3-way telescope was used with the U2 coronal streamer filter, Kodak Royal Gold-400 film, 1-second exposure. Photo by Ernie Piini.

tape recording made by Dr. Shiloh Unruh, a former astronomer from Mount Hamilton near San Jose, California. He used six camcorders mounted on a circular platform to record six different aspects of the eclipse.

As the ingressing partial eclipse phase progressed towards totality, the air cooled and the sky darkened. A slight breeze over the pond ceased as the big show arrived. When the last rays of sunlight became hidden by the moon, 2nd contact clocked in at 3:09:58 p.m. Moments before, a startling "Diamond Ring" flashed before

us as shouts of approval could be heard from the expeditioners and curious locals.

The clicking of camera shutters could be heard as photographers took countless photos and busily recorded this spectacular event with video camcorders. Another, unexpected diamond ring presentation took place when Chris Somerville kneeled before his lady friend, Erin Mumm, and asked as he placed a diamond ring on her finger, "Erin, will you be my wife?" She

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## SJAA Activities Calendar

Jim Van Nuland

### August

- 4 General Meeting, 8:00 p.m., Houge Park, Elinor Gates of Lick Observatory
- 10 Astronomy Class IX, 7:30 p.m., meeting hall, Houge Park. Topic: Meteor observing.
- 10 Houge Park star party. Sunset 8:05 p.m., 62% moon rise 11:42 p.m.
- 10-11 Yosemite star parties
- 11 Fremont Peak star party. Sunset 8:02 p.m., 52% moon rises 0:13 a.m.
- 18 Coe and Peak star party. Sunset 7:54 p.m., no moon.
- 18 Star-B-Q at Fremont Peak: [www.aanc-astronomy.org/  
starbq.html](http://www.aanc-astronomy.org/starbq.html)
- 24 Houge Park star party. Sunset 7:47 p.m., 43% moon sets 11:38 p.m.

### September

- 8 General Meeting: Slide & Equipment night
- 13-15 California Star Party, Lake San Antonio
- 14 Houge Park star party. Sunset 7:17 p.m., 8% moon rise 4:31 a.m.
- 15 Coe and Peak star party. Sunset 7:13 p.m., 3% moon rise 5:45 a.m.
- 28 Astronomy Class X, 7:30 p.m., meeting hall, Houge Park, John Gleason on Astrophotography
- 28 Houge Park star party. Sunset 6:55 p.m., 90% moon sets 4:11 a.m.

**September 13-15 - California Star Party, Lake San Antonio**  
[http://www.sjaa.net/  
calstar2001.html](http://www.sjaa.net/calstar2001.html)

**24 Hour News and Information Hotline: (408) 559-1221**

[www.sjaa.net](http://www.sjaa.net)

## Eclipse over Zambia

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accepted immediately. We learned of this romantic event after totality. Both are from Tennessee.

Three rosy-pink prominences, magnetic storms appearing on the limb of the eclipsed sun, helped beautify this spectacular sight. The pearly-white atmosphere surrounding the sun, the corona, blossomed into a symmetrical flower with short petals. These streamers were similar to the eclipse of August 11, 1999, that I saw from near Munich, Germany. During a period of maximum sunspot activity an eclipse typically produces a symmetrical corona, while in a minimum sunspot year one expects very long coronal streamers.

At third contact the first rays of sunshine poked through valleys on the moon. This "third" Diamond Ring presentation of this eclipse occurred at 3:13:03 p.m., heralding another roar from the highly excited persons on the banks of the Karubwe farm pond. The moon's shadow could be seen racing away from us towards the east, not to be seen again until December 4, 2002 — then from South Africa, the Indian Ocean, or Australia. Totality at our site lasted 3 minutes and 31 seconds.

Julie Heikes, a Polaroid filming specialist and graphic artist from St. Michaels, Maryland, recorded the entire event on her hand-held recorder. She also taped our adventures throughout the rest of our trip.

Kirsten Smith brought her homemade 6-inch telescope for this eclipse and monitored the outgoing partials until fourth contact (4:29:15 p.m.). She projected the sun's image onto white cardboard for easier monitoring. There to share her results were her dad David, and mom Sharon, all from San Jose, CA.

The temperature during the eclipse decreased from a high of 79 degrees Fahrenheit to a minimum of 61 degrees — a drop of 18 degrees. No shadow band activity was reported near the beginning or the end of totality.

For this eclipse I elected to mount a high resolution Canon GL1 camcorder

where I usually mount my C-90, 1000 mm focal length telescope. Everything normally rides piggyback on my 3-Way Telescope (600 mm focal length). The GL1 has three CCD sensors, each assigned to handle one of the three primary colors — red, green and blue. I built a special filter adaptor which bayonets to the front of the fluorite lens. This lens is manufactured from a grown crystal material and provides outstanding resolution, contrast and color reproduction. I used a density-5 solar filter constructed from Baader AstroSolar safety film purchased from Astro-Physics, Inc.

