Issue 6. October 2025

Event Horizon

The magazine of STARFLEET Sciences

2024 STARFLEET Newsletter of the Year

IN THIS ISSUE

Contents

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

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

Cover image: Sol © Barb Barton

"Somewhere, something incredible is waiting to be known."
— Carl Sagan

From the Director's Office

Greetings from Station Schroedinger!

As we celebrate Star Trek's 59th birthday, many of us are thinking about what Star Trek means to us personally as well as culturally. I interviewed several people from across the country for a newspaper article I wrote after returning from Mission Chicago back in 2022. I asked that very question and their stories were deeply personal.

A couple of folks talked about how Star Trek got them through some of the hardest times in their lives, with messages of hope and possibility. Others said it was the first time they saw themselves on the TV screen and felt empowered and proud. I have heard people talk about how the franchise influenced their decision to go into their chosen occupation, and we see that play out with most of our guests at the Sol Speaker Series.

For me, Star Trek represents hope for humanity - that we can overcome the obstacles that make life hard for so many and come together as a global community to be the best we can be. It represents honor and respect, courage and bravery.

Indeed, Infinite Diversity in Infinite Combinations (IDIC) defines strength. Our Earth is vibrant because of its biodiversity, each component playing a unique role that supports the great web of life. We are stronger together.

Our September Academy Challenge, Treknology to Technology, celebrates the influence Star Trek has had on the development of new technology. The vision of Gene Rodenberry truly has influenced the world.

As you celebrate the 59th year of Star Trek, think about how it has influenced your life and the world around you. I share that good stuff with the world.

To the Stars!

Barb Barton

FCAPT Barb Barton
Director, STARFLEET Sciences

From the Editor's Desk

Welcome to the third *Event Horizon* of 2025!

I hope you've had a good summer (or winter for our southern friends). I visited the Destination convention where, alongside the exhibitors and guests, there was a very popular science and community stage. It would great to see so many people enjoying talks on human spaceflight, geology, exoplanets and AI, among other topics.

In this issue of the *Event Horizon* we have our regular features on solar photography and astronomy, as well as the first part of a fiction story set during the 23rd century and in WWIII.

We have also filled quite a lot of pages with Earth-based science, including electrical engineering, rock hounding, CFCs and bugs (the six-legged variety, not computer-based ones...).

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

Celebrating Sciences

The Sciences auxilliary celebrated several awards at the International Conference held at the start of August!

Newsletter of the year 2024:

Event Horizon - STARFLEET Sciences Auxiliary

Newsletter Cover of the year 2024:

Event Horizon issue 2 - STARFLEET Sciences Auxiliary - picture by FCAPT Barb Barton

The issue which we submitted for these categories was Issue 2 from October 2024. Thanks to all the contributors: FCAPT Barb Barton. CAPT Pam Kingsley, ENS Monica Butt, LTJG Amanda Phillips, LCDR Kirk Steinbruegge, LTJG Gábor Nagy, CDR Patrick Litton, COMM Phyllis Seale Foynes, CAPT Rezty Felty, LT COL Michael Stelzer, ADM Richard Heim & Stamets the Tardigrade.

STARFLEET Sciences awards

Science Liaison of the year: Ensign Monica Butt, USS Mercia, R20

Science Officer of the Year: ADM Richard Heim, USS Alaric, Region 1

Sciences Chapter of the Year: ISS Kidd, Region 3

Sciences Region of the Year: Region 1

Richard Heim Award:

CAPT Pam Kingsley, USS Mercia, Region 20

CAPT David Yee, USS Parallax, Region 11

My Experience at the International Conference

By LT Matthew Chrysler
Sciences Chief of Staff
USS Blackstone, R12

This article will be about my experience at the International Conference and what it was like getting ready for the conference and my time while at the conference. This is the first year I have been able to go to International Conference (IC) as a member of STARFLEET International Fan Club but also as part of the Command Staff for STARFLEET Sciences. There were a lot of things going on with changes to the schedule and what needed to be done prior to leaving.

The week prior to leaving for IC I was asked if I would be able to put something together to represent things for Sciences. In just a few minutes I came up with an idea to make binders that show different things that we offer to such as the educational programs, awards, The *Event Horizon*, open positions within Sciences, our handbook, Scientific Research Teams, and a look at the upcoming communication badge for Sciences. This was the easiest way to get information about the different things that Sciences offer and to highlight the active membership within the Auxiliary.

There was a lot of things to get done in a very short period of time - just three days - or at least it felt like there was.

I was also asked to present a power point on behalf of Sciences auxiliary during the All-Auxiliary time during the conference. The power point was so kindly put together by Director FCAPT Barb Barton, CAPT Pam Kingsley, LCDR Diane “Rip” Ripollone, and LTJG Ceraso.

The power point was put together very quickly, and it was well organized. During this time, I was sent to me by MGEN Jeremy Carsten about not receiving the power point the night before I left. With technical issues I informed him that I would bring a copy on a USB drive so there would be an easier way as well for the power point if it didn’t come through.

After getting checked into the hotel I went downstairs to check in for the Conference which was downstairs, and they informed me about where the gaming room was and informed that the silent auction was through the door that was behind the check in table. After getting everything up in the room I then took down the items for the silent auction. They informed them about the prices for each item and went back up to the room for the Marine Mess that night where representatives for the Auxiliaries were special guesses.

The Marine Mess was very well done in my honest opinion. They did a great job, having a dignitary table that had representatives from Sciences, Special Operations, and Tactical.

The dinner was a blast from experiencing a great experience with the Mess and just seeing the true and genuine feeling of upholding the other auxiliaries going forth. It really did make me feel welcome not only as part of Sciences but as a member of STARFLEET INTERNATIONAL Fan Club but also as a member of STARFLEET Marine Corps.

Then the, let's just say vast difference acting abilities, show that was our version of *A Midsummer Night's Dream* by William Shakespeare. It was a great time of just a lot of fun and laughs. I hope you all have seen the videos that were shared from this show. This is not to mention that FADM Nottage was very generous by giving the members, that would like to accept the offer some complementary gifts that may have added to the comedy of the night's show. I will say I will remember this event for a long time and would highly encourage any reader to go to a Dress Mess that was put on by the SFMC at any IC.

Right before the opening I set up the binders for Sciences. While there during the opening proceedings they went through the chapters and Announced the Awards for STARFLEET. It was my honor to represent Sciences to receive The Newsletter of the Year and Newsletter Cover of the Year. Congratulations to CAPT Kingsley on the hard work you put into *The Event Horizon*. It was well noticed and greatly appreciated.

During the All-Auxiliary event, those that were present had time to present about their respective auxiliaries. Tactical went first with a great presentation on their auxiliary. Then it was my turn to present on the Science Auxiliary and give a concise run down on the events, and what we provide for the membership of Sciences.

While presenting I had the honor to announce the annual Award winners from Sciences for Chapter of the Year, Liaison of the Year, Science Officer of the Year, Region of the Year, and The Richard Heim Award.

I also was able to announce a Certificate of Appreciation for Commandant Malotte in his participation in Sciences and his continued support of Sciences.

Due to being in Houston, TX right down the road from NASA's Johnson Space Center there was an opportunity to have a tour while down there. The tour was done by three personnel that normally don't do tours, but they made an exception due to being big Star Trek fans. They were Phyllis Friello, some may recognize from a SOL Speaker event she did for us, Dr. David Alexander or Dr. A who is a Flight Surgeon for NASA, and Will Green who is an engineer that is on contract with NASA.

There are some things in the work to try to get Dr. A as a SOL Speaker one day so keep your eyes peeled, and Will also just joined a local chapter and put his application in with SFI to become a member as well. They all did a great job giving a tour of Johnson Space Center.

The Admiral's Ball was a great night of conversation and connection with people who have either just joined within the last year or two to people who have been in for 20 to 30 years. There were awards announced to a lot of people and promotions that were received from people who have earned them. I would like to say congratulations to those who received any of those awards this year. They had a first this year and it was a speaker for the dinner, and it was well presented.

I will say the biggest impact of IC, to me, was the gaming event that STARFLEET Tactical put on both nights. There were many people that were around a table laughing, playing games and enjoying each other's presence and having a great time.

All in all from being asked to present to figuring out something to put together for physical representation of what Sciences does, and being able to attend my first IC it was a great and wonderful experience. I would highly recommend everyone, if able to, to attend a physical IC because the connections and experiences you get to have were amazing.

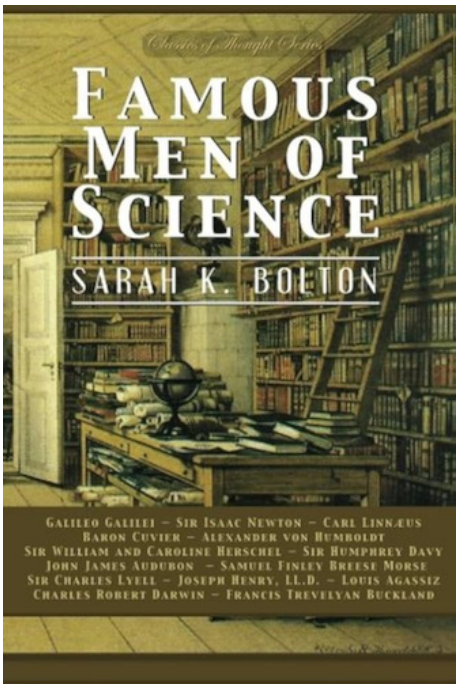
Lastly, I would like to thank the Command Staff for having the confidence in me to present in front of hundred plus people total about Sciences and to everyone from the 3rd Brigade for putting on a wonderful and memorable IC this year.

1st Lt Matthew Chrysler, SFMD
Chief of Staff of STARFLEET Sciences

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.

RAdm. Janice Graham, Chief Science Officer, USS Renegade:



I found another interesting book at the last library book sale. This one is **Famous Men of Science by Sarah K. Bolton** (1960). Names include Copernicus, Galileo, Newton, Herschel, Faraday, Edison, the Curies, Marconi, Einstein, and more. I remember reading perhaps a page about these men in school. There was so much to cover that they couldn't devote much space to each.

But this book goes from their childhoods and many times, how they became interested in their fields, through their discoveries. It is, in a word...fascinating! I'm enjoying it immensely and will probably donate it back so they can let someone else buy it and discover this information.

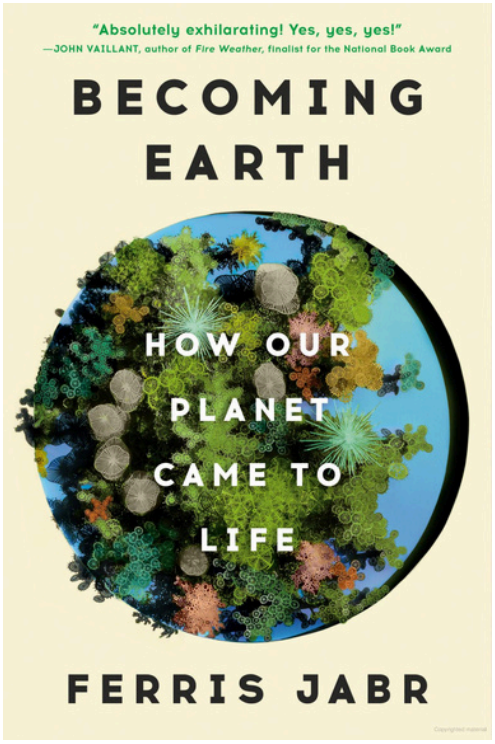
Capt Pam Kingsley, Deputy Director Sciences:

I've been enjoying the **One Minute Geology YouTube channel** run by Prof David Dobson. The majority of the videos talk about the geology of the UK in less than 2 minutes, while some longer videos go more in depth on geology in the news, for example the recent earthquake in Russia. Easy to understand, informative and entertaining!

FCAPT Barb Barton, Sciences Director:

Becoming Earth: How Our Planet Came to Life

By Ferris Jabr



In recent times, scientists have started to accept the idea that Earth is an interconnected, living system. The planet we see today is a result of billions of years of interaction between abiotic and biotic factors, and of course, evolution. In this book, Jabr presents a radical new vision of Earth based on the latest scientific research. It will blow your mind. Rain is summoned by water, pollen, and bacteria spewing from forests. Microbes chew rock to shape our continents and microscopic plankton remake the air and the oceans.

Jabr also explores human's role in transforming the Earth through fossil fuel consumption, agriculture, and pollution, pushing our planet into a crisis. In contrast, he introduces the reader to several people who have devoted their lives to rebuilding ecosystems and educating us about what we can do to understand Earths wonderous ecology and self-stabilizing processes.

Of particular interest to me was the story of Russian ecologist Sergey Zimov and the creation of Pleistocene Park in northeastern Siberia. Sergey and his son Nikita are studying how to rewild the Arctic by introducing herbivores en masse to Siberia and northern Alaska. They believe these large mammals can bring back a lost biome—the mammoth steppe—and prevent permafrost from melting and releasing billions of tons of greenhouse gases into the atmosphere. There are many more fascinating facts and stories in this exceptional book, it is well worth the read.

Ask the staff – What do you love the most about Star Trek?

Dave Newsom - Chief of Operations

“*Star Trek* is a big part of why I'm an engineer today. Watching as a kid and getting into all the fun technical fandom, I had enough teachers saying there's no way any of it will ever be real and kind of triggered my "hold my root beer’ mode.”

Diane Rippalone (Rip) - Chief of Education

“For me its the Science. And as a teacher, I tell my students that *Star Trek* is possible, might not be now. But it brings hope for the future.”

Pam Kingsley - Deputy Director

“Going back to *TNG*, the series which made me fall in love with *Star Trek*, it was the people. The crew of the *Enterprise* were supposed to be the best of the best, but they’re still real people with flaws, fears and the same challenges we have. And they made it to space, to explore strange new worlds!”

Matt Chrysler - Chief of Staff

“I just love how *Trek* shows what life could be like and gives hope for the future. For me there's a lot of things that contributed to my path in medical. and *Trek* could very well be one of them.”

Monica Butt - Deputy Chief of Education

"*Trek* has been with me throughout my life. Watching *Trek* was a special thing I shared with my Mom and it carried me through many hard life changes. The integrity, ideals and morals that are the cornerstone and foundation of Starfleet, the respect and regard every person is given, no matter their differences, the way the program was the front runner of social commentary to promote higher ideals and social justice, the intellectual storylines and the characters/crew of each ship. The friendships and collective striving for the good. And, of course, all the cool tech! Trek has always held a very special place in my heart."

Rip

"Everyone in some way treasures *Star Trek* and that's why we are where we are. Thanks for all the wonderful insights."

Barb Barton - Director·

"What I love about *Star Trek* was on full display at Mission Chicago in 2022 - people of all types celebrating diversity, making a stand against bullying, reaching for discovery, the nicest folks you could ever meet. *Star Trek* asks us to be our best selves, to shed the ways that are not for the greater good. It challenges us to grow and explore, push the boundaries out of sheer courage and curiousity. And it brings together people like all of you and those we serve. Who could ask for more?"

