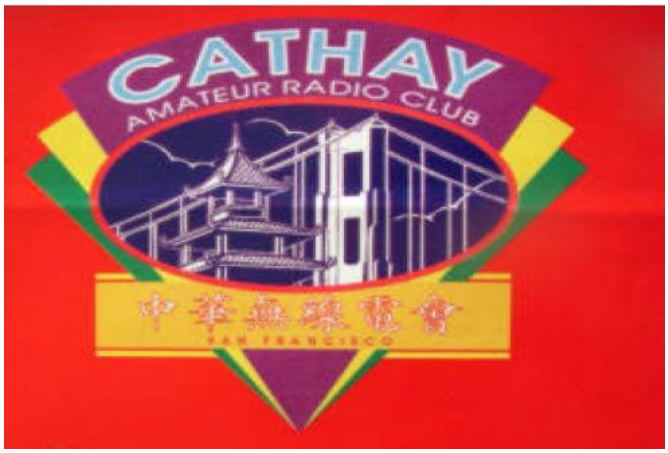

Cathay September 2022

www.cathayradio.org

President: George Chong, W6BUR **email:** *W6BUR@comcast.net*
Vice President North: Leonard Tom, *NX6E* **email:** nx6e@hotmail.com
Vice President South: Bill Fong, *W6BBA* - **email:** w6bba@arrl.net
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Editor: Rodney Yee, *KJ6DZI* - **email:** rodyee2000@yahoo.com
Treasurer: Vince Chinn aka Mingie, *W6EE* - **email:** vince@vincechinncpa.com
Web Master: Edison Fong – *WB6IQN* - **email:** edison_fong@hotmail.com
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.

Follow Up on Memorial Luncheon for Bill Chin – KC6POF on Saturday August 20, 2022 at 12:30 p.m that was held at the Far East Café in San Francisco:

Picture taken at Far East Cafe during Bill Chin's Memorial Luncheon following the Service on 8/20/2022 at First Chinese Baptist Church with CARC members: Howard Louie - N6MNV, Edison Fong - WB6IQN, Michael Wong - WA6BPN, and Robert Lai - KM6QP.

Tech Article Introduction:

Lawrence Livermore Laboratory in August 2021 achieved a record of 1.3 megajoules energy release from a nuclear fusion experiment at the National Ignition Facility. Recently the results have been published in three peer-reviewed papers.

This is another incremental step toward achieving the Holy Grail of sustained nuclear fusion that has the potential to supply almost unlimited energy.

Note that 1 megajoule is the amount of kinetic energy to move a 1-ton mass to the speed of 100 mph.

Please read the **Tech Section** of this newsletter for additional information.

Additional info can be found at: https://en.wikipedia.org/wiki/National_Ignition_Facility

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

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 meeting 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 2022 are:

- Sept 20, 2022
- Oct 18. 2022
- Nov 15, 2022

Location of in person future ACS meetings are yet to be determined as the regular location is under reconstruction until January 2023. 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

+ Recertifications - Coming Soon!

Pre-register here!

https://www.eventbrite.com/e/are-you-a-nert-graduate-looking-to-recertify-pre-register-here-tickets-228380330717?aff=odcleoeventsincollection

This is not for a specific date or location.

San Francisco Fire Department NERT is collecting information from NERT Graduates to help us plan for the new year. By signing up here, you will receive priority notification about upcoming recertification opportunities. This is for any NERT graduate, regardless of when you graduated or whether your NERT certification has expired. Thank you so much for your commitment to NERT and for providing us with information about when you last trained, etc.

Sign Up For Training Classes

This is not for a specific date or location.

San Francisco Fire Department is collecting contact details from prospective students so we can let you know when classes are available. We will email you when classes become available. We plan on holding multiple trainings for new NERTs in 2022 and the information you provide will help us plan. Thank you!

https://www.eventbrite.com/e/never-taken-nert-before-let-us-know-you-are-interested-in-2022-trainings-tickets-125825993935?aff=odcleoeventsincollection

***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

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.

