Issue 5. July 2025

Event Horizon

The magazine of STARFLEET Sciences

IN THIS ISSUE

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Event Horizon is edited by CAPT Pam Kingsley.
Deputy editor COL Patrick Litton.

Submissions are welcomed - please send them to **sfsci-eheditor@sfi.org**

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Cover image: LTjg Vince Ceraso at Space Camp. Used courtesy of Space Camp

"Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world."
– Louis Pasteur

From the Director's Office

Greetings Members of the Sciences Auxiliary!

It is hard to believe, but it was just one year ago that I accepted the position of Acting Director of Sciences. At that time, the Auxiliary was classified as "Established". I had no staff to transition with, no documentation of previous programming or members - literally I was starting from scratch. I only knew one thing. I wasn't going to let Sciences fade away.

Within a few weeks, I was approached by several officers in STARFLEET offering to serve on my staff. Within a few months, we had a full staff, a membership handbook, educational programs, the continuation of the Sol Speaker Series, a website, and an active Facebook page.

On August 9th of 2024, I was notified that Sciences had achieved Permanent status! This year, we are celebrating our first anniversary by releasing beautifully designed Sciences Comm Badges through the Quartermaster store!

Our missions continue to be accomplished through the incredible hard work and dedication of my staff, who believe in Sciences and serving the Fleet. They understand that when we work together, we can accomplish anything. In STARFLEET, we share a common love of Star Trek, a respect for the principles it stands for, and an aspiration to be the best we can be. There is no finer example of this than in the staff and spirit of STARFLEET Sciences.

But even more importantly, Sciences would be nothing without you, our cherished members. Your participation, enthusiasm, sharing on our social media pages, and promoting our events are what makes Sciences Auxiliary so vibrant. It is the energy convergence of staff and members that creates the magic we know and love.

Congratulations to all in STARFLEET Sciences for creating this amazing experience within just one turn around our Sun. I look forward to the next adventures!

To the Stars,

Fleet Captain Barb Barton

Director of STARFLEET Sciences

From the Editor's Desk

Welcome to this bumper edition of the *Event Horizon*!

As well as our regular features, this issue includes articles about the Kola Superdeep Borehole, the deepest hole ever drilled into the Earth; a look at the model of the USS Enterprise held at the Smithsonian Museum, an update on our latest Academy challenge, and we take a fascinating trip to Space Camp with our very own cover star Lt Vince Ceraso!

For cadets, we have a science project you can make with a handful of resources (it may involve eating some Pringles or similar...) and your own version of the Academy challenge.

And we are introducing a fiction section to the magazine for your *Trek* fanfics that have a scientific theme to them.

I hope you enjoy reading this issue, and, as always, if you have any comments, feedback, suggestions or content you would like to contribute, please send it to **sfsci-eheditor@sfi.org**

Captain Pam Kingsley

Deputy Director of STARFLEET Sciences & *Event Horizon* editor

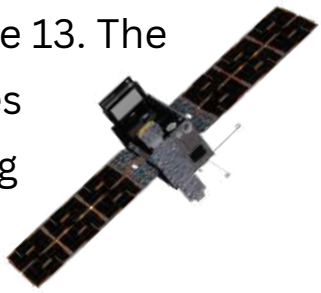
SFSCI recommends...

Each issue members of STARFLEET Sciences will share some of their favourite science-themed websites, books, equipment, places, podcasts, etc. from the past quarter.

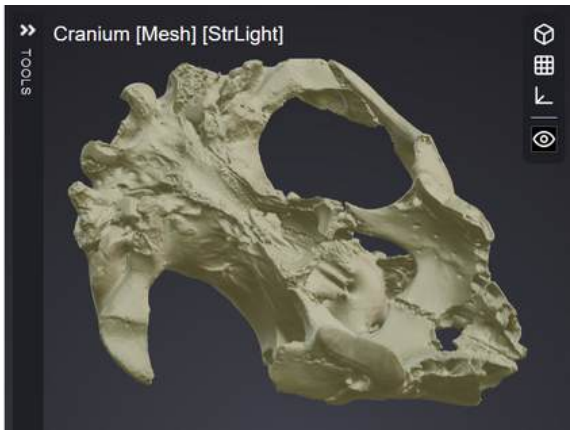
You can go to space for free! Well, maybe not actually you, but the SPace Selfie project by NASA scientist Mark Rober is offering to take a space selfie of you with his SAT GUS satellite.

Upload a picture to **www.spaceselfie.com** and GUS will take a picture of the phone displaying your image with Earth in the background.

Space Selfies are completely free for anyone over age 13. The first batch of selfies should be returning mid-summer.



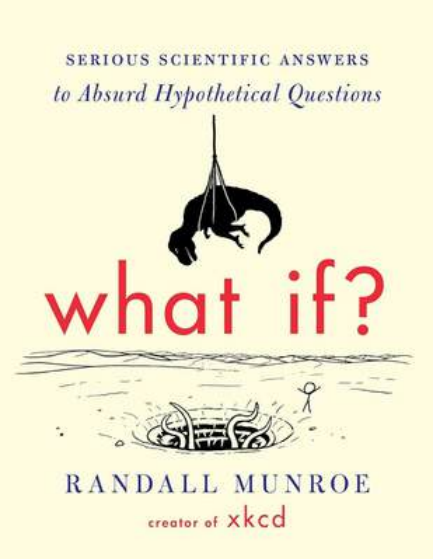
Have you ever wondered what the Hubble Space Telescope was looking at on your birthday, or wanted to know more about how the telescope works? The **Hubble Online Activities** website, hosted by NASA, has the answer to these questions, as well as giving you the ability to turn a space image into a piece of music, find out about the history of the Hubble programme, view some of the amazing images produced over the years, and see what the telescope is observing right now.



VAMP - the Virtual Australian Museum of Palaeontology, is the online home of Australian fossils in 3-D. The scans on this site are available to view, rotate, zoom and download.

Step into the virtual museum to explore rare and important fossils from sites all around Australia, celebrating more than 600 million years of evolution from the Ediacaran to the Holocene. Learn more about the evolution, anatomy, and discovery of remarkable Australian fossils.

RAdm. Janice Graham, CScO, USS Renegade:



"I found a very interesting book in the Science section of a local library: '*What If? Serious Scientific Answers to Absurd Hypothetical Questions*.' The author is Randall Munroe, creator of xkcd.

It's very interesting and entertaining. A few of the questions covered are, 'What if I took a swim in a spent nuclear fuel pool?' 'What place on Earth would allow you to free-fall the longest by jumping off it? What about using a squirrel suit?' And my favorite: 'Could you build a jetpack using downward-firing machine guns?' (The answer might surprise you.)"

He also creates videos answering some of these questions at **https://www.youtube.com/@xkcd_whatif**

RAdm. Dan Adams, USS Mercia:

If you get a chance, go and see Chris Hadfield... he's very entertaining, and presents space and space travel that makes things understandable for everyone. In both his meet and greet and his main talk he is engaging with everyone, especially the kids. Of course he brought his musical talent to the fore too. He's doing another UK tour in 2026

HISTORY OF STARFLEET SCIENCES

By Adm. Richard Heim
Region One & Senior Regional Science Liaison

A long time ago, in a century far far away, STARFLEET Sciences was born. I wasn't there at its creation, but I encountered it shortly thereafter. It was the 1990s, *Star Trek* was in its prime with *The Next Generation* ending and *Deep Space 9* and *Voyager* starting their run, and science was popular with science-themed plots common in *TNG* episodes.

Sojourner, the first of the Mars rovers, had successfully landed on July 4, 1997; the Hubble Space Telescope had been put into orbit, been repaired, and was opening new vistas to the universe; and Martian meteorite ALH84001 showed evidence of what some scientists thought was microscopic fossils of alien bacteria – maybe leftovers of life from another planet! Those were exciting times for science!

STARFLEET Sciences had its beginning in the 1990s, as far as I can determine, under FAdm. Rob Lerman whose administration oversaw an expanded Fleet Division Chief program, although a “special assignment” chapter was created for science (the USS Quintillus) under the Stillwell administration in the early 1980s and there was a “Captain of Sciences” under the Smith administration in the mid-1980s.

I entered the picture in 1998 when I sent an email to FCapt. Dustin Williams asking to be put in contact with the Fleet Division Chief for Science, Capt. Rhonda Green. You see, Starfleet Sciences was part of what they called the Fleet Division Chief (FDC) program under the VCS back then and Rhonda had been selected as FDC-Sciences in early 1998; Dustin was the FDC Director. I was Assistant Regional Division Chief (ARDC) for Region One Sciences at the time and wanted to share my thoughts with her on R/1 Sciences. Well, Rhonda and I never did connect, but in early 1999 I received an email from Lt.jg Rick Driver, who was the new FDC-Sciences.

Rick had just set up a Starfleet Sciences website and listserv and was getting in touch with the Regional Division Chiefs to see what they were up to and get everyone talking to everyone else. One thing he wanted to do was create a course at Starfleet Academy for new Science Officers to help them get started in their new role (he wished he had had some guidance when he started as a CSO). This inspired me to create a Chief Science Officer Handbook for Region One CSOs,

as I had just been selected as the Region One Division Chief for Science in December 1998. That year (1999), FDC-Science had contacts in 11 regions (1, 2, 4, 5, 7, 9, 11, 12, 13, 15, and 17). Some were RDCs (for those regions that had regional division programs), while other contacts were the RCs themselves.

Sometime in 1999, David Klingman became the Vice FDC-Science (and also my ARDC for Region One Sciences). Upon Rick's resignation at the end of the year, David became the new FDC-Science. That made him my "science boss" at the 'Fleet level, while I remained his "science boss" at the regional level – interesting situation!

In 2000, I became a Vice FDC-Science. When David resigned as FDC-Science during the first half of 2000, I was heavily involved in a climate conference and was preparing to go to Australia for a 6-week scientist exchange program (I was a meteorologist working for NOAA at the time). Rick Driver became FDC-Science again, but had to resign (again) in early 2001 because he had to cut back on his activities in 'Fleet due to developments in his personal life. I applied for the FDC-Science position shortly thereafter, but real-life situations delayed the selecting official's decision until that fall. FDC Program Director Col. Matthew Copple offered me the FDC-Science position in October 2001 and thus I began my tenure as the longest-serving Starfleet Sciences Director.

One of the first things I wanted to do was clean up the regional science liaison mess that developed over the previous couple years. Previous FDC-Science Directors started assigning Starfleet Science liaisons in regions that didn't have them. That didn't go over well with the RCs of many regions. I reached out to the RCs and asked them if

they had regional science chiefs and if they did, would they be willing to serve as science liaisons with STARFLEET Sciences. I wanted the liaisons to be volunteers from within the regions, not be people who were assigned by someone from outside the regions. Some regions (like my Region One) had RDC programs, other RCs appointed liaisons from their staff, while ship CSOs in other regions volunteered to be a liaison with the RC's blessing. STARFLEET Sciences had liaisons in seven regions when I started (1, 2, 3, 4, 10, 11, and 15).

I also initiated a Science-Lab listserv, set up a Starfleet Sciences website, and began publishing a newsletter. The website included sub-pages with links to science websites, science lists, science fairs and other educational resources, and science museums like The Franklin Institute Museum of Science in Philadelphia. Over the course of 22 years, the STARFLEET Sciences website recorded about 6900 "hits". Over that same period of time, the R/1 CSO Handbook experienced about 1379 hits.

I also submitted regular STARFLEET Sciences articles to the CQ, building upon articles that I had been submitting as R/1 Science RDC.

Back in 1998, I began a series of articles profiling STARFLEET members who had completed all of the science courses that were offered in the SFA Vulcan Academy of Sciences at the time they completed them. There were nine members who I profiled in articles published over 1998 to 2002.

A month after I was named FDC-Sciences, the Fleet Division Chief program underwent a name change and became the Fleet Division Program. So, FDC to FDP. As you'll see in the next paragraph, there would be other program name changes in later years, which is why I refer to the Sciences part of this program simply as Starfleet Sciences.

Under a new administration, the FDC program was renamed the Fleet Resource Center (FRC) program in 2005, and the FRC program was renamed the STAR (STARFLEET Technical Applied Research) program in 2009. In 2012 the STAR program was transformed into the Holodeck Program. The following year the Holodeck Program was shut down and Starfleet Sciences continued to operate as a STARFLEET interest group within a revitalized Fleet Resource Center (FRC again) conceptual framework. Beginning in 2018, Starfleet Sciences began reporting to the Director of STARFLEET Engage! under the VCS.

With yet another new administration, Starfleet Sciences began reporting directly to the VCS in 2020. In 2022, Starfleet Sciences became part of STARFLEET's Auxiliary Services department. Throughout all of these changes and administrations, I was asked to continue on as Starfleet Sciences Director, so I must have been doing something right!

But all good things must come to an end. In August 2023 I stepped down as Director of Starfleet Sciences, but continued as RDC of Region One Sciences and CO and CSO of the USS Alaric. Like many of the Directors before me, stuff in my personal life led to this decision (heavy workload at NOAA, computer problems, but especially that year I had two surgeries). Capt. John Brice Jr. became the interim Starfleet Sciences Director, followed by Comm. Mike Calhoun in December 2023, then FCapt. Barb Barton in June 2024.

