

# The Ephemeris

January 2014

Volume 25 Number 01 - The Official Publication of the San Jose Astronomical Association



## Houge Park January Events

### 03 January

In-Town Star party (Houge): 7-10PM

### 05 January

Solar observing: 2-4PM

Fix-It Day: 2-4PM

### 11 January

Board of Directors Meeting: 6-7:30PM

General Meeting: 7:30-10PM

Guest Speaker: Dr. Charlie Conroy  
"Galaxies from Beginning to End"

### 24 January

In-Town Star party (Houge):  
7:00-10:00PM

## SJAA Contacts

President: Rob Jaworski  
Vice President: Lee Hoglan  
Treasurer: Michael Packer  
Secretary: Teruo Utsumi  
Director: Rich Neuschaefer  
Director: Greg Claytor  
Director: Dave Ittner  
Director: Ed Wong  
Director: pending  
Beginner Class: pending  
Fix-it Program: Ed Wong  
Imaging SIG: Harsh Kaushikkar  
Library: Dave Ittner  
Loaner Program: Dave Ittner  
Lunar/Planetary: Akkana Peck  
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Editor: Sandy Mohan  
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School Events: Jim Van Nuland  
Speaker: Dr. Charlie Conroy  
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## Letter from the Editor

Dear SJAA Members and Friends,

As I looked out of my plane window flying from San Francisco to Boston on a cold winter day in December, I saw vast stretches of fluted wind-swept mountains all covered in snow, track marks of frozen rivers, and neat white rectangles and circles. I was reminded of an amazing KOED TV special on Mars I had watched just the night before - Mars whose landscape bore a remarkable similarity to Earth - with its incredible mountains, craters, dusty rocks and underground river tracks. Looking back, last year was marked by some amazing developments in space exploration. Let's take a look at a few notable ones. The Curiosity Rover having made a flawless landing on Mars in 2012 continued to send a wealth of data as it went about driving and digging and analyzing samples. The recent discovery that there was once a fresh water lake on Mars has reignited hopes of life on Mars. Jupiter's icy moon, Europa was found to have geysers erupting with water plumes taller than Mount Everest! It is believed that there is a churning ocean underneath the icy crust and testing these waterspouts could be a way to detect signs of life in the ocean beneath. Last year was also marked by the final flight of Space Shuttle Endeavor. My husband and I had camped out at Moffett Field along with thousands of others for several hours to catch a glimpse of the Shuttle as it flew very low, perched atop a modified 747 jet. The Shuttle had made 25 trips to the International Space Station totaling approximately 123 million miles! 2013 has also been a year of considerable excitement featuring the fascinating "sun grazing" Comet ISON that flew in from the

Oort cloud from the outer edges of the solar system. ISON was named after the telescope used to discover it - International Science Optical Network. The comet sparked tremendous interest all over the world as astronomers watched to see if it would survive its fiery encounter with the sun as it flew as close as 750,000 miles. Sadly, it did not survive the intense heat of the sun and was pronounced dead. See Akkana's write up on Comet ISON in the December issue of Ephemeris. And finally, the airwaves were abuzz with news about Kepler's discovery of a staggering number of exoplanets (extrasolar planets) in our Milky Way Galaxy. Scientists now estimate there may be billions of planets in our Galaxy. Lots of exciting news last year, indeed! On behalf of SJAA I wish you a very Happy New Year! May the New Year bring happiness, health and the time to stop, stare and marvel at life and the skies.

