

Cathay June 2023

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 (SK) & his son; Robert Moore 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.

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

Tech Article Introduction:

There is a big push toward zero carbon foot print and to achieve it means seeking out alternative methods of energy and in a cost-effective manner.

One of the proposed energy sources is Hydrogen, but the question remains how to you harvest it in an energy efficient method.

This month's article gives us a peek of how hydrogen maybe harvested in the future. Please read the Tech Section for further information.

CARC/SARES Field Day June 24-25, 2023 Intro

Ed Fong-WB6IQN is hosting the annual CARC/SARES ARRL Field Day in Sunnyvale, CA.

A free dinner at the ARRL field day event will be provided on Saturday June 24, 2023. Now that is an absolutely no string attached unbeatable deal you cannot afford pass up!

Additional details are at the end of this newsletter.

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 2023 are:

- June 20, 2023
- July 18, 2023
- August 15, 2023
- Sept 19, 2023

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).

<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/sffdner 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 TBD

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



Researchers devise new system for turning seawater into hydrogen fuel

<https://www6.slac.stanford.edu/news/2023-04-11-researchers-devise-new-system-turning-seawater-hydrogen-fuel>

The SLAC-Stanford team pulled hydrogen directly from ocean waters. Their work could help efforts to generate low-carbon fuel for electric grids, cars, boats and other infrastructure.

By [David Krause](#) Date: 04/11/2023

Seawater's mix of hydrogen, oxygen, sodium and other elements makes it vital to life on Earth. But that same complex chemistry has made it difficult to extract hydrogen gas for clean energy uses.

Now, researchers at the Department of Energy's SLAC National Accelerator Laboratory and Stanford University with collaborators at the University of Oregon and Manchester Metropolitan University have found a way to tease hydrogen out of the ocean by funneling seawater through a double-membrane system and electricity. Their innovative design proved successful in generating hydrogen gas without producing large amounts of harmful byproducts. The results of their study, published today in *Joule*, could help advance efforts to produce low-carbon fuels.

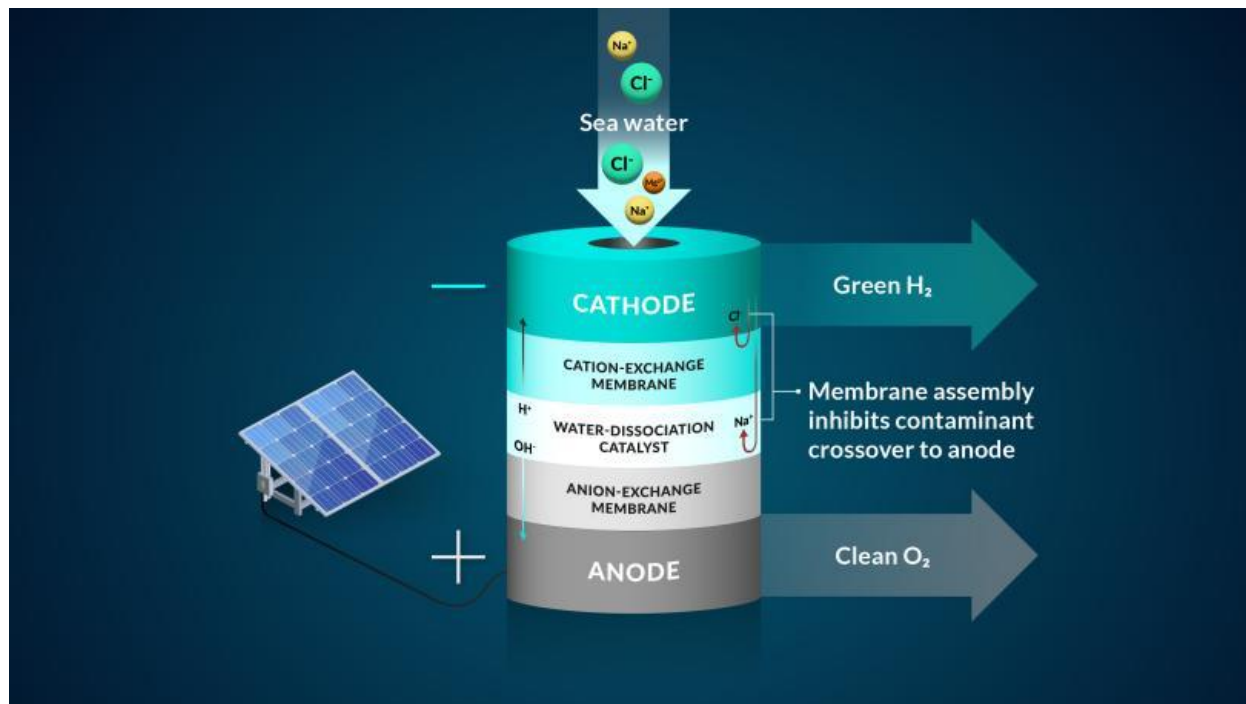
"Many water-to-hydrogen systems today try to use a monolayer or single-layer membrane. Our study brought two layers together," said Adam Nielander, an associate staff scientist with the SUNCAT Center for Interface Science and Catalysis, a SLAC-Stanford joint institute. "These membrane architectures allowed us to control the way ions in seawater moved in our experiment."

