

Ode to E Pluribus Unum for Sunday October 31 2021

I Hope You Didn't Forget to Duck



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NGC 6995: The Bat Nebula from an Ancient Hallowe'en



Image Credit & Copyright: Howard Trottier

Do you see the bat? It haunts this cosmic close-up of the eastern Veil Nebula.

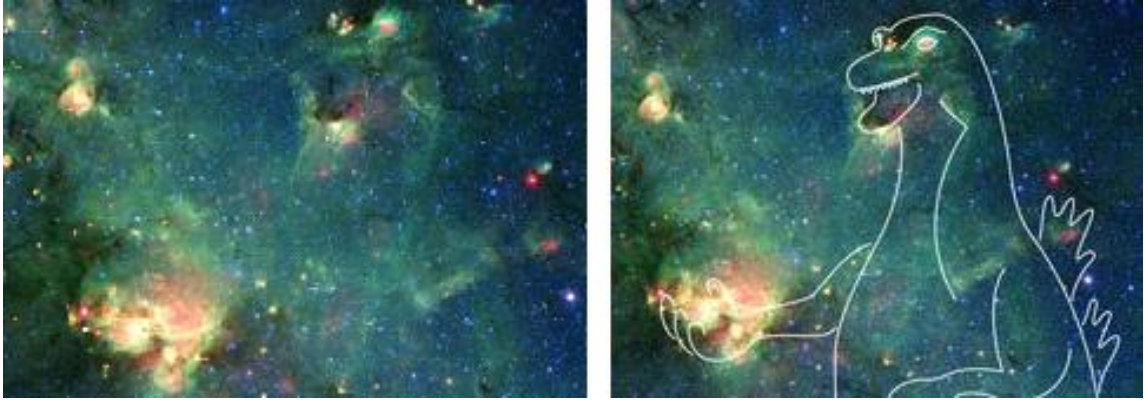
The Veil Nebula itself is a large supernova remnant, the expanding debris cloud from the death explosion of a massive star. While the Veil is roughly circular in shape and covers nearly 3 degrees on the sky toward the constellation of the Swan (Cygnus), NGC 6995, known informally as the Bat Nebula, spans only 1/2 degree, about the apparent size of the Moon. That translates to 12 light-years at the Veil's estimated distance, a reassuring 1,400 light-years from planet Earth.

In the composite of image data recorded through narrow band filters, emission from hydrogen atoms in the remnant is shown in red with strong emission from oxygen atoms shown in hues of blue. Of course, in the western part of the Veil lies another seasonal apparition: the Witch's Broom Nebula.

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A 'Monster' Star-Forming Region Spied by NASA's Spitzer

Just like clouds on Earth, clouds of gas and dust in space can sometimes resemble familiar objects, or even popular movie creatures.



NASA's Spitzer Space Telescope imaged this cloud of gas and dust. The colors represent different wavelengths of infrared light and can reveal such features as places where radiation from stars had heated the surrounding material. Any resemblance to Godzilla is purely imaginary.

Credit: NASA/JPL-Caltech

Do you see a monster in this picture? Do the bright spots near the top of the image look like the piercing eyes and elongated snout of Godzilla?

In reality, this colorful image shows a nebula – a cloud of gas and dust in space – captured by NASA's Spitzer Space Telescope. Over billions of years, countless stars have formed in the material there. During their lifetimes, the radiation they release carves away the gas and dust, reshaping the cloud. Major changes also occur when massive stars die and explode, becoming supernovae. When viewed in visible light, the kind human eyes can detect, this region is almost entirely obscured by dust clouds. But infrared light (wavelengths longer than what our eyes can perceive) can penetrate the clouds, revealing hidden regions like this one.

Four colors (blue, cyan, green, and red) are used to represent different wavelengths of infrared light; yellow and white are combinations of those wavelengths. Blue and cyan represent wavelengths primarily emitted by stars; dust and organic molecules called hydrocarbons appear green; and warm dust that's been heated by stars or supernovae appears red.

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That's Where the New Otani Hotel Was Supposed to Be



It's nice when bosses and workers can discuss their activities
before they trash the town. It calms the natives

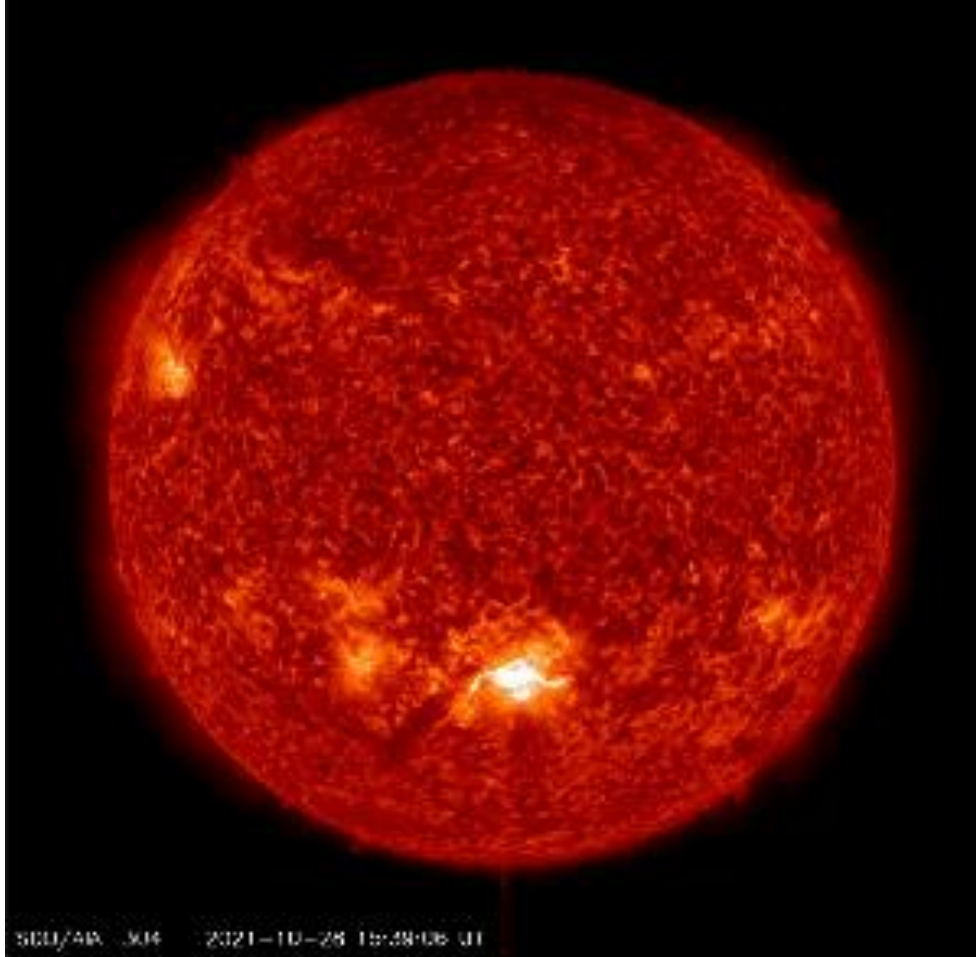
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Now He's Ready for Work



