Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society

May Events

8th-Monthly Meeting and **Star Party** Our meeting will be held at the Herrett Center for Arts and Science and begins at 7:00 pm. The star party follows the meeting. Our guest speaker will be Mr. Steve Bell of the Boise Astronomical Society. Steve will be presenting "Judging the Sky" This presentation will hopefully take some confusion out of rating the night sky prior to observing. If you are new to astronomy or you want to refresh before the warmer weather this topic will help you.

14th-Bi-Monthly Astronomy Talk-Chris Anderson, will be presenting **"The Astronomy of Global Climate Change."** The talk begins at 8:00 pm in the Rick Allen Room at the Herrett Center. Adult admission: $2.50, students: $1.50, children 6 and under free. Telescope viewing following the talk, 9:00 PM to midnight (weather permitting). Admission: $1.50 or free with talk or paid planetarium show admission.

The President's Message

Welcome to the Snake River Skies newsletter, your month by-month guide to the night sky. Each issue contains useful observing information about the visible planet, bright comets and asteroids, along with details on notable sky events like eclipses and meteor showers; see page 2 for more details.

For viewers in the Magic Valley, May continues to bring longer hours of daylight, pushing back observing time until later in the evening. Soon, I hope to have a report on my experiences with the Meade ETX-LS 6" ACF Telescope, which I purchased through the C.S.I. Herrett Center Store.

Finally, the Herrett Center Store is raffling off a Meade LXD-55 Schmidt-Newtonian 6" Telescope w/go-to target location (value $780) for $5 per ticket. There is a limit of 200 tickets, so act soon. To purchase your tickets please contact myself, or Chris Anderson for more information. Money raised will also benefit the Society.

Terry Wofford, Pres.

Below left is the actual telescope in the raffle as set-up on Astronomy Day 2010. Image © 2010.04.24 by Pam Olsen, used with permission.

MVAS Mission

The Magic Valley Astronomical Society was founded in 1976, the Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy. The society serves as a source of astronomical phenomena, history and lore by providing educational and observing opportunities and information for its members and the general public and promotes viewing of celestial objects with special events for adults and children in south central Idaho.

Welcome to the Magic Valley Astronomical Society

Welcome to the society and hello. We hope you have a good time, enjoy the hobby, & bring good skies with you.

We hold indoor meetings each month at the Herrett Center for Arts & Science College of Southern Idaho campus in Twin Falls, ID, USA . Our meetings start at 7:00pm on the second Saturday of the month. There will always be a very interesting program, class or presentation at these meetings, as well as good fellowship. There is always something new to learn.

Following our meetings we have a star party (weather permitting) at the Centennial Observatory, also at the Herrett Center.

Our star parties are free and you don't have to bring your own telescope. Telescopes are also set up outside on the stargazer's deck. Star Parties are held year round, so please dress accordingly as the Observatory is not heated, nor air conditioned.

Wishing you dark skies and clear nights!

MVAS Board

May Observing Highlights

Venus will be climbing higher in the evening sky at dusk all month. It will be shining very brightly at magnitude -3.9. Through a telescope Venus will appear as a nearly full disk early in the month. On the 15th and the 16th, the Moon will be close to Venus and make a good naked eye or binocular view.

Mars will be visible in the south west sky as it grows dark. It will sit by itself between Leo and Cancer. Mars will shine at magnitude 0.9 at mid-month, and magnitude 1.1 at the end of the month. Mars will be too small to see much detail.

Jupiter will be low on the eastern horizon before dawn this month. It will be shinning brightly at magnitude -2.2 so it should be very obviously brighter than any star in that part of the sky. Uranus will be very close to Jupiter all month.

Saturn will be high in the sky to the south in western Virgo as it grows dark. This would be the time to get a telescope on it – when there is less atmosphere to look through. Saturn will peak around magnitude 0.9 this month.

Uranus will be low in eastern dawn sky near Jupiter. They will start the month around 5º apart and close to 1º apart by month's end and will be a good binocular target. It would also be a good way to find Uranus for those who have never seen it. Uranus will be shinning at magnitude 5.9.

Neptune will be above Jupiter in Aquarius in the eastern morning sky. It rises around 2AM so sometime between 4AM and just before dawn starts is the best time to look for it. You will need dark skies and a pair of binoculars or a telescope to spot it.

Moon Phases for May

6 Last Quarter Moon at 4:15 UT.
14 New Moon at 1:04 UT.
20 First Quarter Moon at 23:43 UT.
27 Full Moon at 23:07 UT.

Visible Comets

C/2009 K5 McNaught sweeps from Cepheus past Polaris to Camelopardalis during the month and remains circumpolar.

81P Wild: This periodic comet glows around 10th magnitude and lies within a few degrees of the 4th-magnitude star Iota Virginis all month.