Special care is necessary to handle the large change in brightness from the sun's partial phase to totality. I used the TV mode at 8000 shutter speed and covered the lens with a density-5 filter to record the partial

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### *Another, unexpected diamond ring presentation took place when Chris Somerville kneeled before his lady friend ....*

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phase images. Then at totality, and only when the activity of the bright Baily's Beads/Diamond Ring moment was over, I removed the solar filter and recorded the inner corona and rosy-pink prominences. To open up the exposure for the corona I switched the camcorder to the "Easy Recording" mode. At third contact, I quickly replaced the solar filter to prevent damage to the camcorder. The GL1 has an optical zoom of 40x and a digital zoom of 100x. The 40x zoom presented an ideal image size of the partials and prominences, almost filling my field of view. I remotely zoomed in to capture the full width of the corona. There was no need to use the 100x zoom capability as a larger image size was not required and the loss of resolution would have been unacceptable.

In my twenty-two solar eclipse adventures I have mentioned many times before that there always exists the possibility that the eclipse will be

clouded out; therefore, one must give higher priority to one's itinerary. Traveling to remote countries presents one with a rare opportunity to explore other places, peoples and cultures. Our migrant traveler group took many interesting side trips on this journey. In Lusaka we were shown many of the historic sites pertaining to the revolution which saw this former country of Rhodesia become Zambia and also Zimbabwe.

The night before the eclipse we were treated to a view of the wonders of the Southern sky. We enjoyed seeing the Southern Cross (Crux), with its associated Coal Sack and the Jewel Box Cluster; Alpha Centauri, the closest star (other than our sun) to earth; Beta Centauri; Omega Centauri, that beautiful globular cluster; the amazing Eta Carina nebula; and the "False Cross" which is often mistaken for the Crux. All this was laced together by the amazing arm of the Milky Way. It was at this star party that Kirsten Smith saw "first light" through her homemade telescope. The 19-year old sophomore from Brigham Young University did such a perfect job in her mirror grinding that she was awarded a summer job at the NASA facilities in Mountain View, California.

A real treat was to see the red planet Mars high in the sky, approximately 70 degrees above the horizon, along with the constellations Scorpio and Sagittarius. In North America our view of Mars during this close apparition has been very low in the sky to our south.

The big attraction of this trip was Victoria Falls. The flow of the mighty Zambezi River over this 355-feet high, mile-wide gap is breathtaking. The roar of the falls is one thing, but the misty cloud formed by this act of nature requires the use of raincoats. More so, cameras and camcorders must be totally protected with plastic covers or be ruined by water — as many found out the hard way. The continuous spray cloud above the falls can be seen from miles away. In small groups we all took tethered balloon rides 400 feet up for a

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better view of the falls. The helium filled balloon swayed its nervous passengers from side to side in the afternoon wind. We almost did not go up because of the wind. Group members Wes and Noni Hamilton from Evergreen, Colorado, braved a test ride just before me. We all returned safely.

For comparison, Victoria Falls is twice as high and one and one-half times as wide (5600-feet) as Niagara Falls. The entrance to the falls is marked by a tall statue of Dr. David Livingston, who on November 16, 1855, was the first white man to see the falls. He named them Victoria in honor of the Queen of England. It was near here that I met many of my eclipse-chasing friends from past events.

We enjoyed a sunset cruise on the Zambezi River featuring sightings of many hippos bathing, and the next morning a sunrise champagne breakfast cruise on a vessel provided solely for our group and its cooks and operators.

Several of us were treated to a train ride at sunset over the bridge which straddles the deep gorge of the falls. The bridge, one of the highest in the world, is often used by bungee jumpers. Our eclipse ambassador, Dr. Shiloh Unruh, wore a crazy homemade headgear complete with teddy bear and windmill fan. He was the center of attention throughout our trip, like a clown from outer space. Dr. Shiloh paid a good sum to ride in the engine room and blew the whistle continuously.

We next bussed to the Hwange Game Preserve, rated as one of the best in Africa. We went on two safaris which included some wonderful views of wild animals and colorful fowl. The African acacia and baobab trees made excellent silhouettes during a delightful reddish sunset. We needed several blankets to keep us warm at night, the coldest part of the trip. Cold in Africa?