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Solar Mass Ejections



Did your TV or internet go bonkers yesterday?

If so blame the sun, not your IPO

<https://youtu.be/y3iR4o9R3eY>

We are in the midst of what you might call a solar bad hair week.

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Man Swallows Phone; Waits 6 Months for it to 'Pass Naturally'

Tom Williams

Surgeons from Aswan University Hospital remove a mobile phone from a man's stomach after keeping it for 6 months in his stomach in Aswan, Egypt.



*Surgeons had to perform an urgent operation when they spotted the phone in the man's stomach on X-ray
(Picture: Newsflash)*

Doctors treating a man who was complaining of abdominal pains were shocked to discover he had an entire mobile phone in his stomach.

The unnamed Egyptian patient admitted swallowing the device six months ago but didn't seek help as he hoped it would pass through his body naturally.

He'd been too embarrassed to come forward but the phone had become wedged in his stomach, blocking food from passing through properly.

His tummy pains got so bad he finally had to seek help and was X-rayed by doctors who spotted the phone inside him.

The man didn't seek help for six months because he was embarrassed

The man had to quickly undergo immediate surgery for potentially life-threatening injuries including intestinal and abdominal infections.

The operation took place at Aswan University Hospital in the city of Aswan in Upper Egypt.

Mohamed El-Dahshoury, Chairman of the Board of Directors of Aswan University Hospitals, said it was the first time they had seen such a case in which a patient had swallowed an entire telephone, according to United Arab Emirates media outlet Gulf Today.

There is no update on the man's health status but it is believed that he will make a full recovery. It is currently unclear why he swallowed the mobile phone.

It comes just a month after a 33-year-old man in Kosovo managed to swallow an imitation Nokia 3310.

It was too large for him to digest, and put his life in danger as corrosive battery acid could have leaked out.

Doctors managed to remove it without cutting into the stomach by taking it out in three pieces with endoscopy.

According to the British Society of Gastroenterology, most foreign bodies people swallow pass spontaneously, but 10–20% of cases require endoscopic removal and up to 1% could require surgical extraction or treatment of a complication.

They said that coins, buttons, plastic items, batteries, and bones were common items that were swallowed when they shouldn't be.

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Asger Hamerik (1843-1923)

The Danish Composer studied in Germany under Hans Von Bülow and was a protégé of Hector Berlioz. In 1871 he was offered the post of director of the Peabody Institute in Baltimore, Maryland, where his influence won praise from influential visitors including Tchaikovsky and Arthur Sullivan. He composed most of his large-scale concert works for the Institute's orchestra.

He composed 41 opus numbers, including seven symphonies, chamber music, four operas, five orchestral suites and popular orchestral music, much of it based on Scandinavian folk tunes. During his lifetime he was considered the best-known Danish composer after Gade, and one who was primarily influenced by Berlioz. His Requiem was his most successful work, and the one he considered his best.



Requiem https://youtu.be/hx5121o_0Fg

Symphony #7 <https://www.youtube.com/watch?v=jy5GqRt7E4A>

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AMX III: So You Think AMC Only Built Lemons? Think Again



<https://www.youtube.com/watch?v=xRS31EGEjjo>

<https://www.youtube.com/watch?v=Zq3hESO6oQ4>

<https://www.youtube.com/watch?v=3Yie9bMGDRo>

There were some people at AMC--probably kept in the catacombs so as not to frighten the accountants—who knew about automobiles, how to make them go fast, and even make them beautiful at the same time. It's of the Pantera era but (gulp) prettier.

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Any Complaints?

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Frida's Garden



It's a Frida Kahlo color
deep purple
thrusting, soft,
that combination her password
ruthless rowdy ordinary
in exotic
day to day Mexico
Mexican Sage long stemmed
sabres perky and persuasive
crawling the ground
upright three feet
bending with weight of
glory
languishing over the back
of the swing
green leaves stutter the stems
green purple swaying through both
sky and earth
full bloom thick as
gathered bouquets
this day
birds drop like buckshot
into stems
gathering seeds bugs swallowing
what this mass of beauty
offers
free pass to those
who know
winged wonders
keeping themselves alive
by what is offered where
allowing them to thrive
here then not as on
a metronome
gong tolls
wings lift
purple calm again
meanwhile a bee discovers
my finger tip
an airport runway or landing spot
for bee patrol?
it roams the point
seeking what
I cannot say

tiny feet dance
like those of angels
on a pin's head
straight ahead
single hummingbird returns
to Kahlo's intense purple
royal indeed
partying through the beauty
drinking in open bars
the sweetness of abundance
with nothing abused
nor lost
the cost of all this splendor
no bill asked to be paid
simply sitting in one chair
it takes me
through the afternoon
spiked towards night.

Katherine Holden

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How To Tell Science from Pseudoscience

Our all-in guide to ferreting out falsehoods.