SOL SPEAKER SERIES

Next talk: October 18th, 11am EDT/3pm GMT
"Astronomy Vacations"
Speaker: Prof. Norbert Vance, Director of Sherzer Observatory, Eastern Michigan University

Professor Vance will present his stunning photos of his recent trip to the observatories of Chile, and things to keep in mind while traveling to various popular astronomy spots around the country, with a special highlight of the Star Trek set in Ticonderoga, NY.

Professor Vance is a member of the faculty of Eastern Michigan University and is the Director of the Sherzer Observatory.

He is also the scientific instrumentation specialist for the Physics and Astronomy Department. He designs, repairs, and maintains all demo, lab and project equipment for the department and maintains an extensive inventory of astronomical equipment at Sherzer Observatory, EMU

Professor Vance teaches courses in astronomy and is a life-long Star Trek fan.

November 15th, 11am EST/4pm GMT

"To Be Rare is to Be Precious"

Speaker: Dr. Tyler Bassett, Botanist, Michigan Natural Features Inventory

Rare species are an trend indicator of ecosystem decline as they are more dependent on functioning intact ecosystems than common species. Understanding the conservation status of rare species requires current high-quality data. Michigan Natural Features Inventory manages the Michigan Natural Heritage Database that currently tracks the status of more than 341 rare animal species, 448 rare plant species, and high-quality examples of 80 natural communities.

Tyler is a botanist and plant ecologist with the Michigan Natural Features Inventory, Michigan State University Extension. He studies the ecology, classification, and management of ecosystems, with a focus on the rare plants pecies they support.

In particular, he has a passion for understanding and restoring the fragmented and fire-suppressed prairie-savanna landscapes of the upper Midwest. He has worked in private, public, non-profit and academic spheres for over 20 years to bring the science and practice of conservation and restoration together to improve outcomes for biodiversity.

December 13th 11am EST/4pm GMT
"Early Earth: Maybe not so Hadean After All"
Speaker: Dr. Nicolle Zellner, Physics Professor at Albion College, NASA Solar System Ambassador

Advances in acquiring, analyzing, and interpreting lunar (and other) data are allowing us to better understand how impacts may have influenced (or not) Earth's biological and geological activities. In particular, because of evidence that indicates early Earth possessed the conditions that promoted habitability, impacts may not have been frequent or frequently intense. This talk will provide an overview of our current understanding of Earth's habitable conditions in its first billion years.

Dr. Nicolle Zellner has served as a NASA Program Scientist in the Planetary Science Division at NASA Headquarters. Her research interests focus on understanding the impact history of the Earth-Moon system and how those impacts affected the conditions for life on Earth.

She studies lunar impact glasses to interpret the bombardment history of the Moon (and Earth). To support her research and classroom activities, she has participated in expeditions to Antarctica and Chile.

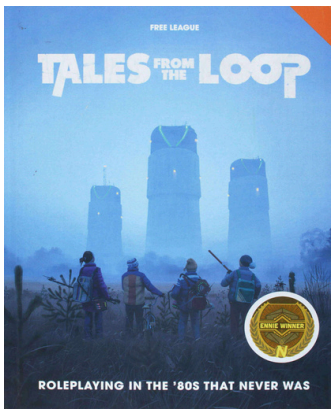
The Sol Speaker Series lectures is a monthly online event free to SFI members bringing interesting and inspiring presentations on a variety of science topics - with the opportunity to ask questions at the end of the talks. To participate or watch live, you need to get the link by registering **here**.

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.

Would you be interested in having Sol talks transcribed post event/translated during the event into another language? If so, please let us know what language you require and we will do our best to help.

In conjunction with STARFLEET Tactical, we invite you to join us for an evening of gaming!



Tales from the Loop: Learn to Play
Saturday, October 11th, 5pm EDT/9pm GMT
Hosted by Michael Rosen

It's the 1980s that never was—giant robots in the fields, strange machines humming, and mysteries waiting to be uncovered. You'll take on the role of Kids in this retro-sci-fi world, using pre-generated characters to uncover secrets and solve eerie puzzles.

To register click here, for more information visit the Discord server.

Amazing SuperWASP

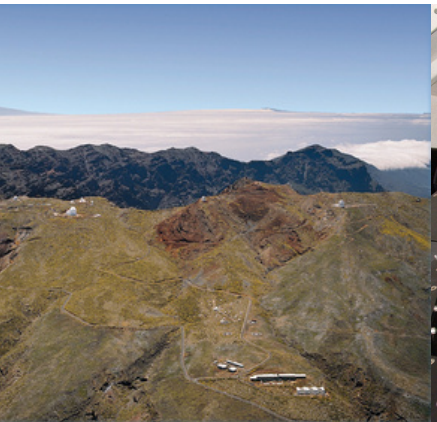
Comm. Michael Lewis, CScO USS Potomac

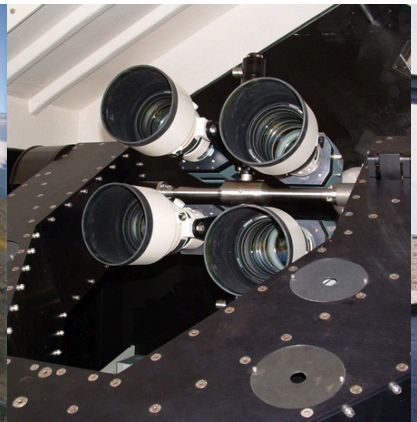
SuperWASP – the world's most successful ground-based survey for transiting exoplanets – used wide-field robotic telescopes to continuously image the night sky. Brightness measurements were obtained from ~100,000 stars per image, every few minutes, every night, and built up into lightcurves for each star.

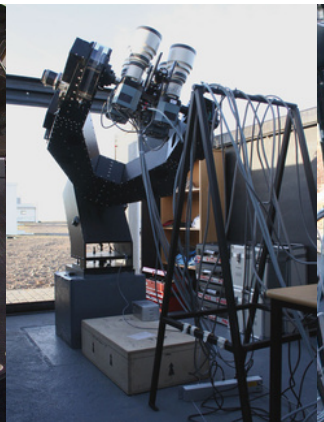
Over 10 years, SuperWASP generated >30 million lightcurves of bright stars across the entire sky (avoiding the Galactic plane where stars are too close together to be resolved). Each lightcurve contains ~20,000 data points.

As well as allowing searches for transiting exoplanets, SuperWASP lightcurves can reveal many variable stars. These include stars displaying pulsations or outbursts, as well as eclipsing binary stars or stars displaying rotational modulation.

A period-search has identified >1.5 million possible periods in around 750,000 objects. The purpose of this project is to identify and classify the folded lightcurves of all objects with measured periods as either eclipsing binary stars, pulsating stars, rotationally modulated stars, or simply junk.







Tools for rock hounding and lapidary work

Words and pictures by COL Sarah ‘Rimfire’ Hays, ISS Kidd

SRT-4321, The Lab Rabbits’ Project - Vasquez Rocks

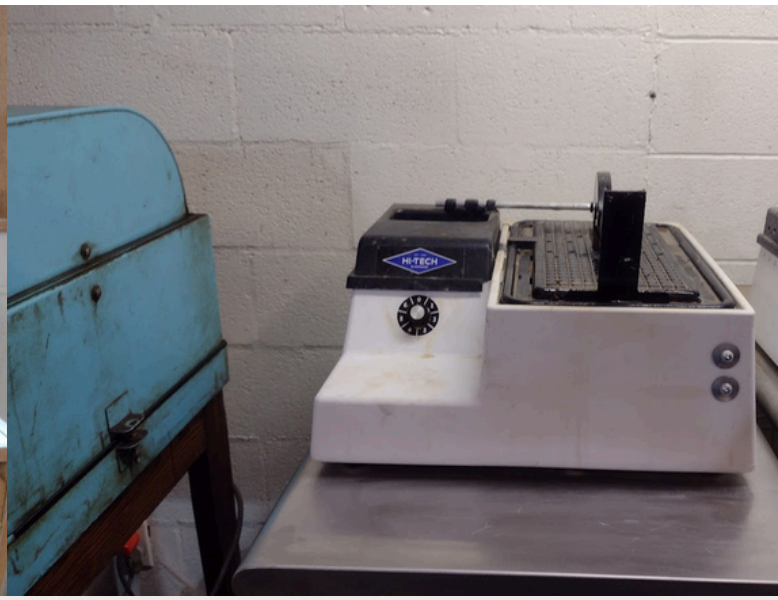
Going rockhounding, I try to keep things as simple as I can. I wear snakeproof boots, a hat, sunscreen, and my every-day carry: a multitool, a flashlight, a pocket knife, and my glasses. Then I’ll add my shades, which are also safety glasses (impact-resistant and ultraviolet-screening), a UV flashlight (helps in identifying minerals), my water bottle in a carrier with a pocket that’s got my first-aid kit, epi pen, a bandana, probably a poncho and maybe a protein bar, and possibly my scratch-tool (hardness-testing) outfit: a nail, a piece of glass, a good carbon-steel blade, and a Mohs card *(a visual aid used to determine the relative hardness of minerals by comparing their ability to scratch each other - ed.)*, in it. I might also have a map and compass in my jeans pocket, just like my LED bright flashlight and multi-tool. I might bring a pocket mineral book or an application on my phone to help tell what a rock is / contains.

This gives me a very portable and pretty safe setup. Of course I’ve got my eyes for noticing a rock, (safety glasses to protect them), my hands for collecting a rock (work gloves to protect them) and a little spit to see what the rock would look like polished. (PRO TIP: NEVER lick the rock. Spit on your finger and rub that on the rock; or use a sprayer or a damp cloth).

I don’t carry a rock hammer, because I try not to collect anything too big to fit in a shirt pocket – unless I’m after a fossil or a big enough rock to slab in the shop. The one exception is if I find worked rock – an arrowhead or other tool. That’s precious, beautiful, historic, and needs to be captured/preserved.

At home, I have a bucket, dish soap, running water and dedicated brushes, from a soft toothbrush to some four-ought steel wool, for cleaning rocks I’ve found. Some of these will get used when I finish a rock in the shop, to be sure I’ve removed all the residue from grinding / polishing.

At the rock shop I have access to power tools, so safety gear is important: safety glasses, ear protection, tie back my hair, closed-toe shoes, clothes that can take a beating, wear an apron. The power tools all spin, mostly really fast; they’ll grab unrestrained hair or loose clothes. That’s bad. They’re cooled and lubricated with water or oil, so they cast off some in use, hence the clothes that can take abuse.



These are photos of machines at the rock shop the Lubbock Gem & Mineral Society operates. Left: The combination machine. The separate hooded device at right in the picture is the part I use -- a leather buffing wheel.

Right: A trim saw. It's lubed/cooled with water. We have two of these, and the large blue object at left is one of our slab saws. I'm not qualified on those yet.

Top:
A cabbing machine. The grits on the wheels start, leftmost, at 80
and go to 14,000 (rightmost / white wheel). The coarser grits are for shaping stones, the finer ones for polishing the cabochon. The finished gem can be used as the set in a ring, necklace, bracelet, watchband, belt buckle, bolo tie or other jewelry.

Bottom:
A faceting machine. It was undergoing maintenance the day I shot this but it's in operation now. This is how multi-surface gemstones are created; the facets allow them to reflect and refract light internally because of how the surfaces are cut.
One of these can also double as a "flat lap," which lets you shape and polish
bigger stones than will fit on the wheels in the earlier pictures.

The power tools are faceting machines, cabochon-making machines, slab saws, trim saws, and a polisher with a wet leather buffing pad.

Sometimes a rock will break in a saw or on a cabbing machine. This is why we use dop sticks and wax to put a handle on the rock we're working as we shape and polish it: it's way safer. The wax and its pot are hot, so we handle those with care.

I also have access there to hand tools: cabochon pattern templates, magnifiers, and marking tools – pencils, markers and a metal scribe, so I can choose a cabochon shape that maximizes the rock's assets and use the shop's bright lights to ensure all the scratches have been polished out.

The saws actually cut rocks by grinding. The wheels on the cab machines do the same thing, much like a belt sander or a bench grinder. We have grits from 600 to 14,000 on the wheels in our shop.

Occasionally the machine will grab the rock and fling it into space (or, more often, the drip pan under the wheel), which is another reason to use the dop sticks. We clean the machines after we use them, which helps them last longer and work better.

Our polisher has a leather pad. We dip the finished face of the stone in water, then tin oxide powder, then set the water to drip on the polishing pad. You want a consistency like toothpaste in the tin oxide/water mix; you work the stone on the pad as if it were another abrasive wheel, to finish with a mirror shine.

For finishing jewelry I can buy bails, chains, clasps, and bolo ends; or I can scratch-build with wire, bezels, and backing plates, all of which get soldered to fit the stone.

I also have epoxy, because there's nothing like spending hours and hours on a rock then having gravity break it via the tabletop or floor. I keep super glue (and acetone, for removing same from skin) when I'm working on something I need to glue together, too.

Above: Ear and eye protection I wear in the shop.

Below: Safety gear. See next page for information

Safety gear

From top: a pair of Chippewa snake-resistant hunting / hiking boots with good traction soles.

Leaning on them at left is my water bottle in its carrier. I usually carry at least a liter of water at the beginning of a field trip. My epi pen lives in the side pocket, and I carry flashlights, a pencil, a plastic magnifying glass, and a granola bar in the pocket with it if I'm out in the field.

Attached to the water bottle is my pair of shades (safety glasses against UV light and impacts). Next to that is my brightly-colored lightweight hat which shades my face from the sun and makes me easy to see in the field.

Atop it are my ear protectors and clear safety glasses -- I wear these in the shop to keep debris and noise from, over time, damaging my hearing or vision; and the hat keeps my hair contained away from the machines.

At the bottom of the photo are my gloves, which protect my hands in the field from splinters, snakebite, etc.

The whole collection, depending on how full my water bottle is, weighs just less than 3 kilos and occupies about 3/4 cubic kilo. My boots are size 8 EE; my hat is an adjustable one from Texas Parks and Wildlife's Caprock Canyons store, and my gloves are a size small from Harbor Freight. The ear protectors came from Academy Sports, are made by Walker, and are designed for use on a firing range, but they work perfectly around the shop's saws, grinders and other machines, which can get loud.

Optionally, in the summer, I may have sunblock in the water bottle carrier pocket too, but I haven't gone field-gathering in several months now. Depending on the weather I may have a poncho tucked into the water bottle pocket

TREKNOLOGY

TECHNOLOGY CHALLENGE

Since 1966, *Star Trek* has offered us a vision of the future by taking us to the furthest regions of space and our own imaginations. By transporting us to strange new worlds and introducing us to new life and new civilizations, and as we boldly go...

None of it would be possible without the fictional technological wonders we have become so accustomed to seeing on screen. Some of which were the inspiration for real-world scientific developments, discoveries, and innovations.

During this challenge we will examine some of the technological advancements in medicine, communications, transportation, robotics, and more that could someday rival what we have come to recognize in Trekverse.

Week 1:
IOTK College of Robotics
CORo 101 - Introduction and History.