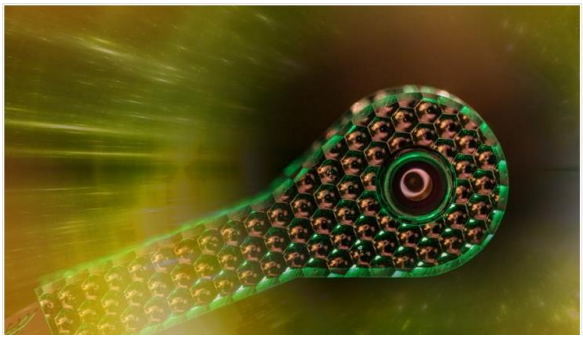
For additional information on the web please refer to:
https://sfgov.org/policecommission/alert

Tech Article

Lawrence Livermore National Laboratory National Ignition Facility

Three peer-reviewed papers highlight scientific results of National Ignition Facility record yield shot

Date: August 8, 2022



On the one-year anniversary of achieving a yield of more than 1.3 megajoules at LLNL's National Ignition Facility, the scientific results of this record experiment have been published in three peer-reviewed papers: one in *Physical Review Letters* and two in *Physical Review E*. This stylized image shows a cryogenic target used for these record-setting inertial fusion experiments. Image by James Wickboldt/LLNL.

After decades of inertial confinement fusion research, a yield of more than 1.3 megajoules (MJ) was achieved at Lawrence Livermore National Laboratory's (LLNL's) National Ignition Facility (NIF) for the first time on Aug. 8, 2021, putting researchers at the threshold of fusion gain and achieving scientific ignition.

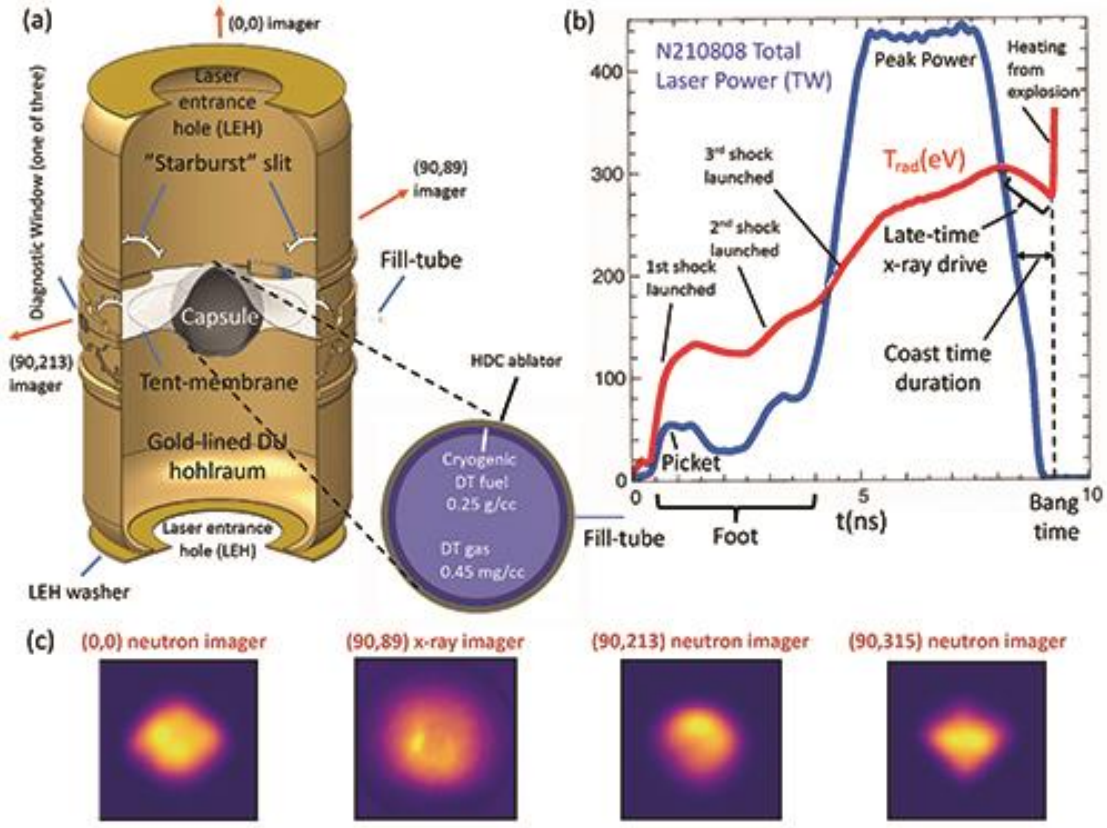
On the one-year anniversary of this historic achievement, the scientific results of this record experiment have been published in three peer-reviewed papers: one in *Physical Review Letters* and two in *Physical Review E* (See papers one and two). More than 1,000 authors are included in the *Physical Review Letters* paper to recognize and acknowledge the many individuals who have worked over many decades to enable this significant advance.