By Natalie Wallington



Trying to determine if Determining something is pseudoscience or real science involves taking a close look.

thegreatcoursesdaily

In our increasingly chaotic digital age, disinformation disguised as science is rampant. It's also getting harder to detect, thanks to new technologies and politically motivated

campaigns against commonly acknowledged scientific truths like vaccine effectiveness, the realities of the climate crisis, and more. Navigating the turbulent sea of online scientific and pseudoscientific information requires a sharp eye, a skeptical brain, and an openness to new ideas about the world around us.

Click the link

Your first exposure to any pseudoscientific claim will almost certainly come in the form of a catchy headline—perhaps a little too catchy. John Gregory, a researcher for the online fact-checking service NewsGuard, warns that fully capitalized words, exclamation points, or strong opinions in the headline of an article are some of the first signs that its contents may be misleading.

“One of the dead giveaways is the use of really emotional language,” he says, adding that the key difference between a factual and misleading story is what evidence its authors use to back up the headline’s claim. This means that your best defense against being duped is to click the link and actually read the article, rather than taking the headline at face value. It’s often difficult for journalists to convey nuance and uncertainty in headlines that are meant to be catchy and brief. The best way to tell whether a headline is accurate, misleading, or downright false is to see for yourself what the article has to say.

Scrutinize the study

Science news is usually based on a specific, detailed study—a feature that sets it apart from other types of news. Ironically, this makes it both easier to verify and easier to fake. On one hand, a primary source like a recently published paper can quickly back up an article’s claims. On the other, many developments in science and medicine are fairly complex, making primary sources difficult for many readers to understand.

“A lot of these [pseudoscience] sites rely on the fact that people are not going to dig into the studies that they’re citing,” says Gregory. “They might even present them in a way that’s not very accessible in order to give the impression of scientific rigor and lend the claims an air of credibility.”

Given that risk, it’s worthwhile to do a little extra digging into the studies behind science news stories. Keep an eye out for a few simple metrics: a large sample size, the presence of control groups, and appropriate caveats in the researchers’ conclusions. All of these items should be included in the paper’s abstract—the paragraph at the beginning that summarizes the study’s methods and findings. News articles about the study should also mention these details.

“Most scientists are very cautious, always leaving open that opportunity for new data,” says Jessica McDonald, the science editor at FactCheck.org. “In fact, if a scientist is 100 percent certain of something, that’s probably a sign that they may not be giving you accurate information.”

This applies both to quoted experts and primary sources themselves. A reliable scientific study will be forthcoming about its own limitations, the scope of its results, and the need for further investigation. Likewise, a trustworthy scientist usually won’t make

sweeping claims about a study's findings, instead explaining the nuances of new discoveries.

Consider the context

Developments in the field of medicine are frequently falsified or misrepresented. This means you'll need an extra level of scrutiny to separate fact from fiction. Often, peddlers of false info rely on a small nugget of truth to help support their claims.

"What they usually rely on is misrepresenting smaller lab studies, maybe an animal model study, but no human trial," Gregory says of articles that purport to reveal miraculous cures to diseases like cancer. "Then, they exaggerate that to say that because [an experimental treatment] killed cancer cells in a lab in a petri dish, it'll do the same in the human body—and that's just not true."

McDonald adds that medical scientific papers are not necessarily accurate just because they are listed on popular preprint servers. Actual publication in a peer-reviewed journal is a promising sign of legitimacy; simple appearance online is not.

"Just because a paper is indexed on PubMed does not mean that it's been vetted," she says. "[Databases like PubMed] can be full of a lot of good information, and also some very dubious scientific papers. They're not necessarily legitimate."

Check the source

A miracle cure, a government conspiracy, or a shocking revelation are all hallmarks of dubious science news—and they often pop up again and again in the same pseudoscience-peddling outlets. If a scientific claim seems suspicious, it's worthwhile to see what other types of stories the site is posting and if the publication's overall character throws up red flags.

"One of the biggest things we depend on [at NewsGuard] is: 'What is the history of this site and the claims they've shared in the past?'" says Gregory. If a website consistently posted anti-vaccine disinformation before the pandemic, for example, it's not going to be a reliable source of info about the COVID-19 vaccines now.

Gregory recommends checking suspicious outlets for information about who writes their articles, who runs the publication, and what organizations they're associated with. If this information is difficult to find or missing altogether, the source may not be reliable. It's also important to look beyond a publication's name to judge its character, says Gregory. Some sites, like the Denver Guardian or the National Vaccine Information Center, rely on legitimate-sounding names to convey authority despite being known peddlers of disinformation and false news, he explained.

Question the motive

Pseudoscience, particularly in the medical field, often aims to serve a specific goal by preying upon the public's fear. At times, this goal may be simply political—for example, denying the existence of the climate crisis may serve the agenda of a particular political party. But often, the motivation behind pseudoscience is financial in nature.

“When it comes to health misinformation sites, and pseudoscience in general, there’s often this ‘They don’t want you to know this’ mentality,” says Gregory. “The sources using those tactics are often trying to sell you something themselves, whether it be a supplement, a medical treatment, consultations, or sometimes the content itself.”

This is another reason why it’s so important to figure out who exactly owns or controls a publication: they may have a financial motivation that inherently destroys the impartiality that responsible journalists are supposed to practice. Giving an overview of various sore throat remedies isn’t necessarily pseudoscience—but promising that One Miracle Tea will instantly cure sore throats probably is. If an article seems to be steering you toward one solution or treatment without giving an honest look at its pros and cons, its authors might be after your money.

Even if an article isn’t trying to sell you a particular product, following the money can also reveal the motivations behind dubious claims. If possible, do a little research on the outlet itself to learn more about its leadership and funding sources. A lobbying group, a private medical practice, a professional business association, or even an individual person with a strong agenda may be lurking behind the curtain.

