

**Attendees:** Mike Weasner (520-289-3402, [mweasner@mac.com](mailto:mweasner@mac.com)); Bill John (520-825-0488); David St Jules (608-719-9350, [djbrstjules@outlook.com](mailto:djbrstjules@outlook.com)); Chip Parfet (303-257-9475; [cparfet@gmail.com](mailto:cparfet@gmail.com))

Weasner called the meeting to order at 6:40pm.

A request was made for a volunteer for a Secretary/Recorder. Auerbach, who had been the Secretary/Recorder since the Committee was founded in 2014, has stepped aside.

The previous meeting minutes were approved as sent out to members.

**Treasurer Report:** Acting Treasurer Mike Weasner gave the treasurer's report. Donations = Totaled \$307 since the previous meeting. Donations were received at the March 2017 Friends of Oracle State Park, the 18 March OSP IDSP celebration, and the 21 March Mountain Vista School Family Reading Night. Expenses = \$0. The Current balance for ODSC is \$582.18. (See spreadsheet attached.)

ODSC T-shirts to sell was briefly discussed. No effort yet has been expended on a potential design. Bill John said he knew someone who might be willing to work on the design. He will contact the person.

**Community action (IDA requirement):**

- Weasner helped Mary Helen Vasquez, ODSC member, draft a letter (with day/night photos) to the Arizona Water Company that has a light glaring into her house.
- The Oracle Community Park Concept Plan was discussed. Pinal County has asked for comments (due by 10 April). Most of the Park proposals reviewed in January 2017 acknowledged and protected the dark sky in Oracle. However, the current draft plan does not acknowledge the night sky, nor is there any lighting discussed in the plan. Weasner submitted these comments and had previously emailed all ODSC members with the comments page info. Auerbach, in an email, had proposed that the ODSC draft a letter to the County addressing these same concerns. Unfortunately, the short review cycle prohibits that.

**Announcements:**

- Mobley continues to work the Park's failed Vixen telescope mount. Parts are needed.
- Rinio is doing dark sky readings at OSP. Recent readings have been favorable.
- Weasner discussed measurements taken by IDA following the 18 March OSP star party. The results compared well to similar measurements taken in June 2015 by IDA using the same equipment. (See attached email from Dr. John Barentine.)
- Oracle State Park now has a new full-time manager: Vince Micallef. As part of the expanded operations at OSP, Weasner noted that the Park rules for visitors will need to be expanded to include restrictions on lighting by overnight campers and RVs. This is in response to an incident at a Texas International Dark Sky Park. Weasner will discuss this with the Micallef.
- Bill John asked about a light near the Park. He had inquired at the property about turning it off as it was likely not needed. No one at the meeting knew the status of this light.

- Weasner briefly talked about the Arizona State Parks Volunteer Luncheon that was held the previous week in Glendale. At the event he was able to give a pitch for the IDA IDSP program at the luncheon.

**Past Events:**

**Sunday, March 18: Second Anniversary Celebration of OSP receiving the designation as an International Dark Sky Park**

- **2:00 - 4:00pm** Weasner gave a class on Beginner Digital Astrophotography. There were door prizes to some lucky registered participants. After dark the participants were able to practice what they learned.
- **4:30 - 6:30pm** Music on the patio. ODSC, IDA, & FOSP had tables after workshop & during the music:.
- **7:00 - 9:00pm** Evening star party. The Tucson Amateur Astronomy Association and the Saddlebrooke SkyGazers Club provided telescopes. The weather cooperated. See the attached email from Jim O'Connor for a nice report.

**Tues, March 21. Family reading night at Mountain Vista School, Oracle, 6:00 - 9:00**

The ODSC had been asked to support this event at Mountain Vista School. The Saddlebrooke SkyGazers Club provided telescopes. Weasner provided ODSC support. The kids, parents, and teachers all seemed to have a wonder time with some nice views through the telescopes.

**Upcoming Events:**

**Saturday, April 29: Special Event at Oracle State Park**

- **2:00 - 9:00pm** This is a special event for local residents. More details to come.
- The ODSC is planning to have a table, 4-6pm. Two ODSC members volunteered to help.
- Telescope support from the Saddlebrooke SkyGazers Club has been requested (although no Club members were present at this meeting).

**Saturday, May 20 or 27: Talk and Star Party at Oracle State Park**

The talk will be by Dr. John Barentine, IDA. Details to be announced. The ODSC plans to have a table and it is hoped that the Saddlebrooke SkyGazers Club will be able to provide telescopes.