Lastly, we flew to Harare, the capital of Zimbabwe, a very modern city with many high-rise buildings. A four-hour bus ride took us south to the famous Great Zimbabwe Ruins, the

remnants of a large city built some 500 to 800 years ago and inhabited then by some 20,000 people. There are two main sites: an impressive Hill Complex and below that the Great Enclosure. Great Zimbabwe means houses of stone. The walls were constructed using individually shaped granite blocks carefully pieced together without the use of mortar. The Great Enclosure, which is the dominant feature, has a circumference of over 800 feet with walls about 33 feet high and 15 feet wide in some places. The purpose of a conical tower near the southern wall remains a mystery to this day. Could there be some astronomical signifi-

cance? The Great Enclosure is the largest ancient building in Africa south of the Sahara. We enjoyed lunch at the impressive Great Zimbabwe Hotel, a must for anyone visiting this area.

As usual every trip must come to an end. This adventure into the heart of Africa for a memorable 12 days I will never forget. Now I'm excitedly anticipating my 23rd eclipse adventure into the shadow of the moon in December 2002. I intend to share the next total eclipse with my grandson, Matthew.

My thanks to my personal editors Joe Heim and May Coon for reviewing this article.

## Birdwatching at the Grand Canyon

Jane Houston Jones

The avian constellations offered many celestial splendors for tourists and astronomers alike at the 2001 Grand Canyon Star Party. The brilliant summer Milky Way provided a celestial canopy for Cygnus the Swan and Aquila the Eagle. A fond farewell to Corvus the Crow as it set beyond the rim of the canyon made me yearn for more bird watching. Luckily, my birdwatching was not over, for northern Arizona is home to a most remarkable and ancient bird, the California Condor.

When we look at the constellation Cygnus, we are looking directly along the Orion Arm of the Milky Way as it spirals inwards toward the galactic center. The name Deneb means "tail" in Arabic and it is easy to see how this star forms the tail of Cygnus the swan. The blue and gold double star Albireo forms the head and the swan spreads its wings on either side of the Milky Way as Cygnus flies forever southward.

Close to Deneb is the shining gas cloud whose name needs no interpretation, the North America Nebula. You can see this extended patch of emission with the unaided eye from a very dark location. Its faint neighbor, the Pelican Nebula is actually a part of the same glowing nebula 100 million light-years across and 3,000 light-years distant. Together, this cloud is six times bigger than the Orion Nebula.



*One of the California Condors sighted at the Grand Canyon by the author. Photo by Barry Peckham.*

Traveling further along the spiral arm we come to a different kind of nebula, the Cygnus Loop, 2500 light-years from our sun. The Cygnus Loop, or the Veil Nebula as it is frequently called, is the remnant of a supernova which exploded about 20,000 years ago. The eastern segment is sometimes called the filamentary nebula, a riot of curvy wisps, strands and laces from the still-expanding stellar shock wave. The western segment is the more familiar piece, visible both north and south of the star 52 Cygni. It looks like a faint tattered lacy ribbon knotted by the star. The star is really in the foreground and not a part of the nebula. The fainter north central piece of the

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## Birdwatching

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remnant is known as Pickering's Triangle. No summer star party is complete without a sweep of the segments of the Veil Nebula, which are best seen with the aid of an O-III filter.

The great rift of the Milky Way begins near Deneb and extends SW deep into the southern Milky Way ending near Alpha Centauri. The dust clouds of the rift are probably 1,000 light-years distant in Cygnus, and approach us in Aquila, Scutum, Sagittarius and Scorpius, where they are only a few hundred light years away. The eagle Aquila is dusted with dark nebulae, ancient star cities, stellar outbursts and the faint puffs of exploded stars. Aquila is on the celestial equator and cuts through the great rift of the Milky Way where it runs NE - SW. Aquila is poor in clusters, rich in faint planetary nebulae, and loaded with dark nebulae.

Turning away from the center of our galaxy, we see the trapezoidal shaped constellation, Corvus the Crow low in the southwest sky. From the big dipper handle, follow the arc to Arcturus, speed to Spica then curve to Corvus. Within the constellation boundary lies R Corvi at the western vertex of a triangle with two 7th magnitude stars. A mira-type variable, it fluctuates from magnitude of 6 to 14 over a period of 317 days. Delta Corvi is a brilliant white primary and faint pale lilac secondary double star. Struve 1669 is a beautiful pair of yellow stars

in a sparsely scattered star field, only 1.5 degrees south of M104 the Sombrero Galaxy in Virgo. Most observers have bumped into this pretty double on their way to the Sombrero.

The most interesting galaxy in Corvus is the Ring Tail Galaxy, NGC4038 and NGC4039. The two components can be visually discerned in a large telescope, and through smaller instruments, varies in appearance from an irregular glow to a comma shaped crescent. The northern galaxy, 4038 is bigger and brighter, a crescent with a dark patch in the middle. The southern galaxy, 4039 is connected at its SE edge to its companion. NGC4361, right in the middle of Corvus near the star R Corvi is a little gray planetary nebula. My first observation

### *[The] vast Grand Canyon with its spires and pinnacles, ... and on a rock pinnacle in the foreground, a perched condor, elegant in dress-black ....*

of this little gem marked the completion of the Herschel 400 two years ago and so it is a favorite of mine.

