

**Cathay September 2024**

[www.cathayradio.org](http://www.cathayradio.org)

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**Mission:** The Cathay Amateur Radio Club is basically an active social club of Ham Radio Operators and their spouses. We support local community requests for HAM emergency communications. Several of us are trained in CPR/ First Aid and are involved with community disaster preparedness.

**Monday Night Net Time:** 9 PM Local Time/PST, As of 8/21/2023 we are switching over from using Repeater: WB6TCS to **Nick Cassarino's Repeater: WA6GEL UHF 444.80000 Mhz, Offset +5Mhz, CTCSS/Tone PL 179.9 Hz on Monument Peak, Milpitas.**

**If you cannot reach the fore-mentioned machine, please use WA6GEL UHF 4448.8 Mhz Offset +5Mhz, CTCSS/Tone PL173.8 which is on Mt. San Bruno.**

The CARC Monday night net is the best way to find out the latest club news. All check-in are welcome.

**Message on Behalf of the President:** Leonard Tom, *NX6E*

Hello CARC Members and Friends;

Many thanks to Nick Cassarino for the use of repeater – WA6GEL for our CARC Monday Night Net.

**Additional folks are needed to help out with conducting the CARC radio net on Monday nights. Please contact Ed Fong ([edison\\_fong@hotmail.com](mailto:edison_fong@hotmail.com)) if you are interested.**

I wish to thank our CARC members that set aside their valuable time to participate in our Monday night's nets.

## **Introduction to Special Announcement**

Time Sensitive provided by Edison Fong – *WB6IQN* info on the **FARS FREE Meeting/Dinner**.

For more information go to the Special Announcement section of this newsletter

## **Introduction Tech Article:**

In January 25, 2018 NASA launched a satellite named Global-scale Observations of the Limb and Disk (GOLD). The mission of GOLD is to study the heliophysics effect of solar and atmospheric variability on the boundary between Earth's thermosphere and ionosphere from geostationary orbit

GOLD equipped with a two-channel far-ultraviolet (FUV) imaging. Spectrograph has recent detected plasma structures in Earth's ionosphere. These plasma structures are known to interfere with radio waves

Plasma is referred to as "The Fourth State of Matter", it is when gases are heated into a mixture of positively charged particles (ions) and negatively charged particles (electrons).

For further information, please go to the Tech Section of this newsletter.

## **CARC Final News Wrap Up**

Chat sub s'em to all you CARC members! - Leonard Tom, *NX6E*

## **Public Service Announcements**

### **HAM CRAM / HAM Licensing**

For upcoming HAM Licensing locations please refer to:

<http://www.arrl.org/find-an-amateur-radio-license-exam-session>

## Auxiliary Communications Service (ACS)

The Auxiliary Communications Service (ACS) is a unit of trained professionals who supply communications support to the agencies of the City and County of San Francisco, particularly during major events/incidents. ACS goals are the support of gathering and distribution of information necessary to respond to and recover from a disaster.

The ACS Net begins at 1930 hours (7:30 p.m. PT) local time each Thursday evening, on the WA6GG repeater at 442.050 MHz, positive offset, tone 127.3 Hz. The purpose of this net is to practice Net Control skills, practice checking in with deployment status in a formal net, and to share information regarding upcoming ACS events. Guests are welcome to check in. ACS members perform Net Control duty on a regular basis. On the second Thursday of each month, the net is conducted in simplex mode on the output frequency of the WA6GG repeater, 442.050 MHz no offset, tone 127.3 Hz.

ACS holds its General Meetings on the third Tuesday of each month from 1900 hours to 2100 hours local time. Currently meetings are exclusively conducted over Zoom during the COVID-19 pandemic, ACS looks forward to meeting in person again as soon as possible.

Upcoming meeting dates in 2024 are:

- Sept 17, 2024
- Oct 15, 2024
- Nov 19, 2024

Location of in person future ACS meetings are yet to be determined as the regular location is under reconstruction. All interested persons are welcome to attend. For further information contact Corey Siegel KJ6LDJ <kj6ldj@gmail.com>.

