Cathay October 2021

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, Repeater: WB6TCS - RX 147.210, TX 147.810, Offset +0.6 MHz, CTCSS/Tone PL100 Hz

Please note: Repeater: N6MNV UHF 442.700 Mhz, Offset +5MHz, CTCSS/Tone PL 173.8 Hz in South San Francisco is cross linked every Monday Night Net at 9 p.m. to WB6TCS 2-meter repeater.

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

Message from the President: George Chong, *W6BUR*

Hello CARC Members and Friends;

Many thanks to Mr. Denis L. Moore – WB6TCS for the use of his repeater for our CARC Monday Night Net.

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

On a personal note: Our esteemed CARC member: Ed Fong -WB6IQN, announced on the CARC Monday night net held on Sept 27, 2021 that he had suffered a mild Heart Attack.

On behalf of the CARC I wish for Ed Fong to have a speedy recovery.

Please note that many people have difficulty recognizing a Cardiac Event and delay in getting the necessary and proper treatment.

Please look for an Ed Fong write up on Cardiac Events in a future issue of the CARC newsletter. It just may save your life or life of a loved one.

Flu Shot 2021 & COVID-19 Vaccine Shot

What experts say about the best time to get a flu shot this year

https://www.cnn.com/2021/09/28/health/flu-shot-influenza-covid-booster-2021-wellness/index.html

According to the CDC this year's regular flu season runs from October 2021 to May 2022 in the Northern Hemisphere. While in the Southern Hemisphere it runs from April 2021 to September 2021.

The CDC considers October 2021 the optimal time frame for those folks that are older or with compromised immune systems to receive the regular 2021 flu shot. Keep in mind that once receiving a flu shot, it will take about two weeks to develop any antibodies that protect against the regular flu.

During the 2019-2020 flu season, we were entirely focused on the COVID-19 and over looked the fact that the regular flu resulted in 405,000 hospitalizations and 22,000 deaths among both children and adults.

A COVID-19 vaccination shot does not provide you with protection against the regular season flu due to the fact these vaccine shots are specifically tailored for the specific viruses. This year's flu shot is targeted for 4 specific flu viruses mostly like to be prevalent for this flu season. Hence it is important that you get your annual flu shot this flu season.

Recent research data has shown that you can safely receive at the same time, both the current flu vaccine shot and a COVID-19 vaccine shot / booster shot, whereas it was previously unknown.

Those folks that have previously received the BioNTech Pfzier COVID19 vaccines shots and meet the requirements to receive a Pfzer COVID-19 Booster Shot, please remember to bring your vaccination card that was issued and updated when you received your 1st and 2nd BioNTech, Pfzier vaccination shots.

For the Pfizer Booster COVID-19 shot requirements please see:
https://www.cdc.gov/coronavirus/2019-ncov/vaccines/booster-shot.html

For those folks wanting a third vaccine shot of Moderna as a **supplemental dosage**:
https://sfist.com/2021/08/15/santa-clara-approves-additional-dose-of-mrna-covid-19-vaccines-for-immunocompromised-patients/

Tech Article Introduction:

This month's tech is about an interesting scientific observation about Black Holes. The initial observations appear to confirm Stephen Hawkin's Area Theorem proposed 50 years ago in 1971: that Black Holes can never shrink.

The observation study was conducted by researchers from the Massachusetts Institute of Technology (MIT), California Institute of Technology, Cornell University, and Stony Brook University. It was based upon the studying of two black holes (GW15091) spiraling inward into one another.

They published their finding in the July 2021 journal *Physical Review Letters* : (https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.127.011103).

To read up more on it, please read about it in the Tech Section.

Chat sub s'em to all you CARC members! - George W6BUR.

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) was organized by the San Francisco Office of Emergency Services (OES) following the 1989 Loma Prieta Earthquake to support the communications needs of the City and County of San Francisco when responding to emergencies and special events.

The Auxiliary Communications Service holds General Meetings on the third Tuesday of each month at the San Francisco Emergency Operations Center, 1011 Turk Street (between Gough Street and Laguna Street), from 1900 hours to 2100 hours local time. All interested persons are welcome to attend.