**Possible Future Events:**

- A **Star Party is scheduled for 9 September**, Oracle State Park.

**Other business:**

The Committee has been discussing developing educational programs on the light pollution six topics. Weasner discussed this with Julie Formo, 4th Grade Science Teacher at Mountain Vista School. She expressed interest in this project and had hoped to be able to this meeting (but wasn't able to).

The meeting was adjourned at 7:50pm.

**Next Meeting:**

4 May: Oracle State Park, Kannally Ranch House, 6:30pm

Signed,

Mike Weasner, Chair



From: **John Barentine** john@darksky.org  
 Subject: Re: Report on Celebration & Star Party at Oracle State Park  
 Date: March 20, 2017 at 14:42  
 To: Michael Weasner mweasner@mac.com  
 Cc: Scott Feierabend scottf@darksky.org



Thanks very much, Mike. I also read Jim O'Connor's really excellent account. I've copied both into my permanent file for ORAC.

I thought you would be interested to know the results of the sky brightness measurements I made on Saturday night. I collected 18 SQM-L measurements, calibrated all-sky imagery, wide-angle ground panoramas, and counted some stars using the Loss Of The Night app.

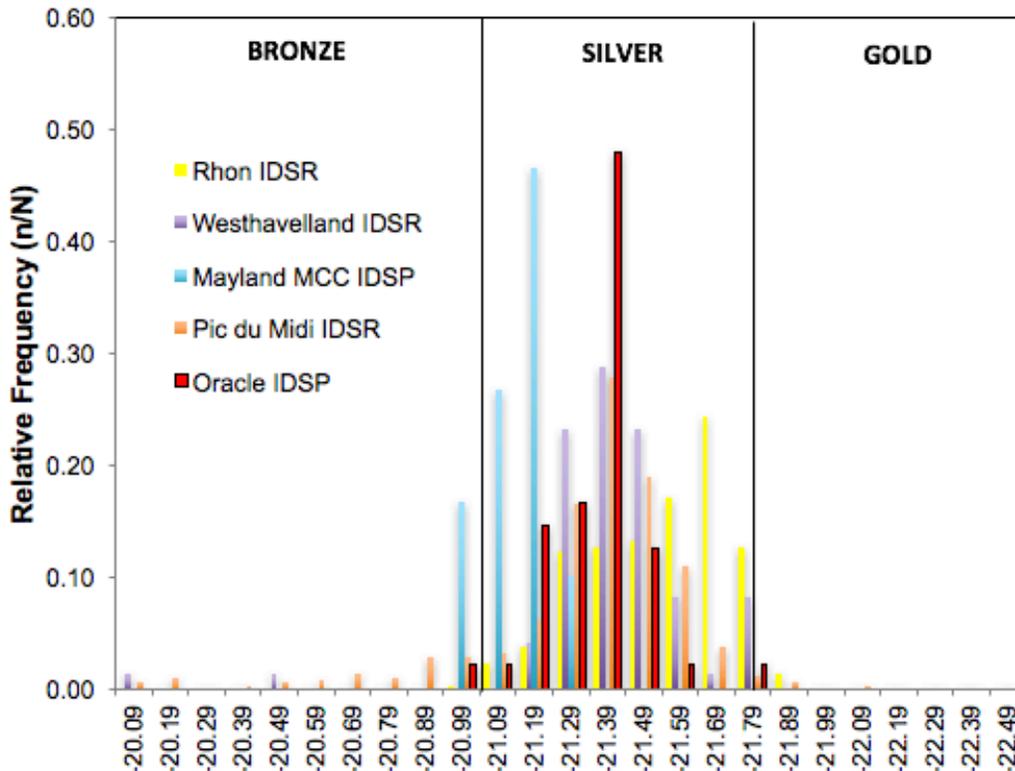
My SQM-L measurements were: 21.34, 21.38, 21.34, 21.38, 21.39, 21.32, 21.33, 21.33, 21.36, 21.32, 21.30, 21.28, 21.29, 21.32, 21.22, 21.28, 21.31, and 21.26.