Week 2:
IOMA College of Emergency Technology Equipment
CETE 101 - The defibrillator part 1
CETE 111 - Cardiac Monitoring

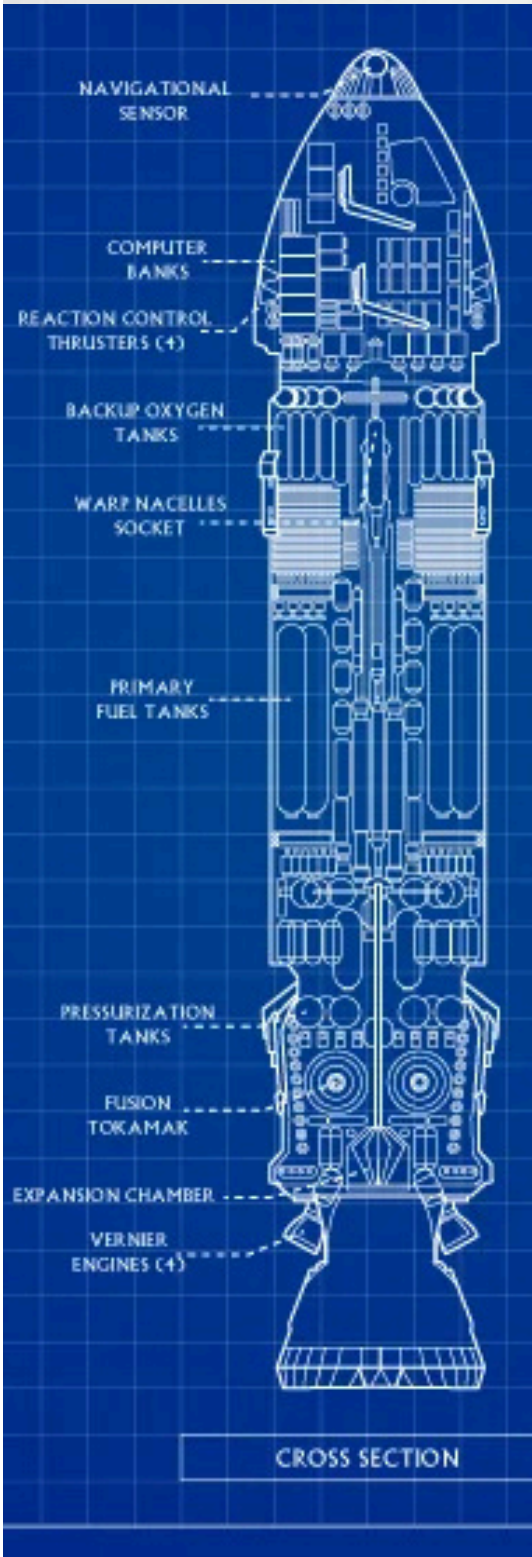
Week 3:
IOTK College of Plasma Technology
CPT 109 - Plasma History and Commercial Uses

Week 4:
IOSS College of Rocketry and Propulsion
SOPr 106a - Rocket Engines part 1
SOPr 106b - Rocket Engines part 2

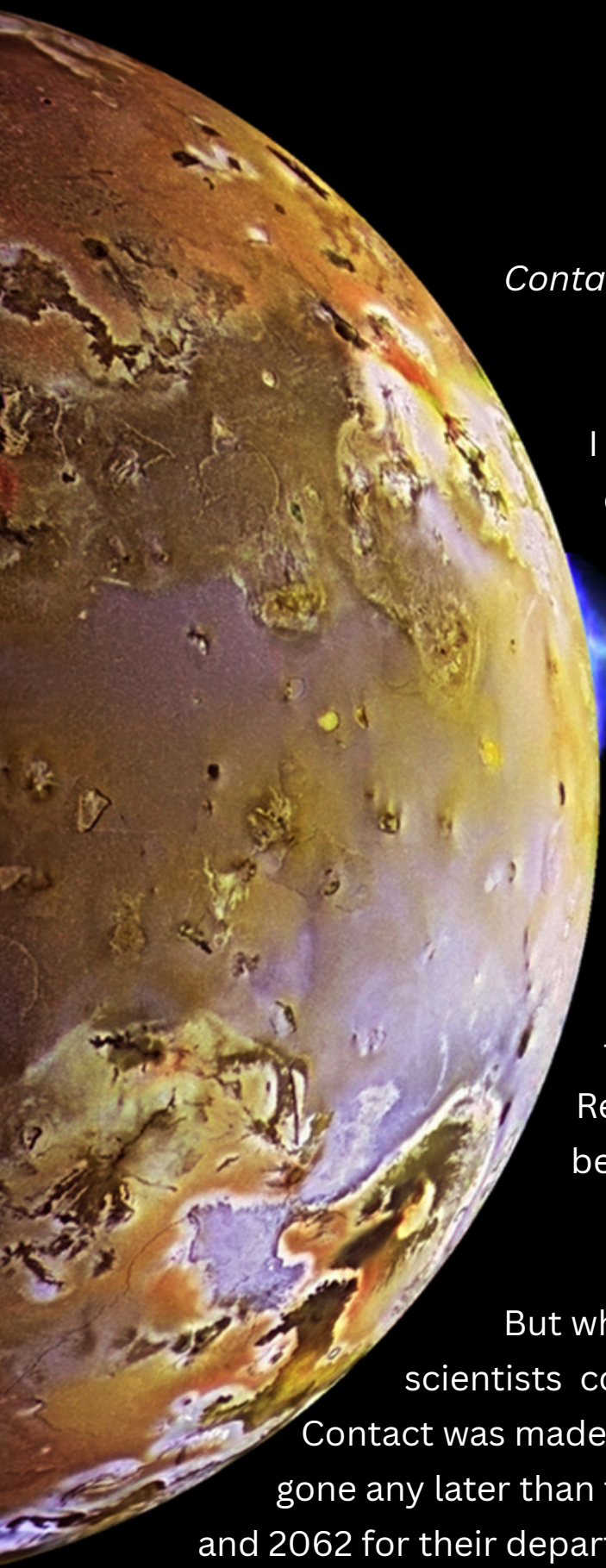
Week 5:
IOSS College of Orbital Mechanics
COOM 101 - The Laws of Motion Regarding Orbits

Week 6:
IOTK College of Laser Technology
COLT 101 - Lasers part 1

All submissions are due by November 1st via **the submission form**.



CFCs & Star Trek's microbes from Io – Science takes time



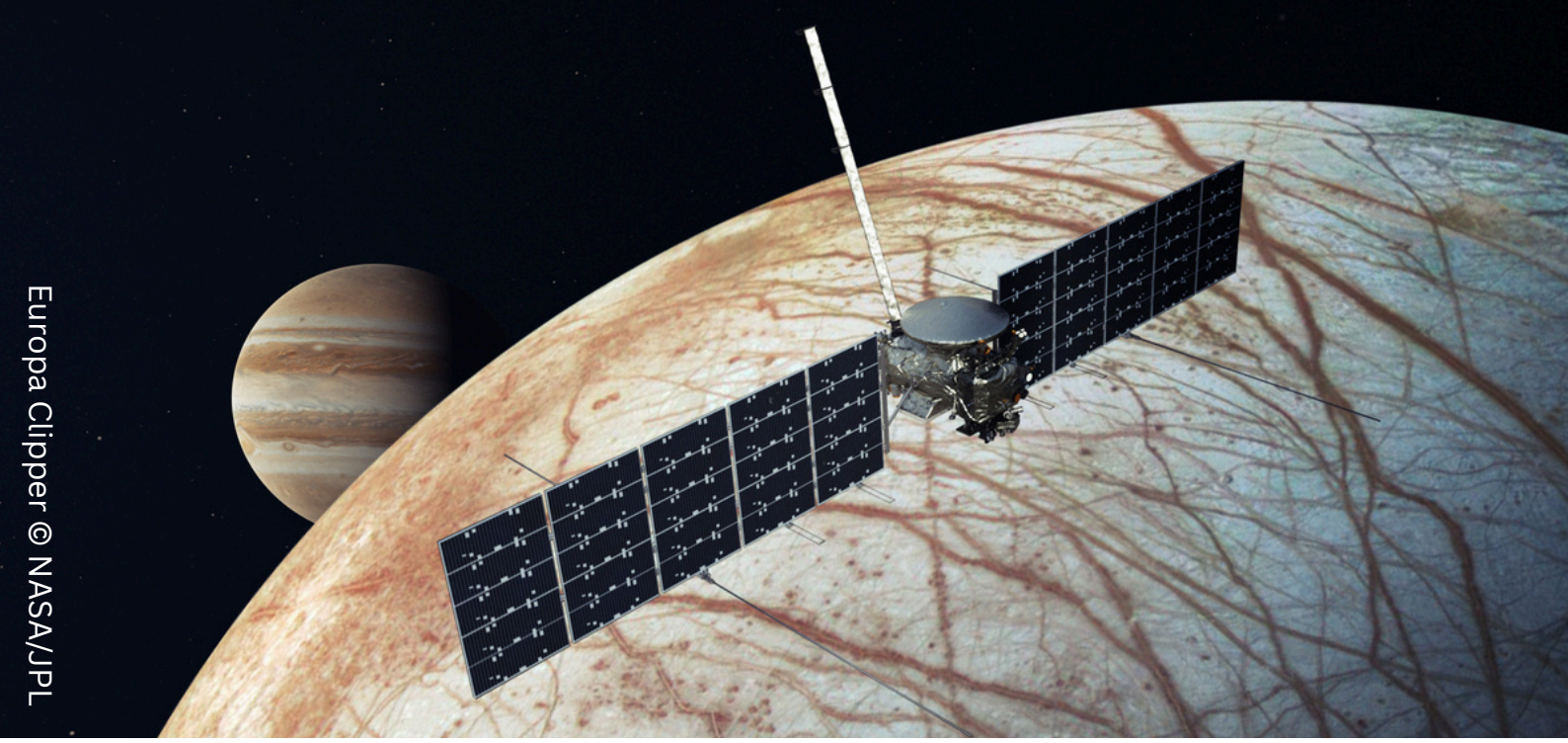
By Capt Pam Kingsley
Deputy Director of Sciences

Contains spoilers for SNW: The Sehlat Who Ate Its Tail *&* PIC: Farewell

I saw a post on Facebook recently complaining that the excellent *Strange New Worlds* episode *The Sehlat Who Ate Its Tail* created a plot hole for the conclusion of *Picard* season 2.

In summary, *SNW* established that a group of scientists left Earth in the mid-21st century as they believed Earth's environmental crisis was too severe to recover from. *Picard* had established that microorganisms recovered by Dr Renee Picard on her 2024 mission to Io had been used to clean pollution from Earth's atmosphere.

But why can't the two stories both be true? The scientists could have left Earth as late as 2062. First Contact was made in 2063, so it's unlikely they would have gone any later than this. So, we have any time between 2024 and 2062 for their departure date.



Europa Clipper © NASA/JPL

Just because Renee found the microorganisms and brought them back doesn't mean it was a quick fix. Io is on average 628.3 million km (390.4 million miles) from Earth. Renee's mission blasted off in 2024 – and we have a real-world analogy we can use for comparison. The Europa Clipper mission launched in October 2024 and is expected to arrive at Jupiter in 2030.

Even if you decide that Renee's rocket was more advanced, you're still looking at at least four years travel time to reach Io, plus however long the ship was in orbit doing science. It would then be another four years back to Earth, so even if the science mission was only a month long, you're still looking at eight years before they get home. (Although I can't believe anyone would send a mission to study Io and then spend anything less than six months there – there would be so much to study! Especially with the travel time.)

If we say she got back in eight years, that makes it 2032. Then scientists study the microbes (at some point Ricardo joins this team) and they find that there could be a way to help the atmosphere. Renee believed the microorganisms were sentient, so that adds another layer of investigation to the studies. That could take another five years at least,

assuming Renee and the crew started studying the microorganisms en route home. That takes it to 2037.

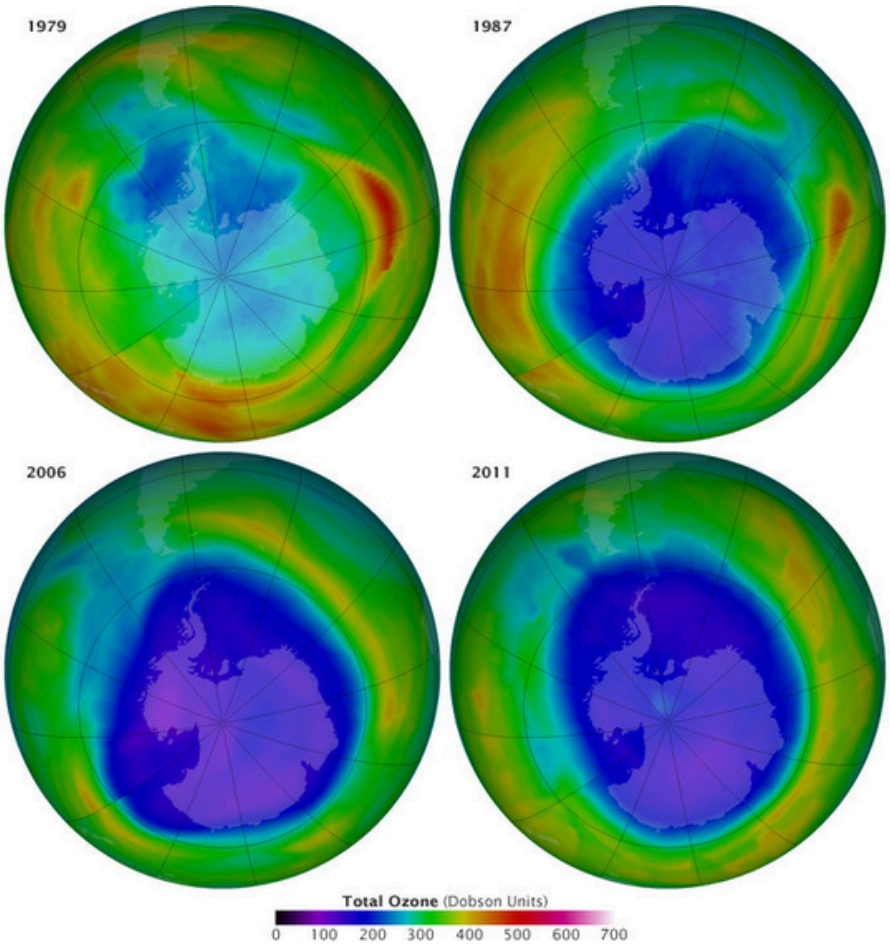
Then they have to convince governments of their findings and that it would be in everyone's interest to help them spread the microbes. You also have to develop a delivery system, convince the sentient microbes that it's a good idea, and reassure the public that it's not a biological weapon and that releasing sentient aliens into the atmosphere isn't the prelude to the War of the Worlds. You have to get every nation with the ability to shoot down your microbes on board with your plans. Given how sceptical and willing to believe conspiracy theories and deny science a lot of people are, hat's easily going to take another five years or more. We're up to 2042.