I feel like I accomplished a lot during my tenure as Starfleet Sciences Director. With a staff of about a half dozen, a cadre of CSO contacts from across the Fleet, and science liaisons in up to a dozen regions at one point, we provided science resources through a web page and science articles published in the CQ and other Fleet publications, encouraged stargazing and astronomy through our Stellar Cartography Department, and supported science discussions and science education throughout the Fleet.

But the real Golden Age for Starfleet Sciences has just begun. Under the dynamic leadership of Director Barton and her dedicated staff, Starfleet Sciences' web presence has been greatly improved over what I could manage and many new and exciting science programs have been initiated, including the Sol Speaker Series, Scientific Research Teams, and coordinated science activities, as well as reports from the regional science liaisons, reports from chapter CSOs, and fun science articles and shared resources in the excellent Event Horizons newsletter! Check Event Horizons for the latest developments.

The science mission has really just begun. Join us as we explore the universe together!

REFERENCES:

(1) A History of STARFLEET: The International Star Trek Fan Association. Compiled by General Scott A. Akers, SFMC and Commodore Jeffery Higdon, SFC. Edited by Admiral Chris Wallace, SFC. 2004 Edition.

Meet the staff - Matt Chrysler

I am Matthew ”Matt” Chrysler. I am from the USS Blackstone NCC- 74918 out of Little Rock, AR. I am the Chief of Staff with STARFLEET Sciences.

How long have you been a Trekkie?

Most of my life to give a short answer, but a longer answer. I would say I remember watching TNG with my mom. I also remember watching the pilot episode for Voyager, and Enterprise. But I didn't keep up with all the series throughout my life but have always loved Star Trek.

What do you enjoy about SFI?

The main thing I enjoyed is the vast things you can do within the organization. For example, if you enjoy getting awards when you finish a task, taking classes within the SFA and MTC would be perfect for you.

I would also say if you enjoyed learning things the Academy would be perfect for someone. If you enjoy playing games SFI Tactical would be ideal. If you want to help more and make things run more smoothly than you can take a role within one of the many auxiliaries we have.

What is your favorite Scientific discipline?

This is a tough question, and I say this because I work in a scientific field being a nurse but outside of that Astrology, Geology, and Marine Biology

are some of my favorite areas of science I have enjoyed taking in the past. I will also add due to taking some of the intro courses the plasma courses are some of my favorite ones so far.

What Academy course would you recommend?
I will say if you enjoy learning about the history of things and work in medical the College of Emergency Technology, but if you want to learn more about some things that go into taking care of a dead body and with some of the legality with it the College of Mortuary courses are phenomenal. And if you want something that will give you a challenge the Marine Training Centre is where you would go.

If *you were on a ship, what job would you have?*
Honestly, I probably would be still in the medical field. Now would I still be a nurse at that time I'm not sure.

Did Star Trek play a role in the kind of job you are currently doing?
I would say it may have a hand in my job. Looking back there is a lot of factors that ended up playing unknowingly factor in my career as a nurse.

What other roles do you have in SFI?
Currently I am the Deputy Assistant Surgeon General for Region 12.

*The Marine Training Centre can be found **here***
*The College of Emergency Technology Equipment can be found **here***
*The College of Mortuary Science can be found **here***

First Contact Launches Sister Chapters!

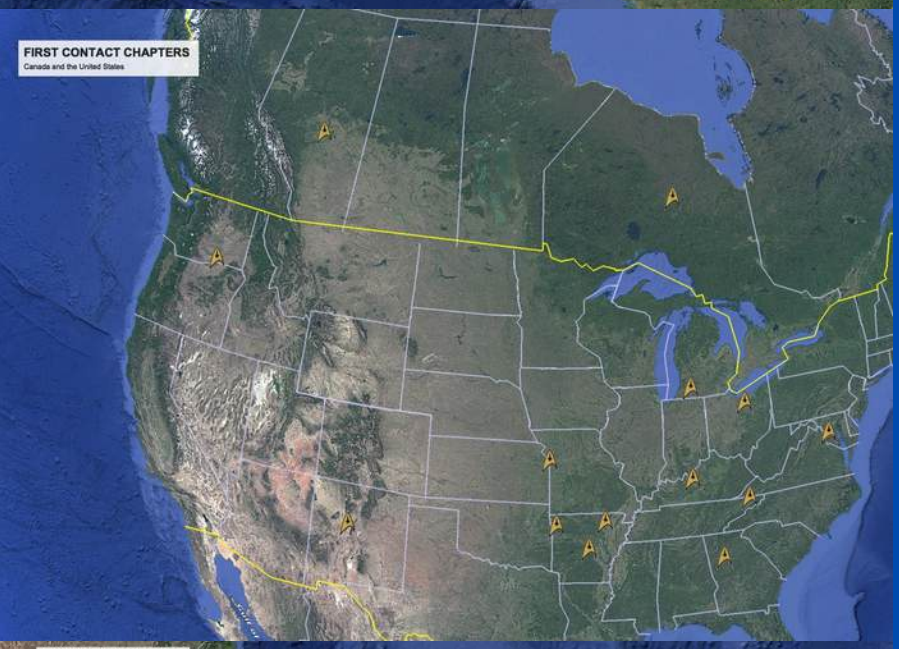
Fleet Captain Barb Barton, Director, Sciences

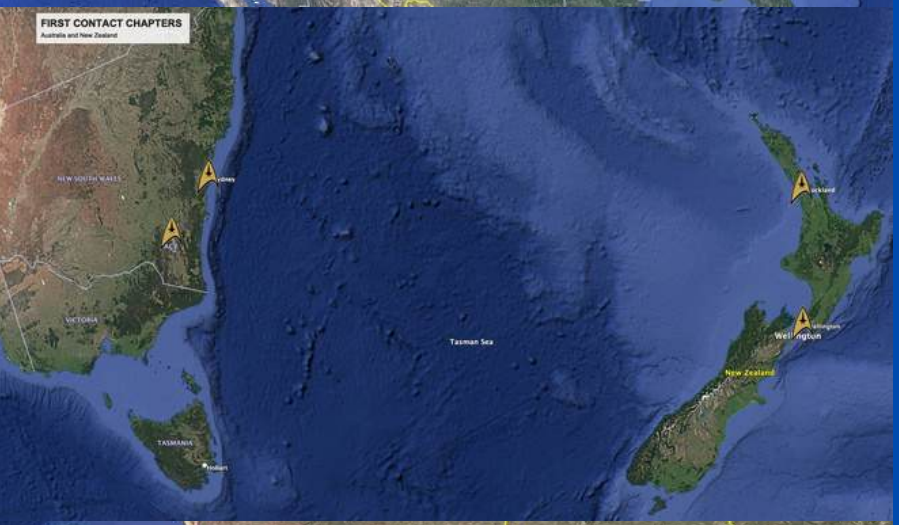
STARFLEET International has over 5000 members from around the globe, so what an opportunity to learn about our different cultures and share the love of Star Trek and Science with fleetmates from other lands! A couple months ago, we announced a new program called First Contact and we are thrilled to report that we have launched!

On June 15th, we had enough chapters sign up to be able to pair each chapter with one from another country. We posted the registration certificates on social media and had a flurry of additional chapters sign up! We now have a total of 30 chapters (15 pairs of Sister Chapters) representing New Zealand, Australia, France, Spain, England, Ireland, South Africa, the United States, and Canada - see where they are on the next page!

The excitement is palpable, and we are confident that each Sister Chapter has exciting adventures ahead learning about each other's chapters, space programs, natural history, gaming, museums, and so much more! STARFLEET Tactical Director FCAPT Mike Rosen and LTJG Vince Ceraso, an Ambassador of the Diplomatic Corps, have joined our Sciences' First Contact team to serve as resources for the participating chapters.

The idea for a First Contact program was inspired by the Sister Cities program, which is a form of agreement between two geographically and politically distinct localities for the purpose of promoting cultural and commercial ties.





As we follow the principles of *Star Trek*'s IDIC (Infinite Diversity in Infinite Combinations), creating First Contact with a chapter from another country on Planet Earth enriches our lives and broadens our horizons. It also gives us opportunities to learn about what is going on in the Sciences in other parts of the world, share information with each other about the lands and waters where we live, ecology and conservation work, space programs, cool places for away missions, and whatever else your curiosity comes up with.

If you are ready to make First Contact, the Commanding Officer of your chapter must complete the application form. If you have any questions, please email Fleet Captain Barb Barton, Sciences Director, at **sfsci-director@sfi.org**. Live long and prosper!

SOL SPEAKER SERIES

Next talk: July 19th, 11am EDT/3pm GMT
“Flagship Species: How Cheetah Conservation Drives Biodiversity”
Admiral Owen Swart (Region 8)

This talk explores how focusing conservation efforts on a single species can drive broader ecological benefits, from habitat protection to public education and fundraising. By protecting cheetahs, we safeguard entire ecosystems—demonstrating that saving one species can mean saving many.

Admiral Owen Swart is a lifelong Star Trek scholar and a dedicated advocate for biodiversity and wildlife conservation. He works hands-on in cheetah conservation, focusing on ambassador animals, human-wildlife conflict mitigation, and public education.

Inspired by Star Trek’s vision of cooperation and sustainability, he applies these principles to protecting endangered species and promoting coexistence between humans and wildlife.

Charismatic megafauna like cheetahs capture the public’s imagination, making them powerful ambassadors for biodiversity.

Coming soon: August 23rd, 11am EDT/3pm GMT
"Crocodiles: the Horse-Hunter and the Balrog"
Dr Alexander Hastings, Fitzpatrick Chair of Paleontology, Science Museum of Minnesota

Dr Hastings is a paleontologist and our paleontology collection curator. Much of his career has focused on sensational ancient reptiles, including horse-hunting crocodiles and colossal snakes.

He now studies all areas of paleontology from giant dinosaurs to tiny oysters and is actively engaged in public outreach to share his enthusiasm for the ancient world.

Coming soon: September 20th, 11am EDT/3pm GMT
"Taking Off to the Stratosphere"
LCDR Diane Ripollone, SFSCI Chief of Education

LCDR Diane Ripollone is a veteran science educator at Cardinal Gibbons High School in Raleigh, NC. In 2022, she participated in NASA's Airborne Astronomy Ambassadors program, flying aboard SOFIA—the Stratospheric Observatory for Infrared Astronomy—to observe infrared astronomy conducted from the stratosphere.

In 2025, Diane was selected as a member of Crew 5 of the North Carolina Space Education Ambassadors (NCSEA) program, a statewide initiative led by NC Space Grant in partnership with NASA Langley Research Center.

Additionally, LCDR Ripollone has served as a NASA Solar System Ambassador since 2017, volunteering for over 600 hours to engage the public with NASA's space exploration missions.

LCDR Ripollone will present her experience flying aboard NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA), located in Palmdale, California. She will discuss the scientific research carried out during her missions and explain SOFIA's role in advancing astronomical discovery.

To help the audience better understand the observatory's work, she will provide a brief overview of the Electromagnetic Spectrum.

The talk will include vivid photos and videos from her time on the aircraft. It will conclude with an interactive Kahoot quiz for attendees.

The Sol Speaker Series lectures are a monthly online event free to SFI members bringing interesting and inspiring presentations on a variety of science topics - with the opportunity to ask questions at the end of the talks. To participate or watch live, you need to get the link by registering **here**.

All previous talks are available at the **STARFLEET International YouTube channel.** If you have any suggestions for topics or speakers for future talks, email **sfsci-director@sfi.org**

If you have any suggestions for topics or speakers for future talks, email **sfsci-director@sfi.org** If you miss a live event, recordings are posted on SFI's YouTube Channel here.

To boldly go...

Inspired by real-life human space missions of the NASA Space Program, PEP is a citizen science project that will conduct missions—Expeditions—in which any member of STARFLEET can participate in.

Expeditions will more or less be small-scale simulations of similar missions by NASA. Expeditions will range from planet and asteroid hunting, to searching for comets, all of which and more will be done through publicly-available citizen science projects. In addition, there will be at-home expeditions such as stargazing and more.

GALILEO EXPEDITION

Expedition Leader: LTJG Vince Ceraso (USS Challenger)

Mission: PEP-1 (Moongazing/Stargazing)

Requirements: Tool(s) such as, but not limited to, telescopes, astronomical binoculars, and star charts may be useful. No experience necessary.

Launch date: July 4, 2025

Duration: 30 Days

Summary:

Everything mankind has come to know about the night sky can be traced back to the time of Ancient Greece. History's earliest astronomers like Galileo Galilei were later instrumental in developing the many methods we now use to observe the night sky.

Fast forward to 2025, and humanity's knowledge of the universe only continues to expand. Modern technology allows for anyone, regardless of how little they know about astronomy, to gaze at the wonders of outer space from their own backyard.

The inaugural Galileo Expedition will see STARFLEET scientists spending 30 days observing the night sky and documenting their findings for the Expedition Report.

For questions about PEP, **email LTJG Vince Ceraso**

If you need a star chart, good ones can be found online at **Stellarium** or **Sky & Telescope**, or you can buy them fairly cheaply online (if you buy one, make sure you get a chart for the correct hemisphere you live in!).