Sky Calendar—May 2010

3 Venus 6.4° N of Aldebaran at 5h UT.

6 Moon at Apogee at 22h UT.

9 Moon near Jupiter at 12h UT.

12 Moon near Mercury at 12h UT.

15 Moon near Aldebaran at 7h UT.

16 Moon very near Venus at 12h UT.

18 Moon near Pollux (evening sky) at 8h UT.

19 Moon near Beehive cluster (M44) at 8h UT.

20 Moon near Mars (evening sky) at 7h UT.

20 Moon at Perigee at 9h UT.

21 Moon near Regulus (evening sky) at 0h UT.

22 Moon near Saturn (evening sky) at 23h UT.

24 Moon near Spica (evening sky) at 21h UT.

28 Moon near Antares (midnight sky) at 3h UT.

The Eta Aquarid Meteor Shower

On Thursday, May 6, the Eta Aquarid Meteor Shower reaches its peak of activity. The Eta Aquarids are courtesy of Halley's Comet. Between May 1 and 8, Look east after sunset for meteors streaking over the eastern horizon, although Aquarius and its star Eta do not rise until the middle of the night. Unfortunately the Moon will be an interfering factor.

Visible Asteroids

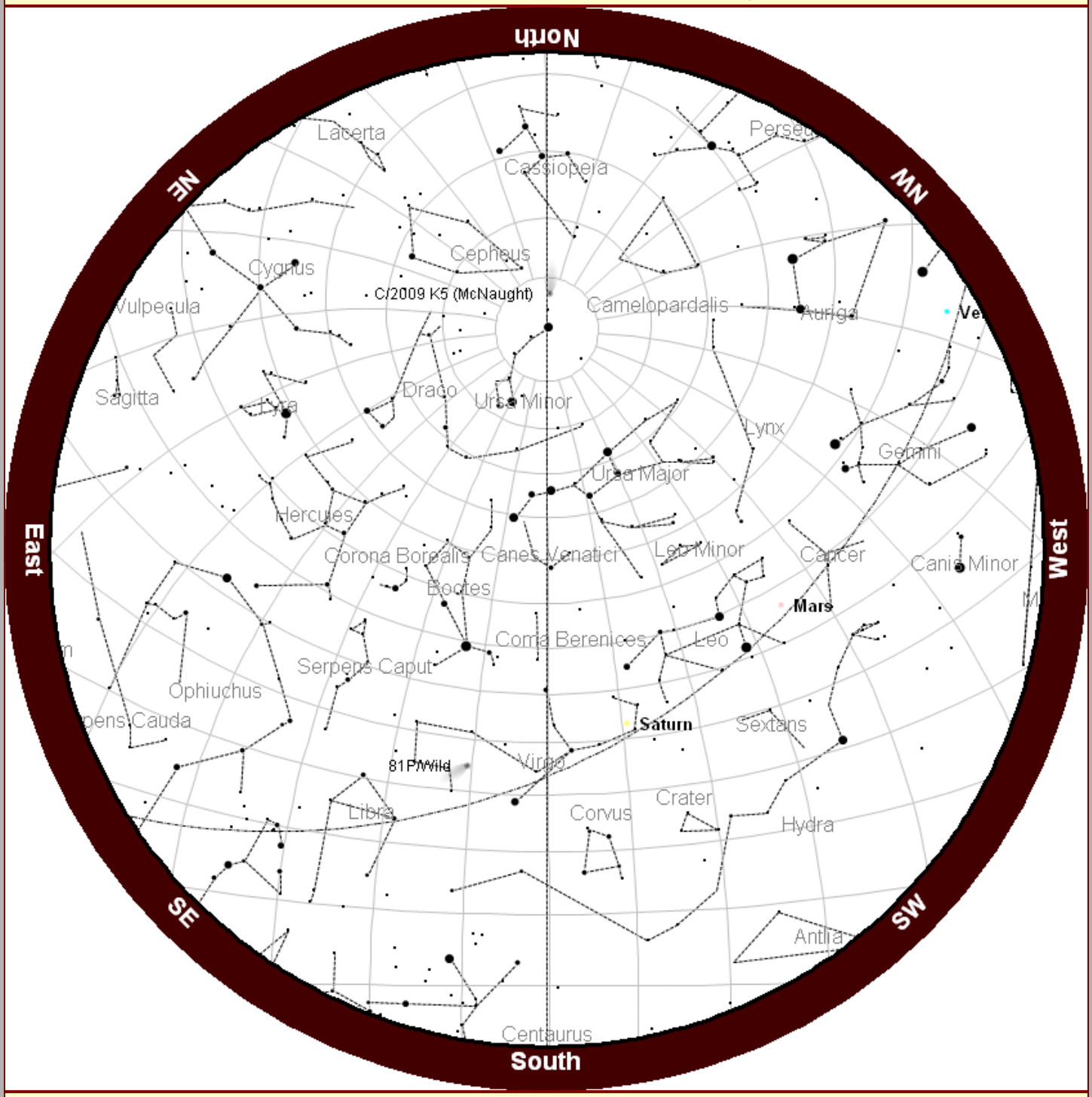
Ceres: This month, Ceres arcs through the rich star fields of northern Sagittarius.