Consult the experts

When you can’t quite tell whether a piece of science news is accurate, doing your own digging may be time-consuming or prohibitively complicated. That’s where fact-checkers like NewsGuard, FactCheck.org, and even us right here at Popular Science come in.

Professional fact-checkers and science journalists are trained to ferret out misleading information and expose it for the pseudoscience it is. In addition to presenting carefully-compiled research in a clear, factual way, they can also help shine light on complex topics by directly consulting subject matter experts.

“Part of what journalists are doing is reaching out to sources we trust and asking them what they think. People should take that seriously,” says McDonald. “I would [also] challenge people to find news organizations that aren’t necessarily in line with their views, and that are known for being middle-of-the-road.”

Consulting a wide variety of non-partisan sources to get an idea of the scientific consensus is a great way to rely on outside expertise without placing all your faith in one outlet. Maybe one newspaper or website is leading you astray—but it’s unlikely that five, 10, or 15 are all at once.

Trust the court of public opinion

If you’re the type of person who takes everything with a grain of salt, it may be difficult to figure out who to trust on scientific issues. There is no perfect answer: certain individual scientists may be corrupt or misinformed, some government officials may have political agendas, and even trustworthy news outlets occasionally make mistakes. That’s why in addition to trusting the experts on science, you may also find it useful to trust the systems in our society that you recognize to be reliable, like the importance of public reputation and even human nature itself.

"Governments like to look good," says McDonald. "They don't want to have their citizens dying." You may not trust the government in every aspect of your life, but your tax dollars are funding a lot of scientific and medical research conducted by people hoping to improve our lives and protect us from diseases, she explains.

If renowned universities and hospitals were actively spreading misinformation, they would risk ruining their prestigious reputations. The same goes for well-regarded news outlets and the journalists who work for them. The public's trust is hard to win, and most institutions wouldn't risk losing it for the sake of one misleading claim. But even if you will never trust large organizations, you can still have faith in individual people.

"Scientists are people too," McDonald says. "A lot of this 'evil scientist' stuff doesn't make sense if you've actually met a scientist. Scientists are just regular people, and they get into this field because... [they] want to help their fellow man."

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Astor Piazzolla (1921-1992)



The works of Argentine tango composer, bandoneon player, and arranger revolutionized the traditional tango into a new style termed nuevo tango, incorporating elements from jazz and classical music.

A virtuoso bandoneonist, he regularly performed his own compositions with a variety of ensembles

Libertango <https://youtu.be/MepPfI7ebMY?t=3>

Adios Nonino <https://youtu.be/VTPEC8z5vdY>

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Watch a Raptor Rip and Snort at 1000 FPS

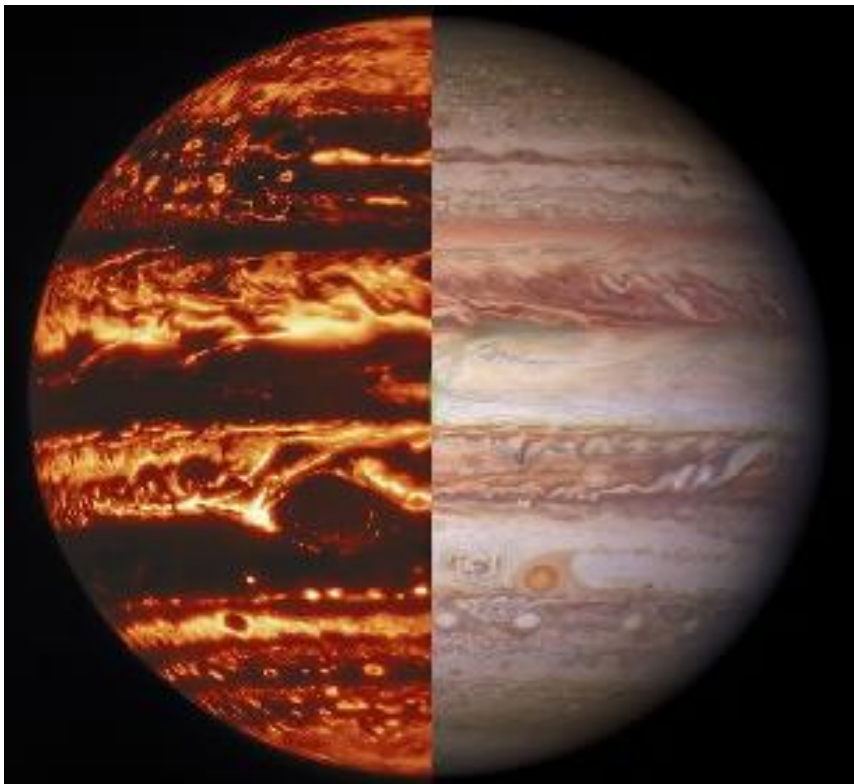


<https://youtu.be/opE6u6Fj5Wo>

Thank you, Tom Demerly. Please send me the keys so I can try one out for myself.

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Jupiter's Bands



Jupiter's banded appearance is created by the cloud-forming "weather layer." In this composite image, the image on the left shows Jupiter's thermal energy being emitted in infrared light, with dark cloudy bands appearing as silhouettes against Jupiter's thermal glow. The image on the right shows Jupiter's appearance in visible light, with

white cloudy "zones" and the relatively cloud-free "belts" appearing as red-brown colors.

The composite was created using infrared data collected by the Gemini North telescope (left) and a visible-light image taken by NASA's Hubble Space Telescope. Both images were created from data captured on Jan. 11, 2017.

More information about Juno is at <https://www.nasa.gov/juno> and <https://missionjuno.swri.edu>.

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F-35 Engine Rivals Prepare For Another Clash

General Electric could find itself in a contest with incumbent Pratt & Whitney for a replacement for the F-35's engine.

By Valerie Insinna



*The F135 engine powers the global F-35 fleet, but may face a competitor in the future.
(Nicolas Myers/US Air Force)*

MIDDLETOWN, Conn.: As the Pentagon looks to increase the power of the F-35 joint strike fighter's engine while cutting costs, Pratt & Whitney and General Electric could be

less than a year away from finding themselves in a rematch over the future of the stealth fighter's propulsion system.

