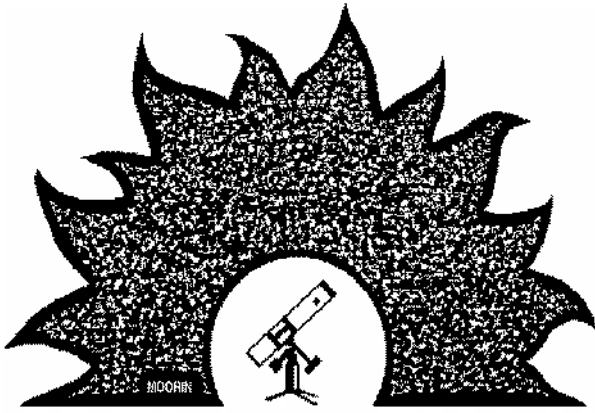




# PAStimes

Phoenix Astronomical Society

[www.pasaz.org](http://www.pasaz.org)

March 2018

Volume 69 Issue 7

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

## Andy Odell to Talk at March 1st Meeting

Data provided by Andy

Binary stars can come as visual ones, such as Alberio, quite lovely, and also as more subtly beautiful spectroscopic and eclipsing binaries. I became interested in them in graduate school, where I studied Spica, one of the first recognized as a spectroscopic binary in 1890. Since then, I've been studying contact binaries, where the

two stars actually touch each other, as well as eclipse. Much knowledge can come from binaries, such as the masses and radii of the two stars. I'll talk about each of the types, and look at the special cases that fall into more than one type simultaneously.

Andy Odell studied physics and astronomy at University (*Continued on [page 3](#)*)



## March 1st PAS Meeting

By Terri, Event Manager

Come join us for our March meeting with popular guest speaker Andy O'Dell. Andy has spo-

ken at PAS previously and received many requests for his return visit. Bring a snack to

share and a friend and enjoy his presentation. Bottled water will be provided by Bruce Wurst.

## February PAS Meeting

By Terri, Event Manager

This was a very interesting evening with 25 PAS Members in attendance and a fascinating presentation by Emilie Dunham. Emilie spoke on 3 topics all concerning meteorites and how their composition can give clues to the evolution of our solar system. She also passed around samples of meteorites that illustrated points in her lecture.

The meeting was opened by President Mike, who introduced the attending Officers of the club, greeted the new attendees

and welcomed two new members to the club: Tom Winslow and Patrick Cassidy. After the talk, Event Manager Terri Finch reviewed some upcoming events and we held our Raffle (won by Sam). Mike closed the meeting at about 9pm, though a number of members stayed to socialize until about 10 pm.

As always, thanks to everyone who attended, those who brought snacks and especially to Emilie for her excellent presentation. Bottled water was provided by

Bruce Wurst. We hope to see you at the next PAS meeting on March 1st.



Emilie Dunham. Photo by Don Boyd.

## January PAS Meeting

By Terri Finch, Event Manager

This meeting was opened by Vice President Paul Facuna. Paul introduced the PAS Officers and then greeted some new faces at the meeting. Club President Mike Marron then did one of his typically thought-provoking presentations. The talk, which ran about an hour and a half in length was called "Cosmological Jets: Using Jets to Learn the History of the Universe". After the presen-

tation and some announcements we held the raffle (won by Ed Wurst). Prior to the meeting, seven PAS members had a pre-presentation dinner with Mike. Many thanks to everyone who provided snacks at this meeting and to Bruce Wurst for donating the case of water. We look forward to seeing you at the next PAS meeting.



Mike Marron. Photo by Terri Finch

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## Upcoming March PAS Events

By Terri Finch, Event Manager

Check out these and other fun events on the PAS Calendar: <http://www.pasaz.org/forums/calendar.php>. RSVP where requested to [Events@pasaz.org](mailto:Events@pasaz.org). On the PAS Calendar, "Private" means the event is for PAS members only. If you wish to become a PAS member and attend the private events, please download a membership form here: <http://www.pasaz.org/forums/downloads.php?do=file&id=129>

**Mar 1:** PAS Meeting at PVCC main campus in room LS-203. Come enjoy a presentation by Andy Odell. Bring a snack to share. Everyone welcome. Doors open at 7:00 pm. Meeting begins 7:30pm. Here's the link for more details about this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2390&day=2018-3-1&c=1>

**Mar 3:** Public Star Party at South Mountain 6:30 to 8:30pm. More details can be found here: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2549&day=2018-3-3&c=1>

**Mar 4:** Free Telescope Workshop at Bookmans, 19th Ave and Northern in Phoenix - 3:30 pm to 5:30 pm. RSVP is required with Terri - [events@pasaz.org](mailto:events@pasaz.org). When you RSVP, email the make and model number of the telescope you need assistance with. We also assist with suggestions and advice on what telescope to purchase to match your needs. We have no telescopes for sale at this event. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2413&day=2018-3-4&c=1>

