Southwest Florida Astronomical Society
SWFAS

The Eyepiece
September 2014

Contents:

A MESSAGE FROM THE PRESIDENT

I hope everyone had a good summer!

It's time for International Observe the Moon Night. We have 2 events planned; one at the Calusa Nature Center Planetarium where programs will run in the planetarium and telescopes will be setup for observing starting at 7:00 pm. The other is at Jaycee Park in Cape Coral. We will be starting that one earlier at 4:00 pm in order to attract attention for the evening. We also will be there to help people with telescopes that they want to bring out. We will have handouts and presentations available as well as solar observing early and the moon once it rises. We can use help at both locations, you don't have to have a telescope to come out and help. (We also have a very bright HST pass that night!

We are starting to get requests in for the fall/winter/spring events. If you know of any events please let me know. Country Oaks Elementary in Labelle has asked for a weeknight in mid-late January. Doug has the Shell Point Village Star Party Feb 7th.

We finally had a good star party last weekend at SeaHawk Park in Cape Coral!
Brian

In the Sky this Month

Moon: September – 1st Quarter 2nd; Full 8th; Last Quarter 15th; New 24th.

The Planets

Mercury will be difficult to spot, and will be very low on the horizon at sunset due to the shallow angle that the ecliptic makes with the horizon at dusk at this time of year.
Saturn dims to magnitude +0.6 this month. It starts the month near, α Librae (Zubenelgenubi), about 20° above the horizon an hour after sunset, but ends the month at only 10° above horizon. We're nearing our last chances of year to see Saturn in the evening with its rings open more than 23° from edge on.
On the 13th at 0.38 UT, magnitude 10.2 moon Rhea will occult or blot out a 7.8 magnitude star.
Mars begins the month at same magnitude as Saturn, but dims to +0.8 as it races back east relative to background stars and Saturn. It will be about halfway between Saturn and red Antares on the 12th. As it approaches Antares, there will be a good opportunity to compare the color of these two well-known "reds".
Uranus is visible in Pisces during the month.
Neptune is visible in Aquarius all month.
Finder charts are located at **skypub.com/urnep**.
Jupiter-rise increases from 2.5 hr to 4.5 hr before sunrise this month. Its magnitude will be -1.8 to -1.9. It is moving eastward from M44, approaching the western edge of Leo.
Venus moves lower this month as it rises only an hour before the sun. It will be within 1° of Regulus on the 5th.

Messier Objects – Compare Sagittarius' group of smaller Open Clusters; M21, M23, M25. Looking north are two more OCls; M29 & M 39. Then the ever popular M57 (ring nebula) is visible overhead.

Double Stars of the Month

Binocular – Alpha Vulpecula; Magnitudes 4.6, 5.9; Separation 427".

Telescope – Cygnus 61 (Piazzi's Flying Star; SE of Deneb); Magnitudes 5.4, 6.1; Separation 34".

Telescope, Challenging – Ophiuchus 70; Magnitudes 4.2, 6.0; Separation 2.8".

The International Space Station: Not visible in evenings this month.

Hubble Space Telescope: Nice viewing opportunities through most of the month.
Sept 4th at 9:31 pm from WSW to SW; max alt 40°; for 3 minutes at 1.7 mag.
Sept 5th at 9:34 pm from WSW to SW; max alt 62°; for 4 minutes at 1.0 mag.
Sept 6th at 9:17 pm from WSW to SE; max alt 87°; for 4 minutes at 0.6 mag.
Sept 7th at 9:11 pm from W to ENE; max alt 82°; for 5 minutes at 0.7 mag.
Sept 8th at 9:04 pm from W to ENE; max alt 74°; for 5 minutes at 0.8 mag.
Sept 9th at 8:57 pm from W to ENE; max alt 69°; for 5 minutes at 0.9 mag.
Sept 10th at 8:50 pm from W to ENE; max alt 67°; for 5 minutes at 0.9 mag.
Sept 11th at 8:43 pm from W to ENE; max alt 68°; for 6 minutes at 0.9 mag.