Propus: The foot of The Twins

Comm Michael Lewis, Chief Science Officer, USS Potomac, R1

Comm Lewis is a member of The American Association of Variable Star Observers (AAVSO), a non-profit worldwide scientific and educational organization of amateur and professional astronomers who are interested in stars that change in brightness—variable stars.


Julius Schmidt

One variable star YOU can see this month is Propus, also known as *Eta Geminorum*. It's in the constellation of Gemini, "The Twins." Gemini is a rectangular shape in the stars that represent the twins Castor and Pollux from Greek mythology. In fact, the top two stars of the rectangle are named Castor (the western star) and Pollux (the eastern star).

These stars mark the heads of the twins. Since Propus is Greek for "foot," it makes sense that this star is found at the bottom of the rectangle, at the end of the leg of Castor, about midway between *Mu Geminorum* and a bright cluster of stars.

A U.S. Navy cargo ship, USS Propus, was named after the star. German astronomer and geophysicist, Julius Schmidt, first recorded Propus as a variable star in 1865. You can conveniently compare it to the nearby star *Mu Geminorum*. Propus slowly changes its brightness by 50% over 234 days.

Eta Geminorum, the brightest star on the right of the image, next to the Jellyfish Nebula with Mu Geminorum
© Johannes Schedler (Panther Observatory)

Besides its variability, Propus has another claim to fame. It lies within one degree of the ecliptic (the apparent path the Sun makes in the sky throughout the year). This is also the part of the sky where you can find the Moon, and many other solar system objects that are much closer to us than the distant stars.

The ecliptic draws its name as being in the part of the sky where eclipses of the Sun and Moon occur. Occasionally, the Moon will occult (pass in front of) Propus. Rarely, one of our solar system planets may occult the star. The last time this happened was in 1910, when Venus made its way in front of the star.

Propus is a red giant star—which you can guess means that it is a really large, red star. In 1881, a famous observer of double stars, S.W. Burnham, discovered that it had a dimmer, yellow companion in orbit around it. Today, we know that there are three stars in orbit around each other there, meaning it is a triple star system. Its even closer companion may eclipse the brighter, main star every eight years.

With a little practice, you could likely detect these changes in brightness, even from all the way here on Earth!

The Deepest Hole on Earth

By Lt. David Lyons, Chief Science Officer, USS Ronald E. McNair

I happened upon information while watching episodes of *Mysteries of the Abandoned* which highlighted an effort by the Soviet Union to reach the center of the earth.

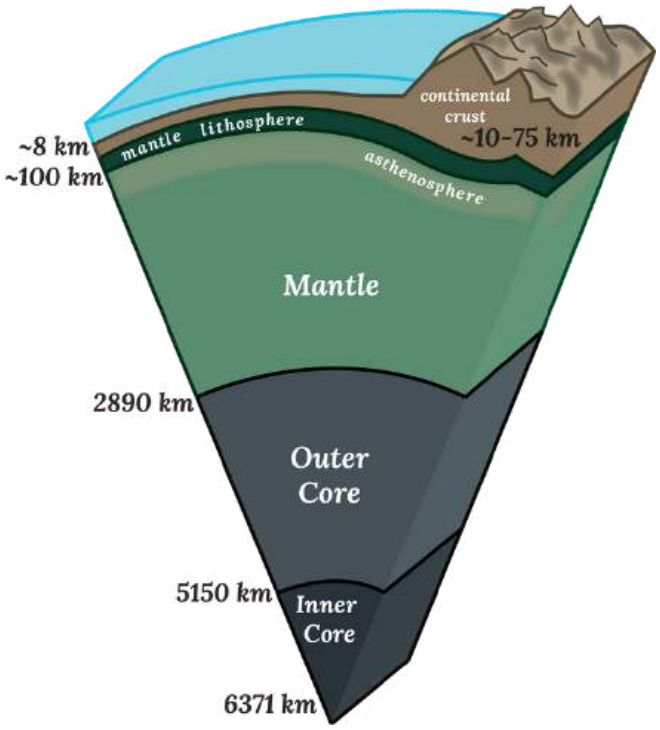
Apparently, this wasn't a new idea, as several nations had tried to drill a hole into the crust of the planet.

The effort by the USA didn't get very deep before ceasing. In the USSR, the Kola Superdeep Borehole kept going for many years. Had the Soviets not run out of money and the government shut down, it's possible their hole could have been deeper.

As it was, a 9-inch steel cap is bolted over the spot where groundbreaking technology was created to help them dig over 7&1/2 miles deep. This is deeper than Mt Everest is tall, and far deeper than the ocean depths where RMS Titanic rests.

The Soviets did report that as they got that deep into the earth, they found that the hole tended to want to collapse onto itself.

Surprisingly, fossils from 2 billion years ago were found, as were sources of water — far deeper than ever thought possible for water sources.



The total depth of this hole by Russia is 1/3 of the total thickness depth of the earth's crust. It remains the deepest hole ever made, on the quest to discover what the mantle and outer core of our planet might look like.

- The borehole is located in the Kola Peninsula, high in the Arctic Circle.
- It is 40,230ft (12.2km) deep and took 20 years to drill.
- Drilling was stopped in 1992, when the temperature reached 180C (356F). This was twice what was expected at that depth.

SFSCI Away Team Academy Challenge

One of the most exciting parts of a science officer's job is having the chance to explore alien worlds - to seek out new life. While we may not have that opportunity, we can explore the possibilities.

From studying exoplanets to speculating about what life may be found there, this six-week challenge will take you on a journey to strange new worlds and introduce you to some of the most unusual life forms we know of.

Week 1 (June 1-7): SPID 129 - Exoplanets part 1
Week 2 (June 8-14): ABIO 101 - Overview & Theories of Life
Week 3 (June 15-21): ABIO 103 - Extra Solar Life
Week 4 (June 22-28): IAI 101 Insects part 1
Week 5 (June 29-July 5): ABIO 105 Extremophiles
Week 6 (July 6-12): MOO 105 - Prokaryotes-Bacteria, Part 1

You may turn in certificates or screenshots of your transcript either as you do the courses or all at once before July 24, to **sfsci-chiefedu@sfi.org**

Good luck to everyone!

Expedition 33: My Space Camp Log

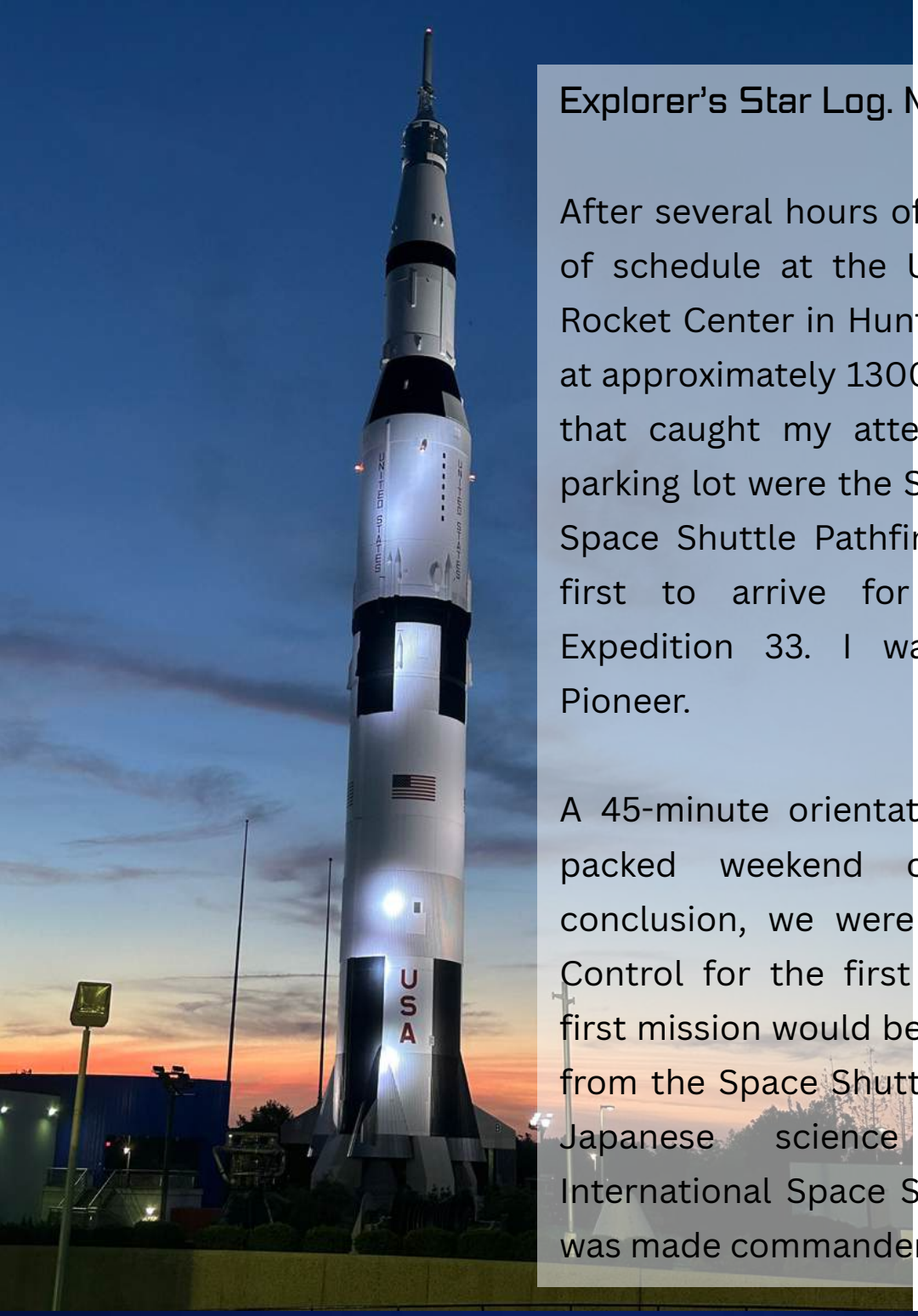
By LTJG Vince Ceraso, USS Challenger

Pictures with logo courtesy of Space Camp, others by author

Over the weekend of May 16-18, 2025, I attended Adult Space Camp, one of the many camp programs offered at the U.S. Space and Rocket Center in Huntsville, Alabama.

Since it opened in 1982, over 1,000,000 people from 140 countries have been trained like astronauts in a variety of different simulations, two of which I will cover in this article. But it was more than just cool simulations. There was a lot of team-building and experiments that required thinking outside the box.

Below is a log I recorded my thoughts in during Expedition 33. Due to the number of activities squeezed into three days, this will only be an account of the main missions and some educational activities. Everything else I will save for another time.



Explorer's Star Log. May 16th, 2025

After several hours of flying, I arrived ahead of schedule at the United States Space & Rocket Center in Huntsville, Alabama, Sol-III, at approximately 1300 hours. The first things that caught my attention pulling into the parking lot were the Saturn V rocket and the Space Shuttle Pathfinder. I was one of the first to arrive for Adult Space Camp Expedition 33. I was assigned to Team Pioneer.

A 45-minute orientation prepared us for a packed weekend of activities. At its conclusion, we were ushered into Mission Control for the first of two missions. This first mission would be a simple crew transfer from the Space Shuttle Discovery to Kibō, a Japanese science module on the International Space Station (ISS), of which I was made commander.


L-R: Launch of S.S. Archer-T'Pol model rocket; Reading over a checklist during Mission 1

My first of two station objectives was simple: make sure Kibō operations are in order for a successful—and safe—crew transfer. Ahead of Discovery's arrival, I deployed the solar arrays to keep the station powered by the Sun. A mission checklist provided much-needed detail for what switches to operate and even a timestamp for when everything should be finished.

My second objective was to conduct science experiments. Using chemicals available in the station cabinets, the mission checklist stated to mix different compounds and record the outcomes; smell, texture, physical reactions. By the time the supplies were set up, two mission specialists were dropped off by Discovery. They took over experiments while I boarded a waiting shuttle.

Onboard Discovery, the two pilots, my bunkmate Tim and his wife Andrea, were making final preparations to separate from Kibō. Likewise, my next and last task would be to power down the Discovery star tracker, a deviceon spacecraft used for navigation. Once things were in order, we strapped in, separated from Kibō, and began our return to Earth.

Minutes into our flight, an anomaly alarm grabbed our attention, indicating a problem.

Such problems can include navigation issues or even structural integrity failure. With Mission Control on the other end of the line, they were able to walk Tim and Andrea through a solution from the ground. In moments, condition was back to normal and it was smooth sailing from then.

With the crisis averted, Tim, a real-life pilot, brought Discovery down gently to Edwards Air Force Base. The mission was a success.

L-R: Kibo Science Experiments during Mission 1; Flag flown in space by Apollo crew

Explorer's Star Log. May 17th, 2025

Today began with breakfast in the crew galley. There, we were greeted by people at each table with lab coats. They were NASA scientists and engineers who would talk to us about their life's work. At my table was John O. Lassiter.