For more information, please attend an ACS meeting, check in on the ACS radio net, or call 415-558-2717.

## Free Disaster Preparedness Classes In San Francisco – NERT Taught by San Francisco Fire Department (SFFD).

<https://sf-fire.org/nert/nert-calendar-meetings-trainings-events>

Training Classes  
TBD

**+ Recertifications**  
TBD

**\*SFFD DOT** is the Fire Department Division of Training. All participants walking, biking or driving **enter through the driveway gate on 19th St.** between Folsom and Shotwell. Parking

is allowed along the back toward the cinderblock wall.

Visit [www.sfgov.org/sffdnert](http://www.sfgov.org/sffdnert) to learn more about the training, other locations, and register on line. Upcoming Special NERT Events.

## **San Francisco Police Department: Auxiliary Law Enforcement Response Team (ALERT)**

The Auxiliary Law Enforcement Response Team (ALERT) is a citizen disaster preparedness program designed. The ALERT program is for volunteers 16 years of age or older, who live, work, or attend high school in San Francisco.

Graduates of the San Francisco Police Activities League (P.A.L) Law Enforcement Cadet Academy are also eligible to join.

ALERT volunteers will no longer need to complete the Fire Department's Neighborhood Emergency Response Team (NERT) ([www.sfgov.org/sfnert](http://www.sfgov.org/sfnert)) training and then graduate into two 8 hour Police Department course specifically designed for ALERT team members.

ALERT members will work closely with full-time and/or Reserve Police Officers in the event they are deployed after a disaster. The Basic ALERT volunteer will have no law enforcement powers other than those available to all citizens.

### **SFPD ALERT Training (New Members)**

The next SFPD ALERT training class has been scheduled for: TBD

\*Class date indicated are only for new members

IMPORTANT- All participants must complete the background interview process in order to be eligible to attend the ALERT training class.

Eligible ALERT participants may register for a training class by contacting the ALERT Program Coordinator, [marina.chacon@sfgov.org](mailto:marina.chacon@sfgov.org), or by telephone at 415-401-4615.

### **SFPD ALERT Practice/Training Drill**

All active/trained ALERT members are asked to join us for our next training drill, via scheduled for on TBD

For more information on the San Francisco Police Department ALERT Program, email us at [sfpdalert@sfgov.org](mailto:sfpdalert@sfgov.org), or call Lt. Marina Chacon (SFPD Ret.), SFPD ALERT Program Coordinator, at (415) 401-4615.

For additional information on the web please refer to:

<https://sfgov.org/policecommission/alert>

# **Special Announcement**

## **Foothills Amateur Radio Society (FARS) Show & Tell Meeting / Dinner – FREE**

[www.k6ya.org](http://www.k6ya.org) – Foothills Amateur Radio Society

Come to the **FARS Show and Tell meeting/dinner** at 7pm Friday September 27, 2024 see what our fellow HAMs have been up to.

The event details:

**Date/Time:**

Friday September, 27, 2024: 7 PM Show-and-Tell, 7:30 PM meeting

**Meeting Place:**

The gym / multi-purpose room at  
Covington Elementary School,  
205 Covington Road, Los Altos, Ca 94024

This FARS dinner meeting is about you. Yes you, our members and guests. Our Annual FARS Amateur Radio Homebrew Contest is an opportunity to show off a project that you have worked on in the past year. Each participant has a few minutes to show and explain his project to our audience. In person presenters each have a chance to win one of our four prizes:

- \$40 First prize
- \$30 Second prize
- \$20 Third prize
- \$10 Fourth prize

## **Tien Fu Restaurant Catered Dinner – No Charge / FREE to HAMs**

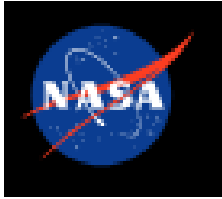
While at the September 2024 **FARS Show and Tell**, hang out with your fellow HAMs and enjoy a **Gourmet Catered Chinese from Award Winning dinner** from Tien Fu Restaurant, the Chef and owner John Hwang who has promised us an unforgettable delicious meal.