Sept 12th at 8:36 pm from W to E; max alt 71°; for 6 minutes at 0.9 mag.
Sept 13th at 8:29 pm from W to E; max alt 78°; for 6 minutes at 0.8 mag.
Sept 14th at 8:22 pm from W to E; max alt 88°; for 7 minutes at 0.7 mag.
Sept 15th at 8:15 pm from W to ESE; max alt 79°; for 7 minutes at 0.8 mag.
Sept 16th at 8:08 pm from W to ESE; max alt 64°; for 7 minutes at 1.0 mag.
Sept 17th at 8:01 pm from W to ESE; max alt 51°; for 8 minutes at 1.4 mag.
Sept 19th at 9:48 pm from W to SE; max alt 30°; for 7 minutes at 2.3 mag.
Sept 20th at 9:41 pm from WSW to SSE; max alt 23°; for 6 minutes at 2.8 mag.
Extracted from http://www.heavens-above.com/

Thanks to Chuck Pavlick for these two great photos:

North American & Pelican Nebula taken at Fakahatchee Strand

Lagoon & Trifid Nebula taken from backyard in light-polluted Cape Coral

Future Events

Upcoming Meetings

Our Next monthly meeting will be September 4th. Speaker/topic for the evening will be Bruce Dissette on the Messier Objects

Star Party and Event Schedule

Date	Event	Location	Time	Info/Contact
Thursday, September 4th	Monthly Meeting	Calusa Nature Center & Planetarium	7:30 pm	Brian Risley
Saturday, September 6th	International Observe the Moon Night	Calusa Nature Center & Planetarium	7:00 pm	Brian Risley & SWFAS
Saturday, September 6th	International Observe the Moon Night	Jaycee Park (off Beach Pkwy N of Cape Coral Brdg)	4-10 pm	Brian Risley
Sept. 27th	Star Party	CRP	Dusk	Bruce Dissette
Thursday, October 2nd	Monthly Meeting	Calusa Nature Center & Planetarium	7:30 pm	Brian Risley
October 25th	Star Party	CRP	Dusk	Bruce Dissette
Thursday, November 6th	Monthly Meeting	Calusa Nature Center & Planetarium	7:30 pm	Brian Risley
November 22nd	Star Party	CRP	Dusk	Bruce Dissette
December 20th	Star Party	CRP	Dusk	Bruce Dissette
Feb 7th 2015	Shell Point Star Party	Shell Point Village	Dusk	Doug Heatherly

Minutes of SWFAS Meeting – August 7, 2014

Will be in an upcoming issue

Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at 9.8 m/s^2 (32 ft/s^2). Only, that's not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

But surprisingly, the amount of *water content* stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers. Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time. Groundwater supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "[W]ithout GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can’t do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, *not* sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand!

Learn more about NASA’s GRACE mission here:
http://www.nasa.gov/mission_pages/Grace/

Kids can learn al about launching objects into Earth's orbit by shooting a (digital) cannonball on NASA's Space Place website. Check it out at: http://spaceplace.nasa.gov/how-orbits-work/