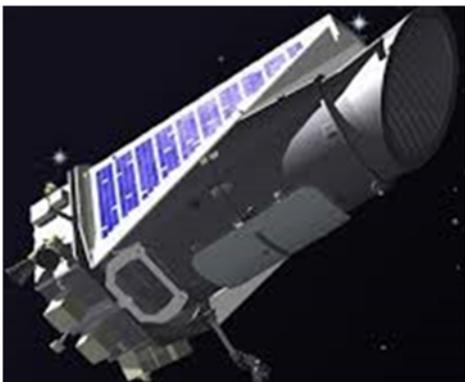
Sandy Mohan



### "The Amazing Selfie of 2013"

NASA astronaut Mike Hopkins took the stunning snap of himself with Earth in the background while performing repairs on the station  
Credit: Mirror.co.uk

## Astonishing Number of Extrasolar Planets



Credit: NASA

NASA launched the Kepler Space telescope in 2009 to detect Earth-sized potentially habitable planets. Based on a statistical analysis of all the Kepler observations, astronomers now estimate that one in five stars like the sun have planets about the size of Earth and a surface temperature conducive to life. Given that about 20 percent of stars are sun-like, the researchers say, that amounts to several tens of billions of potentially habitable, Earth-size planets in just the Milky Way Galaxy!

"When you look up at the thousands of stars in the night sky, the nearest sun-like star with an Earth-size planet in its habitable zone is probably only 12 light years away and can be seen with the naked eye. That is amazing," said UC Berkeley graduate student Erik Petigura, who led the analysis of the Kepler data.

"It's been nearly 20 years since the discovery of the first extrasolar planet around a normal star. Since then, we have learned that most stars have planets of some size orbiting them, and that Earth-size planets are relatively common in close-in orbits that are too hot for life," said Andrew Howard, a former UC Berkeley post-doctoral fellow who is now on the faculty of the Institute for Astronomy at the University of Hawaii. "With this result, we've come home, in a sense, by showing that planets like our Earth are relatively common throughout the Milky Way Galaxy."

For NASA, this discovery is really important, because future missions will try to take an actual picture of a planet, and the

size of the telescope they have to build depends on how close the nearest Earth-size planets are," Howard said. "An abundance of planets orbiting nearby stars simplifies such follow-up missions."

The team cautioned that Earth-size planets in orbits about the size of Earth's are not necessarily hospitable to life, even if they reside in the habitable zone around a star where the temperature is not too hot and not too cold – the so called Goldilocks' Zone.

Credit: Science Daily

## Curiosity Rover Finds Evidence of Freshwater Lake on Mars



Photo: NASA

The Curiosity Rover tooling around on the dry surface of Mars has for the first time uncovered direct evidence of what used to be a freshwater lake, scientists say. There is no water left where the lake once was, but drill tests and chemical analysis of fine-grained rocks by the Curiosity robot's science tools suggest conditions were right for the lake to have once supported microbial life, perhaps as long as 3.6 billion years ago. The latest findings provide the strongest evidence yet that Mars could have been habitable enough for life to take hold, according to the report in the journal Science.

Co-author Sanjeev Gupta, of the Imperial College London, describes the discovery as "great" because lakes are the perfect environment for simple life to develop and be preserved.

"This is the first time that we have actually found rocks on Mars that provide evidence of the existence of lakes," he said.

The rocks contained signs of carbon, hy-

drogen, oxygen, nitrogen and sulphur, according to the report. Small bacterial life forms known as chemolithoautotrophs are known to thrive under similar conditions on Earth, and are typically found in caves and under the sea in hydrothermal vents.

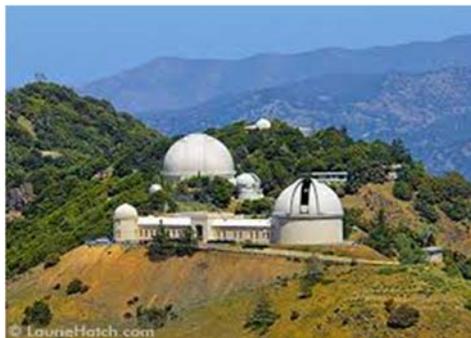
While no life forms have been detected in the rocks, Mr Gupta says the mobile Mars Science Laboratory has drilled into the mudstone and sandstone rocks and found clay minerals, suggesting an interaction with water.

The sandstone also resembles that found in Earth rivers, leading scientists to hypothesise that a river once flowed into the lake, which lies at the foot of a low mountain.