Tien Fu - was established in 1984 in San Francisco. In 1990 they open a branch in Mountain View and in 1997 open a branch in Sunnyvale.

### **Menu**

- Fried Rice Special
- Chow Mein Special
- Lemon Chicken
- Mongolian Beef
- Egg Plant with Szechwan Sauce
- Various beverages will also be available.

## Tech Article



# Alphabet Soup: NASA's GOLD Finds Surprising C, X Shapes in Atmosphere

<https://science.nasa.gov/science-research/heliophysics/alphabet-soup-nasas-gold-finds-surprising-c-x-shapes-in-atmosphere/>

By Vanessa Thomasx    Date: Jun 27, 2024

## Who knew Earth's upper atmosphere was like alphabet soup?

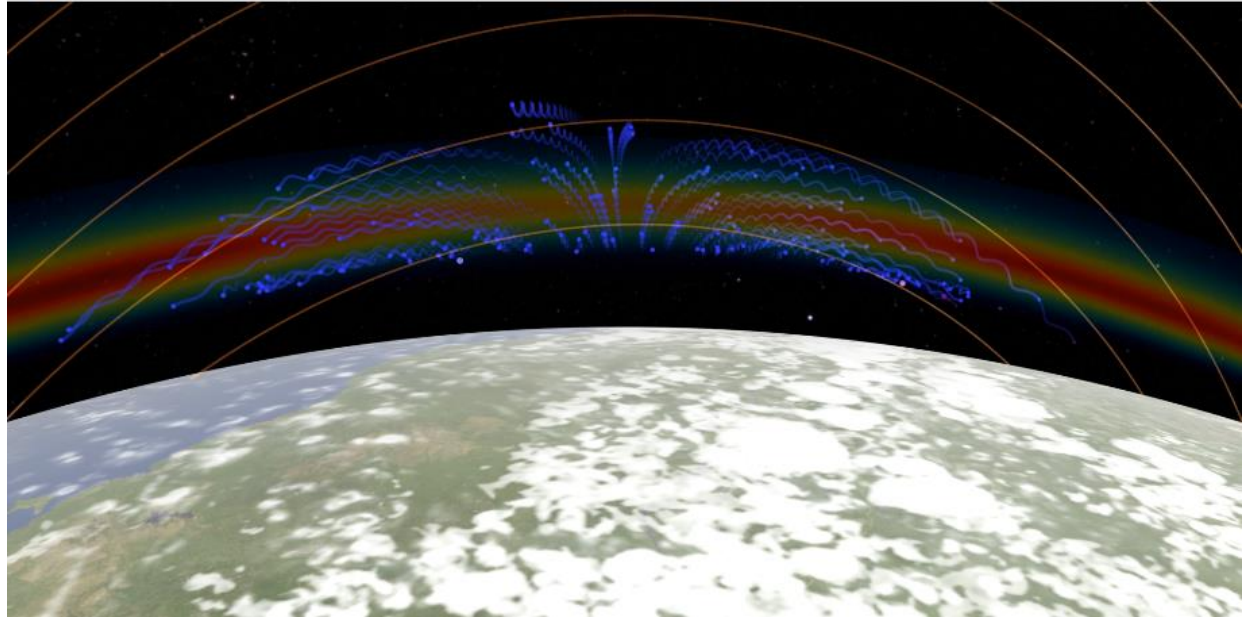
NASA's Global-scale Observations of the Limb and Disk (GOLD) mission has revealed unexpected C- and X-shaped formations in an electrified layer of gas high above our heads called the [ionosphere](#).