The good news is that the conditions at the park have remained remarkable stable over the ~3 years since the certification effort began. Here are statistics for all data reported from 2014-2016 (through the 2016 annual report), my measurements on Saturday, and the combined data set:

	2014-2016	3/18/17	ALL
<b>Mean</b>	21.30	21.32	21.31
<b>Median</b>	21.33	21.32	21.33
<b>Mode</b>	21.33	21.32	21.32
<b>Sigma</b>	0.16	0.04	0.13
<b>Darkest</b>	21.79	21.39	21.79
<b>Brightest</b>	20.91	21.22	20.91
<i>N</i>	30	18	48

So a clear night with the Moon down and the Milky Way out of the way is expected to give a zenith luminance of  $21.3 \pm 0.1$  magnitudes per square arcsecond. Inclusive of the new measurements, ORAC sits squarely in Silver territory:

### Comparison to other Silver IDSPs/IDSRs



20.00- 20.10- 20.20- 20.30- 20.40- 20.50- 20.60- 20.70- 20.80- 20.90- 21.00- 21.10- 21.20- 21.30- 21.40- 21.50- 21.60- 21.70- 21.80- 21.90- 22.00- 22.10- 22.20- 22.30- 22.40-

**Sky Brightness (mag arcsec<sup>-2</sup>)**

Here's a new horizon panorama from roughly south (left) to northwest (right), including the direction toward Tucson to roughly Casa Grande:



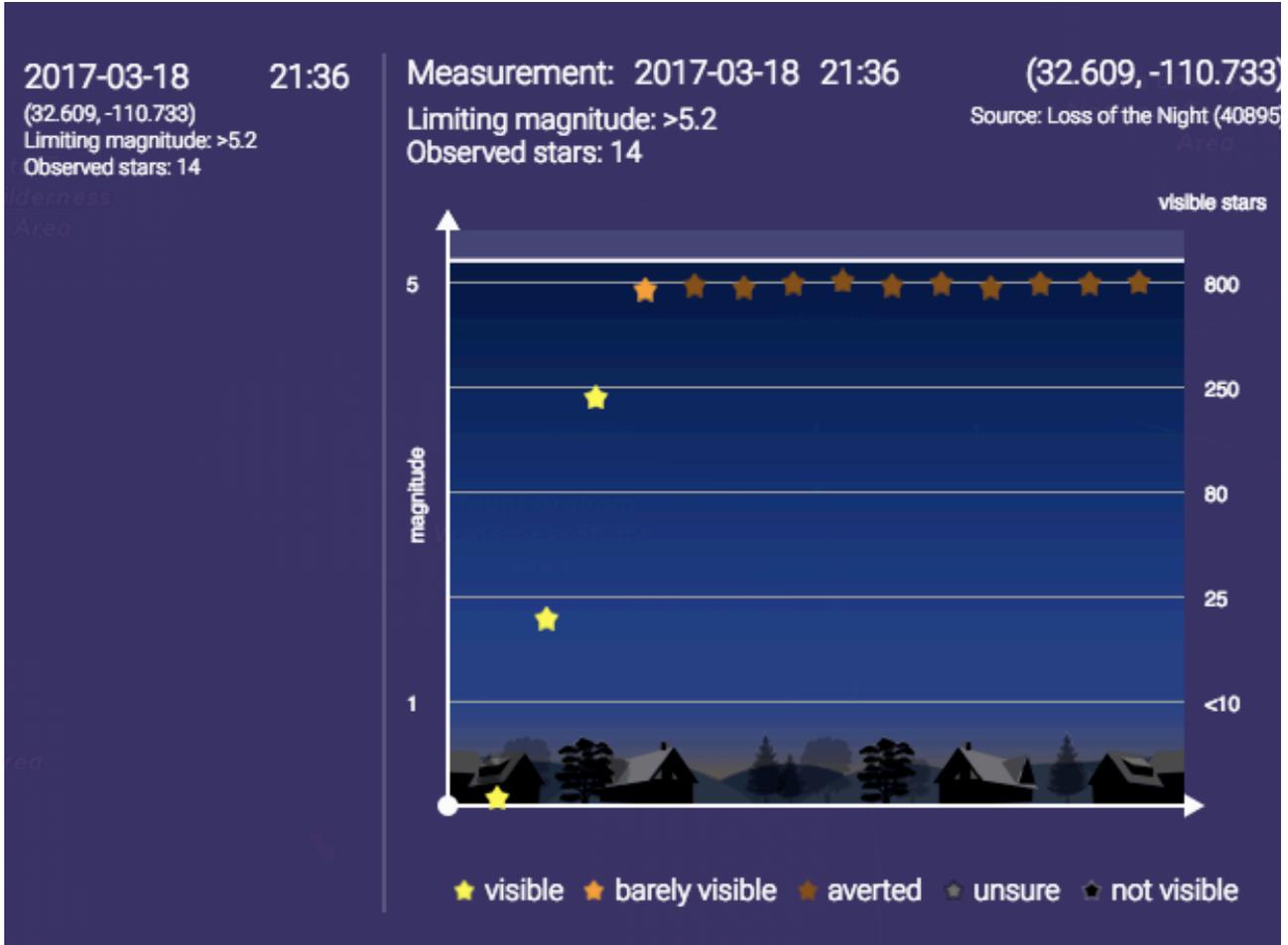
The dome in the direction of Oro Valley-Catalina seems brighter now, visually, than I remember it before. Note its distinctly yellow color.