The Pentagon stopped funding General Electric's F136 engine in 2011, leaving the Pratt & Whitney F135 as the sole propulsion option for the Lockheed Martin-made F-35. However, the F-35 will need an improved engine to support oncoming Block 4 enhancements that will make the jet more lethal, and department officials are contemplating whether another competition between the former rivals could lead to a massive leap forward in engine capability, at a price the services can afford.

"I love competition," Lt. Gen. Eric Fick, who leads the Pentagon's F-35 program office, said Sept. 15. "I'm a big fan of having two viable fighter engine manufacturers in the defense space. What we need to figure out, I think, as an enterprise is: Are we willing to pay the cost associated with [a new engine]."

General Electric Aviation is pitching its XA100 adaptive cycle engine, which the company is developing as part of the US Air Force's Adaptive Engine Transition Program.

The XA100 is "drop in" compatible with the F-35A conventional variant used by the Air Force and most international customers, as well as the F-35C carrier variant, said David Tweedie, GE's head of advanced combat engines. However, the XA100 would have to be majorly modified for use on the F-35B, which can vertically take off and land.

While Pratt & Whitney also has an adaptive engine in the works, the company is proposing an upgraded version of the F135 that it believes will offer the Pentagon the most bang for its buck, said Jen Latka, Pratt & Whitney's vice president for the F135 engine program.

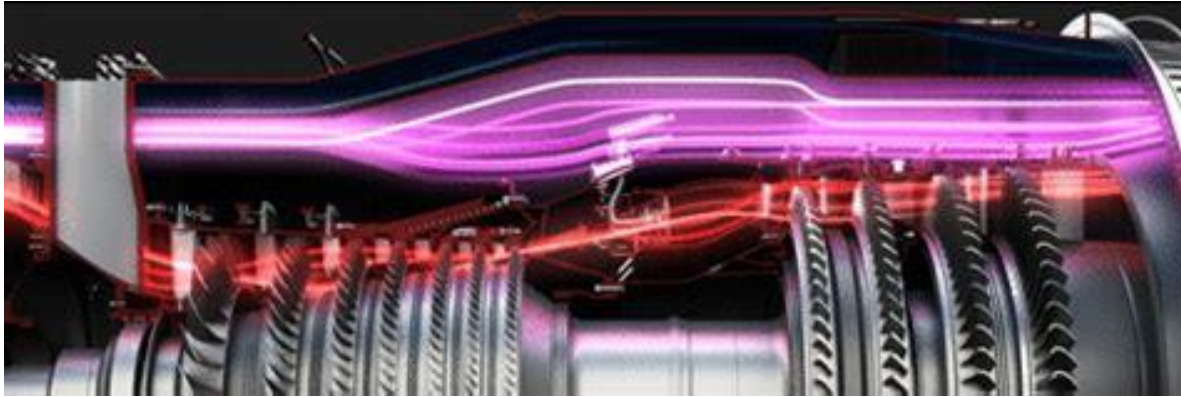
The enhanced F135 would be applicable to all variants of the jet, giving an increase in thrust and power management without forcing the services to field a new engine — or leading to a mixed fleet of adaptive engines and F135s.

The Pentagon's F-35 joint program office is charged with compiling future engine requirements from the US Air Force, Navy and Marine Corps. Within the next six to 12 months, the office plans to carve out a path forward for either upgrading the F135 or starting an engine competition, Fick said.

Much will depend on whether the Air Force continues financing development of Pratt and GE's adaptive engines, and whether the service is willing to pay the increased engineering, procurement and sustainment costs associated with having a different engine than the rest of the F-35 enterprise, Fick said.

"We know that beyond Block 4, we are going to need more power" and cooling, he said. "We know that we need to start [determining a path forward] so that we can put a solution set in place for all aircraft, for all customers."

General Electric's proposal



Tweedie said GE's pitch comes down to the a single question: "Do you want an incrementalist approach, or do you want a transformational capability improvement that's not just good for the next five or 10 years, but for the next 30 or 40 years?"

While engines built for commercial airlines prioritize fuel efficiency and engines built for fighters prioritize thrust, adaptive engines can shift between the two modes — allowing a fighter to use less fuel as it cruises and hence improving its range, but also affording it the thrust it needs during combat.

GE anticipates that the XA100 will increase the F-35's range by 30 percent, increase thrust by 10 to 20 percent and improve fuel burn by 25 percent when compared to current engine performance.

In addition, its thermal management capability would be doubled due to the third stream of air flowing through the XA100, which acts as a heatsink for electronics, avionics and mission systems, he said. That would give the F-35 the cooling it needs to accommodate the upgrades planned as part of Block 4, with margin for additional advances, Tweedie said.

However, the XA100 — like other adaptive engines — is still moving through development and won't be ready until 2027 at best.