While these alphabetical shapes have been observed before, GOLD sees them more clearly than other instruments have and is now finding them where and when scientists didn't expect. Their surprise appearances prove that we have more to learn about the ionosphere and its effects on communication and navigation signals that pass through it

## Earth's Dynamic Interface to Space

Extending some 50 to 400 miles overhead, the ionosphere becomes electrically charged during the daytime when sunlight strikes our planet and its energy knocks electrons off atoms and molecules. This creates a soup of charged particles, known as plasma, that allows radio signals to travel over long distances.

Near Earth's magnetic equator, charged particles are funneled upward and outward along magnetic field lines, creating two dense bands of particles north and south of the equator that scientists call crests. As night falls and the Sun's energy fades, low-density pockets in the plasma, called bubbles, can form in the ionosphere. Because of their varying density, the crests and bubbles can interfere with radio and GPS signals.



<https://science.nasa.gov/wp-content/uploads/2024/06/iriconceptual-limb2pullout-ionfountainigrf-hd1080i-p30.mp4>

Under the combined influence of gravity and Earth’s electric and magnetic fields, charged particles in the ionosphere flow upward and outward away from Earth’s magnetic equator, forming two dense bands, or crests, to the north and south of the equator. [Learn more here.](#)

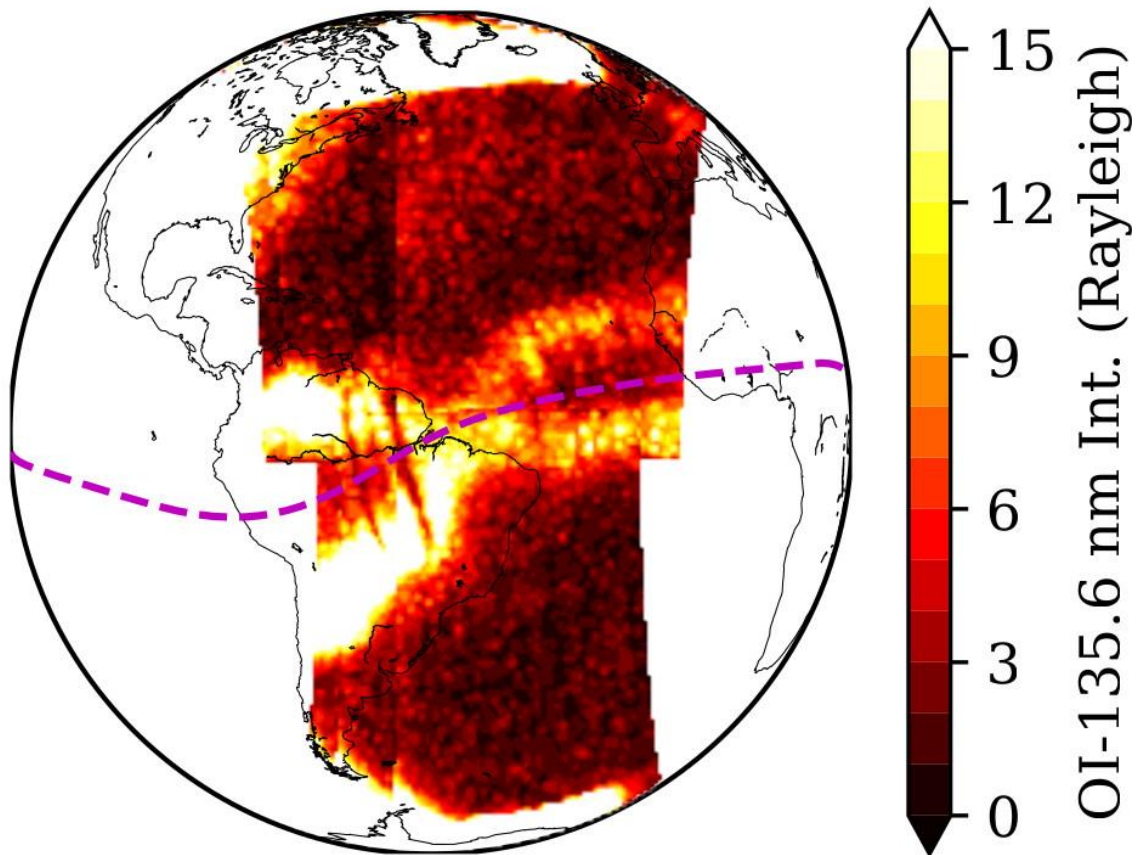
While previous observations provided brief glimpses of crests and bubbles in the ionosphere, GOLD monitors these features over extended periods of time. That’s thanks to its geostationary orbit, which circles our planet at the same rate Earth rotates, allowing GOLD to hover over the Western Hemisphere.