The Crow soon disappeared beyond the horizon. Taking its place in the Arizona sky was our most endangered bird. The California Condor was near extinction twenty years ago. The population now stands at 156, with 25 flying free in Arizona and 34 in California. It soars on the warm thermal currents to 4572 meters (15,000 feet) searching for carrion. Adults are black except for white underwing linings. The head and neck are mostly naked, turning pink/orange at maturity. Males and females cannot be distinguished by size or plumage characteristics.

California condors or their ancestor species have inhabited North America since at least the Pleistocene era (10,000 to 100,000 years ago). Fossils have been found ranging from the Los Angeles La Brea tar pits to Florida. An ancestor of the California Condor, *Teratornis incredibilis* (Unbeliev-



Grand Canyon star partiers (left to right) Barry Peckham of Litebox Telescopes, John Dobson, SJAA Ephemeris editors Jane Houston Jones and Morris Jones.

**California Star Party,  
September 13-15  
Lake San Antonio  
[http://www.sjaa.net/  
calstar2001.html](http://www.sjaa.net/calstar2001.html)**

able Bird Monster) dates back 60 million years and had a wingspan of 17 feet. It may have been the largest bird ever to fly. The modern *G. californianus*, though reduced from this prehistoric size, is still the largest north american land bird with a documented wingspan of up to 9.8 feet and reported spans of 11 and 13 feet. Peregrine Fund Field Biologist Sophie Osborn daydreams as she records these words in her field notes. "An image comes to mind: the vast Grand Canyon with its spires and pinnacles, its looming walls and colorful turrets, aflame in the setting sun. And on a rock pinnacle in the foreground, a perched condor, elegant in dress-black, the wisdom of ages reflected in his bald pate."

Soaring hundreds of feet above the canyon rim one hot June afternoon were several California Condors.

Perched on a rocky outcrop, heating their bodies and feathers in the sun were five more of their brethren, some alighting as we watched. Ten more soared nearby, the biologist reported. "Eighteen of the twenty-three free-flying condors are flying near the south rim today", she told us breathlessly.

I added this observation to my lifetime observing list, and continued on my afternoon walk. That evening, I revisited the celestial birds with my telescope, and recalled the memory of the soaring condor flying free over the high desert landscape.

[Another story and complete photo album is available at <http://www.sfsidewalkastronomers.org/>.]

**Fremont Peak Star-B-Q  
August 18  
<http://www.aanc-astronomy.org/starbq.html>**

## Lessons From Polyphemus

Andrew Pierce

[Editors Note: This article is part of a continuing series about members' experience with SJAA loaner telescopes. Have you borrowed one of the fine telescopes from the SJAA library? Share your experience in an article for the Ephemeris.]

They gather by night in the darkest of places, manipulating their black shrouded cylinders, speaking a language the uninitiated cannot understand. If you have been to a star party you probably seen them. These Druidic figures are the Big Dob Guys<sup>1</sup>.

By the fall of 2000, I had been involved in amateur astronomy for about two years and was curious whether I had what it takes to join this exalted group. My first serious scope was an ETX Astro, the original model, without any electronics. (If you don't think the 90 mm Mak-Cass is a serious scope, I invite you to compare it with images from the department store refractor that resides in a dusty corner of my garage.) After less than a year I graduated to a 9.25-inch Schmidt-Cassegrain, a very competent all-purpose telescope. But I don't have the eyes of a Freeman or an O'Meara who can see profound detail at middling apertures so I wanted to know — did I have what it takes to be a Big Dob Guy?

I knew I was in no rush to add a monstrous new scope to my life without some practical experience. A lot of thought and research went into buying the 9.25 inch scope and I'm grateful with every use that I took the time to study all the options. Before I could think about adding a true light bucket to my garage I wanted to try one out. The SJAA loaner scope program was just the thing.

A quick glance at the *Ephemeris* revealed that the largest scope on tap was a 14.5 inch truss-tube Dobsonian — a scope any true priest or priestess of the exalted rites would be proud to collimate.

<sup>1</sup>Many Big Dob Guys are female, but as a group, like Refractor Guys, I can't help but thinking of them as "Guys."

I e-mailed Mike Koop with my request. He wanted to know one thing — how big was my car? When I replied that I had a station wagon, he suggested I drive up to Fremont Peak that Saturday night because Bob Havner was bringing the scope up there. I had been to the Pinnacles, Lick Observatory, the Trinity Alps and Molokai with a telescope but I had never been to the historic astronomy site and local party zone at Fremont Peak. This could not be missed.