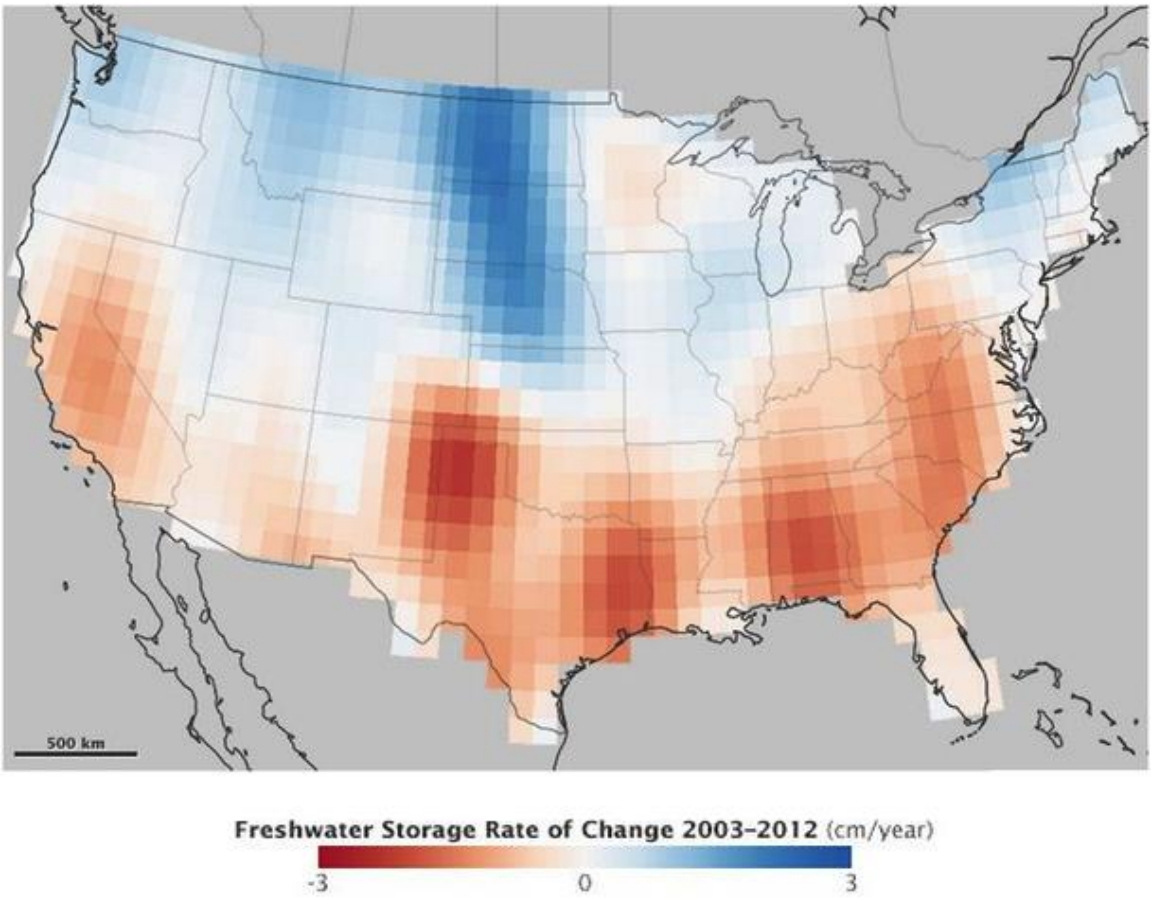


Image credit: NASA Earth Observatory image by Jesse Allen, using GRACE data provide courtesy of Jay Famigleitti, University of California Irvine and Matthew Rodell, NASA Goddard Space Flight Center. Caption by Holli Riebeek.

GRBs: A New Standard Candle?

By: Shannon Hall

Astronomers might be on the brink of developing a new rung on the cosmic distance ladder.

An artist's conception of a gamma-ray burst.
European Southern Observatory

Astronomy is a discipline pursued at unimaginable distances. And yet actually measuring the distance to a nearby exoplanet, or to a galaxy shining at us from the dark depths of the cosmos, seems almost futile.

One of the simplest methods is to use *standard candles* — objects with a known intrinsic brightness — and infer their distances based on how bright they *appear* to be when seen from Earth.

Astronomers have used Type 1a supernovae (SNe) as standard candles to great success. These explosions are the death cry of a dense white dwarf once it has collected too much additional matter. But we're constantly on the search for new standard candles that could be an independent rung on the cosmic distance ladder: a tool for measuring distances to farther and farther galaxies.

Now, two new papers submitted to separate journals have independently found that gamma-ray burst supernovae just might be "standardizable." And although both have yet to go through the rigorous peer-review process, outside experts are commending their work as solid starting points.

Gamma-ray Bursts as Standard Candles?

Roughly once a day the sky is lit up by a mysterious flash of energy. These events — gamma-ray bursts (or GRBs for short) — are among the most explosive and energetic events in the universe, sending out as much energy in a fraction of a second as our Sun will give off during its entire lifespan. Long GRBs (lasting more than 2 seconds) come from massive stars going supernova.

"When these stars undergo core collapse, they form a 'central engine,' which is expected to either be a rapidly rotating black hole that is surrounded by an accretion disk, or a neutron star with an exceptionally large magnetic field," says Zach Cano (University of Iceland), who authored one of the two studies. "When the core collapses, the central engine creates a bipolar jet that pierces through the star, and at a large distance from the star, creates a burst of gamma rays, and later an afterglow."

Type 1a SNe are easily used as standard candles because the amount of light we receive over time follows a specific pattern. The plots of this emission, known as light curves, have a characteristic shape, allowing astronomers to determine the explosion's intrinsic brightness based on this shape alone.

But at first glance, the supernovae that create GRBs have irregular light curves.

So Cano and a second, independent team comprising Xue Li and Jens Hjorth (both from University of Copenhagen, Denmark) simultaneously dug a little deeper. Both teams looked at separate sets of eight GRB-SNe events in order to search for any consistency across the light curves.