Credit: ABC Online

## Lick Observatory May be Shutting Down

The iconic 125-year-old Lick Observatory on Mount Hamilton near San Jose, California, is facing the threat of closure. Astronomers there say the University of California, which funds the observatory, has slashed its budget to fund other projects and has issued a report recommending converting Lick to a public museum. Lick's supporters say the observatory has made key contributions to the development of new scientific instruments and to recent research, such as discovering new extrasolar planets. But the panel that recommended the changes says the moves are necessary to support other projects such as the W. M. Keck Observatory and the planned Thirty Meter Telescope.



Credit: Y. Bhattacharjee, Sciencemag.org



## Kid Spot Jokes:

- ◇ Why didn't the Sun go to college?  
Because it already had a million degrees.
- ◇ What did Mars say to Saturn?  
Give me a ring sometime.

## Kid Spot Quiz:

- 1) What is the Latin name for the Sun?
- 2) About how many stars are in our galaxy?

## Kid Spot Night Sky Challenge: Jan 2014

See if you can spot the following objects in the sky:

- ⇒ Jupiter – look for the Great Red Spot
- ⇒ Craters on the Moon – Tycho and Copernicus
- ⇒ Orion Nebula
- ⇒ Big Dipper or Ursa Major

<http://skyandtelescope.com/observing/ataglance>



M42 Orion Nebula  
Photo: Pillar

# Constellations

## Auriga—The Charioteer

Auriga is one of the 48 constellations listed by the 2nd-century astronomer Ptolemy and remains one of the 88 modern constellations. Its name means 'charioteer' in Latin.

Auriga, which appears as a slightly irregular pentagon north of Taurus and between Perseus and Gemini, is best seen from October through April.

Auriga is most prominent during winter evenings along with the five other constellations that have stars in the Winter Hexagon asterism.

The Winter Hexagon or Winter Circle/Oval is an asterism appearing to be in the form of a hexagon with vertices at Rigel, Aldebaran, Capella, Procyon and Sirius. The stars in the hexagon are parts of six constellations. Counter-clockwise around the hexagon, starting with Rigel, these are Orion, Taurus,

Auriga, Gemini, Canis Minor and Canis Major.

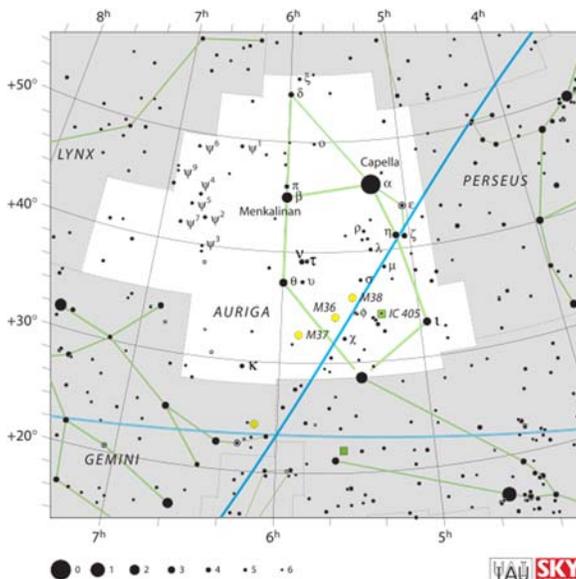
Smaller and more regularly shaped is the Winter Triangle (also known as the Great Southern Triangle), an approximately equilateral triangle that shares two vertices (Sirius and Procyon) with the larger asterism. The third vertex is Betelgeuse, which lies near the center of the hexagon. These three stars are three of the ten brightest objects, as viewed from Earth, outside the Solar System. Betelgeuse is also particularly easy to locate, being a shoulder of Orion, which assists stargazers in finding the triangle.

Its brightest star, Capella, is an unusual multiple star system among the brightest stars in the night sky. The star Capella was said to be the goat Amalthea, the goat that nursed the infant Zeus.

