



Federal Laboratory Consortium  
for Technology Transfer

# 2021

FEDERAL R&D IN PICTURES

# 2021 PLANNER AT A GLANCE



DECEMBER 2020



JANUARY 2021



FEBRUARY



MARCH



APRIL



MAY



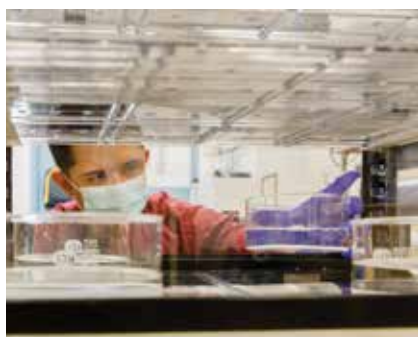
JUNE



JULY



AUGUST



SEPTEMBER



OCTOBER



NOVEMBER



DECEMBER



JANUARY 2022

## LAB TECH EXTRAS

There were too many great Planner submissions this year to fit into just 14 months, so please check out the "Extras" section following January 2022 for bonus photos of six additional amazing FLC technologies.



....and more!

**THANK YOU** to all of the federal laboratories that submitted photos of their innovative technologies!

# ABOUT THE FLC

The Federal Laboratory Consortium for Technology Transfer (FLC) is a nationwide network of over 300 federal laboratories, agencies, and research centers that fosters commercialization best practice strategies and opportunities for accelerating technologies from out of the lab and into the marketplace. The American taxpayers' investment in our national laboratories' research and development (R&D) efforts has spurred scientific and technological breakthroughs that can return dividends for our economy, such as creating new industries, businesses and jobs, when introduced to the marketplace.

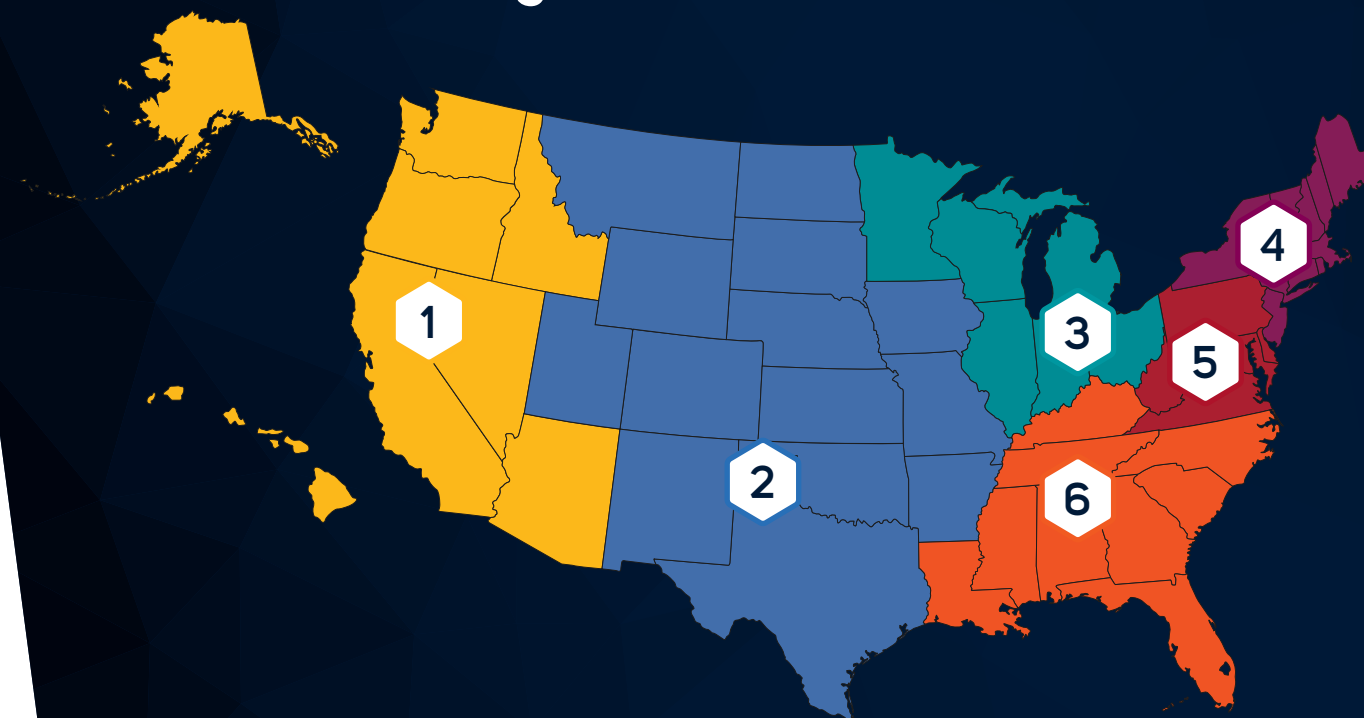
The FLC's mission is to promote, educate, and facilitate federal technology transfer (T2) among its member labs and institutions so they can commercialize new, innovative technologies and create social and economic impacts. The FLC creates and provides resources such as education and training, tools and services, so that federal labs are better able to create partnerships, navigate the commercialization process, and achieve market success.