**Mar 8:** Huge public star party at PVCC Black Mountain Campus, 60th Street and Carefree Highway from 7:00 pm to 9:30 pm. Follow the signs to the star party at the observing deck next to the Aquila building. Everyone welcome. RSVP is requested with Terri - [events@pasaz.org](mailto:events@pasaz.org). This event is weather permitting. When you RSVP by email, please include the number in your party. An auto-reply will be provided from the above email address on the date of the event with a weather update. PAS usually

provides between 10 and 14 scopes for your viewing pleasure. Please do not touch the telescopes. Highlight on this night is the Orion Nebula. Prior to the Star Party, PVCC is will have STEAM activities indoors at the Aquila building from 6pm to 7pm with child and adult-friendly activities. Set up is 6:00 pm for telescopes. More details:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2402&day=2018-3-8&c=1>

**Mar 9:** School Star Party (Private)

**Mar 10:** Private Star Party

**Mar 17:** School Star Party (Private)

**Mar 22:** ASU West Public Star Party. Please see link for details about parking and where to find the star party on campus. PAS will be providing views through professional telescopes from 7:00 pm to 9:00 pm. Here's the link for more info: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2511&day=2018-3-22&c=1>

## Solar System Ambassador

By Newsletter Staff

After a 4-month evaluation process, PAS member Mark Johnston has been selected by NASA as a Solar System Ambassador. <https://solarsystem1.jpl.nasa.gov/ssa/home.cfm>

Solar System Ambassadors are provided with behind the scenes data, news and imagery to communicate the science and excitement of NASA's space exploration missions and discoveries with the people in their communities. His page on the NASA site is

[https://solarsystem1.jpl.nasa.gov/ssa/biography.cfm?US\\_ID=1672](https://solarsystem1.jpl.nasa.gov/ssa/biography.cfm?US_ID=1672) If anyone in the club is interested in the details behind upcoming or current missions, Mark can get all the data they might want. Members are welcome to contact him if they'd like any further information on the program. Congratulations Mark!



Mark Johnston: photo taken by Tim at Trumble Photography during Desert Botanical Garden Star Party on June 9 2017 & provided for use to PAS.

## March 1 PAS Meeting

Continued from page 1  
of Iowa under Dr. James Van Allen, then attended graduate school at Washburn Observatory at University of Wisconsin. He was an assistant professor at University of Northern Iowa, and then moved to Tucson to analyze the data from the Pioneer Venus Landing Probe. After that he moved to Flagstaff to work at Northern Arizona Uni-

versity, and is now retired from there, but still volunteers at the public program at Lowell Observatory, which supplies him with much research telescope time.

Dr. Odell became interested in astronomy at a young age, and after realizing that stars can't live forever, was intrigued with questions about where they come from,

how they live their lives, and how they die. As it turns out, answering questions simply brings up more questions, and eventually one must turn from the library to the telescope to answer them. This may seem like a losing strategy, but in fact, it is an excellent career choice. Dr. Odell will tell us about the three types of Binary Stars.

## “Meet the Guest Speaker” Dinner Prior to the Meeting

Our pre-meeting dinner will be at Chili's starting between 4:30 and 5:00 pm at 513 E Bell Rd, Phoenix, AZ 85022. RSVP is required by the DAY BEFORE so

that Terri has time to call in the reservation. Dinner usually goes until about 6:30. Come chat with the guest speaker and enjoy dinner with PAS. RSVP now at

Events@pasaz.org and include the number in your party.  
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2580&day=2018-03-01>

## PVCC Telescope Workshop Jan 25

By Sam Insana, PAS Officer and Member of the Board of Directors



Mary and Richard being helped by Rick and Rodney. First view of Moon. Photo by Sam.

PAS held this telescope workshop at PVCC in room G147. Rick Cunningham, Rodney Fong and Sam Insana helped Richard and Mary Martinez with their new Christmas 70mm refractor, showing them how to set up and use it. They were delighted by their first view of the Moon.

Sam helped another member of the public, Terry Hartman, over the phone. He had questions about the club, dark observing sites and whether we could recommend someone to help with electrical and mechanical problems with his mount. I referred him to Bruce Wurst who sometimes repairs telescope systems.