Vesta: 7th-magnitude Vesta is an easy find in binoculars. Look for it just after dusk, within Leo.

Pallas: Pallas shines at magnitude +9 and lies in the constellation Corona Borealis Look around midnight, when the asteroid reaches its peak.

Images on this page are courtesy of NASA/ESA/STScI. Comet image is of 81P Wild, imaged with a Skywatcher ED-80 refractor in mid-April 2010. By Pete Lawrence
NASA/APOD NASA logo used to designate NASA related articles and is used from "public domain."

Planisphere for April Late Evening



Fun Facts about the Moon

The Moon is actually moving away from the Earth at a rate of 1.5 inches per year.

The surface area of the Moon is 14,658,000 square miles or 9.4 billion acres. Some of it is known to have water ice covering it.

The Earth rotates about 1000 mph. By comparison, the moon rotates about 10 mph.

The New Moon always rises at sunrise. First quarter at noon. Full Moon always rises at sunset and the Last Quarter will rise at midnight.

Cdr. David Scott (Apollo 15) conducted an experiment of dropping a hammer and a feather to see which would land first. This followed an experiment done by Galileo to test a theory. “All objects released together fall at the same rate regardless of mass.” They both hit together on the Moons surface.

Flipping on the Lights in Space

Exploring the universe is a bit like groping around a dark room. Aside from the occasional pinprick of starlight, most objects lurk in pitch darkness. But with the recent launch of the largest ever infrared space telescope, it's like someone walked into the room and flipped on the lights.

Suddenly, those dark spaces between stars don't appear quite so empty. Reflected in the Herschel Space Observatory's 3.5-meter primary mirror, astronomers can now see colder, darker celestial objects than ever before—from the faint outer arms of distant galaxies to the stealthy "dark asteroids" of our own solar system. Many celestial objects are too cold to emit visible light, but they do shine at much longer infrared wavelengths.

Herschel can observe much longer infrared wavelengths than any space telescope before (up to 672 microns). Herschel also has 16 times the collecting area, and 16 times better resolution, than previous infrared space telescopes. That lets it resolve details with unprecedented clarity. Together, these abilities open a new window onto the universe. "The sky looks much more crowded when you look in infrared wavelengths," says George Helou, director of the NASA Herschel Science Center at Caltech.

"We can't observe the infrared universe from the ground because our atmosphere blocks infrared light, and emits infrared itself. Once you get above the atmosphere, all of this goes away and suddenly you can look without obstruction."

Herschel launched in May 2009 from the Guiana Space Centre in French Guiana aboard a European Space Agency Ariane 5 rocket. Since then, it has expanded the number of distant galaxies observed at far infrared wavelengths from a few hundred to more than 28,000 and with the instrument testing and system checkout phases finally completed, the discoveries are only now beginning. Beyond simply imaging these dark objects, Herschel can identify the presence of chemicals such as carbon monoxide and water based on their spectral fingerprints. "We will be able to decipher the chemistry of what's going on during the beginnings of star formation, in the discs of dust and gas that form planets, and in the lingering aftermath of stellar explosions," Helou says. Those are just the expected things. Who knows what *unexpected* discoveries may come from "flipping on the lights?" Helou says "we can't wait to find out."

Herschel is a European Space Agency mission, with science instruments provided by a consortium of European-led institutes and with important participation by NASA.

This image from the Herschel Space Observatory shows most of the cloud associated with the Rosette nebula, a stellar nursery about 5,000 light-years from Earth in the Monoceros, or Unicorn, constellation. Herschel collects the infrared light given out by dust. The bright smudges are dusty cocoons containing massive embryonic stars, which will grow up to 10 times the mass of our sun. The small spots near the center of the image are lower mass stellar embryos. The Rosette nebula itself, and its massive cluster of stars, is located to the right of the picture. Credit: ESA and the PACS, SPIRE & HSC Consortia.

Rosette Nebula

Constellation:	Monoceros
Right Ascension:	$06^h\ 33^m\ 45^s$
Declination:	+04° 59′ 54″
Distance:	5,200
Apparent Mag.	9.0

This article is courtesy of the Jet Propulsion Laboratory, California Institute of Technology and NASA.

Water Ice Discovered on an Asteroid for the First Time

Water ice has been found on the surface of a nearby asteroid for the first time – a discovery that could help explain how Earth got its oceans, scientists announced Wednesday.

Two teams of researchers independently verified that the asteroid 24 Themis – a large rock hurtling through space in the asteroid belt between Mars and Jupiter – is coated in a layer of frost. They also found that the asteroid contains organic material, including some molecules that might be ingredients for life. But scientists have not found any evidence for life itself on this asteroid, or anywhere else in the universe beyond Earth.