By serving as the touchpoint for T2 communication, education, and open data services tools, the FLC plays a central role in providing the skilled T2 workforce that our country desperately needs. These highly motivated T2 professionals are the driving force behind federal labs' ability to effectively partner with the private sector. The FLC strives to support the dedicated individuals who make up the federal laboratory system by continuing to serve as a gateway for industry, government, and academia to access R&D in an effort to stimulate our nation's economic health.



@federallabs

## FLC Regions



1

### Far West

Regional Coordinator:  
David Nicholson,  
USDA Agricultural Research Service,  
Pacific West Area

2

### Mid-Continent

Regional Coordinator:  
John Eisemann,  
USDA National Wildlife Research  
Center (NWRC)

3

### Midwest

Regional Coordinator:  
Sabra Tomb,  
Air Force Research Laboratory

4

### Northeast

Regional Co-Coordinators:  
Laurie Bagley, Princeton Plasma Physics  
Laboratory (PPPL);  
David Lee, CCDC Armaments Center

5

### Mid-Atlantic

Regional Coordinator:  
Vladimir Popov, Frederick National Laboratory  
for Cancer Research

6

### Southeast

Regional Coordinator:  
Paige George,  
Naval Surface Warfare Center,  
Panama City Division

## Additively Manufactured Nasal Swabs

Combating the spread of COVID-19 requires widespread testing involving the use of nasopharyngeal (NP) swabs. However, U.S. supplies were severely impacted when a supplier from another country halted shipments to the U.S. The solution was to create new NP swabs through advanced manufacturing. Researchers at Lawrence Livermore National Laboratory (LLNL) extensively tested hundreds of 3D-printed nasal swabs from more than a dozen designs. Swabs derived from one of the new designs are being made available to medical providers. The swabs pictured here, representing a number of designs, were 3D-printed at LLNL from a biocompatible, surgical-grade resin and tested in the Advanced Manufacturing Laboratory.



# DECEMBER 2020



SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10 Hanukkah (begins at sundown)	11	12
13	14	15	16	17	18	19
20	21	23	23	24	25	26
27	28	29	30	31 New Year's Eve	Christmas Day	Kwanzaa

## Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory's (LLNL) defining responsibility is ensuring the safety, security and reliability of the nation's nuclear deterrent. LLNL's mission is broader than stockpile stewardship, as dangers ranging from nuclear proliferation and terrorism to energy shortages and climate change threaten national security and global stability. LLNL's science and engineering are being applied to achieve breakthroughs for counterterrorism and nonproliferation, defense and intelligence, energy and environmental security.

[www.llnl.gov](http://www.llnl.gov)

## NOTES

### NOVEMBER 2020

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### JANUARY 2021

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31						

## QUICK REFERENCE

## FAA William J. Hughes Technical Center's Cockpit Simulation Laboratory

This one-of-a-kind Sikorsky S-76 (S76-D) helicopter simulator at the FAA William J. Hughes Technical Center in Atlantic City, New Jersey, provides a research platform geared toward reducing helicopter fatal accident rates. Built from the front end of a decommissioned S-76 helicopter, the simulator provides realistic, high-fidelity modelling of the S76-D's aerodynamics, avionics, and controls. The platform provides a low-cost tool for improving rotorcraft safety through the development of technologies such as electronic flight bags, flight data monitoring systems, vision systems, and augmented or virtual reality displays. These technologies help mitigate risks posed by bad weather, poor visibility, low altitude, and loss of control.



# JANUARY 2021



SUN	MON	TUE	WED	THU	FRI	SAT
					1 New Year's Day	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18 Martin Luther King, Jr. Day	19	20 Inauguration Day	21	22	23
24	25	26	27	28	29	30
31						

## FAA William J. Hughes Technical Center

The Federal Aviation Administration's (FAA) William J. Hughes Technical Center is the nation's premier air transportation system laboratory. The Tech Center's workforce conducts testing and evaluation, verification and validation, and sustainment of the FAA's full range of aviation systems. It also develops scientific solutions to current and future air transportation safety challenges by conducting applied research and development. Additionally, the center provides the gateway for National Airspace System upgrades, improvements, and operational sustainment.

[www.faa.gov](http://www.faa.gov)

## NOTES

### DECEMBER 2020

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### FEBRUARY 2021

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## QUICK REFERENCE



## Blow Molding Technology

Researchers at the Department of Energy's Manufacturing Demonstration Facility at Oak Ridge National Laboratory (ORNL) determined that plastic preforms used to make Coca-Cola bottles met the correct specifications for test tubes in COVID-19 testing kits. ORNL staff found that not only were the soda-bottle preforms the perfect size to hold COVID-19 test swabs, the preforms also feature a beneficial tamper-proof, screw-top cap. The discovery led to Coca-Cola rapidly producing millions of test tubes, addressing a global shortage.