Born in 1955 in Alabama, John worked at NASA for 42 years before retiring in 2020. With his expertise in aerospace engineering, he played a role in the development of solar sails and the SLS space shuttle core stage, as well as structural dynamics testing. I've spoken with plenty of young scientists and astronomers, but meeting someone who I feel helped write history was a very poignant experience.

Decades later, NASA is preparing to fly people back to the moon for the Artemis project. We would not have gotten this far if it weren't for these early pioneers of human space travel that we met today.

After breakfast, we were led back to Mission Control for the next mission. Taking place in the future—2046 to be exact—we would partake in a Mars Rover simulation. Our return to Earth would be via Orion spacecraft. Location of the mission was the Mars Elysium Base (MEB).

Inside MEB, attempting to contact Mission Control during Mission 2

My position this time was data specialist. My station partner and I operated the Mars Rover Perseverance, driving it to several supply crates on the surface. Once there, I took notes of the location coordinates as well as the condition of each crate. Meanwhile, the Orion pilots performed their own routine checkups in spacesuits on the planet's surface.

My next job would have been to communicate the information I gathered back to Mission Control. Later on, my partner and I would return to each location to take a sample using Perseverance's mining drill, operated by me.

Unfortunately, there were communication issues between MEB and MC. With each mission on a timer, camp counselors scrambled to get communications back up and running. Due to these issues taking up so much time, we were unable to mine the surface of Mars. It was onto the next objective: leave the red planet.

Piling into the Orion spacecraft, the four of us performed our objectives: the pilots would set course for and guide us back to Earth while my fellow data specialist and I made sure parachutes and other cautious measures were in place for a safe takeoff and splashdown. Within minutes, we were back, safe and sound.


Operating Mars Rover, Mission 2

Despite technical difficulties, we took the time to explore the base. Like the Kibō module, there was a corner in the MEB for science experiments including a variety of chemicals and even growing plants. I checked out readings on computer displays. It was a unique educational opportunity to get a glimpse at how humanity might adapt to extended stays in outer space.

Explorer's Star Log. May 18th, 2025

Graduation day. Before walking on stage, we had a few more things to finish.

Our Team Pioneer counselor Anna walked us through a tour of Rocket Park and the Davidson Center for Space Exploration. This is where we got to see artifacts from humanity's many excursions to the stars. Anna's passion for all things space science was contagious and only made me want to learn more.

After an impressive planetarium showcasing the James Webb Telescope's greatest discoveries, we were led into the auditorium we had our orientation, this time for graduation. All three teams—Magellan, Pioneer and Mariner—walked on stage one by one to receive their certificates. A single camper was then given a spirit medal for showing exceptional enthusiasm and participation. Finally, one team was additionally awarded for their outstanding activities during the camp; Team Mariner received the recognition.

The ceremony lasted just under an hour. We said our final goodbyes to our counselors, each other, and headed for our cars and departing flights.

This was an experience I'll never forget, and hope to do again someday.

Explorer's Personal Star Log, supplemental

The night before graduation, I had time to walk around Rocket Park for a self-guided tour. No tourists, campers, or employees. Just myself, the stars and some of history's greatest engineering feats, such as the Saturn V rocket. Her navigation lights were up and running, restored after years of retirement. I sat down on a bench in front of the Space Shuttle Pathfinder and did some stargazing. An opportunity to quietly reflect on the long road getting from there to here.

From the archives earlier that day, I got to hold a V-2 timer, used in V-2 rockets. V-2 rockets were the first long-range ballistic missiles that used liquid-propellant for launch and flight. Developed by Nazi Germany during the Second World War, they were used at that time for attacking the Allied Forces. After the war, some German rockets that were captured by the Allies were brought back to the United States and studied meticulously. The V-2 timers became a technological starting point for human spaceflight engineering. They were never used in combat ever again.


V-2 Timer

I remembered the exchange between Captain Picard and Data from *Star Trek: First Contact* (timestamp: 20:45). When Picard sees Zefram Cochrane's Phoenix, he mentions how it was made from a nuclear missile. Data responds by citing "historical irony" that a weapon made to kill would be repurposed for peace. And like Picard and the Phoenix, seeing the Saturn V rocket in person instead of a classroom TV indeed altered my perception of it.

In the back of Rocket Park, there is a Space Exploration Wall of Honor, dedicated to thousands of people, many from Alabama, that helped us understand and travel the final frontier. But the journey wasn't a perfect

one. The counselors and educators at Space Camp did not shy away from the very real risks of spacefaring. There was plenty of talk about the Apollo 1, Soyuz 1 and Challenger disasters, for one thing.

One of the activities was a heat shield test, an experiment where we had to protect raw eggs from 3,000-degree torch fire using household items like spackle, steel wool, corks, and more. This experiment was meant to teach us about ablative heat shielding used on the shuttles. Space Shuttle Columbia was tragically lost with all hands in 2003 during re-entry after part of the shielding broke off.

While we're quick to celebrate Apollo 11's lunar walk and other successful missions, it's important to remember all that we lost along the way. Despite our mistakes, we've learned and continue to learn so much about our place in the universe. I say "mistakes" instead of "failures" because to truly fail is to fall down and never try again.

But to quote NASA Flight Director Gene Kranz, "Failure is not an option."

And to quote Commander Una-Chin Riley from *Strange New Worlds*: "*Ad astra per aspera*." ("To the stars through hardship.")

Now Accepting Nominations for Sciences' Annual Performance Excellence Awards!

STARFLEET Sciences is now accepting nominations for our prestigious Performance Excellence Awards! The deadline for submitting nominations is July 15th. The awards will be presented/announced during STARFLEET's International Conference in Houston, Texas which will be held August 1-3, 2025. These awards are to recognize STARFLEET members, chapters, and regions, who have consistently gone above and beyond the call of duty and who provide an inspiring example of leadership and excellence in promoting Sciences. Nominations can be made on our website at **this link**.

FCAPT Barb Barton, Director, Sciences

Sciences/Sol Liaison of the Year

This prestigious annual award is given to a Regional Sciences or Sol Liaison who has shown consistent dedication and excellence in promoting Sciences and the Sol Speaker Series within their Region. Their conduct has been exemplary and represents the highest ideals of Star Trek. This award is given during the annual International Conference.

Nominations for this award can be made by the Commanding Officer, Regional Coordinator, or the Director of Sciences.

Science Officer of the Year

This prestigious annual award is given to the Science Officer of a Chapter within STARFLEET who has shown consistent dedication and excellence in promoting the sciences within their Chapter or Region. Their conduct has been exemplary and represents the highest ideals of Star Trek.

Nominations for this award can be made by the Commanding Officer, Regional Science Liaison, Regional Coordinator, or the Director of Sciences.

Chapter of the Year – Sciences
This annual award recognizes the Chapter in STARFLEET that has shown consistent dedication and excellence in promoting the sciences. This Chapter serves as an inspiration to all of STARFLEET in its contribution to promoting educational opportunities and activities for its members.
Nominations for this award can be made by the Commanding Officer, Regional Science Liaison, Regional Coordinator, or the Director of Sciences.

Region of the Year – Sciences
This annual award recognizes the STARFLEET Region that has had outstanding participation in the area of the sciences by its Chapters over the past year. This Region serves as an inspiration to all of STARFLEET in its contribution to promoting education and opportunities to its members.
Nominations for this award can be made by the Regional Science Liaison, Regional Coordinator, or the Director of Sciences.

The Richard Heim Award is our only staff award and it is given to a staff member who has given their all and then some to Sciences over the past year. This awardee is selected by the Director and is usually presented at the International Conference. Normally, there is only one award given per year. But I will be handing out two this year and the first staff member is being honored today.

Captain David Yee, I am pleased to present to you the first STARFLEET Sciences Richard Heim Award in recognition and appreciation for all you have given to us since the rebirth of Sciences in the spring of 2024. Your commitment to our success has been inspiring and heartwarming. I am sure I speak for all of us when I say your absence on our staff will be felt deeply. Most importantly, the membership will continue to benefit from the work you have put into this Auxiliary.

Spring has Sprung!

By Phyllis Seale Foynes B.Sc. Hort
USS Liberty Belle, R20

With warmer days ahead in the northern hemisphere, it's time to get active in your garden or balcony!

Of course you can buy your bedding plants in a month or so but why not have a go at growing your own?

Planting Tips:

- Sow your seeds about 1.5cms (half an inch) in depth in a seed tray and give them a good watering in.
- After that initial watering, be careful not to overwater.
- Use those window sills when you don't have a greenhouse.

- When transplanting seedlings, never hold them by the stem. If you accidently crush it then that's the whole plant dead. Hold them by a leaf. They can always grow a new leaf!

Don't forget the most important thing.... ENJOY IT!

Here are some plants to have a think about sowing over the next while....

VEGETABLES				
Plant name	Sow Indoors	Sow Outdoors	Space apart in the ground	Harvest
Cauliflower	March	March to June	50cms/ 20 inches	June to October
Courgette	March to April	May	90cms/ 36 inches	July onwards
Brussels Sprouts	February to April	March to April	60cms/ 24 inches	October to December
Carrots	March to April	March to April	30cms/ 12 inches	May to July
Sweetcorn	April	May	30cms/ 12 inches	July to October
Broccoli	March to May	June to July	60cms/ 24 inches	August to September
ANNUAL FLOWERS				
Plant Name	Sow Indoors	Sow Outdoors	Space apart in ground/ containers	Flowers
Lobelia	February to April	May	10cms/ 4 inches	Late June to October
Impatiens/ Busy Lizzie	February to April	n/a	23cms/ 9 inches	Mid June to September
Marigolds	February to April	April to May	20cms/ 8 inches	Mid June to October
Petunias	February to April	n/a	30cms/ 12 inches	Mid June to September
Sunflowers	For early blooms: April	March to May	40cms/ 16 inches	July to September

Can Humans Accurately Measure the Intelligence of Other Species?

By LT Janet 'Hopper' Livingston, ISS Kidd, Region 3 Science Liaison

Is the science of animal studies biased when humans use measurements based on their own interpretation of intelligence? Documentaries show chimpanzees and dolphins displaying intelligence and emotion in ways humans recognize. But what about bees, rats, Ceti eels, tribbles or tardigrades?

If you share your life with animals, you've likely noticed signs of intelligence as they navigate their world, and felt the emotional connection when they choose to curl up with you. I watched two of my house rabbits learn to become friends. Rhe'Anna taught Torias how to tell me when they were ready for a meal by waiting near the kitchen.

Fortunately, she didn't pass on the ritual she learned from her previous partner, Artie. That was chewing on furniture or baseboards, which attracted my immediate attention and reinforced naughty behavior!

All creatures (human and non-human) enter the world with instincts, one of the most driving is for nourishment.

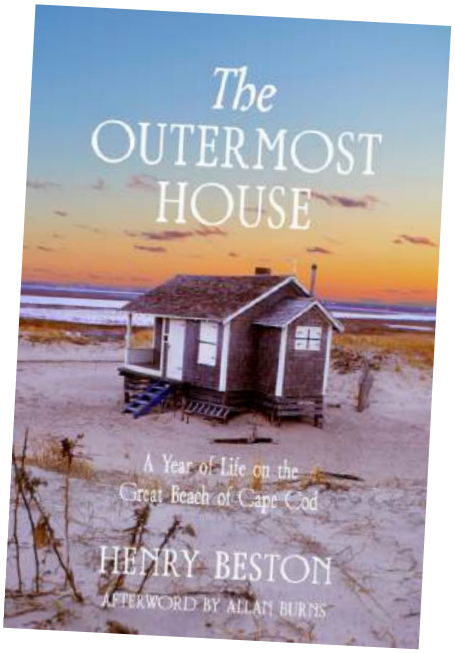
As the young mature they learn real-life lessons and skills from their relatives, through play, observation, and trial and error. While vision helps humans make sense of their world, non-humans may rely more on sound, scent or touch.

From the first time humans encountered non-human life, they likely sorted them into categories: which animals were food, which ones were dangerous. Later categories might have included which animals could be domesticated, farmed and used for transportation.

More recent ones are: pets (indoor, outdoor, caged, chained), food (some animals, like rabbits and chickens, may fall into both pet and food categories), smart animals, dumb animals, beneficial animals, invasive species, pests, zoo animals, circus animals, wild animals, along with a variety of wildlife to be hunted by humans.

Although humans have assigned these arbitrary values to animals, the animals are oblivious to this. They value themselves regardless of humans' need to sort them into groups. The dairy cow and the Bajoran bat, for example, have the same desires as your cat or dog: comfort and companionship, safety and security, health and happiness.

This eloquent quote is from Henry Beston's 1928 book, The Outermost House:



"We need another and a wiser and perhaps a more mystical concept of animals...We patronize them for their incompleteness, for their tragic fate for having taken form so far below ourselves. And therein do we err. For the animal shall not be measured by man.

“In a world older and more complete than ours, they move finished and complete, gifted with the extension of the senses we have lost or never attained, living by voices we shall never hear.

“They are not brethren, they are not underlings: they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth."

A voice from almost 100 years ago offers insight that's still relevant today.