While comets, which have characteristic tails and generally orbit farther out in the solar system, are known to have water, asteroids in that region were thought to be too close to the sun to contain water on the surface without it evaporating away. The largest asteroid in the solar system, Ceres, is thought to harbor a vast amount of frozen water, but scientists suspect all of it is buried beneath a rocky, dusty surface. But in this new study, researchers found concrete proof of water ice on the surface of 24 Themis by measuring the specific characteristics of sunlight bouncing off the surface of the asteroid. They saw the tell-tale signatures of H_2O coating most of the surface of the 123-mile (198-km) wide rock.

Icy rock

"This is the first time we've actually seen ice – literally H_20 – on an asteroid," said one of the study leaders, Andrew Rivkin of Johns Hopkins University. Previously, hints that water might be present on 24 Themis were found in the form of hydrated minerals, which were thought to have formed from the reaction of water with rock. But this time the researchers saw the direct signature of water itself, he explained.

Another science team, led by Humberto Campins of University of Central Florida, found the same thing. Both teams used the NASA Infrared Telescope Facility atop on Mauna Kea in Hawaii to make their observations, but conducted them on different nights. "Our work and their work are very nicely confirming and complementary," Campins said. Campins' team timed their observations so that they caught the asteroid at different points in its rotation, and combined these data to create a rough surface map, showing that not only is ice present on 24 Themis, but it coats much of the surface on all sides.

"To our surprise there was water ice, there were organic molecules, and they were more or less evenly distributed throughout the surface," Campins told SPACE.com. "We thought that was fascinating." Both teams reported their findings in the April 29 issue of the journal Nature. Another researcher – Henry Hsieh of Queen's University Belfast in the U.K., who was uninvolved in either study – noted surprise at the extent of ice coverage on the asteroid.

"The average temperatures of asteroids (about 150–200 Kelvin) at this distance from the sun should cause surface ice to sublimate away in a matter of a few years or less, which is inconsistent with the billions of years that Themis is thought to have spent at its current location," he wrote in an accompanying essay in the same issue of Nature.

Earth's water

The discovery might even provide clues about the origin of water on Earth. Earth as had a violent history, having been bombarded with space rocks throughout much of its life. In particular, a large rock was thought to have crashed into Earth some 4.5 billion years ago, knocking off a chunk that became our moon. This collision would have heated things up so much, any water that was on Earth at that point was vaporized. So how did the oceans arrive?

Some scientists have suggested that most of it arrived via other asteroids that crashed into Earth later in smaller collisions. But for that idea to hold weight, asteroids would have to carry water. Comets aren't a good possibility for this scenario because the water they hold tends to be of a slightly different nature, with atoms in a different configuration, or isotope, than most of the water on Earth.

Though the recent measurements can't tell anything about the isotope ratio of the water on 24 Themis, the fact that there is water there at all is an encouraging sign. "Our data are certainly at least consistent with the idea that you could bring in plenty of water form impacts," Rivkin said. If it sounds surprising that the vastness of Earth's oceans built up from deposits of water by asteroids, Rivkin said it isn't that crazy an idea. "We know that the rate of [asteroid] impacts was very high," he told SPACE.com. "If each impactor, each asteroid, were 20 to 30 percent water by weight, then that could potentially add up."

Article by Clara Mockowitz SPACE.com Senior Writer

Image: An illustration of the asteroid 24 Themis along with two small fragments that orbit with it. One of the small fragments is inert (as most asteroids are) and the other has a comet-like tail, produced by the sublimation of water ice from its surface. Scientists announced the first discovery of water ice on 24 Themis. Credit: Gabriel Pérez, Servicio MultiMedia, Instituto de Astrofisica de Canarias, Tenerife, Spain

The Eerie Silence

If aliens exist, where are they?

The physicist Enrico Fermi asked this question 60 years ago, and it has since come to be known as the "Fermi Paradox". Given how vast the universe is, and the billions of years that life has had to spread across the cosmos, why have we not found any evidence of alien life?

Paul Davies takes a fresh look at this question in his engaging and thoughtful new book, *The Eerie Silence*. Davies runs Arizona State University's Beyond Center for Fundamental Concepts in Science, and he's involved in the search for extraterrestrial intelligence (SETI). In fact, he is the Chair of the SETI Post-Detection Task group, which has developed a plan for the day we do find life elsewhere.

In his new book, he provides an overview of various efforts to contact aliens, and he also notes how recent discoveries have led to the widespread belief that life must be common in the universe. Hundreds of planets have been detected orbiting distant stars, and while these planets are more like Jupiter than Earth, that's mostly due to our detection methods. Less massive planets will likely be found by newer telescopes, and the fact that we have already found so many worlds bodes well for the potential number of habitable planets in the galaxy. In addition, life has been discovered in some of the most extreme environments on Earth, including the deep subsurface where sunlight cannot penetrate.

This suggests that life is possible in all sorts of unusual places, including planets we once would have considered inhospitable to life.