The ACS Net begins at 1930 hours (7:30 p.m.) 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 should perform Net Control duty on a regular basis. On the second Thursday of each month, the net will be conducted on the output frequency of the WA6GG repeater, 442.050 MHz no offset, tone 127.3 Hz, simplex.

Upcoming meeting dates in 2021 are:

- October 19, 2021
- November 16, 2021

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

Upcoming meetings: TBD

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

http://sf-fire.org/calendar-special-events

+ TBD

Spring into Readiness!
This Virtual Drill will take place from 9am-12pm with virtual skill rotations and words from some special guests!

Invitation and sign-up coming next week!

+ Recertifications - Coming Soon!

Now that San Francisco has entered the Red Tier for COVID-19 Transmission (see https://covid19.ca.gov/safer-economy/#county-status for more details), we are working to schedule recertification trainings for NERTs who were current as of December 2019 or later. Stay tuned for details and times over the next month!

(At this time, all class 5&6 recerts will take place outdoors only, at the SFFD Division of Training at 19th St & Folsom St in the Mission.)

***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*** 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) 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 at sfpdalert@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

#029 Saturday 11/06/2021 6pm -10 pm via ZOOM (Night Exercise)

For more information on the San Francisco Police Department ALERT Program, email us at 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

Tech Article

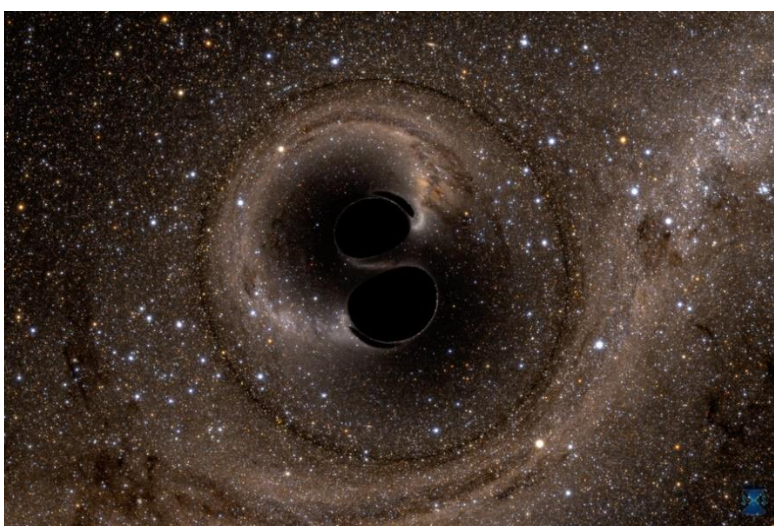
Massachusetts Institute of Technology

Physicists observationally confirm Hawking's black hole theorem for the first time

Study offers evidence, based on gravitational waves, to show that the total area of a black hole's event horizon can never decrease.

Jennifer Chu | MIT News Office
Publication Date: July 1, 2021

https://news.mit.edu/2021/hawkings-black-hole-theorem-confirm-0701



Physicists at MIT and elsewhere have used gravitational waves to observationally confirm Hawking's black hole area theorem for the first time.

This computer simulation shows the collision of two black holes that produced the gravitational wave signal, GW150914.

Credit: Simulating eXtreme Spacetimes (SXS) project. Courtesy of LIGO

There are certain rules that even the most extreme objects in the universe must obey. A central law for black holes predicts that the area of their event horizons — the boundary beyond which nothing can ever escape — should never shrink. This law is Hawking's area theorem, named after physicist Stephen Hawking, who derived the theorem in 1971.

Fifty years later, physicists at MIT and elsewhere have now confirmed Hawking's area theorem for the first time, using observations of gravitational waves. Their results appear today in *Physical Review Letters*.

In the study, the researchers take a closer look at GW150914, the first gravitational wave signal detected by the Laser Interferometer Gravitational-wave Observatory (LIGO), in 2015. The signal was a product of two inspiraling black holes that generated a new black hole, along with a huge amount of energy that rippled across space-time as gravitational waves.

If Hawking's area theorem holds, then the horizon area of the new black hole should not be smaller than the total horizon area of its parent black holes. In the new study, the physicists reanalyzed the signal from GW150914 before and after the cosmic collision and found that indeed, the total event horizon area did not decrease after the merger — a result that they report with 95 percent confidence.