They used two different approaches. Cano assumed that all GRB-SNe follow the behavior of the prototypical GRB-SN 98bw (a step that astronomers have assured me is valid). Li and Hjorth instead directly used the light curves of the GRB-SNe and looked for a correlation among them.

At the end of the day Cano found that the supernova's luminosity correlated surprisingly well with the light curve's width, while Li and Hjorth found that the luminosity correlated surprisingly well with the light curve's decline rate.

"Before the two teams ... [submitted] their papers, it was not clear whether GRB-SNe could be standard candles," says expert Steve Schulze (Pontifical Catholic University, Santiago, Chile). "The papers by Cano and Li and Hjorth provide compelling evidence that GRB-SNe are standardizable." It is even more promising that two independent teams unknowingly supported each other's results so well.

There are multiple advantages to using GRB-SNe as standard candles, and both teams are excited to move forward.

"It appears that GRB-SNe may be as good standard candles as Type 1a SNe," says Hjorth. He explains that a major advantage is GRBs' high redshift range. Astronomers have detected GRBs at redshifts as high as 8, when the universe was only 0.6 billion years old. Using GRBs to measure distances in the early universe would better enable astronomers to understand the universe's mysterious expansion over time.

But the next step is actually *using* GRBs as standard candles. Cano thinks he has found a way to do this, but he's not going public just yet. "Building upon this result, initial (unpublished) results indicate that GRB-SNe can be used in the same fashion as SNe Ia to constrain cosmological models," says Cano. "The initial results also show that the

universe is comprised of mostly dark energy, and with a Hubble constant between 60 to 70 km/s/Mpc," which matches calculations by members of ESA's Planck mission. "The results are preliminary, but the results are exceedingly encouraging."

Of course it's important to stress that this is still a very young method with plenty of hurdles to jump through. Both teams will have to look at much larger data sets before the community will agree this approach works.

References:

Z. Cano. "Gamma-ray Burst Supernovae as Standardizable Candles." Posted to arXiv.org on July 9, 2014.

Xue Li and Jens Hjorth. "Light Curve Properties of Supernovae Associated With Gamma-ray Bursts." Posted to arXiv.org on July 13, 2014.

- See more at: http://www.skyandtelescope.com/astronomy-news/grbs-new-standard-candle-08112014/?et_mid=687221&rid=246752253#sthash.dwTNZXbH.dpuf

Black Hole Trio Questioned

By: Shannon Hall

New data shed light on last month's exciting discovery of a black hole triplet — but they suggest instead that the threesome is really just a twosome.

An artist's conception of a distant quasar.
NASA

Scientists are always skeptical of new claims. So it shouldn't come as a surprise when new discoveries are called into question. They can be a topic of debate and back-and-forth banter for years.

A prime example is the recent discovery of a black hole trio. Although the media gleamed with headlines about this exotic system and raised hopes for what it might herald, newly announced observations suggest that the black hole system might be less than it seems.

A Triple Supermassive Black Hole?

Astronomers first identified the system SDSS J150243.09+111557.3 as a quasar — a supermassive black hole rapidly accreting material at the center of a distant galaxy — three years ago. But its double-peaked spectrum suggested there were two supermassive black holes hiding in the galaxy's core, lying roughly 24,000 light-years from each other.

Last month, Roger Deane (University of Cape Town, South Africa) and colleagues used observations from the world-spanning European VLBI network to resolve one of the two supermassive black holes into two separate radio signals lying 450 light-years apart.

The double signal indicated that again the source was not one, but two supermassive black holes, meaning the system contained three supermassive black holes in total.

Everyone was thrilled. It was, after all, the tightest trio of black holes known to date. Before then, only four triple black hole systems were known, with the closest pair being 7.8 thousand light-years apart — nearly 2,000 times the distance from Earth to the nearest star, Proxima Centauri. But the new pair had a separation nearly one-twentieth as wide.

Deane and colleagues looked through six similar galaxies before finding this trio. The fact that they found one so quickly suggested that binaries were more common than previously thought, holding implications for galaxy evolution and cosmology.

But the result had to be true, withstanding further observations.

The Scientific Debate Begins . . .

Deane's results rippled through the astronomical community. And when Joan Wrobel (National Radio Astronomy Observatory) and colleagues saw that this source might be a compact triplet, they decided to take a second look.