### **Unexpected X-Shaped Crests from Quiet Conditions**

The ionosphere is sensitive to disturbances from both space and terrestrial weather. GOLD has previously revealed that after a solar storm or huge volcanic eruption, the crests in the ionosphere can merge to form an X shape. But now, GOLD has seen an X shape form on multiple occasions when there were no such disturbances — what scientists refer to as “quiet time.”

“Earlier reports of merging were only during geomagnetically disturbed conditions — it is an unexpected feature during geomagnetic quiet conditions,” said Fazlul Laskar, of the University of Colorado’s Laboratory for Atmospheric and Space Physics (LASP), who is the lead author of a [paper about this discovery](#), published in April 2024 by the Journal of Geophysical Research: Space Physics.

2019-10-07, 22:40 - 24:10 UT



Observations from NASA's GOLD mission shows charged particles in the ionosphere forming an X shape on Oct. 7, 2019. (The colors indicate the intensity of the ultraviolet light emitted, with yellow and white indicating the strongest emission, or highest ionospheric density.)  
F. Laskar et al.

These unexpected appearances tell scientists that something else must be involved in forming these X shapes. Computer models suggest that the X could develop when changes in the lower atmosphere pull plasma downward.

“The X is odd because it implies that there are far more localized driving factors,” said Jeffrey Klenzing, a scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, who studies the ionosphere. “This is expected during the extreme events, but seeing it during ‘quiet time’ suggests that the lower atmosphere activity is significantly driving the ionospheric structure.”

This visualization shows a bright, horizontal X-shaped feature appearing in the ionosphere on Oct. 7, 2019, as observed by NASA's GOLD mission. Each of GOLD's observations cover about 45 degrees in longitude and proceed from east to west, alternating between the Northern and Southern hemispheres. Rayleigh is a unit for



measuring the amount of light (in this case, ultraviolet light). See more visualizations from [NASA's Scientific Visualization Studio](#).