Source:
Meet the Neighbors: Animal Minds and Life in a More-Than-Human World
Book by Brandon Keim

More than a prop:
The Enterprise at the Smithsonian

By Adm. Willy Smith, CScO USS Heimdal, R1

Larry McKinley, docent for the Smithsonian's Air & Space Museum in Washington, DC, was a recent speaker at a chapter meeting.

He was an amazing guest speaker. While most of us were expecting Larry to speak about the Air & Space Museum and maybe mention the refurbished Enterprise being there, he surprised us all with the Enterprise being his major focus. He gave us a history of the Enterprise model at the Smithsonian.

“The Smithsonian acquired the original 1966 model of the Enterprise, the one seen at the beginning of all the original Star Trek episodes, in 1974 BEFORE there WAS an Air & Space Museum.

He said some people remarked that it was only a prop from a TV show, but the Smithsonian's attitude was that it was iconic & had a place at the museum because Science Fiction stimulates us all to THINK & so it began its journey to the place it holds today as the first thing you see when arriving at the Air & Space Museum.

“It was a wonderful ZOOM-linked Heimdal meeting – he offered to return!”

Introduction to Astrophotography – Part 4 Processing Your Images

By Fleet Captain Barb Barton, Sciences Director

In Parts 1-3, we learned the different options for taking pictures of deep sky objects and other beautiful things in the sky and the workflow to take the images. We have made a workplan and spent a beautiful starry night taking lots of images of our favorite target, let's say the NGC 2244 the Satellite Nebula. We have also taken our calibration frames (darks and flats).

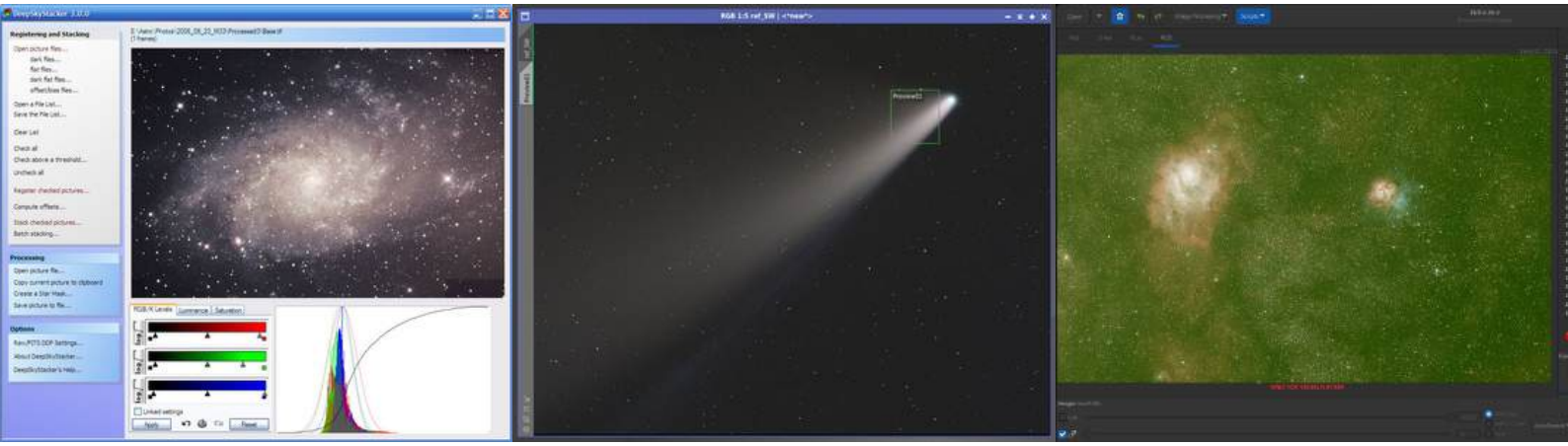
In our final article on the Introduction to Astrophotography, we will put everything together to make a beautiful image using astrophotography processing software. I will use an actual example of processing my photo of the Satellite Nebula, an open cluster in the Rosette Nebula located in the constellation Monoceros.

This cluster has several O-type stars - super-hot stars that generate large amounts of radiation and stellar wind. The age of this cluster has been estimated to be less than 5 million years. It is truly beautiful!

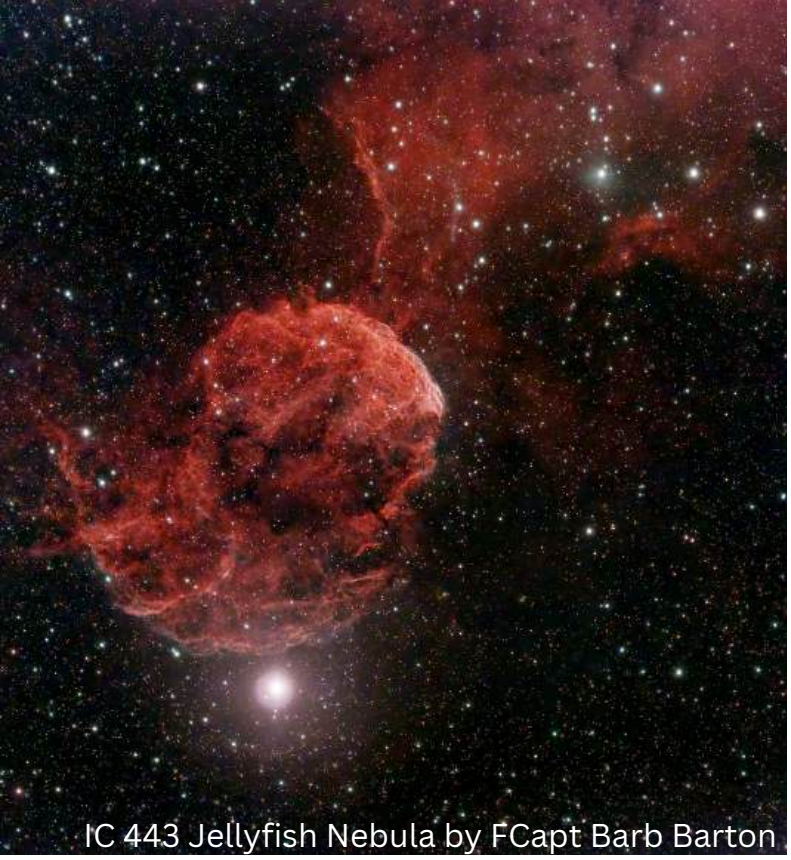
NGC 2244 Satellite Nebula by FCapt Barb Barton

Let's start with what we are working with. In this imaging session of the Satellite Nebula, I used my Redcat 71 telescope with an Optilong L-extreme filter (a 7nm bandpass filter that isolates the H-Alpha and Oxygen III emission lines) and shot 14 - 600 second images (lights) for a total exposure time of 2 hours and 20 minutes. I also took the following calibration frames: 20 – 600 second darks, 20 – 5.1 second flat darks, and 20 – 5.1 second flats. You may recall the calibration frames are critical for improving image quality by reducing noise, correcting for sensor imperfections, and ensuring a smooth, consistent background. I should add here that my goal is always to accumulate at least 20 hours of total exposure time, which brings out great detail in the image.

Our goal now is to stack all the images (both the lights and calibration frames into one image. Then, we will process the image to bring out the color and details.



There are numerous software programs available for stacking/processing astrophotography images. I will focus on the three most popular (*L-R above*) – DeepSkyStacker (free), PixInsight (free trial, expensive), and Siril (free). If you are looking for the absolute highest level of control, PixInsight (PI) is likely the best choice, but it is also the most advanced. I started with Siril and advanced to PI, which is highly technical but offers the most tools.



IC 443 Jellyfish Nebula by FCapt Barb Barton

There are many videos on YouTube which can teach you how to use these programs, but for PI I opted to sign up for Adam Block's workshops, Master's of Pixinsight workshops, and private instruction. I recommend starting with Siril, it is fairly easy to learn and, should you choose to move on to PI, you will already be familiar with terms and similar functionality.

To explain processing would require way more space than our glorious editor Captain Pam Kingsley would allow, so I will briefly share the steps used to create this image and what they do. As with our imaging session, you create a workflow and use basically the same steps for each target based on whether it is a nebula, galaxy, or comet.

Here is the order of steps I took for the Satellite Nebula:

1. Stack images
2. Initial stretching - The point of stretching is to redistribute the image values to those more visible, so the blacks/whites become more visible.
3. Color Calibration – Essentially adjusts the red, green, and blue channels to match the colors to star catalogues which have the actual color of the objects in space.
4. Background extraction – this function basically makes the background of the image uniform, based on the darkest part of the picture.

4. Background extraction – this function basically makes the background of the image uniform, based on the darkest part of the picture.

5. Tighten the stars – The bright stars in an image can “blow out” or be very large and fuzzy, this function will reduce the diameter of the stars to help reduce this effect.

6. Remove the stars – The stars are removed from the image and are turned into a separate image so that I can process the stars and the nebula separately.

7. Enhance the star colors – I boost the star color ever so slightly to make sure that it shows through the nebula.

8. Work on detail and bringing out color in the nebula – this requires working with histograms and a noise remover to bring out the nebula’s beautiful detail and color.

9. Recombine the stars and the nebula.

10. Convert image from linear to non-linear, then export as TIFF and JPG files.

11. Marvel at your beautiful work!

I hope this series has inspired you to consider taking up the hobby of astrophotography!

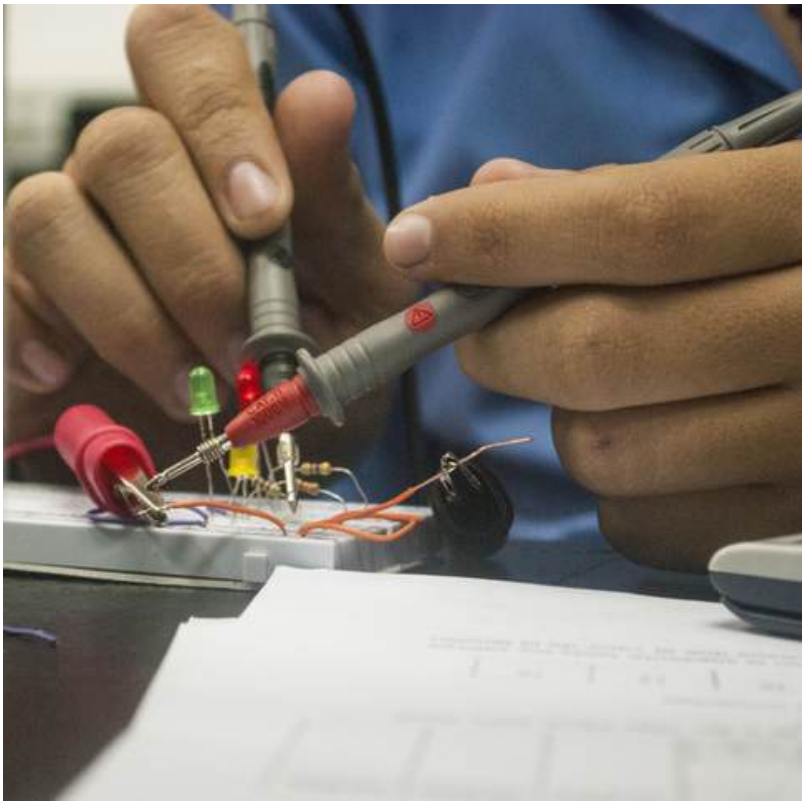
The next series will be on Solar Imaging! STARFLEET Sciences has a Stellar Cartography Facebook page where we share astronomy, astro and solar photography. Come and join us at **https://www.facebook.com/groups/716430362581080**

NGC 7023 Iris Nebula by FCapt Barb Barton

The basics of electrical engineering: The Multimeter

By Lt Col Michael Stelzer, USS Oklahoma, R12

A typical multimeter (also known as a volt-ohm-milliammeter (VOM)) can measure voltage, resistance, and current.



Analog multimeters use a microammeter with a moving pointer to display measurements. Digital multimeters (DMM) have a numeric display and are often cheaper, more precise, and more physically robust than analog multimeters.

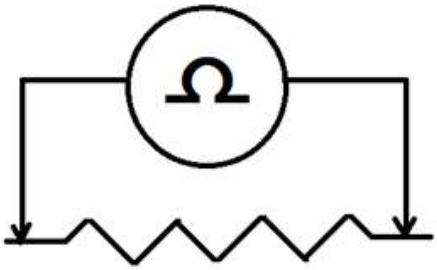
Multimeters have two test leads, one red and the other black. The red lead is to be applied to the positive flow of electrical current, and the black to the return path for current.

When measuring resistance or voltage, the DMM is placed across, (or in parallel) with the component to be measured. Resistance measurements are not polarized, so it makes no difference as to which lead (the red or black) is attached to which side of the component.

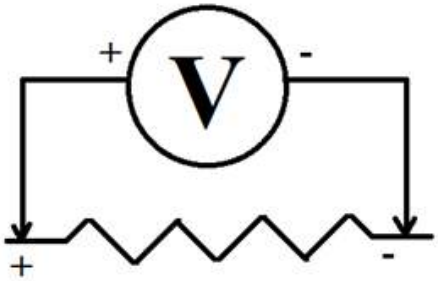
However, voltage measurements are polarized and if the leads are not connected properly, a negative voltage or current will result. A correct reading may then be obtained by merely reversing the connecting test leads.