Davies asks us to step back from the popular view that life must be common in the universe. Instead, he says we should consider the possibility that life on Earth is a fluke, a completely improbable event – a winning ticket in a lottery with a trillion-trillion-to-one odds:

To a physicist like me, life looks to be a little short of magic: all those dumb molecules conspiring to achieve such clever things! How do they do it? There is no orchestrator, no choreographer directing the performance, no esprit de corps, no collective will, no life force – just mindless atoms pushing and pulling on each other, kicked about by random thermal fluctuations. Yet the end product is an exquisite and highly distinctive form of order. Even chemists, who are familiar with the amazing transformative powers of molecules, find it breathtaking. George Whitesides, Professor of Chemistry at Harvard University, writes, "How remarkable is life? The answer is: *very*. Those of us who deal in networks of chemical reactions know of nothing like it."

Davies says there is nothing in the laws of chemistry or physics to indicate life is inevitable, or even a cosmic imperative. He notes there is no mathematical regularity to life, revealing some underlying basic law of nature. Instead, "the chemical sequences seem totally haphazard." And yet, life has its own sense of order, since rearranging those chemical sequences can upend the whole system.

"So the arrangement is at once *both* random *and* highly specific – a peculiar, indeed unique, combination of qualities hard to explain by deterministic physical forces," he writes.

Biology's law of evolution may have played a role in life's origin, since all that's theoretically needed to get the system going is the replication of information. For life today, that replication occurs with DNA, but for the first life, patterns in a physical structure or even particular arrays of atoms may have been enough. While life's origin from non-living materials is still a mystery, Davies says that life may be one possible outcome of complex self-organizing systems. Just like ant colonies, the stock market and the internet, life may result from a law of increasing complexity that occurs under certain circumstances.

To find out whether life was a bizarre accident unique to Earth, we need to search for life elsewhere. Davies points out that there has only been one successful mission by any space agency to search for life on another planet: NASA's Viking mission.

"The media tend to present all Mars exploration as part of the search for life, but this is a sly piece of disinformation," he writes. "It is true that some Mars exploration – looking for water, for example – bears indirectly on the question of life, but explicitly biological experiments have for thirty years been systematically eliminated by NASA missions."

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Most of the extrasolar planets found so far are gas giant planets like Jupiter, and are not likely to have life as we know it. Image Credit: *NASA/JPL/Space Science Institute*

The surface of Mars as seen by one of the Viking Landers. The surface of the Red Planet is thought to be extremely hostile to life, and any bacteria hitching a ride on spacecraft would probably not survive there for long. Image credit: *NASA / JPL / Malin Space Sciences System*

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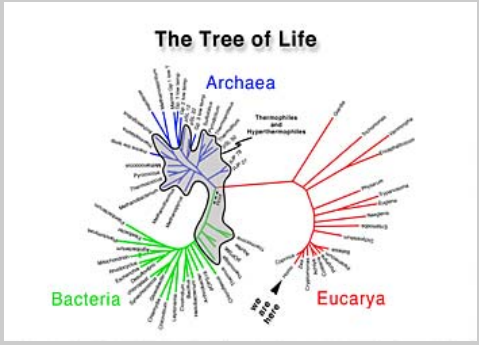
Most scientists think the Viking life experiments found no proof of life, although some, including Gilbert Levin, who designed Viking's "labeled release experiment" contest this conclusion. Even if we were to unquestionably find life on Mars, Davies notes, this wouldn't tell us if there was life farther afield, since Earth and Mars swapped material back and forth over the history of the solar system. Meteorites striking Earth sent some of our rocks hurtling into space and on to Mars, and vice versa – and some of those rocks could have contained microbial life.

To really answer the question, we need to find evidence for life on a far-distant planet. However, Davies says another way to prove that life is more than a freak accident is to find a completely different kind of life on Earth.

"If life started more than once on Earth, we could be virtually certain that the universe is teeming with it," Davies writes. "Unless there is something very peculiar about our planet, it is inconceivable that life would have begun twice on one Earth-like planet but hardly ever on the rest."

All life on Earth can be placed on a diagram called the Tree of Life, which indicates how the various organisms can be traced back to a common ancestor. But a shadow biosphere would be composed of life that would not have a place on the Tree. Davies writes: If you examine the innards of a microbe, chances are you will find the same stuff – DNA, proteins, ribosomes – as is found in you and me. At least, that has been the experience so far. But microbiologists have only just scratched the surface of the microbial realm. Our world is literally seething with these tiny organisms. Just one cubic centimeter (0.061 cubic inches) of soil might contain millions of different species adding up to billions of microbes in all, and the vast majority haven't even been classified, let alone analyzed. Nobody knows for sure what they are; for all we know, some of them could be life as we don't know it.

The Tree of Life shows the interconnectedness of all life on Earth. The Tree is divided between



major cell types: those with a nucleus (eukaryotes) and without a nucleus (prokaryotes: the bacteria and archaea.)