Once the microbes are launched it's still not going to be an instant fix. It's not hard to imagin that some people would be worried about whether it would actually work, and look at the state of the planet and quality of life (look at First Contact) and think they'd be better off being explorers in space. It would take them some time to make plans and build their ship – they could be decades in the planning. It's not a stretch to imagine that at some point between 2042 and 2062 a group of scientists decided to take their chances in space. After all, we must

remember they were scientists – imagine the opportunity of living in space and finding out what's out there in person, not via a probe or telescope. It's not too much of a stretch from people planning ways to live on the Moon or on Mars at the moment.

The scenario is, of course, fictional, but you could liken it to the hole in the ozone layer and CFCs.

It was all the way back in 1974 when a study identified CFCs as a source of stratospheric chlorine, which is a key factor in ozone depletion, but it wasn't until a decade later when world leaders started to draw up plans to address the problem.



Action only started to be taken in 1987 when the Montreal Protocol was signed to stop production and use of CFCs and similar chemicals. The Protocol didn't actually come into effect for a further two years, when the European Community began phasing out CFCs. It took another year for a complete phase-out of CFCs to be agreed on.

Image: NASA satellites have observed the Antarctic ozone hole since the late 1970s—before and after nations agreed to stop producing chemicals that destroy the ozone layer.

The Aura spacecraft, shown in this artist's concept, is a NASA atmospheric chemistry mission that monitors Earth's protective atmosphere. Credits: NASA

That's 16 years from the discovery of the problem to even making a decision to make global change. Compare this to our imaginary timeline of identifying the microbes and deciding they could do something to solve an environmental problem, and you can clearly see a parallel.

It took until 1996 for developed countries to phase CFCs out and a further 14 years, to 2010, for developing nations to do so. That's 36 years from discovery to having taken action, without the risk of alien life forms invading the atmosphere scaring people into not taking action.
Even after this, the environment takes time to recover. Although the hole in the ozone layer has been shrinking since CFCs were phased out, it's still there, and scientists believe it will not be completely healed until 2066*.

I don't know if the writers of *Picard* and *Strange New Worlds* took any of this into consideration when writing their respective episodes, but in this case, fiction is definitely mirroring life. Even when the science is sound and change is in everyone's best interests, unfortunately, things take a lot of time.

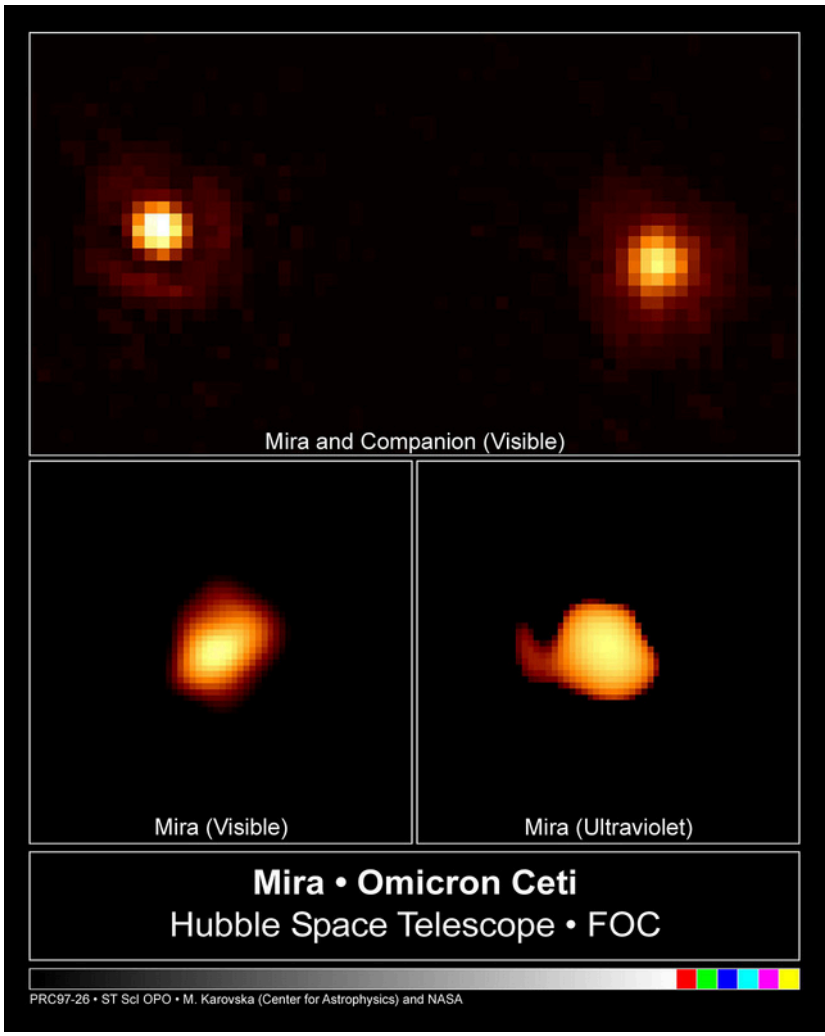
* https://earthobservatory.nasa.gov/images/153523/ozone-hole-continues-healing-in-2024

A view of Omicron Ceti

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

One variable star YOU can see this month is Mira, or Omicron Ceti, in the constellation Cetus the Whale, or Sea Monster. You can find it by imagining the “V” of stars in Pisces (with Alpha Piscium at its tip) as being an arrowhead pointing south to Mira. Another “V” of stars is formed by the Hyades cluster in the face of Taurus, the Bull, pointing to the west. Where the two pointing lines intersect, you will find the variable star....

Or maybe not!

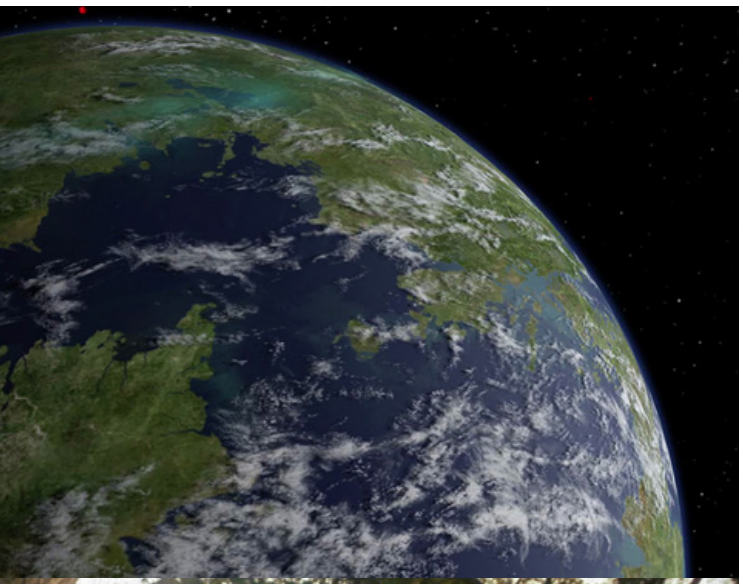


At its brightest, Mira is easily visible to the naked eye. But at its faintest, seeing it may be a challenge, even through binoculars. Perhaps that is why Johannes Hevelius coined the name Mira (Latin for “wonderful” or “astonishing”) in 1662.

David Fabricus thought it might be a nova when he saw it first brighten and then fade in 1596, but then he saw it brighten again in 1609. Today, we know the star’s period is about 332 days, and it spends about half its time fainter than naked eye visibility.

Picture: Margarita Karovska (Harvard-Smithsonian Center for Astrophysics), and NASA/ESA

Miras are a class of variable stars that have completed fusing their hydrogen fuel, and are the coolest, largest, and most luminous red giant stars. Their brightness varies as the star pulsates. Recent Hubble Space Telescope images of Mira show evidence of mass streaming away from the star at a rate of one Earth mass per year.



Mira, or Omicron Ceti, and its fictional planet Omicron Ceti III featured in three Star Trek *episodes.*

In TOS: This Side of Paradise *there is a failed attempt at colonising Omicron Ceti III in the 2260.*

By the mid-24th century, there was a thriving colony on the planet and it is listed as the birthplace as a crewmember in TNG: Eye of the Beholder.

By the early 25th century, the planet was a thriving tourist destination, and the Troi-Rikers consider it as a holiday destination in Picard: The Last Generation.

The basics of electrical engineering: Electric batteries

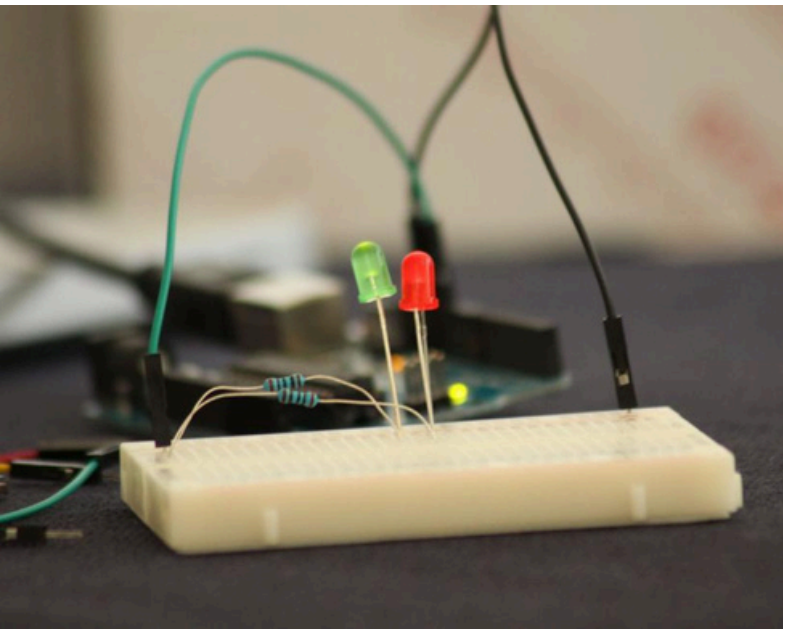
By Lt Col Michael Stelzer, USS Oklahoma, R12

Electrical Power

Electric power (P) is the rate of doing work, and is measured in watts. In direct current (DC) circuits, watts typically represent the heat dissipated by an electrical resistor and is derived using the equation:

$$P = I*V = I2*R = V2/R$$

Where:
P is the electrical power in watts,
I is the electrical current in amperes,
V is the voltage applied or dissipated in volts, and
R is the electrical resistance in ohms.



The maximum amount of power that a resistor may dissipate is rated by the manufacturer and is a function of its material composition, length and cross-sectional area. If the power dissipated by the resistor is ever exceeded, damage to the resistor is likely to occur resulting in an open circuit.

Open and Closed Circuits

A simple circuit is presented in figure 1a below. This circuit consists of a battery voltage source, a switch, a resistor, and the ground symbol (which represents the return path for electrical current back to the battery). In this example, the switch is open, preventing electrical current from flowing (I = 0) and is called an open circuit.

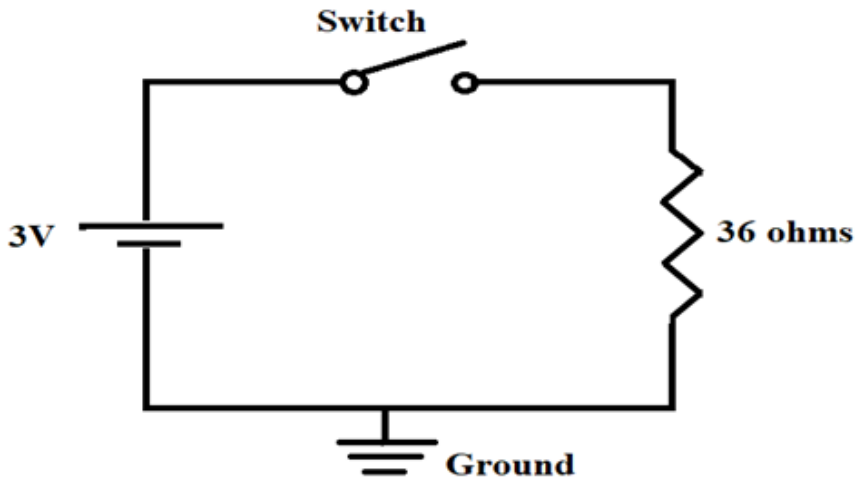


Figure 1a. An open circuit.

However, once the switch is closed, the electrical current can be derived using Ohm's Law (3 Volts/ 36 ohms = 0.083 amps). This current flows (in conventional current flow) from the positive terminal of the battery source to the negative terminal and is the reverse of real electron flow.

Further application of Ohm's Law reveals that the voltage dissipated across the resistor is equal to that applied by the source (Vresistor = Isource * Rresistor = 0.083A * 36 ohms = 3V).

This basic principle confirms Kirchhoff's voltage law, which states that the sum of the voltage rises around a closed loop must equal the sum of the voltage drops around the loop.

Additionally, the law of conservation of energy states that energy can neither be created nor destroyed but only changes its state. Therefore, the energy generated by the source is equivalent to that dissipated by the resistor (Psource = Vsource * I source = Presistor = (Vresistor * Vresistor)/Rresistor = 0.25W).

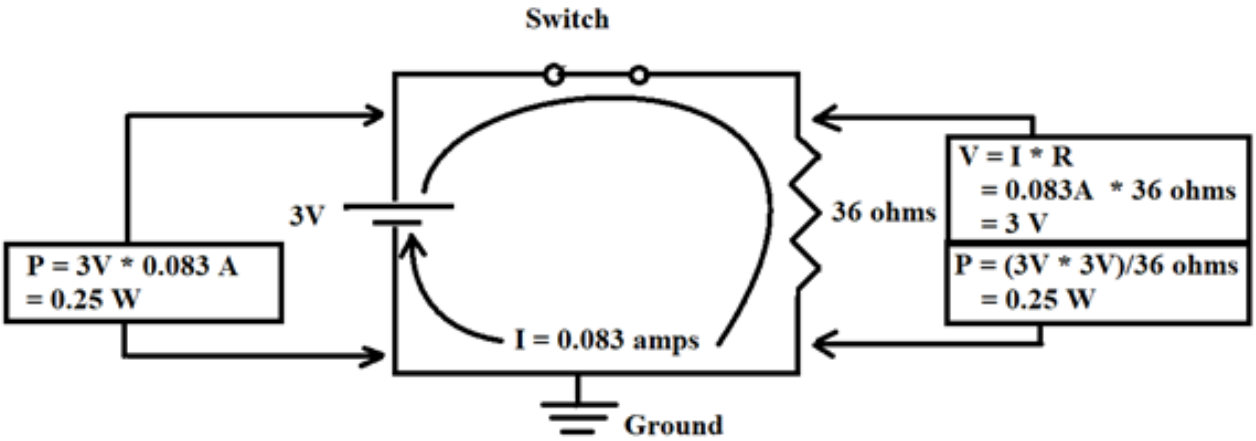


Figure 1b. A closed circuit

Should, however, the voltage source be increased to double its value to 6V, the momentary condition depicted in Figure 2 will result. The resulting increased power condition will exceed that of the manufactured rating of the resistor (Presistor = 0.25W) and will destroy the resistor, resulting in an open circuit (where I =0 A, and Vresistor = 6V).