Current is measured in-line (or in series) with the component and needs to have the correct test leads connected to the correct component leads. This procedure requires opening the circuit so that the ammeter may be placed in-line with the component through which the current may be measured.

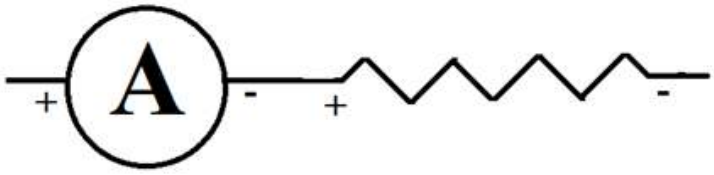
A much more practical method, however, is to merely take a voltage measurement across a nearby resistor and apply ohms law to compute the electrical current which travels through the resistor.



Resistance Measurement



Voltage Measurement



Current Measurement

Celebrating Science in Region 1

By Adm Richard Heim
R1 Science Liaison

Region One Sciences recently attended the 2025 Region One Summit and hosted a panel. Winners of the Region One Sciences Hawking and Galileo Awards were announced at the Summit, and the winners of three new awards were also announced.

The Steven R. Hawking Award for Original Article is awarded for the most original submissions to a club newsletter or listserver. Candidates for the award are nominated by Region One CSOs and voted on by the CSOs. There were four nominees: USS Potomac/Comm. Michael Lewis, USS Renegade/RAdm. Janice Graham, USS Ronald E. McNair/Lt. David Lyons, and USS Tanasi/Lt.jg Teresa Collins. **The winner, by ranked vote of R/1 CSOs, was Comm. Lewis.**

The Galileo Award for Chief Science Officer of the Year is awarded to the most enthusiastic, most energetic, or most productive CSO. Candidates for the award are nominated by Region One CSOs and voted on by the CSOs. There were three nominees: USS Heimdal/Adm. Willy Smith, USS Jurassic/FCapt. Nancy Hall, and USS Potomac/Comm. Michael Lewis. **The winner, by ranked vote of R/1 CSOs, was also Comm. Lewis.**

The Region One Supernova Award is a new award and is for CSOs whose chapter activities show an explosion of creativity and leadership (these are basically runners-up in the Galileo Award category). **The winners were USS Heimdal/Adm. Willy Smith and USS Jurassic/FCapt. Nancy Hall.**

The Region One Quasar Award, also a new award, is for CSOs whose science contributions shine brightly throughout the year (these are basically runners-up in the Hawking Award category). **The winners were USS Renegade/RAdm. Janice Graham, USS Ronald E. McNair/Lt. David Lyons, and USS Tanasi/Lt.jg Teresa Collins.**

Another new award this year is **the Region One Solar Eclipse Award for Promoting Science**. It is awarded to any STARFLEET member for promoting science amongst STARFLEET members & non-members and the winner is determined by the R/1 Sciences RDC or ARDC. **Region 17's FCapt. Jared Finkenbinder was awarded the Solar Eclipse Award** for his work assisting ARDC Michael Lewis, during Michael's Eclipse Ambassador Zoom meetings and PowerPoint presentations, to help students learn more about science and our solar system.

- Comm. Lewis is a regular contributor to the R1 Sciences Report. An example of his contributions is below: *(taken from September 2024's report and used with permission)*

Comm. Lewis advised R/1 CSOs of the **NASA SciStarter Ambassadors Program**, NASA's Enhanced Mentor Protégé Program, and the Globe At Night program....

He noted the **Polaris Program** "is a first-of-its-kind effort to rapidly advance human spaceflight capabilities, while continuing to raise funds and awareness for important causes here on Earth. Polaris, a constellation of three stars more commonly known as the North Star, has been a guiding light throughout

human history to help navigate the world around us and the sky above. The Polaris Program seeks to demonstrate important operational capabilities that will serve as building blocks to help further human exploration to the Moon, Mars, and beyond."

Michael is working to get members of the USS Potomac and USS Bellnap, who are interested in Astronomy, to participate in activities with the Northern VA Astronomy Club, virtual monthly meetings of other Astronomical Societies (including the Richmond Astronomical Society and Memphis Astronomical Society), the Globe At Night project, and the AAVSO (American Association of Variable Star Observers).

He is working to get Chief Science Officers interested in Paleontology to participate in #FossilFriday posts on Twitter. "There are interesting resources mentioned in many of these posts for members of Chapter Science Departments interested in Paleontology to enjoy. Please view this **Pinterest board** for examples."

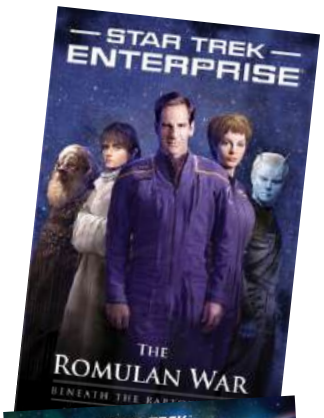
Michael is also working on Chief Science Officers' professional development by: encouraging the filing of monthly reports with the RDC and leading by example as an officer who serves chapter, region and 'Fleet.

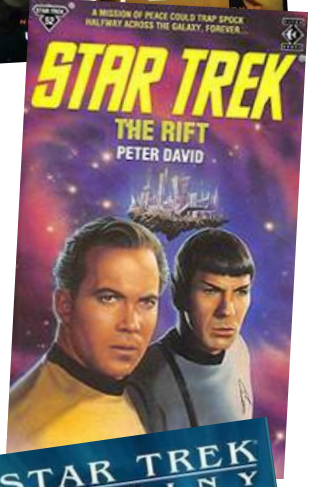
HEROES ALSO WEAR BLUE

https://medical.sfi.org/welcome-to-starfleet-medical/join-us/

https://sciences.sfi.org/join-us/

Science Fiction





Since 1968, *Star Trek* has spawned hundreds of spin-off books and many thousands more fan fictions starring our favourite characters and ships. We want to celebrate some of that creativity in the pages of the *Event Horizon* by sharing some of our members' stories set in the *Trek* universe.

In this issue astrobiology is a feature in both of our featured stories.

Interesting Creatures by Capt Pam Kingsley looks at first contact with nebula-dwelling creatures, and hints back to something that happened in *TNG*.

Merciful, by FCapt Rahadyan Sastrowardoyo, is set in Kirk's time and features an early contact between Starfleet and the Trill.

If you have a story that you have written, ideally with a scientific discipline featuring in the narrative, then we would love to print it!

Please send any contributions to
sfsci-eheditor@sfi.org

Interesting Creatures

By Capt Pam Kingsley, USS Mercia, R20

Captain's log, Stardate 81283.2
We are beginning to chart the Rho Ophiuchi cloud complex, a group of nebulae-filled interstellar cloud. At 460 light years from Sol, it is one of the closest star-forming regions to Earth, but still the best part of a year away. This is the type of mission the USS Anning specialises in – long-range and long-duration missions. We expect to be here for several months while we survey the different astronomical phenomenon present here.

"Preliminary scans are showing gases, dust and some smaller clumps of matter," a lieutenant reported. "One larger object showing on scans. But... I don't see how..."

"Explain," Captain Tharas said, leaning forwards in his chair, antennae twitching.

"Sir, there's a single large object out there. Bigger than an asteroid. It's spherical – a very small protoplanet. But I don't see how it formed." Her fingers danced over her touchscreen as she scrolled through her scans. "There's nothing else even remotely that size out there," she explained.

Tharas leaned back in his chair and looked out at the cloud on the viewscreen. "That sounds intriguing," he mused, steepling his fingers. "Harris, Sahriv, prepare a shuttle to go and take a look. Helm, get us closer."

Photo NASA

Three envirosuited figures stepped on to the protoplanet, tricorders out.

“A tenuous atmosphere comprising helium, argon, ammonia, methane, carbon dioxide and oxygen,” Lt Commander Sahriv, chief science officer, reported. “Possibly from outgassing of the planet as the rocks compress.” A spurt of gas erupted from a nearby fissure as if in confirmation.

“Commander, I’m reading... life signs?” Ensign Harris said. He shook his tricorder, not quite believing the readings.

“Where?”

A scuttering sound vibrated through the ground and up their suits.
“There!” Harris pointed, staring in disbelief as a dozen or more small hairy forms scurried towards them.

They didn’t stop as they approached, but ran around the away team, sniffing at their legs and feet. One started climbing up Harris’s leg.

“Do not move, Ensign,” Sahriv instructed, scanning the creature. “It appears harmless. Perhaps it is curious about us.”

The creature scrambled up to Harris’s shoulder and then down his arm. He raised his hand cautiously to get a closer look. It had a reptilian face with dull brown scales that glinted in a slightly metallic

way. In contrast, the rest of its body was covered in wiry brown/black hair. It regarded Harris with large black eyes, flicking out a long, textured tongue as if tasting the air. Its scaly feet were tipped in short, sharp claws.


Photo CoPilot AI

"Hello," Harris said, tilting his head. The creature mimicked his action, blinking at him.

"You've made a friend," Lt Evans, the third member of the party, observed.

"But how are these creatures living in an unstable rock in an otherwise barren nebula?" Sahriv asked.

"Oxygen from the outgassing?" Evans suggested. "Although I have no idea what they'd eat." She looked around then stumbled as the ground shook. A plume of gas erupted and the creatures ran for shelter as the ground cracked.

Evans, knocked to the floor, heard Harris yell and then watched as he disappeared from view in a cloud of dust. The gas subsided and the ground stilled, revealing a jagged hole where Harris had been.

"Harris, report," Sahriv said in a calm, unemotional voice.

"We're okay, Commander, but I don't think I can climb up," Harris's voice came over the comm."

Evans crawled to the edge of the hole and looked in. Harris was half

standing, wedged a good three metres down with the creature clinging to his chest. Some of the other creatures had approached the hole too and were darting to the edge and back, casting glances down at the pair trapped inside.

"*Anning*, are you reading what has happened?" Sahriv asked.

"Yes, Commander. We're trying to get a transporter lock on Harris now," the reply came. A moment later, *"Sorry, Commander, we can't get a lock. There's something in the rock that's affecting the targeting sensors."*

"We will have to pull you out the old-fashioned way, Ensign," Sahriv said. "I believe we have a length of cable in the shuttle that would serve as rope. Lieutenant, your assistance please."

The pair turned towards the shuttle, but as they did the creatures started scurrying towards them, getting underfoot and slowing their progress. Evans stopped, but Sahriv kept moving, wading through despite the creatures clinging to her legs.

"Lieutenant," she called without turning. Evans shook off the creatures as best she could and followed the Vulcan. Once they had found the cable it was a simple matter to attach the ends to the shuttle as an anchor and lower the remaining looped section into the hole. Harris placed it under his arms and Sahriv and Evans carefully pulled him up.

At the top, Harris sat on the edge and rubbed his leg with a groan. The creature bounded off his chest and bounced around his head before running back to the other creatures.

“I think he’s happy to be safe,” Evans smiled.

“It is unlikely to be sentient,” Sahriv observed. “I doubt that it’s ‘happy’. We should return to the ship before any further incidents. Mr Harris, can you walk?”

Back aboard the *Anning*, Harris was dispatched to sickbay with a sprained knee while Sahriv and Evans joined the captain and the navigator, Ensign Cole, in the briefing room.

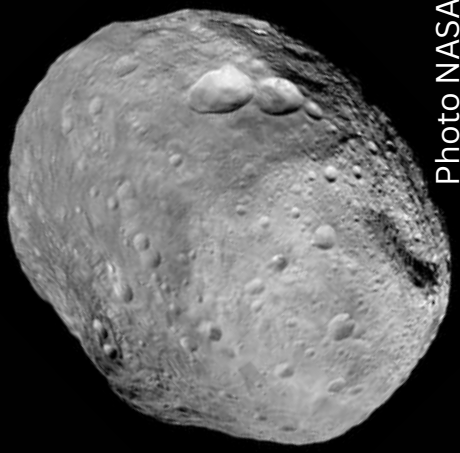


Photo NASA

“The eruption that trapped Harris was large enough to change the object’s course,” Cole reported. “It’s now on a spiralling orbit leading to the star. It’s got maybe a decade before it will be uninhabitable.”

“I feel obliged to point out that we do not know at what point the protoplanet would become inhabitable for these creatures,” Sahriv said.

Cole flushed. “Best guess based on average life forms,” he replied.