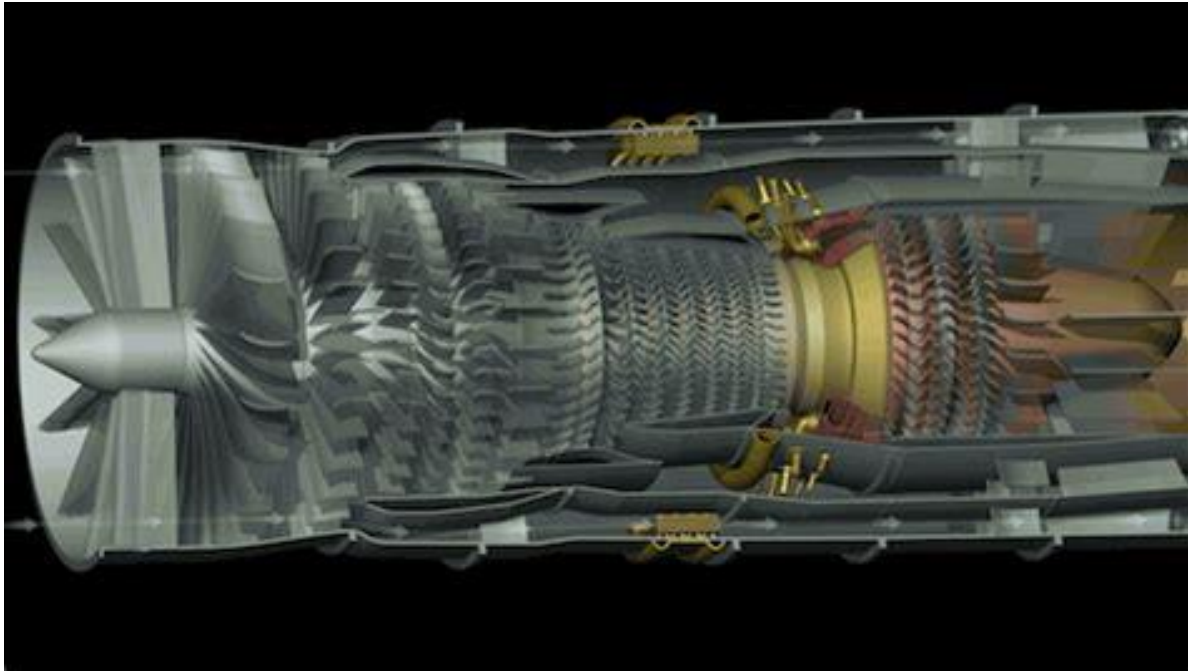
The company has built two XA100s and fired up the second engine on Aug. 26 at GE's facility in Evendale, Ohio. Once that ongoing testing is complete, the Air Force will conduct its own evaluation at Arnold Engineering Development Complex in Tennessee, where it will get "full flight envelope [data] and more precision level performance measurements," Tweedie said.

After the Air Force wraps up its testing sometime next year, all AETP program milestones will have been achieved, and it will be up to the service to determine whether to start a program of record or to continue development of adaptive engines.

While the Air Force has not laid out an acquisition strategy for an adaptive engine, Tweedie said he's been encouraged by comments made by Air Force Secretary Frank Kendall and other Air Force leaders who have shown interest in pursuing a new engine for the F-35.

“The \$4 billion investment that the Air Force has made [in AETP], we think it provides a trend transformational level of capability improvement,” he said. “We think we offer not only capability, but frankly, the lowest risk approach based on the investment that has been made at this point. So we would eagerly look forward to a head to head competition.”

Pratt & Whitney’s proposal



If the Pentagon decides that it needs a leap-ahead engine for the F-35, Pratt & Whitney will be ready with its own adaptive engine — the XA101, which it is developing as part of the AETP effort.

However, with the Defense Department likely looking at constrained budgets for the foreseeable future, Pratt & Whitney officials think it’s more likely that the department opts for a more economical improvement plan for the F135.

The company delivered a study to the F-35 program office in March that laid out two “enhanced engine proposals.” Officials have not disclosed how much development and nonrecurring engineering will cost.

However, once the upgrades are tested and cut into the production line, an enhanced F135 will cost only as much as the original version, and sustainment costs could decrease by as much as \$40 billion over the life of the program, according to the company.

Katherine Knapp Carney, the company’s chief engineer for the F135 program, said that its most expansive suite of upgrades would increase the F135’s range and thrust by as much as 10 percent, while doubling the engine’s thermal management capability.

Knapp Carney declined to detail what kind of improvements could be made to the F135 in order to generate those performance improvements, saying that the company needs

a requirement from the government before it can detail what upgrades it plans to make.

"There's a range of options available that we have, from a Pratt & Whitney perspective," she said during a briefing to reporters at the company's production facilities in Middletown, CT.

"Our objective is to make sure that we are offering cost-effective solutions for those requirements. So the big piece for us is getting a propulsion requirement defined, and then we can go provide the solution based on the different options that we have available to support those future needs."

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Ferrari Shell Commercial



https://www.youtube.com/embed/1_kwxzU4wL4

After the Appian Way you can even get a quick peek at the Colosseum on the way by

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Flash Mob "Soul Bossa Nova" - Stare Miasto



https://www.youtube.com/watch?v=rAp7fPF_OaU

How much can you do with three notes? A lot.

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Chinese River Dance



<https://youtu.be/GZy78vA4SAg>

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One more for old times' sake

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Helping Autonomous Vehicles See Around Corners

By sensing tiny changes in shadows, a new system identifies approaching objects that may cause a collision.

Rob Matheson | MIT News Office



To improve the safety of autonomous systems, MIT engineers have developed a system that can sense tiny changes in shadows on the ground to determine if there's a moving object coming around the corner.

Autonomous cars could one day use the system to quickly avoid a potential collision with another car or pedestrian emerging from around a building's corner or from in between parked cars. In the future, robots that may navigate hospital hallways to make medication or supply deliveries could use the system to avoid hitting people.

In a paper being presented at next week's International Conference on Intelligent Robots and Systems (IROS), the researchers describe successful experiments with an autonomous car driving around a parking garage and an autonomous wheelchair navigating hallways. When sensing and stopping for an approaching vehicle, the car-based system beats traditional LiDAR — which can only detect visible objects — by more than half a second.

That may not seem like much, but fractions of a second matter when it comes to fast-moving autonomous vehicles, the researchers say.

"For applications where robots are moving around environments with other moving objects or people, our method can give the robot an early warning that somebody is coming around the corner, so the vehicle can slow down, adapt its path, and prepare in advance to avoid a collision," adds co-author Daniela Rus, director of the Computer Science and Artificial Intelligence Laboratory (CSAIL) and the Andrew and Erna Viterbi Professor of Electrical Engineering and Computer Science. "The big dream is to provide 'X-ray vision' of sorts to vehicles moving fast on the streets."

Currently, the system has only been tested in indoor settings. Robotic speeds are much lower indoors, and lighting conditions are more consistent, making it easier for the system to sense and analyze shadows.