Comparison of Tucson between mid-2015 and now (the 2015 panorama is incomplete). Note the change in the color of the light dome, presumably due to the shift of the municipal lighting system to white LED in the interim:

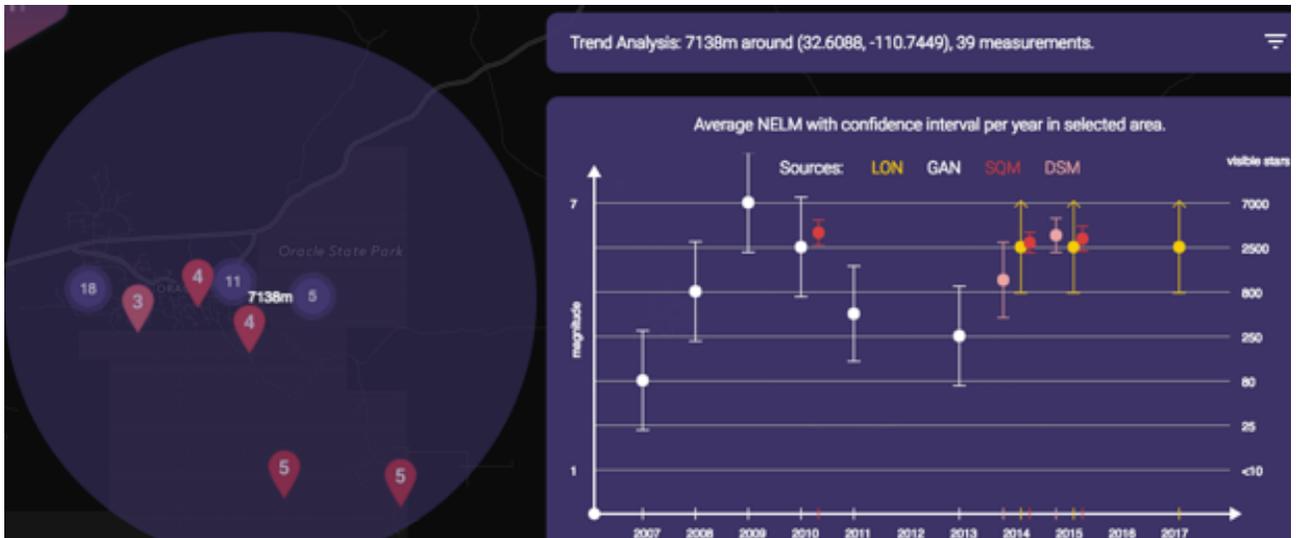


These were taken with the same camera, lens, and settings in both cases. I'm puzzled by the fact that the dome over Tucson seems *brighter* than expected, given that the near-complete LED conversion project is forecast to result in an overall 62% reduction in lumens. The pixel values

And here's my Loss Of The Night app measurement:



My visual acuity isn't great, so it's possible that some of my marginally-detected stars would have been easily detected by others. Here's all of the data to data available through the My Sky At Night website (<http://www.myskyatnight.com>) for an area including both the park and the town:



Excluding what I think are spurious Globe At Night (“GAN”) measurements from other years, I think the estimates of sky brightness since the certification effort began have been very stable. (“LON” = Loss Of The Night app, “SQM” = Sky Quality Meter, “DSM = “Dark Sky Meter”).

All in all, I think this is a success story, although I worry about the development in around Catalina and Saddlebrook as it relates to impacts to the park. That’s a target for outreach, as we discussed.

John

**John C. Barentine, Ph.D.** | Program Manager  
International Dark-Sky Association

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From: Skylook123@aol.com  
Subject: Observing Report Oracle State Park Star Party Saturday March 18, 2017  
Date: March 19, 2017 at 19:16

To: jimknoll@q.com, jrinio@azstateparks.gov, threеоaks@earthlink.net, allenklus@gmail.com, irkitzman@gmail.com  
Cc: mweasner@mac.com, leaders@tucsonastronomy.org, john@darksky.org

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Here are my observations from the Second Anniversary Celebration of OSP IDSP Status.