## March 15 2018

Sunrise: 06:38

Sunset: 18:36

Full: March 1 & March 31

Q3: March 9

New: March 17

Q1: March 24



## What's Up For March?

By Don K. Boyd, PAStimes Editor

| <u>Planets</u> |          |       |       |
|----------------|----------|-------|-------|
| Name           | Date     | Rise  | Set   |
| Mercury        | 03-15-18 | 07:19 | 20:01 |
| Venus          | 03-15-18 | 07:26 | 19:47 |
| Mars           | 03-15-18 | 01:56 | 11:47 |
| Jupiter        | 03-15-18 | 11:02 | 09:39 |
| Saturn         | 03-15-18 | 02:32 | 13:30 |
| Uranus         | 03-15-18 | 08:06 | 21:02 |
| Neptune        | 03-15-18 | 06:15 | 17:42 |
| Pluto          | 03-15-18 | 03:27 | 13:28 |

All Times Arizona Time



# What Is the Ionosphere?

By Linda Hermans-Killiam

High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere.

How did all those ions get there? They were made by energy from the Sun!

Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms. At the ionosphere, atoms from the Earth's atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What's left is a positively or negatively charged atom, called an ion.

The ionosphere is filled with ions. These particles move about in a giant wind. However, conditions in the ionosphere change all the time. Earth's seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

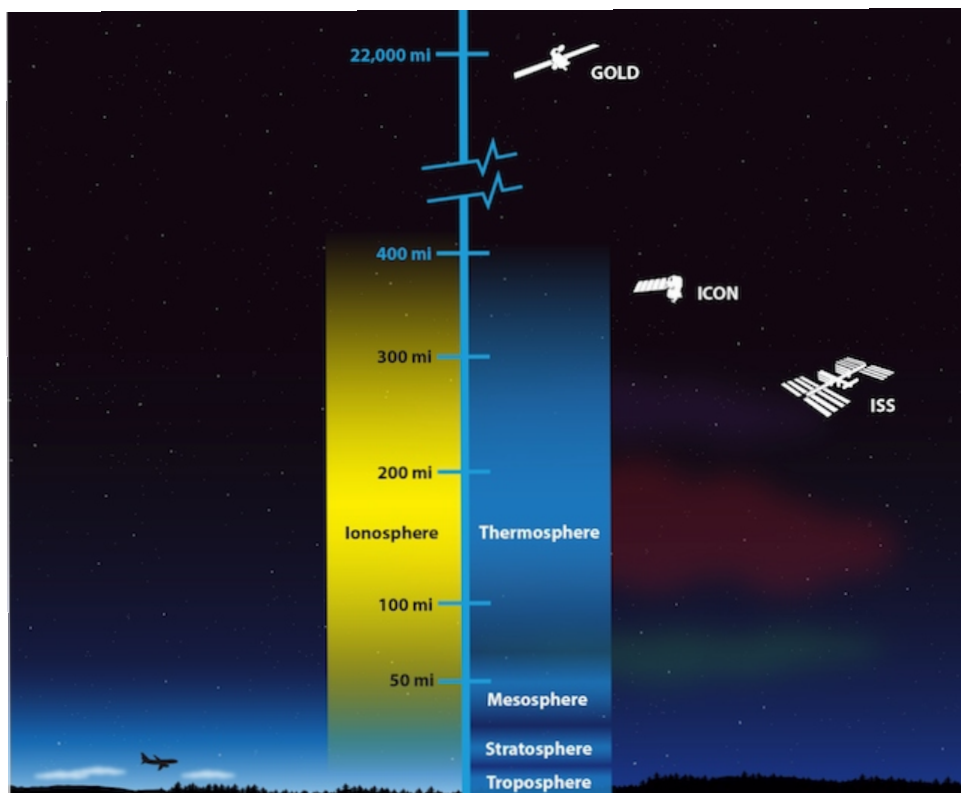
In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas every half hour. It will measure

the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD's wider view. ICON will study the forces that shape this part of the upper atmosphere.

Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before.

To learn more about the ionosphere, check out NASA Space Place: <https://spaceplace.nasa.gov/ionosphere>



*This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station (ISS). Credit: NASA's Goddard Space Flight Center/Duberstein (modified)*



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[paradisevalley.edu/  
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5 - 8 PM: Activities