Tharas held up a hand. “Unfortunate in any case, but not our

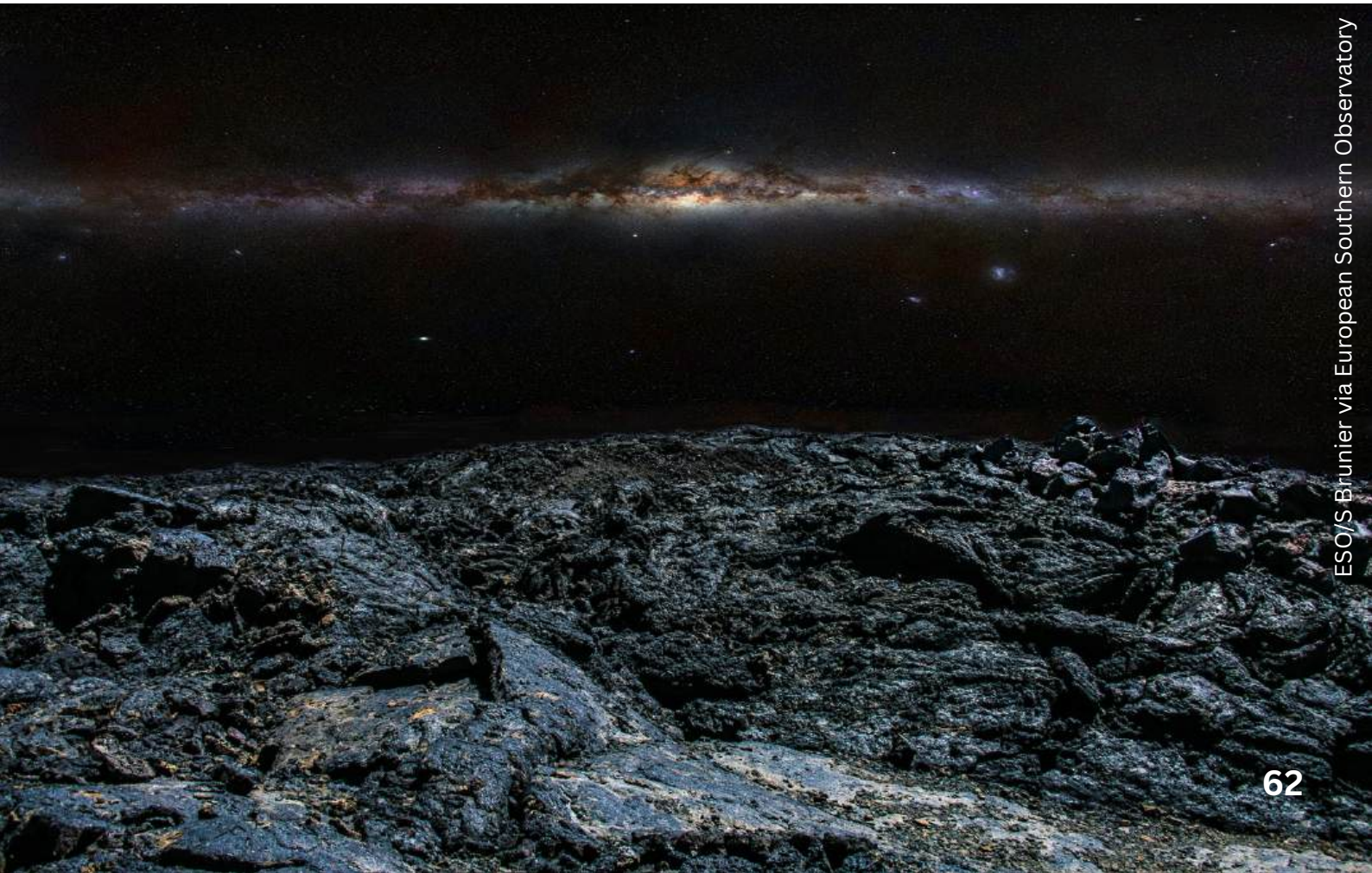
concern," he said. "We will study these creatures while we are here and then move on to the rest of the cloud."

"You're going to leave them to die?" Evans asked. "You can't do that! It would be easy enough to divert the planet's course with tractor beams, or a gravity tug while we study them."

"Need I mention the Prime Directive?" Tharas said.

"It doesn't apply," Evans replied. The Andorian's eyebrows rose but he said nothing, so she continued. "They already know about us, and we've already affected their way of life – we rescued one of them from the hole when we pulled Harris out.

"They also asked us for help in that case – they swarmed us when we tried to go to the shuttle without Harris, trying to get us to go back to the hole to help him and their compatriot."



ESO/S Brunier via European Southern Observatory

Tharas looked at Sahriv. “Unwarranted anthropomorphism, but accurate as far as it goes,” she said.

“If they asked us for help to save one of their own, they would certainly want help to save more than one if they knew what danger they were in,” Evans continued. “And even if you choose not to, it’s not a Prime Directive issue because that’s already been negated, so the death of that entire species would be on your conscience.”

Tharas half smiled. “Are you trying to make me feel guilty, Lieutenant?” he asked. “I feel obliged to point out that these creatures are probably doomed anyway. When the outgassing eventually stops, they will suffocate. But,” he raised a hand to forestall any objection. “Let me consider it. We have time before its position changes enough to affect climate?”

Cole nodded.

“Then continue your studies of the creatures – give them a name, please. I don’t want to keep referring to them as ‘the creatures’. And give me options and parameters for adjusting the planetoid’s course. Dismissed.”

Three weeks later the Anning had completed its survey work in that sector and was due to move on. Captain Tharas visited the science lab where Sahriv, Evans and Harris were working.

“Captain,” Sahriv stood up as he entered the lab.

“How are our shadowfur lizards?” he asked.

“Technically they are *Hirsutodrakon Noctis*,” Sahriv said.

Tharas waved away the correction and moved to look at her screen. “Can you summarise for me?”

“They’re interesting creatures. Unpredictable, and remarkably resilient to change,” Sahriv said. “We believe they’re using something to supplement the oxygen in the air, and our hypothesis is that they are getting it from the rocks.”

The captain’s antennae arched back in surprise. “They breathe rocks?”

The Vulcan raised an eyebrow. “It is not quite as simple as that, Captain,” she said. “But rocks are comprised of a high percentage of oxygen. The Earth’s crust is approximately 45 per cent oxygen. I suspect that the creatures have a method of extracting that oxygen, much as fish have gills to extract oxygen from water.”

“So they would be able to survive even when the outgassing of oxygen stops?” Tharas asked.

All three officers nodded.

Tharas was quiet for a moment and then turned to Evans. “So, Lieutenant, you’re about to tell me that my other argument for not interfering with this planetoid’s orbit has been shot down, aren’t you.”

Evans looked away then back at the captain. “Yes, sir,” she said.

“They are not doomed to suffocate as long as there’s rock to metabolise.”

“And do we know what they eat?”

“Bacteria in the rocks, sir,” Evans answered promptly.

“I see,” Tharas said. “In that case, please report to Ensign Cole and work out the details of a gravity tug to stabilise the protoplanet’s orbit.”

Evans and Harris exchanged grins.

A consciousness within the cloud regarded the ship as it manoeuvred closer to the planetoid to begin the slow process of correcting its orbit.

It watched for a few minutes and then shifted its attention to a companion.

“They are interesting creatures. Unpredictable in many ways, and remarkably resilient to change,” it emoted.

“What do you recommend?” its companion thought.

“Continued observation in the wild,” the first replied. “We have nothing to gain by attempting to domesticate them or observe in captivity. Do you recall Nagilum’s failed efforts?“

“I do,” the second returned. Its thoughts were mildly disrupted for a moment, then the natural calm returned.

“Very well,” it agreed. “We will observe but not interfere. Perhaps, in time, they will reach a level of advancement in which we can truly know them. Until then, we will watch and wait.”

“Watch and wait,” the first echoed. “After all, they do plan to be here for some time…”

Merciful

by Fleet Captain Rahadyan Sastrowardoyo, USS Challenger NCC-1676-D, R7

All pictures with this story except Trill physiology generated by AI/CoPilot

2284

The night-shift bridge crew on the Tereshkova picked up on the alien science vessel's emergency broadcast first. The audio signal was weak, and in an older form of linguacode.

A sensor scan indicated that the vessel's hull was hundreds of years old. Before calling either the captain or exec, the officer of the deck attempted to establish voice contact with the vessel.

Nothing on voice, but a text message arrived, identifying the vessel as a ship of the Trill Commission, in need of urgent medical help.

The OOD woke Captain Morgenthau up and gave her the sparse details. Corinne Morgenthau instructed the OOD to copy the hospital ship *John Mandeville*'s CO on the situation and stated that both ships should increase their speeds to warp factor 8. *Tereshkova* and *Mandeville* were only separated by eight kilometers, traveling as an expedition on the same patrol.

In her quarters, Lieutenant Aurora de la Cruz, M.D., seconded to the patrol as liaison to Starfleet Intelligence, was up late reading. Her intercom whistled at her, and she hit the accept touchpad. "De la Cruz."

“Aurora,” came the voice of Captain Morgenthau, “Bridge just told me we have a Trill vessel adrift and in need of help. Per standing orders, I’m letting you know…”

“I’ll be up there shortly,” responded Dr. de la Cruz and clicked the ‘com off. While she and the captains of both ships were cordial enough to her, they were chary about Starfleet Intelligence involvement, particularly because both suspected de la Cruz of actually being the directorate known as Section 31.

That wasn’t the case. Dr. de la Cruz had gone on one mission with S31, or “the Section” (as some preferred to call it), in her younger days just out of Starfleet Medical Academy.

She had initially approached that mission with curiosity but would later regret her involvement at all. Starfleet Intelligence had quite a few medical officers since its inception, and one would think that the counterintelligence agency whose very existence was compartmentalized would have many as well, but the dark-uniformed senior officers that pressed her into service gave the hint that any they’d had were no longer in the Section, whether due to death or retirement.

She changed into a fresh uniform and went up to the *Tereshkova*’s bridge. Captain Morgenthau and Lieutenant Commander Sabrina Moyet, the XO, were already there, being briefed by the gamma-shift office r of the deck, a young lieutenant junior grade whose name de la

Cruz couldn't recall immediately. Bedford, that was it; he was five years out of the Academy. His primary billet was as the third-shift science officer and his specialty was astrobiology.

"How long until the situation becomes critical?" Moyet was asking.

"Apparently a matter of hours, no more than twelve," was Bedford's response.

The turbolift hissed open again, and Chief Medical Officer T'Raav came out of it. Her normally serene face was creased with a concerned frown. In Dr. T'Raav's left hand was a PADD. "I've downloaded everything we know, but I do not understand why this particular procedure is necessary. I can divine some information from some Trill texts, but it doesn't make any sense to me."

Morgenthau nodded. "We'll read in Captain Ilund on what we need to do, but I don't think their information is any more recent than ours."

The junior officer at the communications station responded to a tone at his station. "Mamsirs—" he was from the Philippines on Earth and used

that particular word to address multiple genders— “Incoming from the Trill ship. An ambassador, Cyrus Prati. He wishes to speak with both us and Captain Ilund.”

Morgenthau nodded. “Set up the conference communications.”

A minute later, the Tereshkova’s main viewer displayed a venerable Trill male, apparently Ambassador Prati, and Captain Carolyn Ilund, the John Mandeville’s commanding officer.

Prati coughed as a prelude, “Captains, may I please ask that any officers that have security clearances below the level required for wartime strategy and tactics leave your respective bridges?”

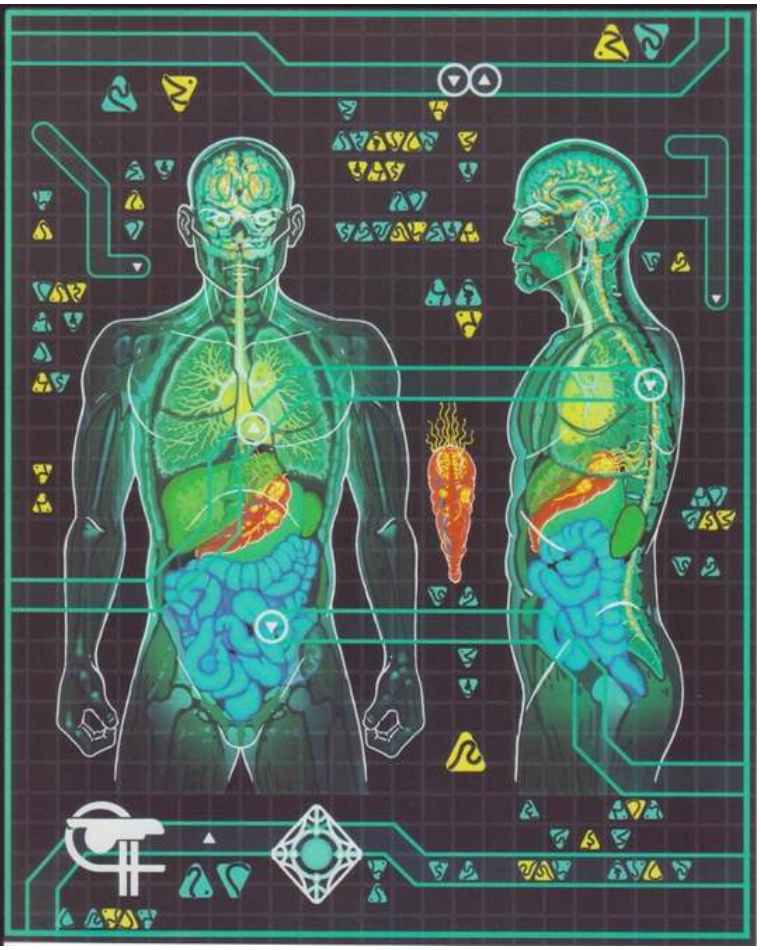
On the screen, Ilund frowned. Morgenthau and Moyet looked at each other. “Yes,” said Morgenthau, with Ilund repeating it a moment later.