### C-Shaped Bubbles Point to Strong Turbulence

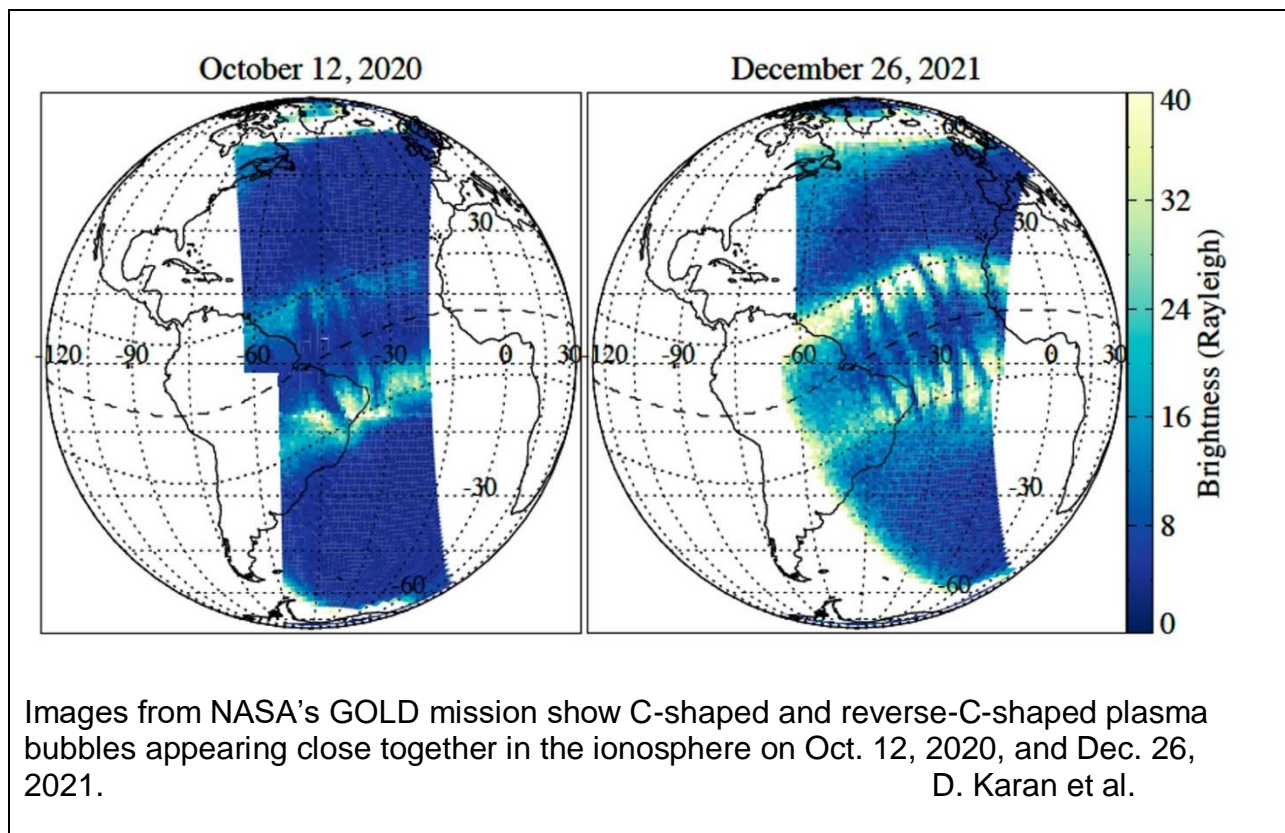
GOLD has also found surprising C-shaped plasma bubbles that point to other puzzling dynamics influencing the ionosphere.

Most plasma bubbles appear long and straight, forming along magnetic field lines. But some bubbles are curved into C shapes and reverse-C shapes, which scientists think are shaped by terrestrial winds. Computer models suggest a C-shape forms if winds increase with altitude at the magnetic equator and a reverse-C forms if the winds decrease with altitude.

“It’s a little like a tree growing in a windy area,” explains Klenzing. “If the winds are typically to the east, the tree starts to tilt and grow in that direction.”

In a [paper published in November 2023](#)