Driving to Fremont Peak is a little like driving in Rome or Chicago — you should not be allowed to drive up there unless you have driven there at least twice before. With the help of the wrong map I ended up in foggy Salinas where a local helpfully directed me up Crazy

### *Driving to Fremont Peak is a little like driving in Rome or Chicago ....*

Horse to the San Juan Grade which I followed all the way to San Juan Bautista without seeing the sign for Fremont Peak. After circling the mountain twice, I knew where it was, but I still had no idea of how to get there. I finally found my way to the top three hours after leaving Palo Alto.

It was worth it. I found Bob Havner by stumbling around in the dark until I saw a Big Dob that had a "loaner scope" look. Loaner scopes do not come with ceremonial plaques, custom shrouds or digital setting circles. Bob let me push the scope around a little bit, my first real experience with a Dobsonian. My observing notes read simply: "I could enjoy this."

After a few minutes I let Bob have his last outing with scope. It was September 30, 2000, a night when Fremont Peak was at its best, with virtually no light pollution penetrating from the foggy lowlands. There was a large enthusiastic crowd. In fact, if you are reading the *Ephemeris* there is a pretty good chance you were there. I

particularly remember, very late at night looking through Jane Houston Jones' big scope at M38 and the nearby NGC 2158 cluster.

A week later on October 6, 2000, I picked up the loaner scope from Bob Havner at Hough Park. It was beautifully collimated from the start, an experience that did not always recur. Bob left me with the scope and soon a line of fifteen kids and parents queued up to look at the moon on this partly cloudy evening.

Bringing the scope home was like bringing home a puppy. It made a mess in my house and garage and took far more time than I could have imagined. It wouldn't fit into the garage without bending. However, I soon found I could assemble it and disassemble it, collimate it and even look through the eyepiece without a ladder. I also grew to admire the elegant simplicity of the Dobsonian design, which is all about homage to the biggest practical mirror.

Bob Havner warned me it was not a very good planetary scope and I found that it did not produce optimal planetary images compared to the 9.25 SCT or a 6 inch Mak-Cass. However, my notes remind me that at various times I was able to split the Double Double in Lyra cleanly, see the Cassini division and see detail on Jupiter beyond the obvious bands, including the Great Red Spot. Still, for any one thinking of borrowing this scope it is not trivial to collimate, it does not always hold its collimation, and it performs best on galaxies and nebulae and less well on star clusters, double stars, and planets.

So what did I learn from the monstrous Cyclopean beast? First and foremost I learned what aperture can do. I got my first look at such objects as the Intergalactic Wanderer, NGC 2419, in Lynx; Hubble's Variable Nebula, NGC 2261; the Flame Nebula, NGC 2024; and Thor's Helmet in Canis Major, NGC 2359. The planetary nebula M27 took on a whole new shape, with bilateral extensions that are perpendicular to the familiar hourglass shape.

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## **Lessons from Polyphemus**

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I was also able to get spectacular wide field views of galaxy groupings and saw details of galactic structure that gave the faint fuzzies distinctive personalities.

I also learned that one is less likely to use a telescope if it is difficult to put together and requires a large vehicle to move. The big dob could fit in a mid-size hatchback by nesting the mirror box inside the rocker box and placing the mirror and upper ring in the back seat, but this is not recommended. I did not get the scope out to dark site locations as often as I thought I would and on several occasions opted to bring the 9.25 inch Schmidt Cassegrain simply because it assembled more easily and can be disassembled and packed in less than five minutes. The 14.5 inch loaner scope does not have clamps or captive hardware. It takes about 45 minutes to assemble and collimate if you do not have help.

I also learned that if you go by yourself to a dark site with a 14.5 inch scope and want some help you can count on the kindness of strangers.

## **Volunteer to Help KTEH**

**August 16**

**Mike Koop**

The SJAA has been requested to provide volunteer support answering phones for the KTEH pledge drive on Thursday August 16th from 6:30 p.m.-11:30 p.m. During this shift, *Best of Cosmos*, and *Odyssey: The Mind's Eye* will be showing for approximately 3 hours. Food is provided and our club will receive on-air credit for their contributions of time during their volunteer shift if we provide 10 or more people. Please contact Mike Koop (WK: (408)473-6315) or via email ([koopm@best.com](mailto:koopm@best.com)) if you are interested in helping out.

One night at Fremont Peak there was only one other amateur astronomer because the park rangers had run off the friend who was supposed to meet me. Brian, a total stranger was glad to help, even as his wife yawned in their car. Once set up, I spotted a milky looking cluster near M35. After showing it to Brian, I realized it was the same object, NGC 2158, that Jane Houston Jones had shown me two months earlier at the same site. And so the torch was passed.