Luckily the team had been sitting on data from the VLBA (a similar array to the European VLBI network, with 10 identical antennas across the United States) of the distant system for a few years. "We already had the data, but we got busy with other research problems," says coauthor Hai Fu (University of Iowa). Deane's results

prompted them to take a closer look at their data and see if they could spot anything interesting.

The team was surprised to find that their data went much deeper, revealing an odd structure that seemed to be linking the two radio sources together. "So we thought, 'Wow, maybe we should re-evaluate the possibility of this binary black hole interpretation,'" explains Fu.

Wrobel's team now interprets the double signature as a single black hole shooting off jets. When the jets hit the interstellar medium, they form hot spots. So the two radio sources are not two separate black holes, but two hot spots formed from the jets of a single black hole.

"This result is interesting and reveals some substructure that was not possible to see in our slightly less sensitive and lower resolution data," says Deane. But although he acknowledges that the VLBA observations cast doubt on the triple black hole, he cautions that (as the authors themselves say) further observations are required to explore this alternative interpretation further.

Wrobel's team favors their argument — while secretly hoping that they're wrong. If the tight binary exists, it would allow astronomers to explore uncharted territory, such as realms warped by strong gravity. But the results remain inconclusive. Wrobel's team has already put in a proposal for another round of observations.

"This is an ongoing scientific debate," says Fu. "I hope the public can enjoy it."

References:

R. P. Deane et al. "A Close-pair Binary in a Distant Triple Supermassive Black-hole System" *Nature*, June 25, 2014

J. M. Wrobel et al. "Evidence from the Very Long Baseline Array that J1502SE/SW are Double Hotspots, not a Supermassive Binary Black Hole" *The Astrophysical Journal Letters* , Accepted

- See more at: http://www.skyandtelescope.com/astronomy-news/black-hole-trio-questioned-08182014/?et_mid=688302&rid=246752253#sthash.Uxwvc109.dpuf

Fingerprint from the First Stars

By: Camille M. Carlisle

Astronomers might have found a star that was infected by the explosive death of one of the universe's first stars.

The first generation of stars to form in the universe would have been massive and luminous, potentially growing to be more than 100 times the Sun's mass. When they died in supernova explosions, these stars would have ejected heavy elements into their surroundings, particularly iron.
National Astronomical Observatory of Japan

These first stars are called Population III stars, in an expansion of the Population I and II categories created by Walter Baade in the 1940s. Population I stars are generally the youngest, most heavy-element-tainted stars, while Population II stars are older and less tainted; Population III stars came (theoretically) before both.

Pop III stars would have formed from the pristine hydrogen-and-helium mix filling the early universe. They synthesized the first batches of heavy elements — such as carbon, oxygen, and iron — and spewed these into the cosmos when they died, thereby influencing the universe's early evolution.

Astronomers haven't found any of these stars still shining today. That, paired with computer simulations of conditions in the cosmos's earliest eras, suggests that Pop III stars were the massive, live-fast-die-young type. Just how massive remains unclear, but most were probably several tens of Suns, with a few reaching a couple hundred times the mass of our star. (In other words, über-big.)

Such stellar behemoths would have died in spectacular supernovae. The most massive might even have died in a peculiar explosion that theorists call a pair-instability supernova, or PISN.

Stars generally exist in *hydrostatic equilibrium*, in which the collapse-encouraging force of gravity is balanced by the collapse-averse pressure of gas and radiation. In the lead-up to a PISN, the central temperature of the massive star rises to such a dramatic fever that the photons deep inside convert into electrons and their antimatter partners,

positrons. Unfortunately for the star, electrons and positrons don't do much for the outward, gravity-countering pressure, and so gravity takes over and initiates a runaway collapse. The collapse compresses the star's innards, triggering runaway fusion of the star's remaining fuel, which in turn sets off a colossal explosion.

A PISN explosion would taint the surrounding gas with high levels of nickel, calcium, and iron, among other things. But it wouldn't create elements heavier than iron (such as strontium or barium) because that would require a cache of extra neutrons, and there aren't a lot of neutrons around to work with. (A PISN doesn't create a neutron star.)

PISN Left a Mark?

Astronomers have seen hints of PISN-like events before, in a supernova seen in 2007 and also in two other superluminous explosions found in archival data of the early universe, reported in 2012.