“The record shot was a major scientific advance in fusion research, which establishes that fusion ignition in the lab is possible at NIF,” said Omar Hurricane, chief scientist for LLNL’s inertial confinement fusion program. “Achieving the conditions needed for ignition has been a long-standing goal for all inertial confinement fusion research and opens access to a new experimental regime where alpha-particle self-heating outstrips all the cooling mechanisms in the fusion plasma.”

The papers describe, in detail, the results from Aug. 8, 2021 and the associated design, improvements and experimental measurements. LLNL physicist Alex Zylstra, lead experimentalist and first author of the experimental *Physical Review E* paper, noted that in 2020 and early 2021 the Lab conducted experiments in the “burning plasma” regime for the first time, which set the stage for the record shot.

“From that design, we made several improvements to get to the Aug. 8, 2021, shot,” he said. “Improvements to the physics design and quality of target all helped lead to the success of the August shot, which is discussed in the *Physical Review E* papers.”

This experiment incorporated a few changes, including improved target design. “Reducing the coasting-time with more efficient hohlraums compared to prior experiments was key in moving between the burning plasma and ignition regimes,” said LLNL physicist Annie Kritcher, lead designer and first author of the design *Physical Review E* paper. “The other main changes were improved capsule quality and a smaller fuel fill tube.”



This three-part image shows the cut-away characteristic target geometry (a) that includes a gold-lined depleted uranium hohlraum surrounding an HDC capsule with some features labeled. The capsule, ~2 mm in diameter, at the center of the ~1 cm height hohlraum, occupies a small fraction of the volume.

Laser beams enter the target at the top and bottom apertures, called laser entrance holes. In (b), total laser power (blue) vs. time and simulated hohlraum radiation temperature for the Aug. 8, 2021 experiment are shown with a few key elements labeled.

All images are 100 square microns. Imaging data is used to reconstruct the hotspot plasma volume needed for inferring pressure and other plasma properties.

Since the experiment last August, the team has been executing a series of experiments to attempt to repeat the performance and to understand the experimental sensitivities in this new regime.

“Many variables can impact each experiment,” Kritcher said. “The 192 laser beams do not perform exactly the same from shot to shot, the quality of targets varies and the ice layer grows at differing roughness on each target. These experiments provided an

opportunity to test and understand the inherent variability in this new, sensitive experimental regime."

While the repeat attempts have not reached the same level of fusion yield as the August 2021 experiment, all of them demonstrated capsule gain greater than unity with yields in the 430-700 kJ range, significantly higher than the previous highest yield of 170 kJ from February 2021.

The data gained from these and other experiments are providing crucial clues as to what went right and what changes are needed in order to repeat that experiment and exceed its performance in the future.

The team also is utilizing the experimental data to further understanding of the fundamental processes of fusion ignition and burn and to enhance simulation tools in support of stockpile stewardship.

Looking ahead, the team is working to leverage the accumulated experimental data and simulations to move toward a more robust regime – further beyond the ignition cliff – where general trends found in this new experimental regime can be better separated from variability in targets and laser performance.

Efforts to increase fusion performance and robustness are underway via improvements to the laser, improvements to the targets and modifications to the design that further improve energy delivery to the hotspot while maintaining or even increasing the hot-spot pressure. This includes improving the compression of the fusion fuel, increasing the amount of fuel and other avenues.

"It is extremely exciting to have an 'existence proof' of ignition in the lab," Hurricane said. "We're operating in a regime that no researchers have accessed since the end of nuclear testing, and it's an incredible opportunity to expand our knowledge as we continue to make progress."