Event: Second Anniversary Of Oracle State Park Achieving International Dark Sky Park (IDSP) Status

Date: March 18, 2017

Location: Oracle State Park, Oracle AZ, about 4400 ft elevation

Weather: Clear skies, mid-80s at home in Marana, AZ about 45 miles west when I set out, quickly dropping with elevation and sunset in the park to around 60F.

Seeing: and Transparency: Generally excellent.

Equipment: 10" f/10 Meade 2120 SCT operating at f/5 (1270mm), Orion EQ-G Atlas mount, MallinCam Xterminator live video camera, QFX 19" LCD 12V monitor, Werker deep cycle 100 amp-hour power supply with A/C inverter.

This public outreach was the end of a full day of celebration of the second anniversary of the International Dark Sky Association award of IDSP status to OSP. I arrived near sunset, after most of the activities were completed and the band was finishing. I met with a key "life force" behind the success of OSP, Mike Weasner. Mike, along with others from Friends of Oracle State Park, put in a Herculean effort to accomplish the goal that ended two years ago with the designation of International Dark Sky Park status. This was a tremendous accomplishment, since by state direction OSP had been closed from 2008 through 2011. Centered around the legendary Kannaly Ranch House, the restoration of the lands to active state park status and then, four years later the work to establish OSP as an IDSP is an example of what a few dedicated citizens can get done. During the day, Mike conducted one of his astrophotography classes and later in the evening I talked with several of Mike's students who were quite laudatory about the photography class. Mike is truly setting an example for giving back to the community. Quite humbling, actually.

While I was setting up, I had the pleasure of talking with Dr. John Barentine, a program manager at IDA with whom I've interacted for several years as first OSP achieved IDSP status, then my primary point of attention, the Grand Canyon National Park, was designated last year as a Provisional IDSP with a few years of final finishing touches to complete the effort. I've started to dabble in spectroscopy, and for the last two years off and on I built a few homemade spectroscopes using CD segments. There are several dozen web sites with instructions, and some kits as well, but my attempts at a solar spectroscope got me the spectra but never the Balmer lines or Fraunhofer figure. John, however, has been successful at doing so using a DVD. The slit input geometry is important, as is the size of the CD segment in getting the finer resolution so it looks like I have some work to do. However, for stellar spectra I now have a Star Analyzer 100 grating for my camera and the RSpec software to decode the camera stills or video. That might turn out to be fun to do at public events, quite outside the box of the typical eye-candy show and tell. Not the sun though - too large and close unless I do some more CD/DVD cutting! But then, our star parties are mostly at night, so I'm getting ready for point sources.

We had several scopes present from both Tucson Amateur Astronomy Association and the Saddlebrooke Stargazers to honor the anniversary. Don Cain is in both groups, Allen Klus and I were there from TAAA, I believe John B. might have had a small refractor, and there was at least one more scope. Allen's setup, a large refractor, was giving gorgeous views with greatly scaled fields of view. I was able to pull off a great night despite kicking the tripod and getting way off on polar alignment. I ended up with over 100 visitors, in groups of about 20 or so. All of the community were great students wanting to learn about the features of sky dome above.

Mine got to be so difficult to work with I stayed on the Orion Nebula, M42, since I could bring it back onto the monitor screen due to its huge size. At times I kept the integration time down to 2.1 seconds because the core stellar group, the Trapezium, was easily visible at the core of the gorgeous glowing ball of colorful gas. We discussed the nature of the color in the nebula, with the ultraviolet energy of the super hot giant Trapezium stars knocking electrons off of the resident hydrogen gas and other free electrons moving in to balance the charge, giving up a red photon. That led to discussions of the native eye vision being grey at night due to the rod cell activation as a night human survival trait for detecting motion, not detail (you don't care about the color of the bear's eyes, just that there is a bear moving around out there). The video camera processes the available light and sends true color to the monitor. That discussion led to the life span and evolution of the giant stars compared to our Sun's nature. While our Sun will end life in more of a whimper with the final creation of carbon and oxygen, the fusion inside a giant star will lead to a whole chain of reactions within the star in shells based on temperatures and pressures, eventually leading to iron. That is the death of the giant star in a catastrophic nuclear explosion, creating all of the elements from iron to uranium as well as the stuff of life.

While we walked through that journey governed by the size of the star, we did the cultural tour of the night sky with many Native American points of view discussed, along with the Elephant of Creation: our Big Dipper turned upside down. Parents and children alike were impressed that while the Elephant of Creation is in the sky, good behavior is essential because the Creator is watching, with a better memory than Santa Claus!