Joining Rus on the paper are: first author Felix Naser SM '19, a former CSAIL researcher; Alexander Amini, a CSAIL graduate student; Igor Gilitschenski, a CSAIL postdoc; recent graduate Christina Liao '19; Guy Rosman of the Toyota Research Institute; and Sertac Karaman, an associate professor of aeronautics and astronautics at MIT.

Extending ShadowCam

For their work, the researchers built on their system, called "ShadowCam," that uses computer-vision techniques to detect and classify changes to shadows on the ground. MIT professors William Freeman and Antonio Torralba, who are not co-authors on the IROS paper, collaborated on the earlier versions of the system, which were presented at conferences in 2017 and 2018.

For input, ShadowCam uses sequences of video frames from a camera targeting a specific area, such as the floor in front of a corner. It detects changes in light intensity over time, from image to image, that may indicate something moving away or coming closer. Some of those changes may be difficult to detect or invisible to the naked eye, and can be determined by various properties of the object and environment. ShadowCam computes that information and classifies each image as containing a stationary object or a dynamic, moving one. If it gets to a dynamic image, it reacts accordingly.

Adapting ShadowCam for autonomous vehicles required a few advances. The early version, for instance, relied on lining an area with augmented reality labels called "AprilTags," which resemble simplified QR codes. Robots scan AprilTags to detect and compute their precise 3D position and orientation relative to the tag. ShadowCam used the tags as features of the environment to zero in on specific patches of pixels that may contain shadows. But modifying real-world environments with AprilTags is not practical.

The researchers developed a novel process that combines image registration and a new visual-odometry technique. Often used in computer vision, image registration essentially overlays multiple images to reveal variations in the images. Medical image registration, for instance, overlaps medical scans to compare and analyze anatomical differences.

Visual odometry, used for Mars Rovers, estimates the motion of a camera in real-time by analyzing pose and geometry in sequences of images. The researchers specifically

employ "Direct Sparse Odometry" (DSO), which can compute feature points in environments similar to those captured by AprilTags. Essentially, DSO plots features of an environment on a 3D point cloud, and then a computer-vision pipeline selects only the features located in a region of interest, such as the floor near a corner. (Regions of interest were annotated manually beforehand.)

As ShadowCam takes input image sequences of a region of interest, it uses the DSO-image-registration method to overlay all the images from same viewpoint of the robot. Even as a robot is moving, it's able to zero in on the exact same patch of pixels where a shadow is located to help it detect any subtle deviations between images.

Next is signal amplification, a technique introduced in the first paper. Pixels that may contain shadows get a boost in color that reduces the signal-to-noise ratio. This makes extremely weak signals from shadow changes far more detectable. If the boosted signal reaches a certain threshold — based partly on how much it deviates from other nearby shadows — ShadowCam classifies the image as "dynamic." Depending on the strength of that signal, the system may tell the robot to slow down or stop.

"By detecting that signal, you can then be careful. It may be a shadow of some person running from behind the corner or a parked car, so the autonomous car can slow down or stop completely," Naser says.

Tag-free testing

In one test, the researchers evaluated the system's performance in classifying moving or stationary objects using AprilTags and the new DSO-based method. An autonomous wheelchair steered toward various hallway corners while humans turned the corner into the wheelchair's path. Both methods achieved the same 70-percent classification accuracy, indicating AprilTags are no longer needed.

In a separate test, the researchers implemented ShadowCam in an autonomous car in a parking garage, where the headlights were turned off, mimicking nighttime driving conditions. They compared car-detection times versus LiDAR. In an example scenario, ShadowCam detected the car turning around pillars about 0.72 seconds faster than LiDAR. Moreover, because the researchers had tuned ShadowCam specifically to the garage's lighting conditions, the system achieved a classification accuracy of around 86 percent.

Next, the researchers are developing the system further to work in different indoor and outdoor lighting conditions. In the future, there could also be ways to speed up the

system's shadow detection and automate the process of annotating targeted areas for shadow sensing.

This work was funded by the Toyota Research Institute.

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John Parr



The English musician, singer, and songwriter, is best known for his 1985 US #1 single "St. Elmo's Fire (Man in Motion)" and for his 1984 US #6 Rock single "Naughty Naughty".

He has written and performed ten major motion picture themes including Three Men and a Baby and The Running Man. Parr has sold over 10 million albums and was nominated for a Grammy award for "St. Elmo's Fire" in 1985.

St. Elmo's Fire: Man in Motion <https://youtu.be/Gho77Y7Tcl4>

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Fish Fishing for Birds



<https://www.youtube.com/watch?v=h4pxLHG0Wzs>

<https://www.youtube.com/watch?v=B49lhUhjccc>

The sea off the Republic of Seychelles is calm. Suddenly a fish leaps out of the sea to feed on the wuyou gull. Initially, the story of a fish eating a bird came only from a fisherman's story. In the absence of any photographic evidence, the director of the crew thought this was a worthwhile risk for a 30-year career. So the crew of four took 800 kg of filming equipment, which includes anti-shake camera, went to a remote atoll in the Republic of Seychelles where it was shot. It took several weeks to finally capture the rare fish shots.

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Bowerman Landfill; Orange County CA



Installing Bowerman's landfill liner

Comanco.com

<https://www.youtube.com/watch?v=FTD03QAk0E>

What is behind a huge landfill in California?

If you think of landfills as 'dumps' get ready to change your mind. Landfill technologies are going through constant evolution in order to meet increasingly stringent environmental regulations.

Can we do without them? Maybe someday, but don't hold your breath.

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My Walking Thoughts

October 31, 2021

Is this a Smoking Gun?

This past Wednesday, I took my theretofore trusty VW diesel Sportwagen to a local repair shop because of a warning light regarding DEF (diesel exhaust fluid). Returning to retrieve the vehicle later in the day, I took the opportunity to walk the two or so miles along several of Ventura's commercial streets. No surprise to find the number of cannabis and tattoo establishments have reached new highs, but I was struck by the

growth in the number of cigarette and cigar stores that seemed to have sprung up along the way like ugly toadstools.