Now Wako Aoki (National Astronomical Observatory of Japan and the Graduate University for Advanced Studies, Japan) and colleagues have approached PISNs in a different way, by finding a star that bears the chemical fingerprints of one of these explosions.

The star, SDSS J001820.5-093939.2, is one of 150 low-metallicity stars that the team surveyed. It's a cool, hydrogen-core-fusing star with a mass just under half the Sun's, shining at an apparent magnitude of 15.8 just south of the celestial equator, in the constellation Cetus.

J0018-0939 has the high levels of nickel, calcium, and iron expected from PISN tainting. It also has low levels of light elements, such as carbon and magnesium, compared with iron — also in keeping with PISNs. Its composition doesn't fit what would have been created if it had formed from material infected with a regular, core-collapse supernova, with a white dwarf's Type Ia supernova, or with a combination of the two. Instead, the various chemical markers suggest the best explanation is that the star formed from material seeded by the death of a *very* massive star (more than 100 solar masses and maybe up to about 250), either in a PISN or in a more run-of-the-mill, core-collapse supernova.

Admittedly, this all sounds like a game of Six Degrees of Separation, where the Pop III star is Kevin Bacon. "The thing is that stellar archaeology is always only circumstantial, even in the most clear-cut cases," says Volker Bromm (University of Texas at Austin), who is at the forefront of Pop III theoretical work.

Bromm explains that there are two arguments in favor of the Pop-III enrichment scenario. One, the PISN theory naturally explains J0018-0939's relatively high level of heavy elements: the PISN explosion inserted a whole lot of these metals into the local surrounding gas. Two, the standard explanations simply have more problems than the PISN one.

J0018-0939 is the only star of about 500 in this metallicity range that has this peculiar makeup, the authors note in the August 22nd *Science*. That parallels theoretical work done by Bromm and others that suggests these massive stars were only a few percent of the total Pop III population.

One interesting implication of the discovery by Aoki's team: J0018-0939 is "metal poor" in the grand scheme of things (it has less than 1% of the Sun's level of iron), but compared with the most metal-poor stars (where the iron abundance can be 1/100,000 or less of the solar level) the star is metal rich. Many astronomers assumed Pop III stars wouldn't be able to contaminate their surroundings with a high level of heavy elements, and so they have focused on extremely metal-poor stars when looking for those formed from material marked by a Pop III supernova. But a PISN can inject a high level of heavy elements into its immediate surroundings, seeding material at a level higher than previously looked for. In other words, astronomers might have been looking in the wrong place for PISN-marked stars. Maybe with this new insight, they'll be able to find more and learn how common highly massive stars were in the early universe.

Reference: W. Aoki et al. "A chemical signature of first-generation very massive stars." *Science*. August 22, 2014.

Happy Times for Comet Watchers

By: Bob King

Seize the moment and bookend your next clear night with two fine telescopic comets: Jacques at dusk and Oukaimeden at dawn.

Comet Jacques (C/2014 E2) has returned to evening skies! Discovered last March 13th by Cristovao Jacques and the **Southern Observatory for Near Earth Asteroids Research** (SONEAR) team, this comet hails from that commodious, cometary beer cave called the **Oort Cloud**, where these icy critters chill for billions of years as much as a light-year away from the Sun.

Comet Jacques glows a striking green-blue from fluorescing gases in its coma on August 17, 2014. The narrow ion tail is much fainter. *Image by Chris Schur.*

Earth takes a year to make a turn around the Sun and Pluto a tedious 248, but they're speed demons compared to Jacques, which barely plods along for most of its 20,000-year orbit. It's been a long wait, but we're glad you're here.

Comet Jacques and its orbit seen projected on the plane of the solar system on August 21, 2014. The comet's orbit is actually steeply inclined to the plane of the solar system; it's currently far north of the ecliptic. *Chris Peat / Heavens Above*

Jacques lingered in the evening sky through spring, slowly brightening until passing perihelion on July 2nd. Pumped up now by solar heating and approaching Earth since that warm encounter, the comet has grown a bulbous head and long, skinny ion tail that bears an uncanny resemblance to the onions I've pulled out of my garden this summer.