Hydrogen gas is a low-carbon fuel currently used in many ways, such as to run fuel-cell electric vehicles and as a long-duration energy storage option – one that is suited to store energy for weeks, months or longer – for electric grids.

Many attempts to make hydrogen gas start with fresh or desalinated water, but those methods can be expensive and energy intensive. Treated water is easier to work with because it has less stuff – chemical elements or molecules – floating around. However, purifying water is expensive, requires energy, and adds complexity to devices, the researchers said. Another option, natural freshwater, also contains a number of

impurities that are problematic for modern technology, in addition to being a more limited resource on the planet, they said.

To work with seawater, the team implemented a bipolar, or two-layer, membrane system and tested it using electrolysis, a method that uses electricity to drive ions, or charged elements, to run a desired reaction. They started their design by controlling the most harmful element to the seawater system – chloride – said Joseph Perryman, a SLAC and Stanford postdoctoral researcher.



A representation of the team's bipolar membrane system that converts seawater into hydrogen gas. (*Nina Fujikawa/SLAC National Accelerator Laboratory*)

“There are many reactive species in seawater that can interfere with the water-to-hydrogen reaction, and the sodium chloride that makes seawater salty is one of the main culprits,” Perryman said. “In particular, chloride that gets to the anode and oxidizes will reduce the lifetime of an electrolysis system and can actually become unsafe due to the toxic nature of the oxidation products that include molecular chlorine and bleach.”

The bipolar membrane in the experiment allows access to the conditions needed to make hydrogen gas and mitigates chloride from getting to the reaction center.

“We are essentially doubling up on ways to stop this chloride reaction,” Perryman said.

A home for hydrogen

An ideal membrane system performs three primary functions: separates hydrogen and oxygen gases from seawater; helps move only the useful hydrogen and hydroxide ions while restricting other seawater ions; and helps prevent undesired reactions. Capturing

all three of these functions together is hard, and the team's research is targeted toward exploring systems that can efficiently combine all three of these needs.

Specifically in their experiment, protons, which were the positive hydrogen ions, passed through one of the membrane layers to a place where they could be collected and turned into hydrogen gas by interacting with a negatively charged electrode, or cathode. The second membrane in the system allowed only negative ions, such as chloride, to travel through.

As an additional backstop, one membrane layer contained negatively charged groups that were fixed to the membrane, which made it harder for other negatively charged ions, like chloride, to move to places where they shouldn't be, said Daniela Marin, a Stanford graduate student in chemical engineering and co-author. The negatively-charged membrane proved to be highly efficient in blocking almost all of the chloride ions in the team's experiments, and their system operated without generating toxic byproducts like bleach and chlorine.

Along with designing a seawater-to-hydrogen membrane system, the study also provided a better general understanding of how seawater ions moved through membranes, the researchers said. This knowledge could help scientists design stronger membranes for other applications as well, such as producing oxygen gas.

"There is also some interest in using electrolysis to produce oxygen," Marin said. "Understanding ion flow and conversion in our bipolar membrane system is critical for this effort, too. Along with producing hydrogen in our experiment, we also showed how to use the bipolar membrane to generate oxygen gas."



Researchers collect seawater in Half Moon Bay, California, in January 2023 for an experiment that turned the liquid into hydrogen fuel. From left: Joseph Perryman, a SLAC and Stanford postdoctoral researcher; Daniela Marin, a Stanford graduate student in chemical engineering and co-author; Adam Nielander, an associate staff scientist with the SUNCAT, a SLAC-Stanford joint institute; and Charline Rémy, a visiting scholar at SUNCAT. *(Adam Nielander/SLAC National Accelerator Laboratory)*

Next, the team plans to improve their electrodes and membranes by building them with materials that are more abundant and easily mined. This design improvement could make the electrolysis system easier to scale to a size needed to generate hydrogen for energy intensive activities, like the transportation sector, the team said.

The researchers also hope to take their electrolysis cells to SLAC's Stanford Synchrotron Radiation Lightsource (SSRL), where they can study the atomic structure of catalysts and membranes using the facility's intense X-rays.

"The future is bright for green hydrogen technologies," said Thomas Jaramillo, professor at SLAC and Stanford and director of SUNCAT. "The fundamental insights we are gaining are key to informing future innovations for improved performance, durability, and scalability of this technology."

This project is supported by the U.S. Office of Naval Research; the Stanford Doerr School of Sustainability Accelerator; the DOE's Office of Basic Energy Sciences, Chemical Sciences, Geosciences, and Biosciences Division through the SUNCAT Center for Interface Science and Catalysis, a SLAC-Stanford joint institute; and the DOE's Energy Efficiency and Renewable Energy Fuel Cell Technologies Office.