This brought to mind something I read recently to wit:

A new FTC report found more cigarettes were purchased in 2020 than in 2019 -- the 1st uptick in 20 years -- as tobacco companies spent \$7.84B on marketing. Manufacturers sold 203.7B cigs in 2020, enough for ~618 for every person in the US.

I, like most males of my generation, smoked in my younger days. It's not that we didn't know better; hell, we called cigarettes *coffin nails* despite the regular advertising appearances of faux physicians in clinical garb telling us cigarettes were good for our health.

It's not that we felt we were invincible, we just happened to be the target of one of the largest marketing efforts on the planet where motion picture companies and our favorite movie stars (not the villains of course) were paid big bucks to light up before, during, or after some significant activity. Well, insignificant ones too.

At last, various sports organizations—those having to do with auto racing for instance—decided *genug ist genug*, and banned the appearance of cigarette ads on racecars.

Bowing to the inevitable, MadAve went after the ladies, actually shifting the statistics to where more women in the US smoked than men.

Then as real physicians and terminally ill movie stars began showing up on TV telling what we all knew anyway, the numbers of smokers in the US began to decline: during the 1970s by a trickle and in the late 80s to a near deluge, at which point I opined that the biggest Y2K threat was not to the spreadsheet world but the tobacco industry...that by the end of the millennium, I reckoned, nearly all men and the vast majority of women would have shucked the habit.

Wrong...Of course I've been wrong on so many things, these days I hesitate to offer an opinion on whether the earth will rotate enough about its axis tomorrow to let the sun shine on Ojai, CA, so beware anything I predict.

Anyway, I'm not going to try and convince anyone who smokes to stop...that's his or her business. Nor am I concerned about secondhand smoke because that's my problem. If I don't like it, I am privileged to avoid going to places where it's liable to be present.

I'm not even going to rail against the tobacco industry for its skill at seducing the unwary.

Why not? Well, for starters, to tell a fox not to be a fox is a waste of time, but even more to the point, it's hard to believe today even with all the misinformation flooding the airwaves, anyone can claim—just as we couldn't back in the day—*unwariness*. Smoking is responsible for so many bad outcomes—nicotine-stained fingers to crinkly skin—even the most benign consequences are hard to ignore.

Instead, I do wonder if there isn't some way to establish a counter-*something* here; an iconic movement that will mobilize peer pressure to oppose the marketing onslaught regardless of how large it becomes.

Face it, even with the heavy tax overrides on cigarettes, the \$7.8 billion advertising price tag is chickenfeed compared to the \$208 billion at the other end of the rainbow. Double or triple the cost and it's still a nice business to be in, particularly since the buyers do not seem to be dissuaded in the least by what to me are exorbitant prices for a throw-away commodity.

City Streets stats confirm the majority of trash swept up on highways and byways in the US are the leftovers from the tobacco trade...butts, filters, or packaging. Worse still, a significant portion of these, along with a few million tons of bottles, cans, and fast-food wrapping paraphernalia end up in waterways.

So back to my question, isn't there some suite of countermeasures that we can put into play to change the experiment without resorting to draconian means?

While I'm thinking about it, does anyone have figures on what percentage of those dead from Covid were compromised by smoking? Anyone know? Anyone asking? Anyone care?

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Root 66



Doctor John I. Hall

John I—Uncle John--and I go back farther than most people in my life other than those of my immediate family.

He arrived in Southern California in early 1943, a newly minted Lieutenant Commander, USN Medical Corps, posted to the Long Beach Naval Hospital where he was to practice his orthopedic surgery skills on the burgeoning crowd of Navy and Marine Corps casualties returning the Pacific War battlefields; at that time principally Guadalcanal.

He stayed with us in Los Angeles when he first arrived awaiting assignment—a process that in the tried-and-true military practice of 'hurry-up-and-wait' took nearly two months. This was just fine with me and apparently for him as well as it gave me the opportunity to acquaint him with the important things in my life, chief among which were my fortifications on several vacant lots in the area, from which I was prepared to defend family and neighbors from sneak attacks by the wily Japanese.

Uncle John and I walked, enjoyed the weather, talked, and bonded...and stayed that way over the years. Why a grown, accomplished man of skills, curiosity, and intellect

should choose a nonsensical kid for a companion I will never quite fathom, but he did...so there you are.

After he was assigned to the staff, he took up quarters in Long Beach near the hospital, but it was his custom to come up to our house for Friday and Saturday nights, spiriting me away with him for Saturday rounds, during which I got to meet his patients...primarily at that point Marines, whom he claimed were the finest bunch of people he had ever met. It made no difference how terribly wounded they were, (1) they never complained, and (2) all they wanted to do was get back to their outfits...even if they had to wiggle and crawl to get there.

We'd arrive around mid-morning and he'd turn me loose in the wards, counting on me to make my own rounds talking with 'his guys.' They quickly became 'my guys' or perhaps it was the other way around, but it was his opinion that my presence added a bit of normalcy to the situation.

This arrangement went on for the several months before he was shipped to the South Pacific, and from there north to where the rapidly expanding Pacific Fleet was conducting its operations against the steadily shrinking Japanese perimeter.

We corresponded quite frequently—I would draw pictures of burning Japanese ships and airplanes in case he wasn't quite certain what was happening in his neck of the woods—and he would respond by letting me know where to mark his position on the wall-sized world map in my bedroom.

He stopped by on his way home following the end of the war, and we continued to correspond by mail over the dozen years prior to the Root 66 adventure.

In later years when I was stationed on the East Coast, I would fly an A-4 down to Warner Robbins Air Force Base, 30 or so miles South of Macon, and with Aunt Jessie's connivance, he and I would spend a weekend in endless conversation, indulging ourselves in treasures liberated from Mrs. Yellin's Jewish Delicatessen, washed down by \$1.00/gallon jug wine of some sort.

He died while I was in Vietnam, and it should come as no surprise I miss him to this day.