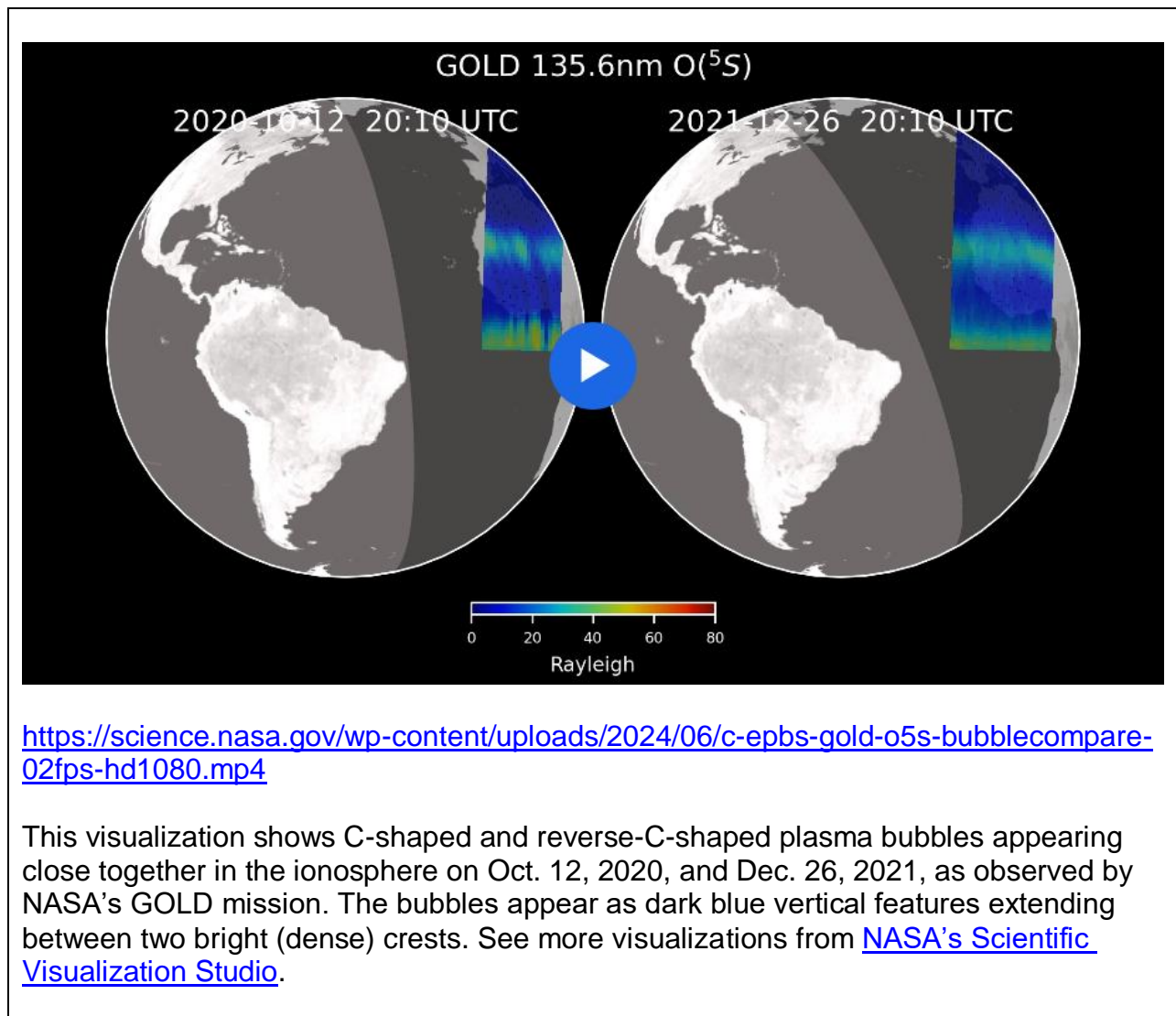
in the *Journal of Geophysical Research: Space Physics*, LASP scientist Deepak Karan and colleagues report that GOLD has observed C-shaped and reverse-C-shaped plasma bubbles appearing surprisingly close together — as close as about 400 miles apart (roughly the distance between Baltimore and Boston).



“Within that close proximity, these two opposite-shaped plasma bubbles had never been thought of, never been imaged,” said Karan. To have wind patterns change course in such a small area, Karan thinks some sort of strong turbulence — like a vortex, wind shear, or tornado-like activity — is likely at play in the atmosphere.

“The fact that we have very different shapes of bubbles this close together tells us that the dynamics of the atmosphere is more complex than we expected,” Klenzing said.

These close pairings appear to be rare, with only two instances recorded by GOLD so far. Yet because these features can disrupt critical communication and navigation technology, “It’s really important to find out why this is happening,” Karan said. “If a vortex or a very strong shear in the plasma has happened, this will completely distort the plasma over that region. Signals will be lost completely with a strong disturbance like this.



Scientists hope GOLD's continued observations, combined with those from other heliophysics missions, can help unlock these mysteries of the ionosphere and their effects on our lives.

By [Vanessa Thomas](#)

**NASA's Goddard Space Flight Center, Greenbelt, Md.**