Because scientists must culture microbes in a lab in order to study them, an entirely different form of life would go unnoticed because the tests are custom-made to handle known life forms. Davies says new tests need to be developed to see what might be hidden right in front of our eyes.

Astrobiologists often say that complex life may be rare in the universe, but microbial life is probably abundant. They base this assumption on Earth's history, because simple life started relatively quickly here, perhaps within 500 million years after Earth's origin, but multi-cellular life didn't appear until much later. The first evidence in the fossil record of multi-cellular life dates back to about 2 billion years ago, some 2.5 billion years after the Earth formed. The story of life on Earth is mostly a saga of single cells.

Even if complex life can be found elsewhere, does that mean it will be intelligent? By "intelligent," we often mean a species that will use science to investigate the universe. Davies again throws cold water on our assumptions, saying the scientific method is a specific outcome of Greek philosophy and medieval European monotheism. Despite this, Davies gamely uses the Drake Equation to estimate there could be 10,000 civilizations in the galaxy capable at this time of communicating by radio waves.

"At this time" is an important element of his estimate, since a barrier to interstellar communications is not only distance but time. Consider aliens living one thousand light years away. Davies points out that if they were able to see Earth in their telescopes, they would not see us as we are today, but as we were in the year 1010 A.D. – long before we invented radio dishes. And because human radio technology is only about 100 years old, it will take another 900 years for our first signals to reach them.

Communication signals on Earth are now mostly sent by optical fibers rather than by radio wavelengths, so Davies says there's no reason to think advanced aliens would bother with that technology. Instead, he suggests they may use neutrino beams, various wavelength beacons, or a galaxy-wide internet system to communicate.

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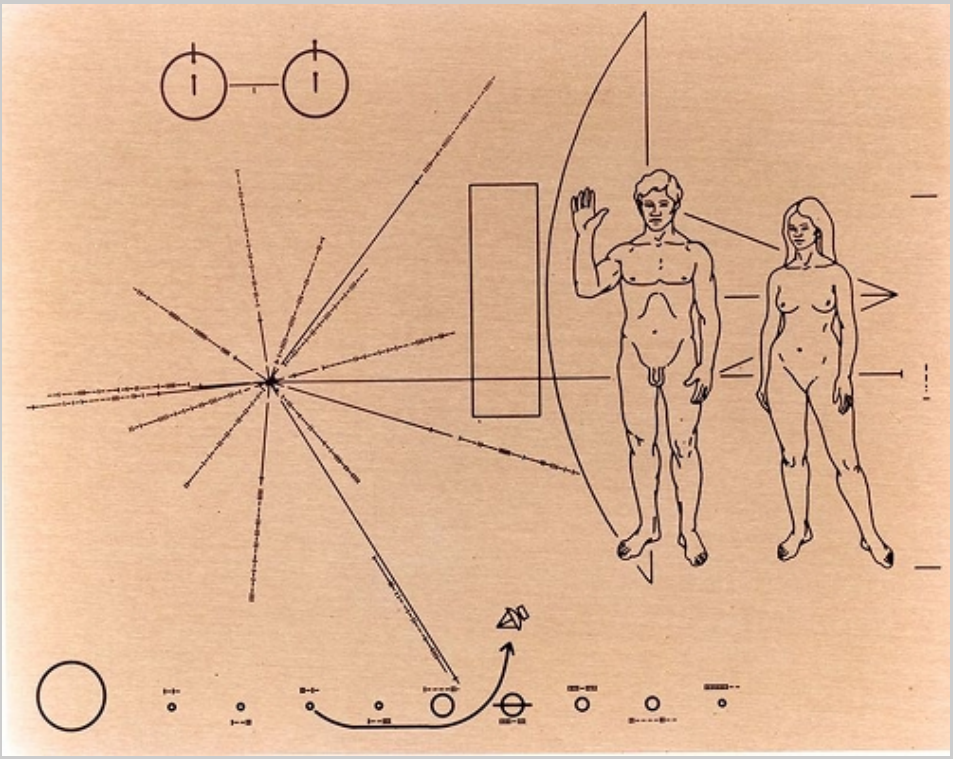
Aliens living more than 100 light years away wouldn't see evidence for radio technology on Earth, such as the Very Large Array in New Mexico. Image credit: *VLA, NRAO*



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Communication signals on Earth are now mostly sent by optical fibers rather than by radio wavelengths, so Davies says there's no reason to think advanced aliens would bother with that technology. Instead, he suggests they may use neutrino beams, various wavelength beacons, or a galaxy-wide internet system to communicate. We might even find clues to alien technology closer to home in the form of reproducing nanomachines, or microprobes that latch onto DNA. Davies thinks the SETI search should be expanded to include these, and it also should look for alien footprints in space that indicate advanced mining or engineering projects, or waste dump sites.