Citation: D.H. Marin, J.T. Perryman et al., *Joule*, 11 April 2023
(<https://doi.org/10.1016/j.joule.2023.03.005>)

For questions or comments, contact the SLAC Office of Communications at communications@slac.stanford.edu.

SLAC is a vibrant multiprogram laboratory that explores how the universe works at the biggest, smallest and fastest scales and invents powerful tools used by scientists around the globe. With research spanning particle physics, astrophysics and cosmology, materials, chemistry, bio- and energy sciences and scientific computing, we help solve real-world problems and advance the interests of the nation.

SLAC is operated by Stanford University for the U.S. Department of Energy's [Office of Science](#). The Office of Science is the single largest supporter of basic research in the physical sciences in the United States and is working to address some of the most pressing challenges of our time.

ARRL Field Day – Saturday June 24, 2023

The 2023 Annual CARC / SARES Picnic - ARRL Field Day

By Ed Fong - *WB6IQN*

Date : Saturday June 24, 2023 – starting at 2 PM - dinner is at 4PM

Where: Fairbrae Swim & Racquet Club - 696 Sheraton Dr, Sunnyvale, CA 94087

Cost: Free to all CARC / SARES Members, family and friends

Raffle tickets: - \$5 each or 3 tickets for \$10

RSVP: edison_fong@hotmail.com

ARRL Field Day is coming up this year. It will take place Saturday June 24, 2023. Mark your calendars.

This year we have been very fortunate to reserve the very exclusive Fairbrae Swim and Tennis Club in Sunnyvale, CA for our CARC and Sunnyvale Amateur Radio Emergency Service (SARES) 2023 ARRL Field Day.

This venue was brought back by popular demand having previously hosted CARC/SARES Field Day events. This is a beautiful well-maintained private facility in the heart of Silicon Valley with easy driving access and plenty of parking. It has a half Olympic size swimming pool, two full size tennis courts, large picnic area, industrial kitchen and full-size dining hall, clean restrooms, and showers for use of both members and guests.

We reserved the facility from 2 PM Saturday, June 24th through Sunday (at least till noon) for our CARC/SARES ARRL 2023 Field Day.

A **FREE** catered Italian dinner will be served at 4 PM. Food will be catered by the Pasta Market 460 E El Camino Real, Sunnyvale, CA 94087.



Menu - Meat lasagna, egg plant parmesan, various pizzas, garlic bread with their famous cheese spread, and mix salad with a variety of dressings.

The restaurant owner has promised an Italian feast to be enjoyed by all. It would be appreciated that attendees bring a dessert to share with our group. The club will provide for plain water, sparkling water, coca cola and diet coke. Optional cash donations or additional purchases of raffle tickets would be accepted to help defray the cost and go toward future club events.

Bring your entire family (or extended family) to have a great day of socialization, great food, swimming, tennis, and of course HAM Radio.

Radios and antennas will be set up for HF and VHF the day before. Bring your own radio and feel free to plug it in and operate. This is a great opportunity to operate other radios and experience the look and feel of various manufacturers.

There will also be the traditional raffle, which will include but not limited to – the uSDX+ HF all mode transceiver, quad band mobile radio, antennas, etc.

Raffle tickets are \$5 each => 3 for \$10

A partial sample of raffle prizes are shown below:



uSDX+ - QRP HF transceiver - Covers 80-6 meters – SSB, CW, digital QRP transceiver. 5 watts CW – 10 watt SSB. Built in CW decoder, full DSP noise reduction. Complete with 4000 mAh Li-on battery, AC adapter/charger, Speaker/microphone.



Radioddity QB25 (Quad Mobile 25 watt transceiver) 2 meters, 1.25 meter, 70cm

This radio boasts 200 memories, full software programmability, great bullet proof front end with 0.25 uV sensitivity, full FM broadcast radio, direct microphone key pad entry, and absolutely the best color display out there and more.

If you have been looking to get on 220 MHz, this is the latest and greatest. You will be a proud owner of one of this radio.



Tiny SA - 100KHz - 960 MHz spectrum analyzer with full touch color display – resolution of 2.6KHz -640KHz. Built in calibrated signal generator from 0.1 MHz-960 MHz.



Baofeng UV5R x3 Tri-band handie talkie

Drop in Lion smart charge, 1800 mAh Lion, battery, belt clip, antenna

Frequency coverage:

- 65-108 MHz – FM broadcast – receive only
- 136-174 MHz – VHF – TX/RX
- 220-240 MHz TX/RX
- 420- 520 - MHz - TX/RX



2AH Lion USB Backup pack - great to have, USB charging with solar backup - has a built in LED Flashlight. Complete with USB charging cable and compass.

Mark your calendars – this is going to be fun filled event!!!!

See below pictures of the exclusive and well maintained Fairbrae Swim & Racquet Club in Sunnyvale, CA.



Fairbrae club front entrance



Picnic Area



Lounge Area



Overhead shot of Tennis courts and Swimming Pool