Their findings mark the first direct observational confirmation of Hawking's area theorem, which has been proven mathematically but never observed in nature until now. The team plans to test future gravitational-wave signals to see if they might further confirm Hawking's theorem or be a sign of new, law-bending physics.

"It is possible that there's a zoo of different compact objects, and while some of them are the black holes that follow Einstein and Hawking's laws, others may be slightly different beasts," says lead author Maximiliano Isi, a NASA Einstein Postdoctoral Fellow in MIT's Kavli Institute for Astrophysics and Space Research. "So, it's not like you do this test once and it's over. You do this once, and it's the beginning."

Isi's co-authors on the paper are Will Farr of Stony Brook University and the Flatiron Institute's Center for Computational Astrophysics, Matthew Giesler of Cornell University, Mark Scheel of Caltech, and Saul Teukolsky of Cornell University and Caltech.

An age of insights

In 1971, Stephen Hawking proposed the area theorem, which set off a series of fundamental insights about black hole mechanics. The theorem predicts that the total area of a black hole's event horizon — and all black holes in the universe, for that matter — should never decrease. The statement was a curious parallel of the second law of thermodynamics, which states that the entropy, or degree of disorder within an object, should also never decrease.

The similarity between the two theories suggested that black holes could behave as thermal, heat-emitting objects — a confounding proposition, as black holes by their very nature were thought to never let energy escape, or radiate. Hawking eventually squared the two ideas in 1974, showing that black holes could have entropy and emit radiation over very long timescales if their quantum effects were taken into account. This phenomenon was dubbed "Hawking radiation" and remains one of the most fundamental revelations about black holes.

"It all started with Hawking's realization that the total horizon area in black holes can never go down," Isi says. "The area law encapsulates a golden age in the '70s where all these insights were being produced."

Hawking and others have since shown that the area theorem works out mathematically, but there had been no way to check it against nature until LIGO's first detection of gravitational waves.

Hawking, on hearing of the result, quickly contacted LIGO co-founder Kip Thorne, the Feynman Professor of Theoretical Physics at Caltech. His question: Could the detection confirm the area theorem?

At the time, researchers did not have the ability to pick out the necessary information within the signal, before and after the merger, to determine whether the final horizon area did not decrease, as Hawking's theorem would assume. It wasn't until several years later, and the development of a technique by Isi and his colleagues, when testing the area law became feasible.

Before and after

In 2019, Isi and his colleagues developed a technique to extract the reverberations immediately following GW150914's peak — the moment when the two parent black holes collided to form a new black hole. The team used the technique to pick out specific frequencies, or tones of the otherwise noisy aftermath, that they could use to calculate the final black hole's mass and spin.

A black hole's mass and spin are directly related to the area of its event horizon, and Thorne, recalling Hawking's query, approached them with a follow-up: Could they use the same technique to compare the signal before and after the merger, and confirm the area theorem?

The researchers took on the challenge, and again split the GW150914 signal at its peak. They developed a model to analyze the signal before the peak, corresponding to the two inspiraling black holes, and to identify the mass and spin of both black holes before they merged. From these estimates, they calculated their total horizon areas — an estimate roughly equal to about 235,000 square kilometers, or roughly nine times the area of Massachusetts.

They then used their previous technique to extract the “ringdown,” or reverberations of the newly formed black hole, from which they calculated its mass and spin, and ultimately its horizon area, which they found was equivalent to 367,000 square kilometers (approximately 13 times the Bay State’s area).

“The data show with overwhelming confidence that the horizon area increased after the merger, and that the area law is satisfied with very high probability,” Isi says. “It was a relief that our result does agree with the paradigm that we expect, and does confirm our understanding of these complicated black hole mergers.”

The team plans to further test Hawking’s area theorem, and other longstanding theories of black hole mechanics, using data from LIGO and Virgo, its counterpart in Italy.
“It’s encouraging that we can think in new, creative ways about gravitational-wave data, and reach questions we thought we couldn’t before,” Isi says. “We can keep teasing out pieces of information that speak directly to the pillars of what we think we understand. One day, this data may reveal something we didn’t expect.”

This research was supported, in part, by NASA, the Simons Foundation, and the National Science Foundation.