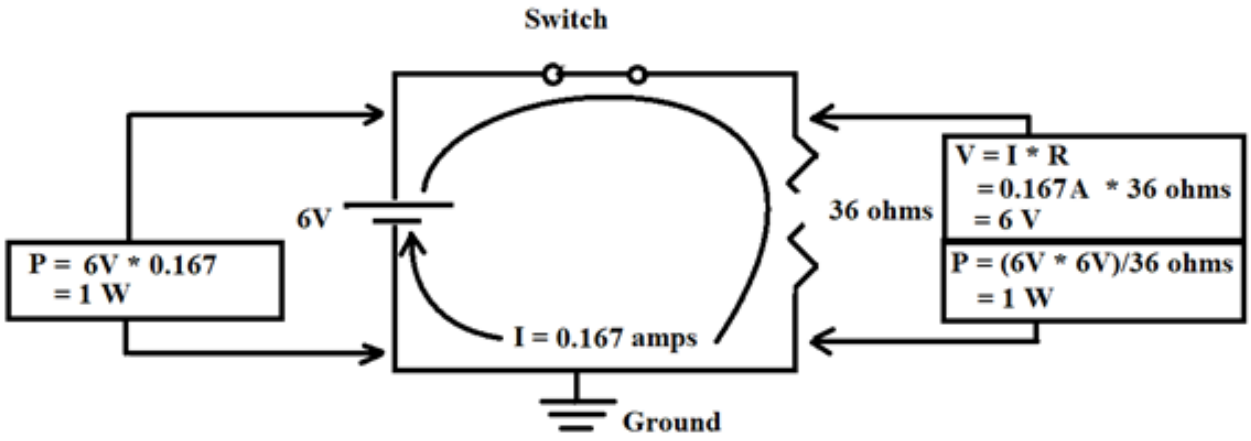


Figure 2: Exceeding the Power rating of the resistor

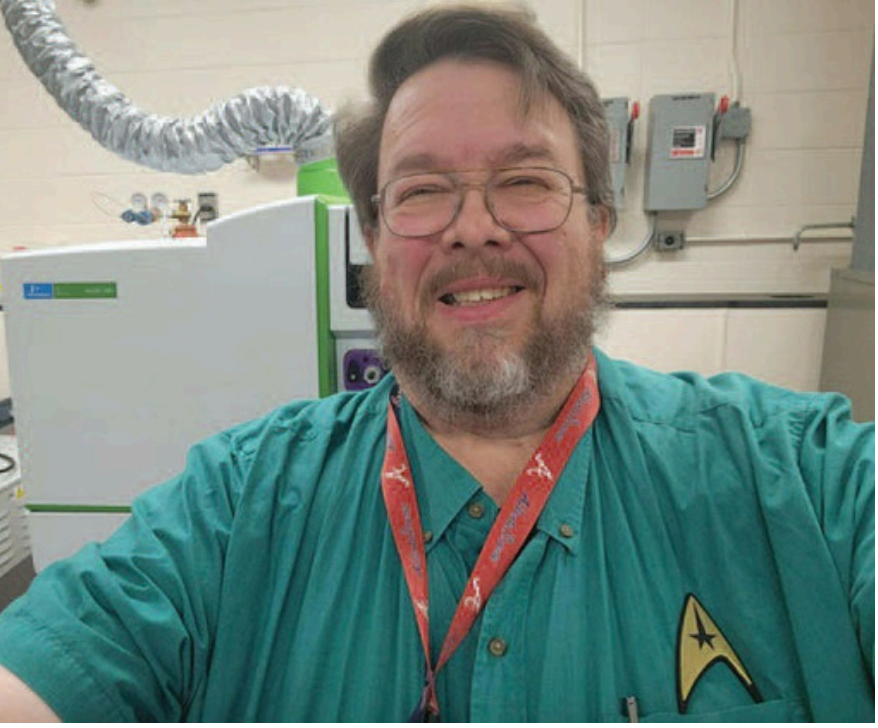
1st Place: CDR Gene Cahill, USS Justice

Photo contest winners

The CQ ran a photo competition on the theme of science earlier this year. The winners were announced in July's CQ - just in case you missed it, here they are!

2nd Place:
LTjg Vince Ceraso, USS Challenger

(Outside studying planets with my laptop and PADD displaying my own exoplanet data from NASA.)



3rd Place:
LCDR Craig Dooley, USS Ronald E. McNair.

Installing an ICP Mass Spectrometer at a customer's chemistry lab.

Honorable Mention:
CPO Petra Sheehan, USS CúChulain

Photograph from Project Earth cleanup, May 2025.

The contest may be over, but we would love to see any pictures of members doing real-world science, along with a short explanation of what you are doing.

Pictures can be sent in to **sfsci-eheditor@sfi.org**

Contributions from under 18s are welcome, but please make sure you have parent's/guardian's permission before submitting anything.

Meet The American Burying Beetles!

A Report from SRT-4321, The Lab Rabbits
By Lead Researcher LT Janet 'Hopper' Livingston
The Forensic Files Project

The next new antibiotic or food preservative could be based on studies of the American Burying Beetle and its oral and anal secretions. (I don't know who initially saw a potential relationship here, but researchers are making fascinating discoveries. JL)

In January 2025, scientists reported the beetle's remarkable resistance to insecticides called neonicotinoids. Although the beetles initially appeared affected by exposure to this toxin, 'many' recovered within 24 hours.

Protected in the USA by the Endangered Species Act since 1989, Nicrophorus americanus is the largest carrion-eating beetle in North America. It ranges in size from 1" to 1.8", and has brilliant orange-red accents on a shiny black body.

Their diet consists of the fresh remains of small mammals and birds, which they can detect from up to 2 miles away. Working with a mate, these nocturnal beetles will remove the fur or feathers from the carcass. Then they dig a tunnel under the body and pull it into the soil. Once set in its grave, the beetles coat the corpse in oral and anal secretions to save as a future food source for their offspring.

Known as one of nature's most efficient recyclers, they contribute to the ecosystem by returning nutrients to the soil and helping keep ant and fly populations under control.

These beetles can thrive in a variety of habitats, from meadows to forests to grasslands, as long as sufficient carrion is available. However, habitats are threatened by several risks, including artificial lights, agricultural land uses, urban and suburban development, and climate change.

Sources:

National Geographic magazine, May 2025 issue, Unbeatable Beetles by Kelsey Nowakowski

American Burying Beetle at fws.gov

American Burying Beetle at biologicaldiversity.org

What Does A Blue Shirt Mean to Me?

By Capt Brett McIff
Public Health Lead STARFLEET Medical

Throughout the history of Star Trek, uniforms have changed many times. One thing that hasn't changed is the meaning of the Science Division blue tunics.

Red, depending on your timeline, could be anything from Command, Engineering, Support, Security, and so on, but blue has stayed steady on throughout the series. That blue shirt means that the wearer is founded in the scientific method, but doesn't differentiate between the sciences.

As a public health practitioner/researcher, I span the distance between research and practice on a daily basis. While my area of expertise is deep in one particular area, like many specialists I also know a little about a lot.

For many of us, the key element of that knowledge is more about the process, the evaluation, and addressing how we know what we know. The role of a science specialist is to frame the world in a process of exploration and expansion. Each specialist works with others to expand

and develop the understanding of a problem or situation, not to take precedent but to be an integral part of the whole.

The blue shirt means saying what you know, and analyzing what can be assessed. It also means not making guesses or wild leaps into the unknown (we leave that to certain command officers).

For example:
KIRK: Spock, give me an update on the dark area ahead.

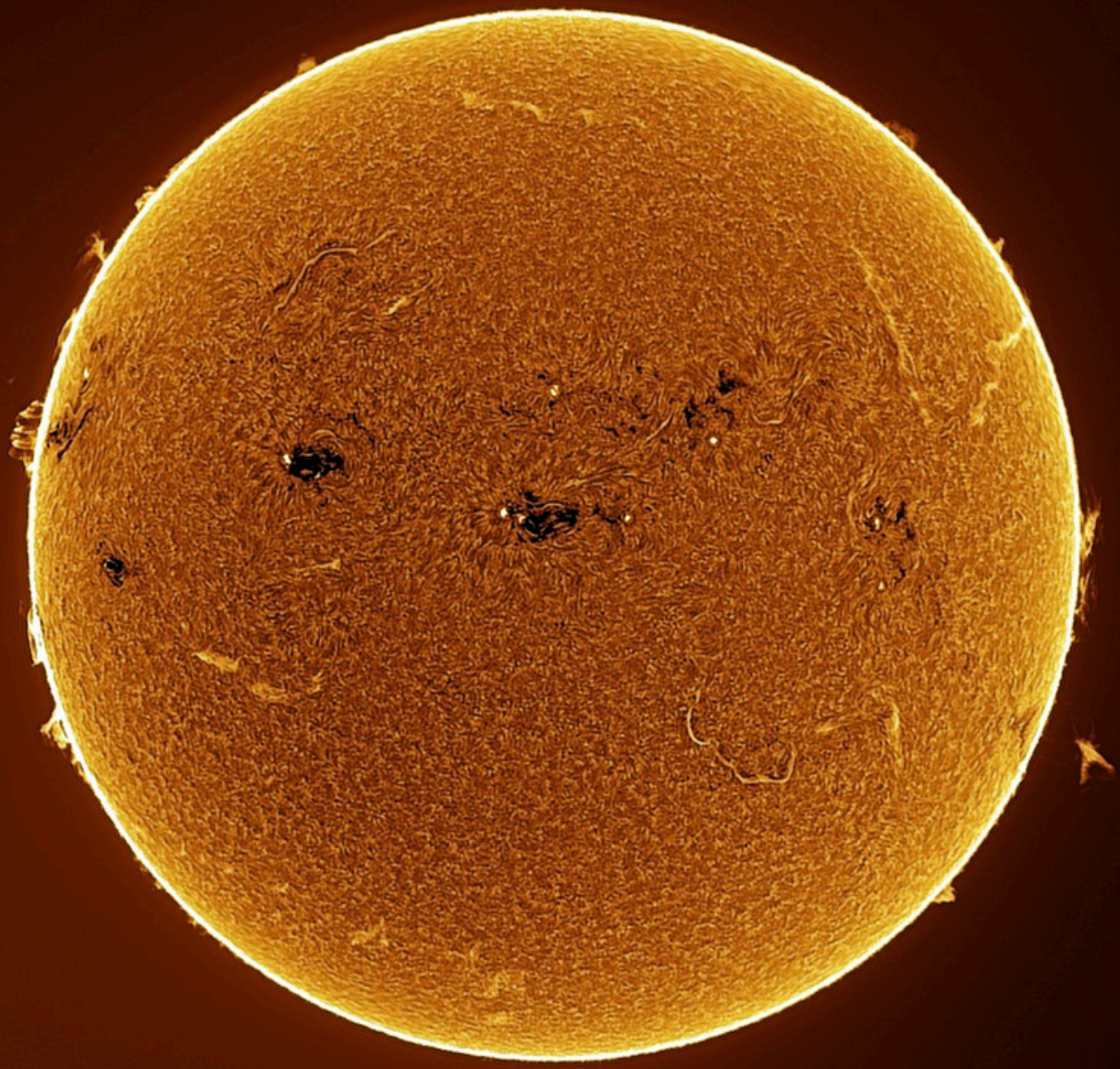
SPOCK: No analysis due to insufficient information.

KIRK: No speculation, no information, nothing. I've asked you three times for information on that, and you've been unable to supply it. Insufficient data is not sufficient, Mister Spock. You're the science officer. You're supposed to have sufficient data all the time.

SPOCK: I am well aware of that, Captain, but the computers contain nothing on this phenomenon. It is beyond our experience, and the new information is not yet significant.

KIRK: I don't know about you but I'm tired. If you can't tell me what it is, let's use reverse logic. Perhaps it'll help if you tell me what it isn't.

Capturing Sol: Solar Photography



Words and pictures by FCAPT Barb Barton, Director, Sciences

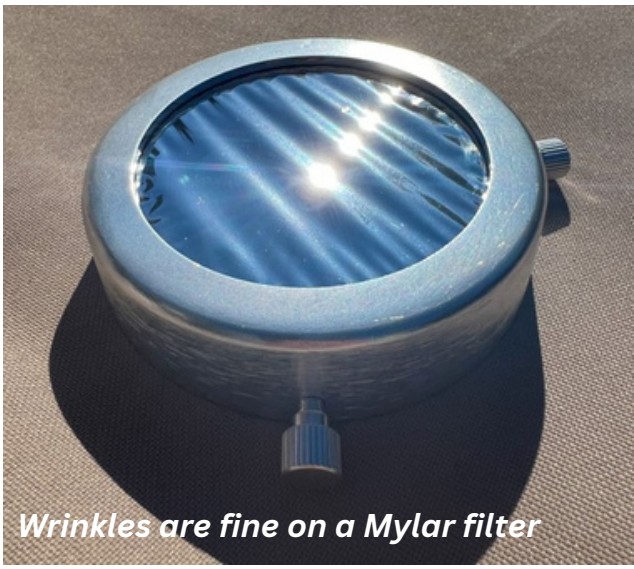
It wasn't until I took my first photo of the Sun with a dedicated solar telescope that I realized it was more than a bright blinding light source in the sky, something that could make you go blind if you stared at it too long.

In that first image, I saw a surface that looked like the peel of an orange. I saw what appeared to be flames shooting off the surface and filaments that looked like narrow clouds. There were dark spots, disturbed magnetic fields that look like freckles. It was so much more than I could have ever imagined.

Picture: The full disc showing lots of detail, shot with Hydrogen alpha filter.

There are several ways to photograph the Sun, but before we talk about that, we need to address safety first. When viewing or photographing the sun or any phase of a partial solar eclipse, remember that you MUST observe safe practices to prevent damage to your eyes and/or equipment (but mostly to your eyes):*

- NEVER look directly at the sun with your naked eyes. Permanent damage to your eyesight, up to and including blindness, may result.
- During a total solar eclipse, eye protection is NOT required during periods of totality when the viewer is in the path of totality. Totality is bookmarked by the “diamond ring effect.” Annular eclipses, even during maximum eclipse, still require eye protection.
- ONLY use solar viewing glasses sold by a reputable dealer and ensure that they meet current ISO 12312-2 standards.
- INSPECT all solar viewing gear and filters for damage and tiny holes. If damaged, DO NOT use.
- DO NOT point a lens at the sun unless the optics are fitted with a PROPER solar filter.
- DO NOT look through the optical viewfinder of an unfiltered SLR camera when it is pointed at or near the sun.
- DO NOT look through the viewfinder of a rangefinder camera when it is pointed at or near the sun.