Auriga has three, open cluster, Messier objects;

- M36 (approx. 60 stars, 4,100 light years away),
- M37 (approx. 500 stars, 3,600 to 4,700 light years away),
- M38 (approx. 100 stars, 4,200 light years away)

M37, the brightest of the three clusters, covers an area nearly as large as the full moon and contains a number of red giants.



Source: Wikipedia, IAU Sky & Telescope

## Kid Spot Quiz Answers:

- 1) Sol
- 2) 200 billion

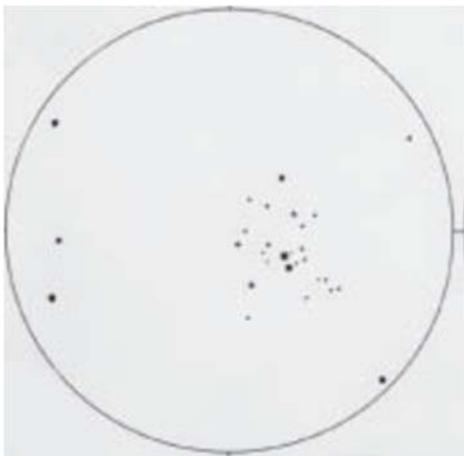


## Starhop from a cascade to the river Eridanus

Mark Wagner

This month we visit a famous open cluster with nebulosity, a number of lesser known open clusters, and finally a bright planetary nebula. Only one of these is a Messier object. If you wonder why these articles include only a handful of bright objects, it is because well known objects can be found easily in any number of printed astronomy guides or on the Internet. I also pick objects within a strict observing window each month, concentrating on a swath of sky two hours of Right Ascension wide from zenith east at astronomical dark. This month is from Right Ascension 03:28 to 05:28. In prior months I've mentioned several local observing sites, all within an hour drive of San Jose. This month I select objects that you may be able to observe from your backyard or at an SJAA in-town star party at Houge Park. Unless otherwise noted, the notes you'll read are from my daughter Mimi's observations (my note taking though) from our Los Gatos backyard in a 10" f/5.6 Dobsonian. All drawing are courtesy of local observer Peter Natscher.

Our first object is in Camelopardalis (Cam). NGC1502 is an open cluster which punctuates a 2.5 degree long string of pearl asterism comprised of a cluster... a nice swirl of



Open cluster NGC1502 (Camelopardalis) at 124x, sketched by Peter Natscher

stars."

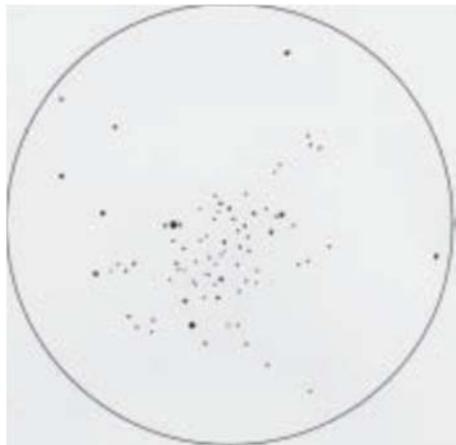
**Everyone knows the next one**, the Seven Sisters, *Subaru*, The Pleiades — M45. Located in Taurus, this open cluster is obvious without optical aid. It is a wonderful target for binoculars, revealing dozens of young stars. Robert

Leyland in Novato describes it in his 8" f/6 Dob: "Tonight they were very nice. The telescope brings out dozens of additional stars beyond the 6 I can see directly, (maybe 7 or 8 with averted vision). The 4 brightest stars

simply glowed and a faint touch of nebulosity surrounded them."