On another night at Montebello, I had a similar experience, although the person who helped me assemble and collimate, an experienced amateur telescope maker, commented that I had the "world's most dysfunctional Dob." This was a little unfair. The scope is obviously a homemade project, but it does what it's supposed to do. Since it's a giant clumsy one-eyed beast, I took to calling it Polyphemus.

I also learned that a large aperture can do amazing things even in the suburbs. Towards the end of my period with the scope I couldn't get out to tour Virgo and Coma Berenices due to bad luck, bad weather, and other distractions. The final Saturday night that I had the scope I was not in a position to go to a dark site but it was an unusually dark fine night in my yard in Palo Alto. I was able to traverse Markarian's chain and several other galaxy trails in Virgo and Coma, picking up no fewer than eight new-to-me galaxies with the scope set up only 10 feet from my front door. I also got a nice surprise on my last night with the scope, as a combination of good collimation and good seeing gave me a memorable view of M3, after I had given up on getting super sharp views of clusters with this telescope.

So am I a big Dob guy now? Well, not yet, but next summer, if you see someone fussing over one of Tom Noe's 14.5 inch Dobs, muttering something about Abell clusters or optimal thermal performance, it just might be this alumnus of the SJAA loaner program.

## **Mooning**

### **Hawaiian Moonscapes**

**Dave North**

Anyone who's been to Hawaii knows they have a different take on things.

We recently made a trip there, in part to get a different take on the Moon and planets.

Okay, a good part of the reason was to catch Mars high in the sky during this low opposition, and we did (only briefly, though, as the weather was not all that cooperative).

All was not lost.

The Big Island (where we spent all our time) is basically Volcanism Central for Earth. And the greater portion of what we see on the Moon was formed from volcanism.

(The notable exception, of course, is impact cratering, which often led to volcanic events — such as the basaltic floods in the maria).

Anyone going to Hawaii with the idea that they would see moonscapes as they appear today would be largely disappointed (with one notable exception).

The Big Island volcanoes are all wayyy too new to look like the Moon, which stabilized from a macrovolcanic point of view some billions of years ago, and since has been pulverized to sandy dust.

Much of the basaltic flow on Hawaii runs from brand new to hardly old enough to notice the difference — from a lunar point of view.

But what you can see is how the Moon looked when it was young, and how that might lead to what we see today.

In that respect, you couldn't ask for a better place.

Perhaps the most striking thing you'll see is the large, collapsed lava tubes in the newer flows from Pu'u O'o, which has been the main site of activity for the last 15 years or so.

I had always thought the usual story involved huge tubes that drain, and after some thousands or millions of years, finally collapse from some strain or nearby impact.

Not so.

Some of the large tubes collapse almost immediately after draining, and that's not uncommon.

From that we learn that many of the sinuous rilles (which probably formed this way) may have been visible in their present state since not too long after they formed!

This was a real revelation for me.

Speaking of lava tubes, by far the best I've ever seen for variety of size, color and formation are right in the suburbs of Hilo.

You can drive right up to them and walk in, if you have a flashlight.

There are no admittance fees, no supervision, just caves.

It's wonderful. Go.

Another impressive visual is Mauna Loa, which translates as "Long Mountain."

It's very well-named, since it is the classic shield volcano on our planet. The rise from base to top is quite gradual, and it's hard to believe from looking at it that it's nearly 14,000 feet tall.

It's just so ... well, long!

That really gets across the idea behind the large shield zones like Rumker, and even more notably the huge shields on Mars (including the largest mountains in the solar system).

Mauna Kea, where all the telescopes are, translates as "white mountain" or "sun god mountain" depending on your source.

Either name is also apt.

And there you'll find the one true moonscape we found on Hawaii, right at the top where the telescopes are!

It's made of old cinders that have been windblown into gradual heaps, and the effect is almost identical to pictures I've seen of the moon. It is, perhaps, the best place on Earth to walk on the Moon.

Not too far down is a small barren valley strewn with rocks that could easily pass for the photos sent back from Mars.

Amazing. Three planets within a few miles of each other...

New lava is shiny, shapely, and fascinating. Nowhere else have we

seen such a complex and beautiful volcanic display.

It was not possible to see any open flows, though we did catch sight of some Red Hot Lava (is that a rock group?) through a window into a lava tube.