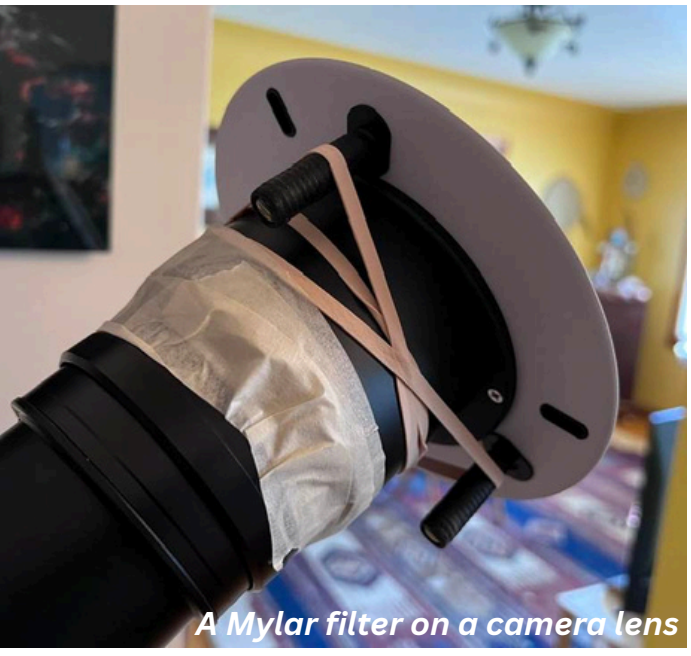


Wrinkles are fine on a Mylar filter

- DO NOT point any camera directly at the sun (including DSLRs, mirrorless, and point-and-shoot style cameras) unless the lenses have PROPER solar filtration.
- DO NOT use your camera’s optical viewfinder if you are using an ND-type “solar” filter. Use Live View or an electronic viewfinder (EVF) only. We recommend a metal or Mylar-type certified solar filter for photography.

- DO NOT use an ND-type filter as eye protection for direct solar viewing through any lens.
- DO NOT use non-solar filter drop-in lens filters for solar protection. If using a drop-in solar filter, it is recommended to have an IR/UV Cut filter at the front of the optic.
- DO NOT use solar viewing glasses as an optical filter for cameras or other optical devices such as spotting scopes or binoculars.
- DO NOT place solar filters between your camera and lens. Solar filters (except for specialized intermediate scientific filters) go in front of your lens.

Now that you have your eyes protected, how do you photograph our nearest star? It is not advised to use a phone camera as you can damage the light sensors, so I will focus on non-phone cameras and telescopes. For all of these, you need a filter.



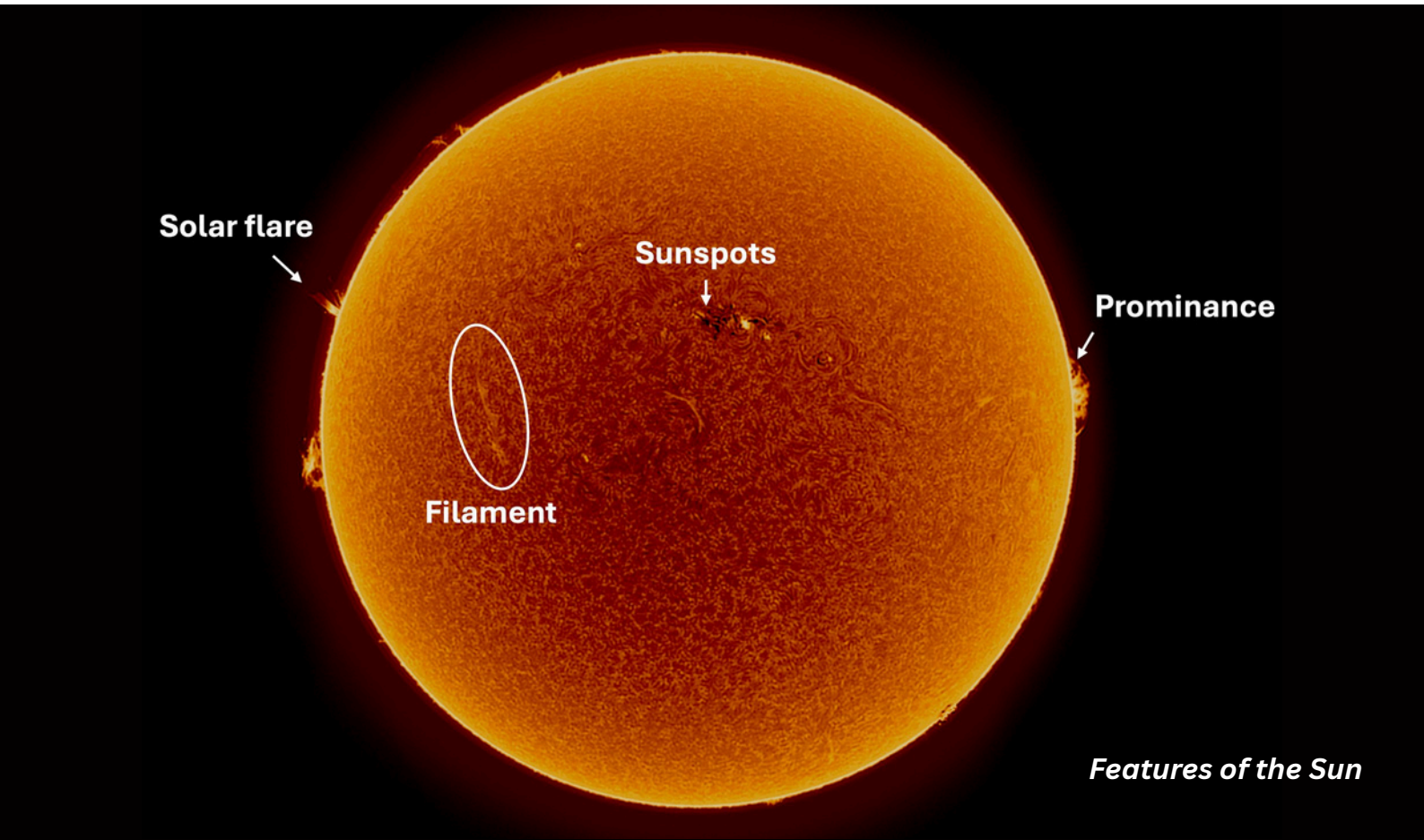
A Mylar filter on a camera lens

There are three types of filters commonly used solar photography. Mylar® film white light solar viewing filters, heavy Neutral Density (ND) filters (minimum 16-stop), and Hydrogen Alpha / H-Alpha / Ha solar filters. Mylar® is a polyester film that is great for solar photography filters and solar glasses. These are less expensive than other types of filters. Wrinkles in the Mylar® will not affect your image. Your images will show a whitish or pale-yellow sun with black sunspots - you will not see other features. If you are using the optical viewfinder on your camera, you may look at the sun through a Mylar® filter mounted on the front of the lens. (Do NOT look through an unfiltered camera lens while wearing Mylar® solar glasses.)

ND Filters, neutral density filters, simply darken the image. They are not for solar viewing or using optical viewfinders. They are more expensive and not ones I have worked with before.

Hydrogen alpha (H-Alpha/Ha filters) electronic filters capture the narrow band of hydrogen alpha waves and allow you to see filaments, prominences, and the details of the chromosphere. These require an electric power source and manufacturers often recommend the use of UV/IR cut filters if you are doing extended observations. Hydrogen alpha filters are mounted on telescopes between the eyepiece and the scope. On cameras, they are placed between the camera and the lens.

You will need to do some experimenting to find the best camera settings for you, but a general recommendation is to set your camera to ISO 100-400, exposure 1/100-1/4000s, and f6-12. After taking several photos you will be able to determine the best settings for the conditions outside and your camera and lens. But if you really want to dive into solar imaging, you need to get a solar telescope.



Features of the Sun

My set up for solar imaging, note shade tent over computer

I use a Lunt 60mm solar telescope with a hydrogen alpha filter and software called SharpCap to set up my imaging sessions. The solar telescope has a special planetary camera attached to it.

Once the images are taken with either a camera or telescope set up, you will need to stack them and then process them to bring out the details. Stacking is the simply taking lots and lots of photos of the same thing and them compiling or “stacking” them into one image, which brings out much more detail and reduces background noise.

I take 2000 images of the disc of the sun, then stack the best 200. For prominences, I take photos for 40 seconds and stack the best 101 images. I use a histogram to determine the exposure time.

Some people prefer to use Photoshop, others use specialized software developed specifically for astro and solar photography. I have used IMPPD in combination with Photoshop, but now prefer the Solar Tools processing in Pixinsight.

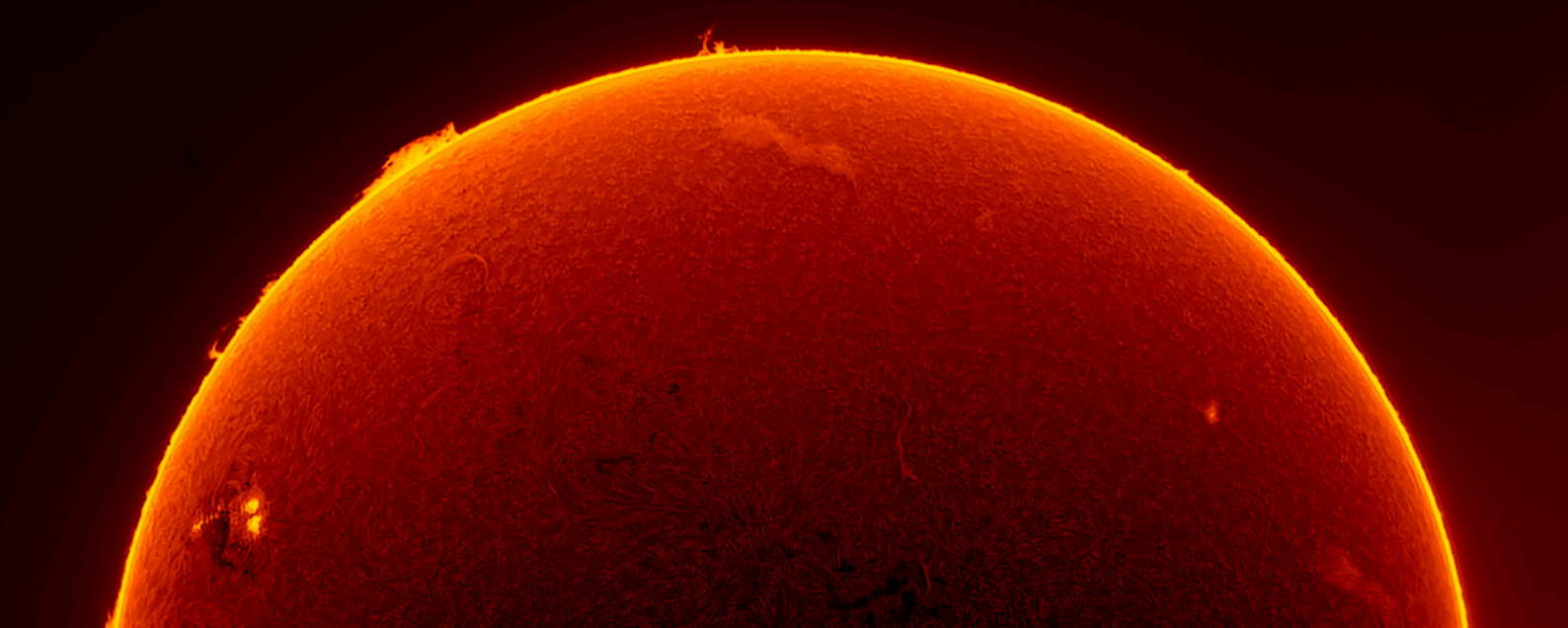
Whichever method you prefer, there is a learning curve if you are a beginner. I have provided a link below which will help get you started on your journey to learning more about our beautiful star, Sol and how to take beautiful pictures. Happy shooting!

Sources:

Safe viewing guidlines: https://www.bhphotovideo.com/explora/photography/tips-and-solutions/14-tips-for-solar-viewing-and-photography-safety

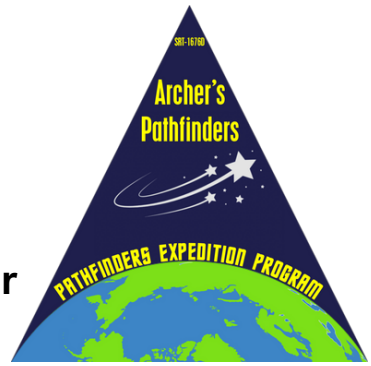
Solar Imaging: Techniques and Tools | 2025-05-05 by Andrea Girones https://www.youtube.com/watch?v=icqJiRxNAbk

Image: The top half of the Sun showing surface activity.



Expedition Report: PEP-1 (Galileo)

LTJG Vince Ceraso, USS Challenger
Expedition Leader



From July 4 to August 3, 2025, several STARFLEET officers embarked on the first long-duration mission of the Pathfinders Expedition Program (PEP). The Galileo Expedition—officially PEP-1–was a thirty-day stargazing activity. Multiple chapters and regions were represented in this first of many expeditions.

Using telescopes, star charts, or the latest smartphone apps, mission specialists—expedition participants—would study the stars, Moon, meteor showers, and other interesting activities in the night sky. Additionally, mission specialists were encouraged to log their findings and discoveries and share them with the rest of the crew.

Unfortunately, this first expedition did not come without its issues. Primarily communication issues with people who signed up as well as inclement weather. The latter made observations and reporting quite difficult depending on location and severity of weather. Thankfully, with problems come solutions. Solutions that will be implemented for all future expeditions.

Due to these difficulties, this first report is regrettably shorter than I intended for it to be. Regardless, I would personally consider this first Pathfinders Expedition Program mission a success; I as well as the rest of STARFLEET Sciences are grateful to everyone for participating.

While photographs were taken by a few people, astrophotography/stellar cartography will be saved for the upcoming second PEP mission, the Hubble Expedition.

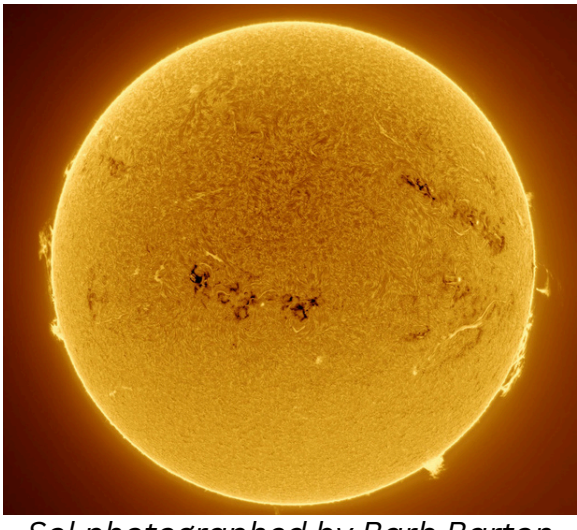
Here are some highlights of the Galileo Expedition from our participating officers, including Scientific Research Team (SRT) leaders:

LTJG Angelique Anderson (USS Draco Ignis) observed the skies STARFLEET members from the Petfleet division. Using her Seestar S50, LTJG Anderson photographed the Moon and distant nebulas and star clusters. Such observations include the Wizard Nebula in Cephus, the star Vega in the constellation of Lyra, and 52 Cygni in the constellation of Cygnus.

Similarly, in late July of the expedition, **LCDR Diane Ripollone (USS Kitty Hawk)**, Lead Researcher for Voyagers of Discovery SRT-1659, observed Venus in the night sky with a waning gibbous Moon.