Move to NGC 1647 in Taurus using the V of the Hyades as a pointer. Come off the bottom (eastern) extension. The four stars are a great yardstick, taking that distance beyond Aldebaran and slightly west to mag 5.0 97-Tauri. A nice V of stars can be seen in a low power field, and the cluster sits just beyond the vertex of the V. A grouping of three double stars seem to define the central portion of the cluster, arcing gently east to west. The brightest star in the field was about 23' S of the center of the group. Six and one half degrees east south-east in Taurus is NGC 1817. It sits just off the tip of Orion's bow. Steve Sergeant used his Nexstar 5 at Houge to note "It is at the lower limit of stuff I expected to really see that night. With only perhaps 5 bright stars in my view, it was definitely an object for subtle tastes. One thing that made it interesting though, was observing it as a double cluster with dozen faint 8th and 9th magnitude stars. It's known as Kemble's Cascade. Begin in Perseus on Algol. Move 9 degrees north-northeast to Mirfak (Alpha Persei), then 10 degrees north into Cam to dim SAO 24054 (mag 4.2). Using an optical finder will make this easier. Continue 4 degrees north northeast to an east-west chain of four stars all mags 4 and 5. Then imagine the chain continuing the same distance east-southeast. You will have found a small bright jewel. A tight pair of bright stars stand out in the middle of the group, with other pairs running mostly east to west on either side of the bright pair. The cluster was visible in my 11x70 finder. This one is worth a look.

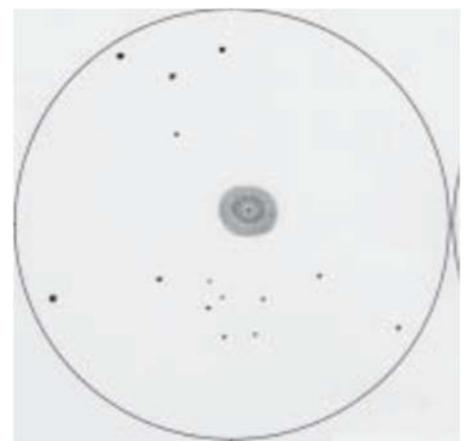
NGC 1528 is in a convenient location, and is easy to find in my 11x70 finder. It is an attractive open cluster with many bright stars. Two distinct chains extend west from the center of the group in a northeast to south-



Open cluster NGC1528 (Perseus) at 120x sketched by Peter Natscher

west direction, and a distinct condensation of stars sits southeast of the chains. Find it by following the curve of Perseus from Mirfak east, to where bright right triangle of mag 4 stars point west (these are the three eastern-most stars in the stick-figure of Perseus). Imagine a fourth star forming a parallelogram at the northeast corner, and you've found the spot. Just over a degree southeast you'll see NGC 1545, another open cluster in an easy location just east of a pair of mag 4 and 5 stars. It is a deceiving cluster. At first it seems there is nothing there but 4 bright stars. After looking a bit, many dim components begin to appear. The cluster is large. Bright Capella is east south-east from NGC 1545. The three stars close to the south of Capella are called "The Kids" and are the jumping off point to open cluster NGC 1664. Make another parallelogram using The Kids but place the imaginary star slightly more westerly. A bright star sits very close just SE of a chain extending south of a central concentration of stars defining the core of the cluster. Another chain emanates from the core sweeping to the east. All in all, this is a pretty neighboring NGC-1807."

The last object is a bright planetary in Eridanus — NGC 1535. At 48"x42" this will appear about half the size of the Ring Nebula. I find it by star hopping from Rigel almost 20 degrees west to Zaurak (34-Eridani) which is



Planetary nebula NGC1535 (Eridanus) at 245x, sketched by Peter Natscher

the brightest star in the area at mag 3. Just about 4 degrees back toward Rigel, you'll find this planetary.

William Schultz reports with his CG11 from Henry Coe "WOW! This P/N was bright enough to stop your eye at 80X, and it demanded more magnification. I clearly saw the two layers of nebulosity, the dark inner space and clear view of the central star."

Mark Wagner (Jan 2003)

- ◇ **Advanced Loaner Telescope Program**
- ◇ **Quick STArT Program Report**
- ◇ **SJAA Library**  
From Dave Ittner

These programs have been impacted by the work being done at the hall (our primary storage location for all of the clubs assets).

Hopefully we will be back up and running smoothly in January.