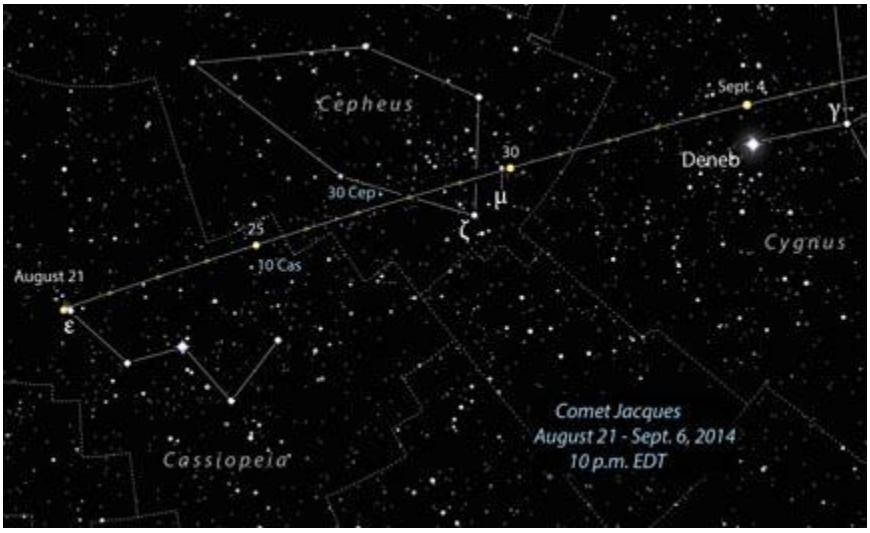
Last month and early this, Comet Jacques resided in Taurus and Auriga low in the dawn, but its elongation (angular distance) from the Sun has been rapidly increasing over the

past two weeks. In an exquisite example of astronomical timing, the Moon has departed the evening sky at the same time Jacques has returned to it. Sweet!

What's more, the comet is still magnitude +7 and within range of 10×50 binoculars. Don't expect onions though; Jacques will look more like a dab of mist. A 4-inch telescope is sufficient to reveal a bright pseudo-nucleus within a diffuse 7′ or 8′ coma. Large-scope owners will detect the pale green emission from cyanogen (CN) and diatomic carbon (C_2) in the coma and possibly a degree or more of its long, faint tail.

A striking portrait of Comet Jacques in front of the emission nebula Sh 2-205 on August 15, 2014. *Image by Michael Jaeger.*

Fortunately, as the comet's distance from the Sun continues to increase, its distance from Earth shrinks, causing it to remain steady in apparent brightness. Seiichi Yoshida, who maintains the excellent **Weekly Information about Bright Comets**, predicts that the comet will hold its current magnitude through early September. Jacques passes closest to our planet on August 28th at a distance of 52.4 million miles.



Finder chart showing the daily position of Comet Jacques across Cassiopeia, Cepheus and Cygnus in the next two weeks. Note that on the evening of August 21st in North America, the comet passes close by Epsilon Cassiopeiae. Stars are shown to magnitude 7.5. Click to enlarge. *Source: Chris Marriott's SkyMap*

Comet Oukaimeden

Comet Oukaimeden, with a coma about half as large as Comet Jacques' and a short, east-pointing tail, can be viewed just before dawn low in the eastern sky now through the beginning of September. *Image by Damian Peach.*

Dusting up the other end of the sky is Comet Oukaimeden (C/2013 V5). It's magnitude 8.5 or 9.0 at the moment, but this sleeping beauty is expected to crest to 5.5 by mid-September. Oukaimeden (OO-kay-MEE-den) is named for the observatory in Marrakech, Morocco, where it was discovered last November. As always, take predicted comet magnitudes with a teaspoon of skepticism.

Like Comet Jacques, this comet hails from the Oort Cloud — with an incoming orbital period measured in millions of years. After its orbit is gravitationally tweaked by the planets, particularly Jupiter and Saturn, it will drop by the inner solar system more frequently: about once every 6,000 years.

To see Oukaimeden, get to bed early and set your alarm for two hours before sunrise. You'll find it low in the eastern sky traveling east through dim Monoceros near Canis Minor.

Finder chart for Comet Oukaimeden's as it flies across Monoceros through early September. (The horizon location at 5 a.m. changes daily.) Stars to magnitude 8. Click to enlarge. *Source: Chris Marriott's SkyMap*

Like a migrating bird, Oukaimeden heads south as fall approaches. Observers at mid-northern latitudes will only be able to track the comet until the start of September before it's lost in twilight. Those in the tropics and southern latitudes will hang onto it longer.

Have at these icy travelers now before they go back into hiding for the rest of our lives.

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