Elsewhere on Earth, **Ensign Will Horning, Lead Researcher of Burnham's Surveyors SRT-80118 on USS Katherine Johnson**, launched a survey for Globe At Night, a citizen science project dedicated to raising awareness about light pollution. The SRT leader observed the constellations Hercules and Cygnus. Brocci's Cluster and the double star in Draco provided additional beautiful sights.

While the Galileo Expedition was a stargazing activity, cameras were encouraged but not required. **Fleet Captain Barb Barton, USS Tecumseh and Director of STARFLEET Sciences,** joined the Galileo Expedition with different observation techniques and equipment, such as the Lunt 60mm Ha solar telescope, Williams Optical Redcat 71mm telescope, and different types of cameras along with a laptop and hard drive.



Sol photographed by Barb Barton

Turns out the Sun is—no pun intended—boiling with activity. According to FCAPT Barton's daily observations of Sol, many solar flares were seen making their way into space. These solar flares are caused by pent-up magnetic energy being forcibly ejected from the Sun. Aside from Sol, NGC 4236 (Caldwell 3), a barred spiral galaxy, was observed and beautifully photographed.

Captain Deborah Keyes attended Astro Fest at the Orlando Science Center. The PEP-1 mission specialist from USS Haven was left in awe after observing our Sun with a telescope at the science center's Crosby Observatory.

Across the pond in the United Kingdom, **Deputy Director of STARFLEET Sciences Captain Pam Kingsley from USS Mercia** observed Pleiades with a pair of Praktica 10x50 binoculars. Pleiades is an open star cluster in the constellation of Taurus 444 light-years away.

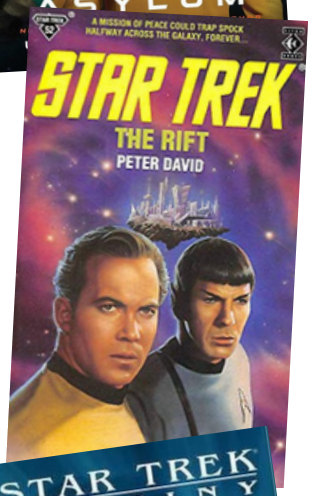
In my own backyard, I observed on clear nights some of the brightest stars in the sky. Altair was one of the first I observed. At a distance of 16 light-years away, Altair the twelfth brightest visible star in the sky and, while the star has been known for generations, didn't get its name until 2016 by the International Astronomical Union.

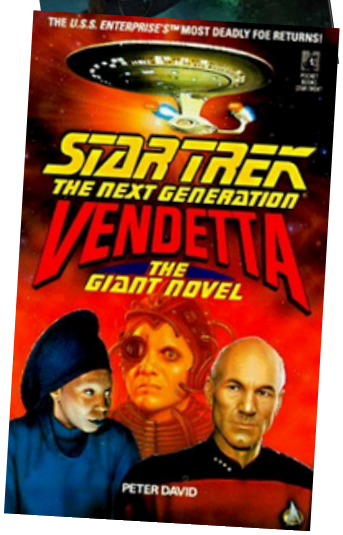
As previously stated, one of the more common reports was cloudy skies. In fact, it provided a lot of difficulties during the Galileo Expedition. Nevertheless, like any resourceful STARFLEET officer, PEP-1 mission specialists adapted. **LT Jessica Sommer (USS Renaissance),** who has witnessed the International Space Station passing over Region 13 in the past, observed light from the Moon behind dense clouds. Of course, any effort or progress from mission specialists is good enough for STARFLEET Sciences!

On nights of clouds, I used the Stellarium app to track the movements of satellites belonging to various agencies and organizations. Of the nearly 15,000 satellites in orbit around Earth, 11,700 are currently active. Most notably, I tracked the movements of several of Elon Musk's Starlink satellites. GPS satellites were also very common.

Despite the difficulties we endured during this first expedition, STARFLEET Sciences are once again grateful for the members who signed up to participate. With each new mission of the Pathfinders Expedition Program, we will come closer each time to discovering more of the wonders of our galaxy. The Galileo Expedition was only the beginning.

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 we feature *Provenances* by Fleet Captain Rahadyan Sastrowardoyo; half set aboard the USS Tereshkova in the 23rd century, half taking place amid Khan Noonion Singh's rule of Earth during WWIII.. *(Reader discretion advised - themes of death)* The story will continue in the next issue!

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

PROVENANCES

by Fleet Captain Rahadyan Sastrowardoyo, USS Challenger

Pictures in this story except for ship image generated by AI/CoPilot.

PROLOGUE: January 16, 1994

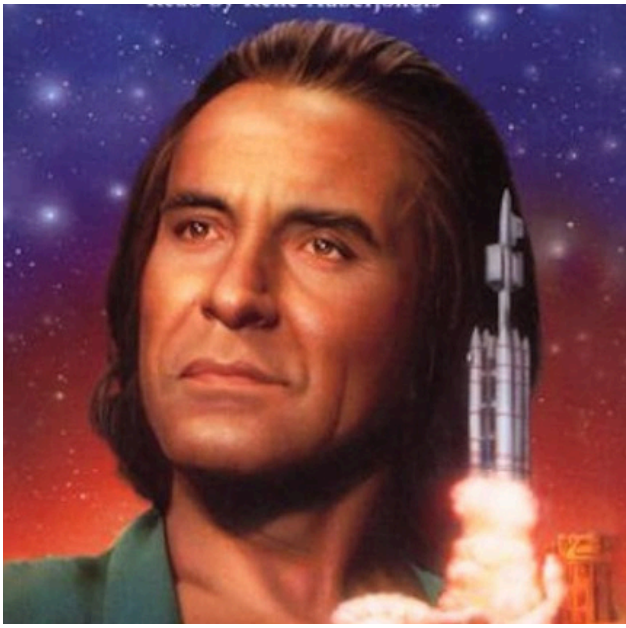
This wasn't in the brochure, Nancy thought to herself wryly. Inappropriate, dark humor was a familial coping mechanism.

She was blindfolded, and the room where she and others – she guessed at least several dozen, from the gagged mutterings and smells of body odor – seemed large. There had been an echo when they had been walked or dragged in.

It was the third year of the war that had no official name. Some media called it Gulf War II, some even World War III, some just Khan's War. Nancy was one of six students from her Connecticut college that had been approved for a Study Abroad program in her father's home country of Indonesia. Despite the conflicts, mostly on the Asian continent, some administrators still thought it safe to continue the programs. Nancy was not on a main island of Java or Sumatra or even Borneo, but somewhere in the east of the archipelago.

Maybe it was stupidly optimistic to blithely assume that the summer would just consist of the eight weeks of the program, plus a couple of weeks at the end to visit extended family, then home to the United States.

Nancy heard a door open, then a quiet, deep voice that seemed to be coming from everywhere said, “Welcome.”



“You are prisoners of the Lord Khan, Noonien Singh. You are destined to be part of his great and powerful force that will give this world order. You have no hope of returning to your loved ones. Accept your fate, and become part of the greater good.”

Several years ago, “Khan” Singh had presented himself as a charming, handsome techno billionaire. He claimed to be from a mix of people who were in old newsreels and magazines as Sikh separatists that made their fortunes after Partition and lower-caste Indians that a hagiography -- rushed into print – described unoriginally as “the salt of the Earth.”

Khan received the full media blitz: photos with presidents, prime ministers, other world leaders, musicians such as Alison Blaire, Lila Cheney and Cats Laughing -- even the reformed Beatles – and many other celebrities. He was seen at fundraisers and movie premieres. A journalist proclaimed him “the next Henry Starling,” and the label stuck.

But in 1990, another side of the international superstar began to emerge. Rumors of his true origins surfaced as he ran for public office in India. Within a year, he was prime minister. Then the mask dropped entirely. His troops and acolyte politicians helped India annex neighboring countries, including Bangladesh, Sri Lanka, the Maldives, and Pakistan. Puppet “governors-general” were installed in the formerly independent countries.

The rumors were confirmed by Khan and his cohorts. All of them were products of a human genetics-modification program begun in the 1950s. The Senate Majority Leader, Robert Kelly (D.-Massachusetts), spoke against the so-called Augments as did the United Nations Secretary-General and Queen Elizabeth II, among others. Some, like the senator and presidential hopeful, John F. Kennedy, Jr., scion of an elite family, attempted to "both sides" Khan and merely preached caution. Still, as many in the First World experienced economic downturns, especially food shortages, "giving the world order" grew in popular support.

ACT ONE: January, 2285

Captain's Log, Stardate 8006.2:
The USS Tereshkova is transporting classified cargo to Starbase 10. As Tereshkova is a science-probe vessel, not a transport vessel or capital ship, it was considered prudent to divide the cargo among three different ships, none of them known to each other. Our ETA is 48 hours.

The closer we get to Romulan territory, the more wary I get. Only myself, First Officer Moyet, and Chief Engineer Savak have been apprised of the nature of our cargo.

Personal Log, Stardate 8006.2:
Starfleet Communications, in conjunction with the Terran firm of Dane/Palmer/Pym, has developed a new form of ansible crystal, with the hope that these will improve long-range subspace communications with a minimal need for relays. Extremely urgent communications such as subspace livelinks require a great deal of power, and simulations show that these new crystals with reduce power use by as much as 25 percent.

Captain Corinne Morgenthau leaned back in her chair in her small ready room. The Gagarin-class *Tereshkova* was nowhere near as large as a heavy cruiser, but during the 2282 refit, she had requested space on the deck below the bridge for a ready room. It was a welcome respite for many of the missions they had gone on in the past three years.

She turned her attention to the personnel files of several whom she felt were overdue for promotion or reassignment. Morgenthau had promoted Angelo Bedford, a junior science officer specializing in geology and officer of the deck for gamma shift, to full Lieutenant. Bedford was a steady officer, and had gone on a few landing parties where he'd acquitted himself well. The assistant chief science officer, Seaton Grosvenor, had put in a request for promotion and Morgenthau was willing to sign off on that, pending recommendation of chief science officer Arismunandar. Among the engineers, Antonia Sawalha was scheduled for promotion to Lieutenant Junior Grade. Sawalha was alpha-shift's bridge liaison to Engineering; Savak preferred to mind Main Engineering during alpha shift and only came up to the bridge if a situation demanded it.

Morgenthau's mind drifted to her – well, she wasn't sure what to call what had been going on with Rebecca Gallaudet, captain of the *USS Ride*. It was less complicated that what each had experienced in the past, but somehow deeper, too. During classified missions, there could be no personal communications for fear of giving a ship's position away. Any official communications were encoded and brief. The two had worked out something very simple: one would bounce a glyph on a low-frequency channel rarely used by any Federation or allied powers. It was their shared symbol for, *"Can't talk now. I love you."*

Love, Morgenthau reflected, *was an easy word to say, but more difficult to really mean.*

Her brief reverie was interrupted by intercom on her desk whistling at her. She hit "accept" and the face of her executive officer, Lieutenant Commander Sabrina Moyet, was instantly on her screen. "Yes, XO?" Moyet's face, often almost Vulcan in its imperturbability, conveyed an expression of consternation.

"Captain, please come to the bridge. Long-range sensors indicated a strange," she paused, "*wormhole*-like anomaly in our flight path."

"Of course." Morgenthau adjusted the jacket of her uniform and headed upstairs quickly.

“Report,” she said with a calm she wasn’t sure she felt.

“I’ll put it on the main viewer,” responded Lieutenant Commander Marthe Arismunandar. On the forward screen, the tactical framing showed an object invisible to infrared, visible light, and ultraviolet ranges. Other overlays noted gravitational variances, measured in megapascals, and quantum fluctuations, in Alderson-Hasslein units. Black-body temperature of the object was given in nanokelvins.

“Yes,” agreed Morgenthau. “Mr. Grosvenor, launch one towards the object, standard sensor package.”

After a moment, Grosvenor said, “Done. Telemetry feed’s good.” They indicated a screen above the science station.

“Shall I launch marker buoys to warn off other vessels, sir?” asked Tabakow.

“Prepare them, but don’t launch them as of yet. Do send Starfleet a brief message about what we’ve run into. I don’t anticipate we’ll be asked to delay our current mission to investigate, but one never knows.”

Arismunandar and Grosvenor looked at each other, then Arismunandar spoke. “In the meantime, we’ll tentatively tag the object as ‘Tereshkova-2285-Alpha-Zero-One.’ “It was the first unknown object they’d encountered that year.

“Yes,” agreed Morgenthau. “Dismissed,” she added.

“Sensors just picked that up two minutes ago,” volunteered Grosvenor, normally on duty for beta shift, who was standing next to Arismunandar.

“Oddly,” added Arismunandar, “this close to such an object, the entire ship should have felt its effects close to an hour ago.”

“Magnify,” said Morgenthau and Moyet almost simultaneously, and the image enlarged. One side of the otherwise round object was of an uneven shape, as if a chunk had been taken out of it. Alphanumerics on the right side of the viewer showed the ship’s computer creating a wiki entry for the object.

“Possibly part of it’s stuck in subspace?” suggested Arismunandar.

“I think it’s stuck in a continuum other than subspace,” said Lieutenant Lech Tabakow in a Polish accent. He was the beta-shift communications officer. “It’s invisible to our frequencies somehow.”

The region through which Tereshkova was traveling was nearly devoid of matter, at least none that the navigational deflector had to push aside. A cloaking device, such as the Romulans possessed, could still be detected by its displacement of particulate matter.

Moyet was the beta-shift officer of the deck, but she deferred to Morgenthau. “Recommendations?”

“What’s the closest we can approach?”

Grosvenor studied their instruments. “Not transporter range. One million kilometers.”

“Our ETA is just under 47 hours. We have enough time to at least dispatch a probe,” suggested Ibernerra, the junior officer at Navigations.

INTERLUDE ONE: February 28, 2054:

It was the third week of a High Ultraviolet Index Warning in Europe. The outside temperatures rarely fell below 35 degrees. At Gare du Nord station in Paris, Dorian Quan and her husband Daniel stepped off the maglev from Kuala Lumpur, a robot trolley carrying their luggage behind them. Their security hoverbots, eight in all, accompanied them from the maglev where they had been the only passengers. A human security escort contingent was just ahead of them, their leader dressed all in black. He presented his credentials to Dorian.

She examined them carefully and nodded. She was the eldest daughter of Li Quan, president of the Eastern Coalition of Nations, and she was used to the routine. It was just after midnight. Their itinerary was only on hardcopy not electronic, and decoys dressed as Dorian and Daniel were in London, Rome, and Leiden, all arriving at their destinations within minutes of one another.

Aside from the escort contingent, they were not noticed. Dorian was dressed in an old-fashioned trench coat over a plain black pantsuit, and Daniel was in a cobalt-blue suit. Over his shoulder was a black messenger bag with handwritten notes for the meeting. Their clothing was proof against projectile weapons and even lasers. Nanoskin that renewed itself every five minutes protected them from any gas or pathogenic attack. The hoverbots scanned them continuously for any changes in life signs.