One problem with our past searches, says Davies, is we tend to imbue aliens with human motivations and behavior. He is especially critical of previous attempts to craft messages for aliens. The phonographs on the two Voyager spacecraft, which had greetings in 55 languages, as well as music, bird song, and other sounds from Earth, he calls "a pointless gimmick." Davies is equally dismissive of the plaques on the Pioneer 10 and 11 spacecraft, which depicted male and female human figures (with the male's hand raised in greeting), and our solar system and its location in the galaxy: This image may be worthless as far as signaling aliens is concerned, but it speaks volumes about humans. A brief message to an unknown alien community should presumably reflect the things that we consider most significant about ourselves. The picture is dominated by human shapes, yet our physical form is probably the *least* significant thing we can say. It is almost completely irrelevant both scientifically and culturally. To put it bluntly, who gives a damn what we *look* like? The raised hand part is the height of absurdity; such a culturally specific mannerism would be utterly incomprehensible to another species, especially one that might not have limbs.

Instead, Davies says our messages should be based on mathematics, preferably containing equations that describe our knowledge of the laws of the universe. By talking about what we may have in common with life elsewhere, true communication can take place. Only later should we share more Earth-centric information.

Davies says if we ever do make contact, human society would be changed forever. He thinks religion would be especially hard-hit. But he also acknowledges that SETI itself has been described as a religion, since it is driven by faith rather than proof. Even if the hunt for aliens comes up empty after a million years of searching, he says that would not be absolute proof that they don't exist.

As a scientist, Davies says he wouldn't be surprised if life on Earth turns out to be entirely unique. This lonely outlook makes him uneasy, but he also notes this would be a golden silence, because life on Earth would be even more precious if we really are alone.

Still, the fact that we don't know and may never have the answer about alien life is reason enough to keep searching, says Davies. By stretching our minds to try to envision all the possibilities in our search for aliens, not only may we one day find what we seek, but in the process we also will learn about many other deep and enduring mysteries of the cosmos.

Image upper left: The Pioneer plaques are onboard the Pioneer 10 and 11 spacecraft, which launched in 1972 and 1973. The pictorial message was designed to provide information for aliens about the origin of the spacecraft, and include a human male figure waving "hello." Image credit: *NASA Ames Research Center*

Image below: The Japanese Space Agency's robotic spacecraft Kaguya captured this image of Earth while orbiting the Moon. Despite our hopes for a universe teeming with life, Davies says we shouldn't be surprised to discover that we are alone in the cosmos. Image credit: *SELENE Team, JAXA, NHK*

Looking into the Eyepiece

M13 -Globular Cluster in Hercules.

M13 is one of the most prominent and best known globular clusters. Visible with binoculars in the constellation of Hercules, M13 is frequently one of the first steps beyond the ordinary visible to the casual sky gazer. M13 is a colossal home to over 100,000 stars, spans over 150 light years across, lies over 20,000 light years distant, and is over 12 billion years old. At the 1974 dedication of Cornell University's Arecibo Observatory, P.R. a radio message about Earth was sent in the direction of M13. The reason for the low abundance of unusual blue straggler stars in M13 is currently unknown. M13 is the brightest cluster in the northern hemisphere.

Globular clusters are gravitationally bound concentrations of stars, which form a nearly spherical system around our galaxy. They orbit the galactic center along highly elliptical paths, and on average one revolution takes 300 million years.

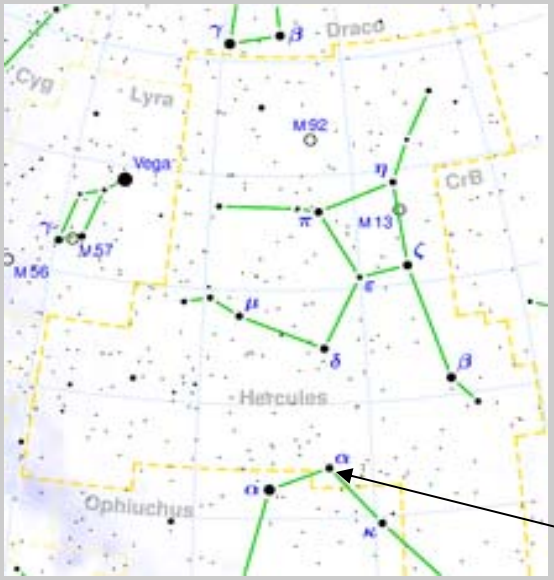
M13, the Great Cluster in Hercules, teeters on the edge of naked eye visibility and appears in binoculars as a small, circular, hazy glow. It contains over 300,000 stars, and its total luminosity is 300 thousand times the Sun. The cluster is located in the "Keystone" of Hercules, about a third of the way along a line drawn from Eta to Zeta Herculis, and any optical aid will reveal it. Small refractors or large binoculars show a large, bright smudge, but resolution of individual stars is difficult. A 4.5-inch telescope starts to show stars at the cluster's edge as individual points, and with a 6-inch scope their images are strong and steady.