After Lieutenant Bedford and the gamma-shift helmsman and navigator – as well as Dr. de la Cruz -- had vacated the bridge, and their counterparts on *John Mandeville* had done so as well, Prati briefed the senior officers of the two ships, and sent them each an encrypted message with details of what was needed for a surgical procedure involving two Trill women, Tebrok Kah and Lokos L’Rel.

The two captains muted Prati briefly while they conferred with each other, then gave their assent. The procedure would occur in the

Mandeville's main surgical suite at 0600, about an hour in the future. A *Tereshkova* medical team would be primary, with a *John Mandeville* team as backup.

There were no detailed texts on Trill symbiont physiology in Federation Standard, and the Trill themselves were extremely guarded. That might change when they joined the UFP, but the negotiations were still ongoing and proceeding slowly.



When Trill were assigned to Federation starships beginning in the 2250s, a microtape of Trill medical data was assigned with them but only for the duration of their assignment. Such were encrypted and thus nearly impossible to copy. The neurotransmitter isoboramine occurred in only the Trill and in no other humanoid species thus far encountered. Even a subspace livelink request to Memory Alpha yielded no results.

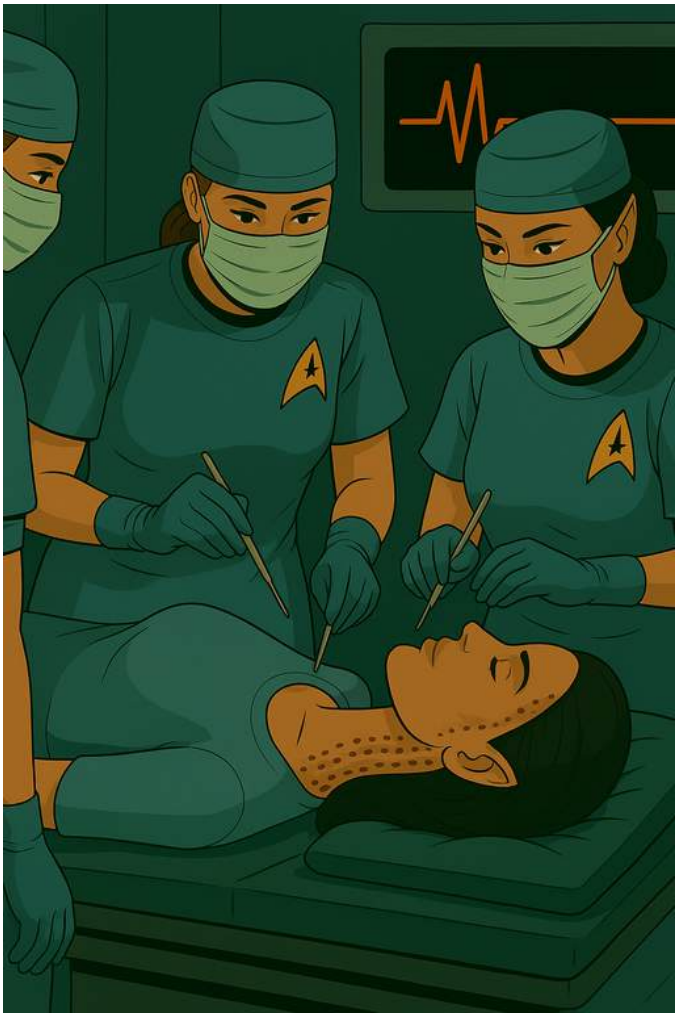
Dr. T'Raav assigned herself, Dr. de la Cruz, and Nurse Benitez to the operation, which could take several hours. One of the Mandeville's senior science officers monitored remotely.

If transporter-based surgery were feasible, the cross-symbiont transfer would be far easier but it wasn't. And Ambassador Prati, albeit with a great deal of uncommon reticence, had told the respective captains of

the *Tereshkova* and the *John Mandeville* as to the urgent need and rationale why. Not even Dr. de la Cruz, the expedition's liaison to Starfleet Intelligence, was allowed to know why. But she was also one of the surgeons scrubbing in on the procedure, so she might actually figure it out while it was going on.

Tebrok Kah and Lokos L'Rel were both quiet, under cryosurgical frames on neighboring biobeds. When they were shuttled – not transported – over to the Mandeville, they were accompanied by hektoliter containers of isoboramine type M and isoboramine type N, which were essential to the procedure.

The medical team proceeded with an excess of caution. Aseptic uniforms and masks, plus life-support belts. The surgical suite's sterilites were tied into reserve power.



Dr. T'Raav asked the two Trill, "Ready?"

"Yes," answered Kah for both of them – or all four of them, depending on one's perspective. "We've already said our prayers," she added with a wry smile. L'Rel looked over at Kah with a loving look.

"Then let's go."

The procedure concluded quicker than expected, about 1500 ship's time. The team from the Mandeville had offered to step in around 1200, but the

Tereshkova team refused, but T'Raav added that if the procedure required going past 1530, they would appreciate being relieved.

The three ships remained on station for another day. The involvement between the two Federation ships and the Trill vessel received a higher classification under Starfleet directives to be sealed for a hundred years. This was in accordance with the negotiations between Trill and the Federation.

The two Trill women -- now named Tebrok L'Rel and Lokos Kah -- had a brief celebratory meal with Ambassador Prati and a small contingent from both Starfleet ships.

All had apparently gone well, but Morgenthau -- as the senior of the two captains -- made a standing offer of assistance should any complications arise.

Cadets only past this point!

Spock and McCoy have decided to give Captain Kirk a logic puzzle to solve. They have prepared 5 drinks for the captain that all look and smell the same.

One will give Kirk hiccups, one tastes of soap, one is Kirk's favourite coffee, one has tribble fur in it, and one will make Kirk's hands turn blue!

From these clues, can you work out which one is Kirk's coffee?

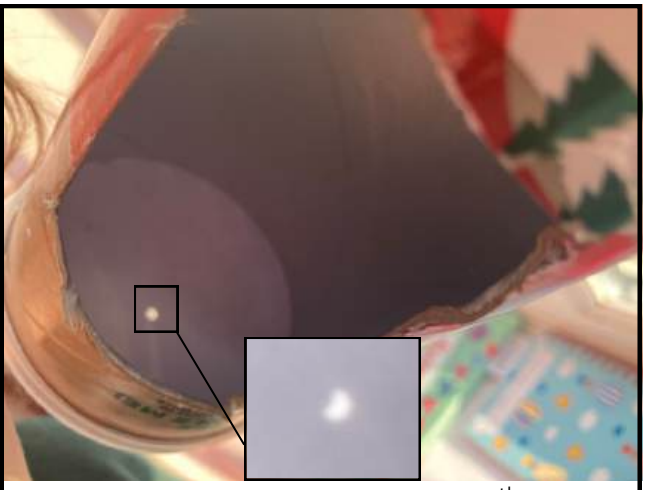
- Cup 1 will do something unpleasant to Kirk
- Hiccups are not on either end of the line
- The tribble fur is next to cup 4
- Cup 3 tastes bad
- The coffee is between the soap taste and the blue hands drink

	1	2	3	4	5
Coffee					
Soap					
Blue hands					
Tribble fur					
Hiccups					

Answer: The coffee is in cup 2. Cup 1 will give Kirk blue hands, cup 3 tastes of soap, cup 4 will give Kirk hiccups and cup 5 has tribble fur in it.

How to make a pinhole viewer

By Cdt4 Chloe Kingsley, USS Mercia, R20



Partial exclipse of the sun on 29th March 2025 as seen through the pinhole viewer

You will need:

- A Pringles tube or something similar
- White paper or card
- Scissors *
- A skewer or other sharp point *

* Under 18s should check with parent/ guardian before using sharp tools.

1. Take off the foil cover inside the lid.
2. Draw a rectangle on the side of the tube near to the lid and cut it out.
3. Draw around the lid on a piece of paper or card. Cut it out and put it inside the lid then put the lid back on.
4. Make a small hole in the middle of the other end of the tube.
5. Point the hole at the sun and you will see a dot of light appear on the white paper in the lid. This is a picture of the sun!

If you make a pinhole viewer and use it to see the sun, we'd love to see pictures. Send them to **sfsci-eheditor@sfi.org** Under 18s should get parent/guardian's permission.

SFSCI Cadets Away Team Academy Challenge

At SFSCI we like to run Academy challenges throughout the year, asking you to take courses in the STARFLEET Fandom Academy on a certain theme.

This month's challenge is all about what you would find if you were a science officer exploring an alien world – and for the first time, this challenge includes a cadets' version!

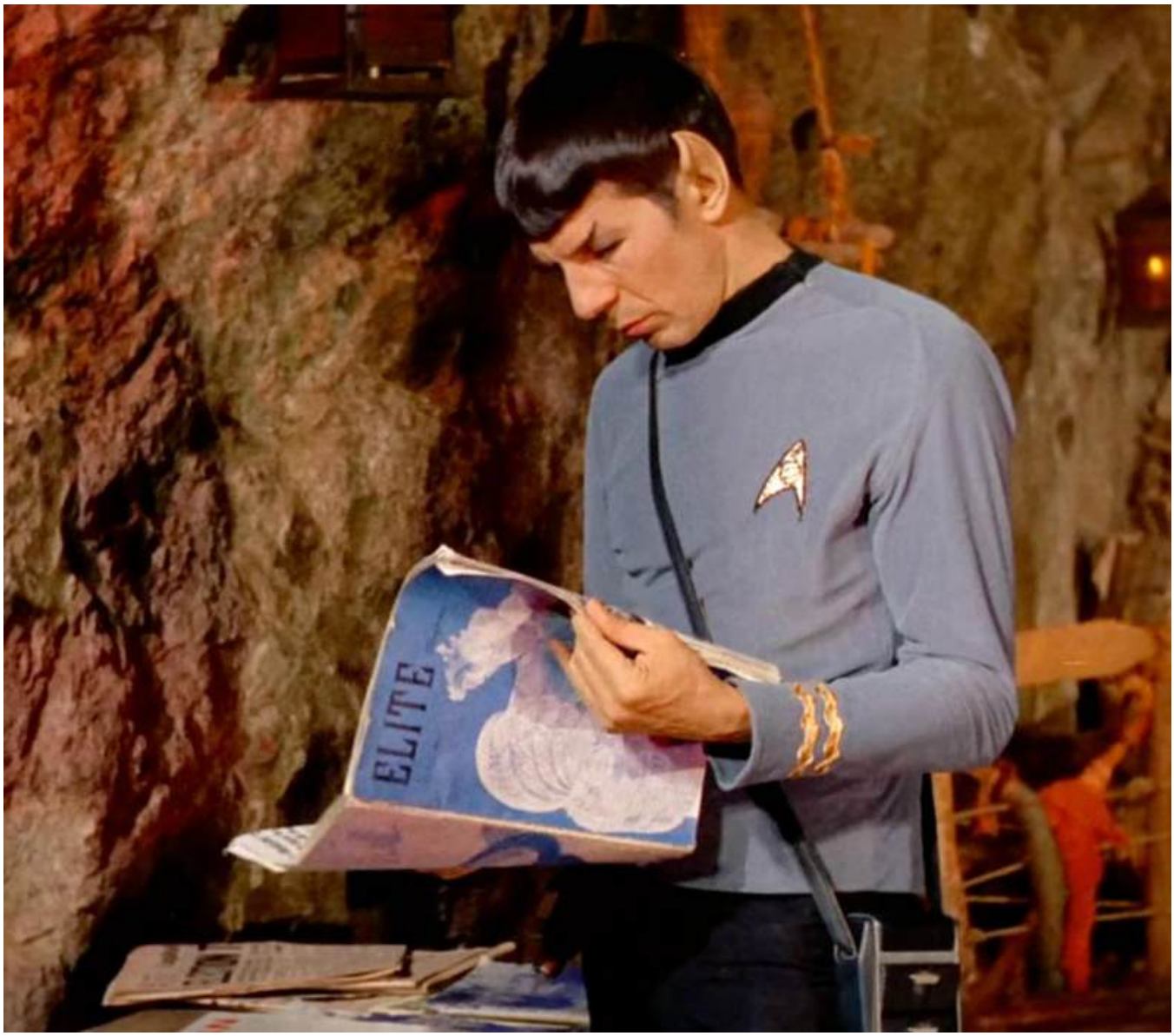
You'll be studying some of the strange animals and insects that have made an appearance in *Star Trek* as well as finding out more about the real-life alien worlds that are out in the cosmos.

The courses are:
Week 1-2 (June 1-14): CFXZ 101 - Animals & Insects in Star Trek Pt. 1
Week 3-4 (June 15-28): CFXZ 102 - Animals & Insects in Star Trek Pt 2
Week 5-6 (June 29-July 12): SPID 129 - Exoplanets part 1

If you don't have an Academy account you will need to ask a parent or guardian to sign you up for one.

Once you've completed the courses you can turn in your certificates or screenshots of your transcript before July 24 to **sfsci-chiefedu@sfi.org**

Good luck to everyone!



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