We also had a striking Zodiacal Light present from the western horizon up the ecliptic for over 45 degrees elevation. Once I pointed it out, it couldn't be missed. It was placed between two light domes from populated areas, but the Roman Candle of Zodiacal Light could clearly be seen as natural and impressive knowing that it was the light of the Sun reflected off the remaining dust in the Solar System, the shards of our home star system's creation.

Among the discussions of other cultures' points of view, and legends of many of the constellations overhead, some of the other questions that came up and were explained were the colors of the stars and how much of their total energy we could see. Orion was great for that, with Betelgeuse, an aging cold red giant so our eye is not seeing the infrared portion of the light being generated, while down at Rigel, a hot new blue star is hiding the energy of the ultraviolet portion of its spectrum from our eyes. Some of the best questions came from the youngest children in the crowd, including "What is a black hole?" That led to a great discussion on the fabric of space, and how light is affected by the pull of enough gravity. Enough material without nuclear fusion to hold the material at bay and so much gravity in so small a location traps light. And we don't really know what's happening, just that the equations say you can't figure it out, it's a mystery.

We did some Seminole, Cherokee, O'odham, and Greek cultural comparisons including the overly vain Greek queen of Ethiopia Cassiopeia being alternatively seen by Navajo as the nurturing spirit for the family and the Akimel O'odham figure of the spider that created the Summer Milky Way as a web that aids the tribe by trapping wayward children so that their parents can re-educate them in the ways of the tribe. There were quite a few alternative impressions by young children regarding what figures they saw in the star groupings. Lots more culture was discussed, far too many to list here but the notion of Seminole that the arms of the Summer Milky Way being the arms of the Creator protecting the creation He loves, and the Pleiades use by the Navajo for governing planting cycles had a couple of adults say that looking at the sky that way was more comforting than the Greek mythology. Native American lore can be quite life affirming.

We ended up talking about the creation of open clusters and the general nature of the angular momentum of the original gas cloud gradually

we ended up talking about the creation of open clusters and the general nature of the angular momentum of the original gas cloud gradually dispersing most clusters. We looked at the largest one visible to the naked eye - the inner five stars of the Big Dipper, called the Ursa Major Moving Group, all from the same gas cloud and approximately the same distance from us.

All in all, a tremendous experience with great people, with great work by Mike Weasner and the Friends of Oracle State Park, and Ranger Jennifer Rinio, bringing it all about. Many thanks to all!

Jim O'Connor  
South Rim Coordinator  
Grand Canyon Star Party  
gcsp@tucsonastronomy.org

In a message dated 3/15/2017 8:31:51 A.M. Mountain Standard Time, jimknoll@q.com writes:

Jennifer (Rinio), Allen (Klus), Jim (O'Connor), Irene (Kitzman), Paul (Ross -- tentative),

This is a reminder for the Star Party supporting Oracle State Park on Saturday March 18<sup>th</sup>, 2017. **Oracle State Park is located at 3820 E Wildlife Dr (ORACLE)**. Any **weather issues** will be **evaluated by 4 pm** on the day of the event and an update will be sent via email if required. **Check email prior to departing for event.**

Directions: Highway 77 (Oracle Road) north from Tucson. Follow signs to Oracle State Park

Map: <https://www.google.com/maps/place/Oracle+State+Park/@32.6093993,-110.7338081>

Nearest Moon Phase: Last Quarter.

We have **four TAAA** telescopes scheduled. Believe there may be some other scopes there as well (**Jennifer/Michael – please let us know if other scopes will be there**).

**Setup Time: 6:30 pm**                      **Start Time: 7 pm**                      **End Time: 9 pm**

**Sunset: 6:34 pm**

Viewing Location: Sidewalk along the Kannally Ranch House parking lot and on the Ranch House upper patio. Some manual movement of equipment may be required due to exact observing location.

Age Group: All Ages

Other Activities: 2<sup>nd</sup> anniversary of the International Dark Sky Celebration/Designation.

Estimated # Participants: **100** (Please provide updated estimated # of participants post event)

Activity POC: Jennifer Rinio. (520) 668-9916.

I will not be at this one, so if there are any questions when you arrive, please coordinate with Jennifer. My cell # is below for any additional

please coordinate with Jennifer. My cell # is below for any additional coordination or clarification (call or text) prior to the event. Thanks.

Jim

Jim Knoll

TAAA Community Event Coordinator

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