### *The Shallow Sky*

## A Daytime Occultation of Jupiter

Akkana Peck

Mars is still the Planet To Watch in early August. It's shrunk to 17 arcseconds (from its maximum of 20.8 back in mid-June). That's as big as the disk of Saturn, still big enough to see detail, but look while you can, because it will continue to shrink rapidly as the month progresses, to only 14" at month's end. Look early in the evening, while it's still (relatively) high in the southern sky, and you might see some of the detail that's been visible this opposition: both polar caps at once (unusual for Mars — usually it's tilted so that we can only see one or the other), Sinus Meridiani and Sabaeus (which have been unusually prominent this year, and should be best placed around the middle of August), dark Syrtis Major and nearby light Hellas (well placed during the third week of the month), and, on the other side of the planet, Margaritifer, Acidalia, and Niliacus Lacus (visible to us in early to mid August).

Watch for changes in the south polar region. Mars' southern hemisphere is coming out of winter, so the south polar cap should be shrinking. Sometimes that means, paradoxically, that the south pole area may get brighter, as ice turns to bright sunlight-reflecting haze.

Photographers and observers with wide-angle binoculars might want to try to get a view of Mars near the Lagoon Nebula (M8) near the end of the month, though they're not close enough to appear in the same telescopic field.

As Mars leaves us, diminishing in size as it dips lower in the evening sky during the course of the month, there's

So in that regard, it doesn't look lunar at all there. But once, the Moon did look something like Hawaii.

And as much as I like the Moon now, I have to admit Hawaii looks a lot better!

compensation: Saturn is back, rising near midnight and making a nice pattern near Aldebaran and the Hyades. The ringed planet is quite far north this year, and we should be able to look forward to a good pass. Its rings are tilted even more generously than they were last year: can you see the outer ("A") ring all the way around?

Jupiter trails Saturn by two and a half hours, and is visible to morning observers. It makes a close approach (1.2 degrees) with Venus (which hovers low in the morning twilight for most of the month) on August 6. But Jupiter's real show this month comes on August 15 during the daytime, when it passes behind a thin crescent moon. Jupiter will disappear behind the moon's bright limb at about 1:20pm, and reappear at about 2:30.

The thin crescent moon will be somewhat hard to find with the sun this high in the sky: look about 45 degrees west of the sun, then use binoculars or a telescope to spot nearby Jupiter. Will the Galilean moons be visible? Probably not, but I'll be looking. The disappearance and reappearance will take a minute or more, due to Jupiter's size; this is a great chance to share views of an occultation with coworkers or the public, without having to risk missing the "big event" yourself.

As always, when using a telescope or binoculars during the day, be careful not to aim anywhere near the sun; best is to try to set up somewhere in the shade, if possible, which not only makes it impossible to sweep across the sun by accident, but also reduces glare and greatly improves the image.



*William Dellinges, formerly of the SJAA, met editors Jane and Mojo at the Grand Canyon Star Party. He sends along this photo of his observatory in Apache Junction, Arizona, and regards to all his friends back in San Jose.*

## Around The Galaxy

Tom Zeglin

There is an excellent 37-part series which has been running on the Discovery/Science Channel (AT&T 272) called *Around The Galaxy*. I learned, not only what I was looking at, but **why**. The series is produced for The Learning Channel by the BBC, Terence Murtaugh, and others. Episodes are mostly one hour in length, and cover everything from creation, to black holes, to man on Mars in 2050. The series features interviews with the top scientists in the world, including Steven Hawking, the Shoemakers, and Murtaugh, and have great computer animation and narration as well. Bart Simpson even helps out on black holes. Recent episodes had discussions by Seth Shostak of SETI (who

spoke recently at the SJAA). There is so much information in certain segments, such as the one on black holes, that they are worth watching twice.

For the benefit of those members who missed them, I am taping the series, and will continue to do so as they add new ones. I have taped thirty-two so far, and five more new ones are listed for the balance of July. The tapes could be made available for checkout at the meetings if someone would take that responsibility. I am also taping the repeats that are sprinkled in, so that there will be copies for multiple people to check out.

For more information, contact me by email at [rtzeglin@netzero.net](mailto:rtzeglin@netzero.net).

## Celestial Calendar

### August 2001

Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
FM	22:56 PDT	03	21:07	00:20 04:12
LQ	00:53 PDT	12	23:55	06:56 14:35
NM	19:55 PDT	18	04:24	12:43 20:43
FQ	12:55 PDT	25	14:24	18:54 23:15

Nearer Planets:	R. A.	Dec.
Mercury, 1.33 A.U., Mag. -1.5		
07 05:37 13:25 21:10	09:17:4	+17:37
17 07:20 13:59 20:35	10:32:1	+10:44
27 08:06 14:20 20:33	11:33:8	+03:14

Venus, 1.22 A.U., Mag. -4.3		
07 02:19 10:35 18:52	06:28:6	+21:54
17 03:28 10:44 18:00	07:18:8	+21:23
27 03:45 10:55 18:05	08:09:0	+19:52