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## Observers Handbook

The RASC Handbooks are available for sale, \$25 each. From the RASC's website, "The Observer's Handbook is a 352-page guide published annually since 1907 by The Royal Astronomical Society of Canada."

<http://www.rasc.ca/observers-handbook>

Quantities are limited, be sure to get yours today, or at the next Fix-It session; January 5, 2014.

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## General Notices

From the Board of Directors

- February 2014 is the annual meeting for Board elections.
- Board positions to be determined this February 2014:
  - Rob Jaworski
  - Greg Claytor
  - Dave Ittner
  - open board seat
- Qualified candidates will be voted for at the annual membership meeting on February 2014.

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## Announcements

From the Board of Directors

- There is currently one (1) board seat open that needs to be filled. See Lee Hoglan or any board member if you are interested.

- The swap meet has been cancelled due to its proximity [caused by construction setbacks] to the annual Auction scheduled for March 2014..
- The Beginner Class Instructor position is still open. See any board member if you are interested.

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## Board Meeting December 14, 2013 Excerpts

### In attendance

Rob Jaworski, Lee Hoglan, Ed Wong, Greg Claytor, Dave Ittner, Michael Packer, Teruo Utsumi

Excused absence: Rich Neuschaefer

### Swap Meet

Subsequent to the Dec 2013 board meeting the decision was made to cancel the Swap Meet. See Board Announcements.

### Recognition Program

Greg Claytor is heading up the formation of a recognition program so the SJAA has a way to formally thank volunteers and other contributors. Greg has recently found seals and other supplies that are closer to an astronomy theme for the printed recognition certificates. Michael suggested having an annual event for annual awards event for the Gregory award, an annual award, and certificates. The idea is to make the annual awards a big event for the club.

### Potluck

Next: February 2014 Annual Meeting.

### Astronomy Technology Today Magazine subscription discount

SJAA members are entitled to a discount on a subscription to this magazine; please contact Ed Wong for details.

## Fix-It Program

From Ed Wong

We had several people come in for help this past month. Two needed help on how to set up their scopes and doing star alignments. The other two needed help with collimation. Thanks to Phil and Dave for helping out.

If you plan on bringing something to the FixIt session inside Building 1, though it's not required, we ask that you check out the FixIt page on the SJAA website and fill out the form so we know what to expect. Here's where to find it all:

<http://www.sjaa.net/fixit/>

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## Clubhouse Renovation

### Houge Park Facilities

From Rob Jaworski;

The renovation is complete!!

## Dark Sky Events

### January — February

### 2014

#### 04 January

Mendoza Ranch: 6-11PM

RCDO: tbd

Henry Coe State Park: open

#### 25 January

Star Party; RCDO: 7-9PM

#### 01 February

Mendoza Ranch: 6-11PM

Henry Coe State Park: open

#### 22 February

Star Party; RCDO: 7-9PM

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Articles for publication should be submitted by the 10th of the previous month.

San Jose Astronomical Association  
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San Jose, CA 95159-8243

<http://www.sjaa.net/contact>

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## San Jose Astronomical Association Membership Form

P.O. Box 28243 San Jose, CA 95159-8243

**New**    **Renewal** (Name only if no corrections)

**I prefer to get the Ephemeris newsletter in print form (Add \$10 to the dues listed on the left). The newsletter is always available online at <http://ephemeris.sjaa.net>.**

### Membership Type:

- Regular — \$20  
 Regular with Sky & Telescope — \$53  
 Junior (under 18) — \$10  
 Junior with Sky & Telescope — \$43

Questions? Send e-mail to  
[sjaamemberships@gmail.com](mailto:sjaamemberships@gmail.com)

Subscribing to Sky & Telescope magazine through the SJAA saves you \$5 off the regular rate. (S&T will not accept multi-year subscriptions through the club program. Allow 2 months lead time.)

Bring this form to any SJAA Meeting or send to the address (above). Make checks payable to "SJAA", or join/renew at <http://www.sjaa.net>

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