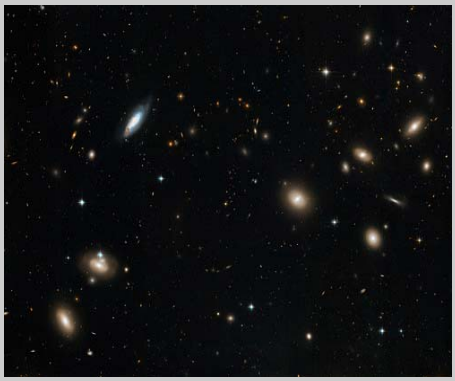
With 8- and 10-inch instruments the size of the cluster swells a bit, and the clarity of individual stars closer to the center increases. Nevertheless, resolving the bright core into stars is nearly impossible. Careful observers with 6-inch or larger instruments might also notice dark patches against the disk of the cluster. The cause is probably intervening interstellar matter.

Inhabitants on a planet inside M13 would probably know nothing of the Galaxy and other galaxies, as their view would be completely blocked by the brilliance of their own skies. To them, the Great Cluster in Hercules would be "the Universe".

Constellation:	Hercules
Right Ascension:	$16^h\ 41^m\ 41.44^s$
Declination:	+36° 27′ 36.9”
Distance:	25.1 lt-years

Image: M13 Amateur Astrophoto NASA/APOD
Map of the location of M13 in Hercules from WikiMedia Commons.





Coma Cluster in Coma Berenices.

Coma Cluster (Abell 1656) is a large cluster of galaxies that contains over 1,000 identified galaxies. Along with the Leo Cluster (Abell 1367), it is one of the two major clusters comprising the Coma Supercluster.

The cluster's mean distance from Earth is 99 Mpc (321 million light years). Its ten brightest spiral galaxies have apparent magnitudes of 12–14 that are observable with amateur telescopes larger than 20 cm. The central region is dominated by two giant elliptical galaxies: NGC 4874 and NGC 4889. The cluster is within a few degrees of the north galactic pole on the sky. Most of the galaxies that inhabit the central portion of the Coma Cluster are ellipticals. Both dwarf, as well as giant ellipticals, are found in abundance in the Coma Cluster.

The Coma cluster contains about 800 galaxies within a 100 x 100 arc-min area of the celestial sphere.

Constellation:	Coma Berenices
Right ascension:	$12^h\ 59^m\ 49^s$
Declination:	+27° 58′ 50”

Image: NASA/ESA/StScI Hubble Heritage

Fun Fact:

Ras Algethi (Alpha Herculis), is a red giant and possibly the largest visible star in the sky is located in the constellation of Hercules. It has a variable apparent magnitude of 3.48/5.4.

Ras Algethi is located at the bottom of the constellation as Hercules is on his head and borders Ophiucus.

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Image of the Centennial Observatory on the front page is courtesy of Chris Anderson, Observatory Manager. The Centennial Observatory is located at the Herrett Center for Arts and Science, College of Southern Idaho, Twin Falls, ID, USA. Shoshone Falls is a major attraction to the Magic Valley and a prominent landmark on the Snake River. Falls image is used under "public domain;" unknown photographer. M-51 on the front page was imaged with the Shotwell Camera and the Herrett Telescope at the Centennial Observatory by club members Rick Widmer & Ken Thomason. M-81 is a STScI/ NASA/ESA photograph and is used under "public domain."

Membership Information

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy.

Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be $20.00 for individuals, families, $10.00 for students.

Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com or home telephone: 736-1989 or mail directly to the treasurer at his home address. 550 Sparks Twin Falls, ID 83301

Donations to our club are always welcome. Please contact a board member for details.

Fire and Ice with the Aurora Borealis

Iceland's Eyjafjallajökull Volcano, which twice erupted in March & April, is seen in this image with the Aurora Borealis in the background. The aurora seems eerily a part of the volcano's eruption and is above the snow capped hills of southern Iceland.

In the upper right hand portion of this image is the northern constellation of Corona Borealis—the northern crown. The brightest star in Corona Borealis is Alphecca a mag. 2.23 (Alpha Coronae Borealis) elipsing binary star. The primary component is a white main sequence star and the companion is a yellow main sequence star. Together the pair make a elipsing binary system similar to Algol.

The photographer notes the following:

"Photographing an erupting volcano together with the Northern Lights on a starry night! Only described as the greatest Kodak moment of my life. Minutes later it was gone."

Arnthor Ævarsson, Hveragerdi, Iceland
www.icecold.photostockplus.com

Membership Benefits

Sky and Telescope group rates. Subscriptions to this excellent periodical are available through the MVAS at a reduced price of $32.95.

Astronomy Magazine group rates. Subscriptions to this excellent periodical are available through the MVAS at a reduced price of $34.00

Receive 10% discounts on other selected Astronomy Publications.

For periodical info. and subscriptions Contact Jim Tubbs, Treasurer

Lending Library: Currently we have no books to lend.

MVAS Lending Telescopes, the society currently has two telescopes for loan and would gladly accept others. Contact Rick Widmer, Secretary for more information.

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