The contingent formed around the couple – two in front, two in back and two on each side – and they strode towards a waiting hovercar. They would soon be whisked away to meet with Anna Schiff, the President of the United States -- formerly an undersecretary in the State Department prior to the nuclear detonations above Washington, D.C. the previous May -- Charlotte Spencer, formerly known as Queen Elizabeth III, representing both a recovering United Kingdom and the European Union; and Dr. Ismail Abdul-Karim, leader of the Pan-Semite Union.

And then all hell broke loose.

The bodies of all ten people exploded. The hoverbots picked up audio below the threshold of human hearing; that was the only warning.

News channels all over the world were immediately interrupted with a message, in text in multiple languages, that the eldest daughter of the hated president of the Eastern Coalition, her husband, and their retinue of bodyguards were now dead. An anti-ECON group claimed responsibility and said they had used Blakeney matter-teleporting technology to materialize objects inside of the ten.

The meeting's intent had been to make sure World War III didn't continue, or that a World War IV did not take place. Neither of those seemed avoidable now.

INTERLUDE TWO: June 5, 1994:

Nancy had been sound asleep, possibly made more manageable by something in their food and drink given by their captors. She was awakened by a hiss of something against her shoulder, an intramuscular injection, then by a gentle shaking

Nancy and about 25 others had slept in a different room from one where they'd been for several months. She looked around and saw all were being treated by two men in dark fatigues that had no insignia.

Their features showed them to be of Southeast Asian descent. TNI? she thought as she leaned up on one arm The Tentara Nasional Indonesia, the Indonesian military forces, had made a few unsuccessful attempts to rescue them and the others, but no other attempt had been made in a few weeks.

"*Siapa kamu*?" she asked the nearer man. *Who are you?* He turned to her, smiling slightly.

"*Teman-teman*," he replied. *Friends*. The other man, appearing to be in his 40's, finished his rounds of the captives.

"*Kami adalah tim yang maju*," the older man said. *We're an advance team*. He added, "*Namanya Purnomo*." He continued, "*Akan ada yang lain yang segera tiba. Kai akan mengantar anda ke rumah anda*." *Others will be here soon. You're going home*.

ACT TWO: January, 2285

A couple of hours later, the object simply stopped behaving like a wormhole, or at least much of it did. And it was now visible on the infrared through ultraviolet ranges. Subspace pings were now reflected, indicating an apparent change in form from when the Tereshkova had first encountered it. Alpha-Zero-One started to appear more cylindrical. And familiar.

The senior staff was assembled in the briefing room. Arismunandar began: "The presence of our probe seems to have affected how much of the object is revealing itself to us. Unknown if there's an intelligent being of a type we haven't yet met, or if it's a cybernetic intelligence – a more advanced form of our own computers – at work."

“I’m on the fence about recommending a boarding party to take better readings, given we have the time,” she continued.

Captain Morgenthau and Dr. Aurora de la Cruz (recently breveted to lieutenant commander) were seated across the table from one another. De la Cruz, a medical officer, was the Tereshkova’s liaison to Starfleet Intelligence. “It looks like a Romulan scout ship of a hundred years ago,” she opined. “General form, but their equivalent of a warp drive seems to be missing.”

Morgenthau nodded grimly. “Agreed.”

Chief Engineer Savak, a Vulcan, added his concurrence. “When the Romulans left our system centuries ago, the FTL drive elements were mounted on the sterns of the colony vessels. They weren’t in the ring design common to contemporary ships of the Vulcan Expeditionary Group.” For some time, it had been general knowledge that the Romulans were one of a few offshoots of the Vulcans.

“Then I’ll recommend a standard boarding party,” said Morgenthau. “Marthe, you know who’s best, but…” she turned to Savak. “I’d like you to go, given your expertise in non-Federation technologies.”

“I would welcome the opportunity, Captain,” said the engineer. He didn’t smile, but there was a gleam in his eye.

Morgenthau hit a touchpad to contact the shuttle bay. “This is Morgenthau. Prepare the Anh-Thu Nguyen for launch by 1800.”

INTERLUDE THREE: June 8, 1994

They had been on the run for three days. A few of their number had succumbed to a fast-acting illness that none of the medicines carried by Purnomo and Jantang could treat. Those bodies had to be left behind, but Purnomo had shot video and stills with what he described to Nancy as “a hand-held computer” for their families.

Nancy took the baby from the dead mother’s arms and stood up. She looked uncertainly at the two older men. “*Kita tidak punya waktu tidak menguburkan wanita malang itu*,” Purnomo said. *No time to bury this poor woman*. She nodded.

There were maybe a dozen of them left.

ACT THREE: January, 2285:

The *Tereshkova* boarding party returned with a large device the same size as an inspection pod. Prior to beaming back, they had conferred with Captain Morgenthau about it; ultimately, she decided to take it with them on their current mission.

Chief Engineer Savak, who had led the team, had found what seemed to be a manual for the device, inscribed in an odd script on indurate metal.

Science Officer Arismunandar, who had stayed on Tereshkova, had run the scans through the ship's computer. It was billions of years old, contemporary with the heyday of the Thrintun – more popularly known in the Alpha and Beta Quadrants as the Slaver Empire.

The *Tereshkova* resumed its mission.

EPILOGUE ONE: June 8, 1994

Sightless, Nancy was also hallucinating. "Papa, what's the limit?" Nancy asked the younger one who had introduced himself as Jantang. Hartriono swallowed hard. "*Kami tidak bisa mengeluarkanmu dari sini, Mbak*," he said. *We can't get you out of here, sister*.

This wasn't an element of the past that could be changed. The records on Purnomo's hand computer -- Rahadyan's disguised tricorder -- had shown her obituaries in the Yale Daily News and Yale Herald, and the New York City newspapers, with her death date this year, 1994. She was destined to be one of millions of casualties of the Eugenics Wars

The one thing they could do… Each of them took one of Nancy's hands, so she wouldn't go to Jannah without knowing she would be missed. She said nothing further, then her breath was stilled.

The two brothers heard the low whirr of a hoverskiff. The filters in their contact lenses revealed markings that it was an auxiliary vessel from a larger ship of the TNI Navy. The survivors would be rescued and returned to their families, as history had shown.

'Purnomo' and 'Jantang' presented their carefully forged orders to the Indonesian officer who led the team, but demurred a lift themselves.

"*Kendaraan kita akan sebera tiba*," 'Jantang' said. *Our ride will be here soon*.

After the hoverskiff was out of sight, a portal seemed to appear near the two. They stepped through it, returning whence they had come.

EPILOGUE TWO: January, 2285:

In her quarters, Aurora finished composing her report to Starfleet Intelligence. She didn't include the flashbacks she'd been having.

To be continued…

Dedicated to my two mothers: my biological mother, Teresita Sastrowardoyo (1933-2020), and the aunt that helped raise me, Aurora Manejar (1931-2016)

The Adventures of Stamets
Dublin to Malta edition

Stamets flew to Malta with Commodore Phyllis Seale Foynes for a lovely break in the sun. They stayed in Luqa (pronounced lou-a) and travelled around the island from there.

Luqa was a quiet but very beautiful town with obvious remnants of British rule such as the red phone box and red postbox.

The capital city of Valetta is an ancient fort city and is very lively. Stamets and Commodore Phyllis went to a wine festival there and also enjoyed a mojito for the first time!

They have street cats in Luqa that are well looked after by the town council as they take care of the rodent and cockroach population. The cats are given food, regular vet checks and even have little street houses.... which Stamets investigated.

Commodore Phyllis also enjoyed the biggest glass of ale in the world Cisk is the beer of Malta.!

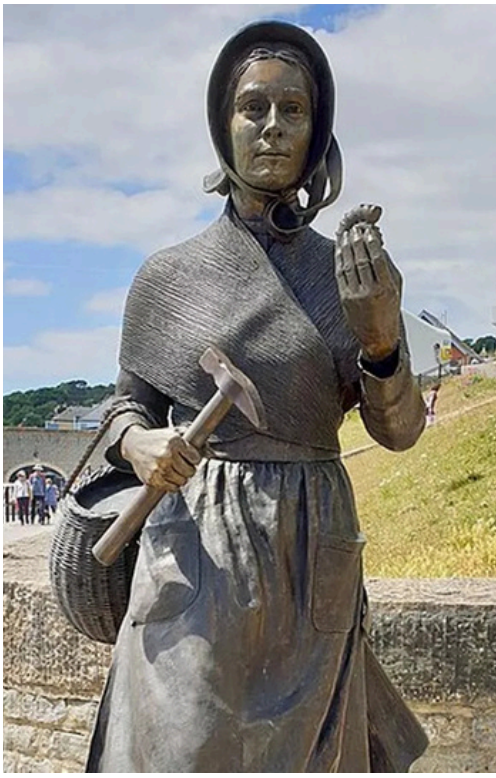
All set with the prosecco and Pringles. Stamets knows his treats!

They flew to Malta on a shuttle named St. Bridget, where Stamets ran off to play on the flightdeck!!!!

CADETS ONLY PAST THIS POINT!

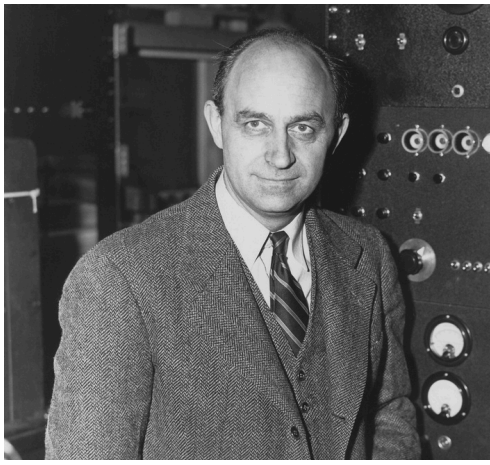
Can you find the names of all the scientists hidden in this grid?

R	W	E	I	K	L	N	N	T	A	D	N	U	R
L	C	A	O	E	O	D	E	Y	R	A	R	H	C
A	H	R	T	B	I	N	G	S	C	R	H	A	O
J	A	C	E	T	N	N	A	O	H	W	U	W	P
O	N	L	I	R	I	H	S	N	I	I	B	K	E
H	D	E	A	N	Y	E	W	T	M	N	B	I	R
N	R	C	N	C	U	R	I	E	E	C	L	N	N
S	A	A	A	K	K	S	K	R	D	I	E	G	I
O	S	L	E	E	N	C	C	D	E	A	N	O	C
N	E	E	K	P	G	H	N	H	S	E	I	C	U
B	K	V	A	L	N	E	A	E	W	L	M	E	S
O	H	O	R	E	A	L	L	E	H	A	R	B	L
H	A	L	D	R	Y	N	P	I	R	N	E	I	A
R	R	I	E	U	C	L	I	D	P	A	F	R	D



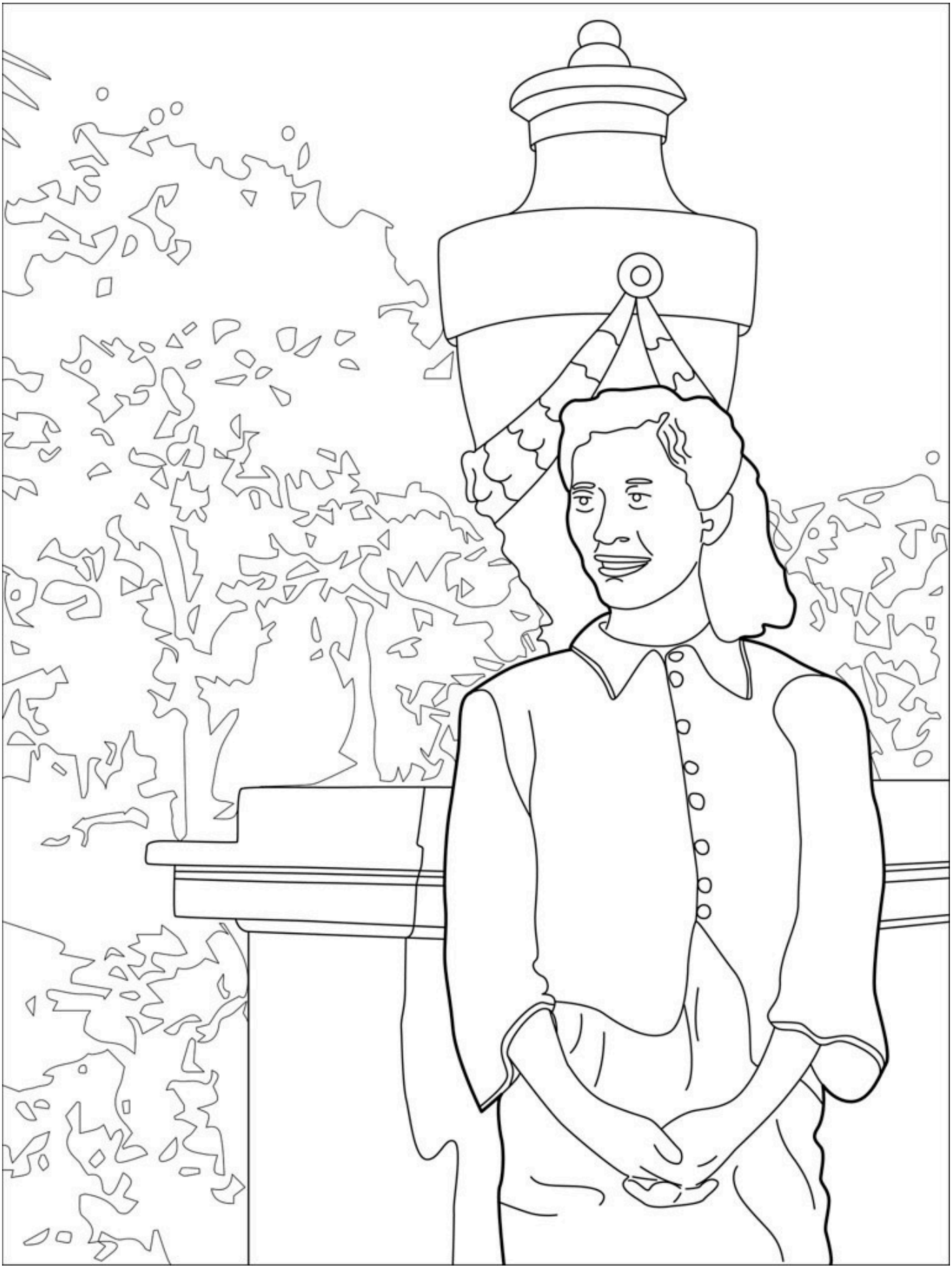
Statue of paleontologist Mary Anning (1799-1847) in Dorset, UK

Anning
Nobel
Johnson
Curie
Drake
Hawking
Hubble
Herschel
Planck
Einstein
Yang
Tyson
Euclid
Kepler
Fermi
Watt
Archimedes
Chandrasekhar
Copernicus
Lovelace
Brahe
Darwin
Bohr



Enrico Fermi (1901–1954)

Play this puzzle online at : https://thewordsearch.com/puzzle/8591248/



Xia Peisu (1923–2014) was a Chinese computer scientist and educator known for her pioneering research in computer science and technology. She has been called the "Mother of Computer Science in China".

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Join the discussion on Discord: **https://discord.gg/3nW8wXhPTF**