Mars, 0.62 A.U., Mag. -1.5		
07 17:56 21:08 00:24	17:03:3	-26:55
17 16:09 20:39 01:12	17:16:3	-27:00
27 15:47 20:17 00:50	17:33:6	-27:01

Jupiter, 5.75 A.U., Mag. -2.1		
07 02:05 10:30 18:54	06:23:3	+23:05
17 02:34 09:55 17:17	06:31:8	+23:00
27 02:03 09:24 16:45	06:39:7	+22:54

Saturn, 9.35 A.U., Mag. +0.7		
07 00:47 08:53 16:58	04:46:2	+20:37
17 01:01 08:13 15:25	04:49:4	+20:42
27 00:24 07:36 14:49	04:52:0	+20:45

SOL Star Type G2V Intelligent Life in System ?		
Hours of Darkness		
06:44 07 05:36 13:16 20:55 09:09:2	+16:23	
07:13 17 06:24 13:12 19:59 09:46:9	+13:23	
07:43 27 06:32 13:09 19:45 10:23:8	+10:01	

Astronomical Twilight:	Begin	End
JD 2,452,128	07	04:35 21:51
	138	04:48 21:34
	148	05:00 21:17

Sidereal Time:		
Transit Right Ascension at Local Midnight		
07 00:00 = 19:55		
17 00:00 = 20:35		
27 00:00 = 21:14		

Darkest Saturday Night: 18Aug 2001

Sunset 19:58

Twilight End 21:33

Moon Set 20:11

Dawn Begin 04:49

Hours Dark 07:16

## For Sale

Rick Davidson has for sale a large astronomy collection including a Celestron C-8 telescope, accessories, eyepieces, CCD accessories, books and charts. Available for purchase as a set or individually. Email to [ravison@ispwest.com](mailto:ravison@ispwest.com)

Celestron Refractor GP-C102 with equatorial "Great Polaris" mount. It is basically brand new, I just don't have the room to store it any more. Price new - \$1,400, will take \$850. Please email to [sbrereton@msn.com](mailto:sbrereton@msn.com).

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## **Telescope Loaner Program**

Mike Koop (408) 446-0310

## **Web Page**

Bill Arnett bill@nineplanets.org

## **SJAA Loaner Scope Status**

All scopes are available to any SJAA member; contact Mike Koop by email ([loaner@sjaa.net](mailto:loaner@sjaa.net)) or by phone at work (408) 473-6315 or home (408) 446-0310 (Leave Message).

### **Available Scopes**

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
1	4.5" Newt/ P Mount	Tim Roberts
8	14" Dobson	Jack D. Kellythorne
10	Star Spectroscope	Steven Nelson
13	Orion XT6 Dob	Li Chung Ting
15	8" Dobson	Daron Darr
19	6" Newt/P Mount	Ikkka Kallio
24	60mm Refractor	Al Kestler
29	C8, Astrophotography	Doug Graham
32	6" f/7 Dobson	Sandy Mohan

### **Scope Loans**

These are scopes that have been recently loaned out. If you are interested in borrowing one of these scopes, you will be placed on the waiting list until the scope becomes available after the due date.

# Scope	Description	Borrower	Due Date
3	4" Quantum S/C	Hsin I. Huang	9/15/01
6	8" Celestron S/C	Craig Scull	8/17/01
12	Orion XT8 Dob	Michael Koop	7/30/01
16	Solar Scope	Bob Havner	9/2/01

### **Extended Scope Loans**

These are scopes that have had their loan period extended. If you are interested in borrowing one of these scopes, we will contact the current borrower and try to work out a reasonable transfer time for both parties.

# Scope	Description	Borrower	Due Date
2	6" f/9 Dob	John Paul De Silva	?
7	12.5" Dobson	Bruce Horton	8/10/01
9	C-11 Compustar	Paul Barton	Indefinite
11	Orion XT6 Dob	Raghu Srinivasan	9/16/01
21	10" Dobson	Ralph Seguin	Repair
23	6" Newt/P Mount	Dennis Hong	7/28/01
26	11" Dobson	Robert Morgan	9/2/01
27	13" Dobson	Gene Schmidt	6/30/01
28	13" Dobson	Michael Dajewski	9/2/01
31	8" f/8 Dobson	John Templeton	8/16/01

**Loaner Notes:** Member Dix McGuire has donated a home-built 8" f/8.5 to the loaner program. It has a nice Earl Watts mirror and a University Optics cell. Jim Bartolini is currently doing minor repairs on the scope, and it should be ready for loan this month. Thanks Dix and Jim!

## **Publication Statement**

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## **Submit**

Submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to [ephemeris@sjaa.net](mailto:ephemeris@sjaa.net).

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