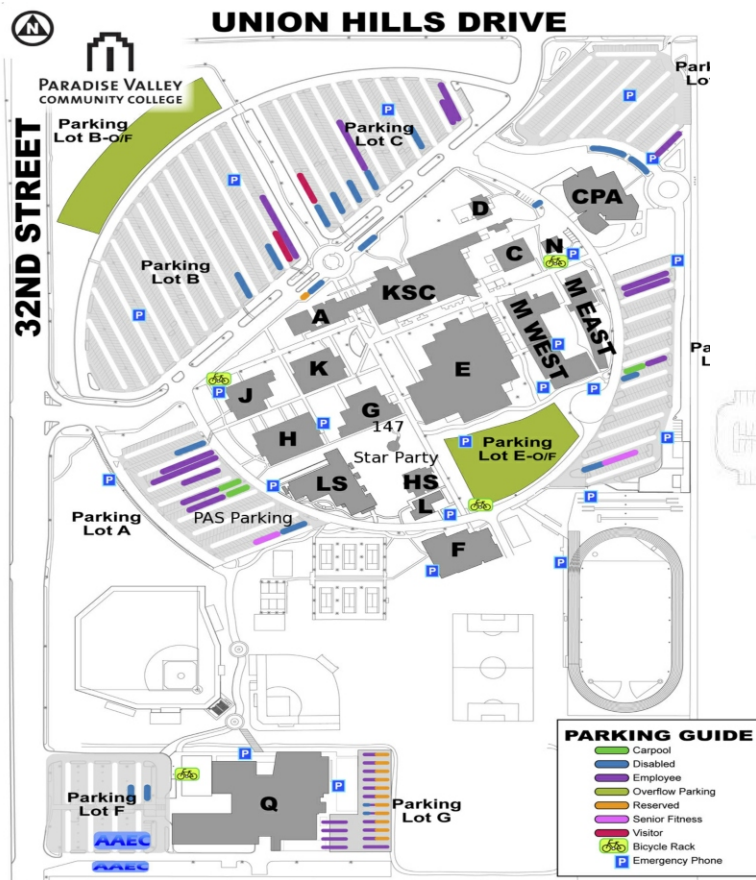
**THURSDAY, MARCH 8TH**

7 - 10 PM: Star Party



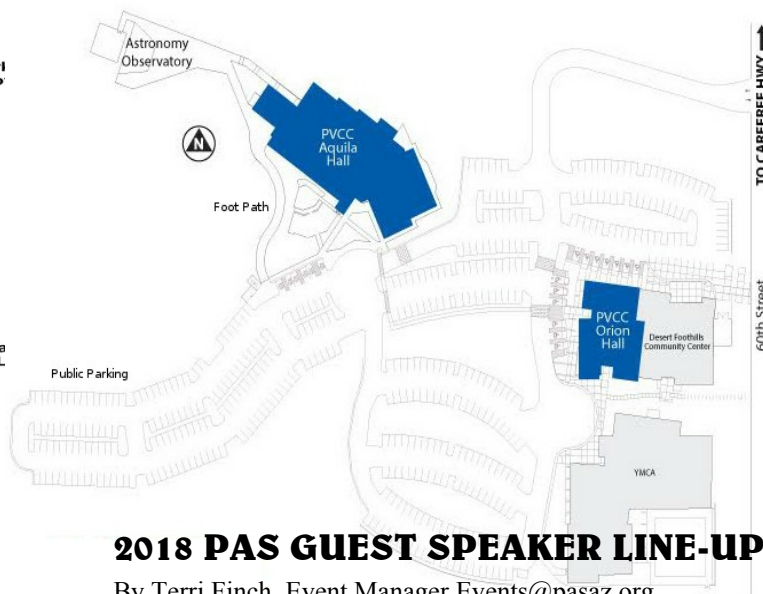
## Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



## Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



## 2018 PAS GUEST SPEAKER LINE-UP

By Terri Finch, Event Manager [Events@pasaz.org](mailto:Events@pasaz.org)

PAS Meetings are held at PVCC Main Campus on the first Thursday of the month in Room: LS-203 unless otherwise noted. Do you have an idea for a guest speaker? Email Terri the details. Here are the next scheduled guest speakers at PAS: <http://www.pasaz.org/index.php?pageid=meetings>

**Apr 5:** Gene Hanson "A Look at Another Astronomy Club"

**May 10:** Tom Polakis "CCD Photometry from Inside the Light Dome"

\*\*\* Summer Break - No Meetings

**Sep 6:** Laurence Garvie, Topic: Meteorites

## March 2018

| Sun                            | Mon | Tue | Wed | Thu                            | Fri                                     | Sat                                     |
|--------------------------------|-----|-----|-----|--------------------------------|-----------------------------------------|-----------------------------------------|
|                                |     |     |     | 1<br><i>PAS Meeting</i>        | 2                                       | 3<br><i>Public Star Party</i>           |
| 4<br><i>Telescope Workshop</i> | 5   | 6   | 7   | 8<br><i>Public Star Party</i>  | 9<br><i>School Star Party (Private)</i> | 10                                      |
| 11                             | 12  | 13  | 14  | 15                             | 16                                      | 9<br><i>School Star Party (Private)</i> |
| 18                             | 19  | 20  | 21  | 22<br><i>Public Star Party</i> | 23                                      | 24                                      |
| 25                             | 26  | 27  | 28  | 29                             | 30                                      | 31                                      |