# FEBRUARY



SUN	MON	TUE	WED	THU	FRI	SAT
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
	President's Day					
21	22	23	24	25	26	27
28						

## UT-Battelle, LLC/Oak Ridge National Laboratory (ORNL)

Oak Ridge National Laboratory (ORNL) provides exceptional researchers with distinctive equipment and unique facilities to solve some of the nation's most compelling challenges. As the largest U.S. Department of Energy (DOE) open science laboratory, ORNL's mission is to deliver scientific discoveries and technical breakthroughs that will accelerate the development and deployment of solutions in clean energy and global security while creating economic opportunities for the nation.

[www.ornl.gov](http://www.ornl.gov)  
[www.ut-battelle.org](http://www.ut-battelle.org)

## NOTES

### JANUARY

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31						

### MARCH

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21	22	23	24	25	26	27
28	29	30	31			

## QUICK REFERENCE

## Thermoplastic Tidal Power Turbine Blades

National Renewable Energy Laboratory (NREL) researchers Robynne Murray and David Barnes lay fiberglass infused with thermoplastic resin in a turbine blade mold at NREL's Composites Manufacturing Education and Technology Facility. This research is part of NREL's collaboration with Verdant Power to manufacture, install, and validate full-scale thermoplastic tidal power turbine blades in a river environment to determine whether the innovative blades absorb less water and experience less structural degradation in water than traditional epoxy resin blades. Thermoplastic resin materials have been shown on a smaller scale to have lower energy consumption, reduced manufacturing times, and can be recycled at the end of their life.



# MARCH



SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
Daylight Saving Time starts	22	23	24	25	26	27
28	29	30	31			Passover (begins at sundown)

## National Renewable Energy Laboratory (NREL)

The National Renewable Energy Laboratory (NREL) focuses on creative answers to today's energy challenges. From breakthroughs in fundamental science to new clean technologies to integrated energy systems that power our lives, NREL researchers are transforming the way the nation and the world use energy.

[www.nrel.gov](http://www.nrel.gov)

## NOTES

### FEBRUARY

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28						

### APRIL

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18	19	20	21	22	23	24
25	26	27	28	29	30	

## QUICK REFERENCE

## SEDONA: SpEctroscopic Detection of Nerve Agents

Los Alamos National Laboratory has developed the only portable screener to accurately detect chemical nerve agents, providing results in seconds. Current airport detection systems cannot scan for the threat of organophosphorus nerve agents and insecticides. Small quantities of these toxic chemicals can very quickly cause widespread exposure and severe symptoms. SEDONA screens through an unopened bottle using the principles of nuclear magnetic resonance spectroscopy. The system can be deployed and operated with minimal training. SEDONA dramatically reduces the likelihood of a successful nerve agent attack at airports, government buildings, embassies, sporting events, concerts, and political rallies.



# APRIL



SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
Easter		FLC 2021 National Meeting				
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

## Los Alamos National Laboratory

Los Alamos National Laboratory is a multidisciplinary research institution dedicated to enhancing national security by ensuring the safety and reliability of the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction while solving problems related to energy, environment, infrastructure, health, and global security concerns. Triad National Security LLC operates the laboratory for the Department of Energy's National Nuclear Security Administration (NNSA).

[www.lanl.gov](http://www.lanl.gov)  
[www.energy.gov/nnsa](http://www.energy.gov/nnsa)

## NOTES

### MARCH

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28	29	30	31			

### MAY

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23/30	24/31	25	26	27	28	29

## QUICK REFERENCE

## Vapor Phase Explosive Threat Detection

The detection of explosive threats via vapor sampling is challenging because of the number of molecular signatures and their vapor pressure range. To perform vapor screening, the air must be sampled and pre-concentrated using a filter constructed of a high surface area, heat resistant polymer. Here, DHS Transportation Security Laboratory (TSL) research chemist Dr. John Brady prepares a filter for analysis using a thermal desorber connected to a gas chromatography triple quadrupole-mass spectrometer. The detection of low vapor pressure analytes at sub-parts per quadrillion sensitivity is enabled by these innovative, TSL-developed methods and tools.



# MAY



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SUN	MON	TUE	WED	THU	FRI	SAT
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Memorial Day

#### APRIL

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#### JUNE

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20	21	22	23	24	25	26
27	28	29	30			

## QUICK REFERENCE

## The DHS Transportation Security Laboratory (TSL)

The TSL, part of the U.S. Department of Homeland Security Science and Technology Directorate, helps protect our nation's civilian air transportation systems. By virtue of its accomplished experts, cutting-edge facilities and partnerships, TSL offers the homeland security community and transportation security partners the ability to advance detection technology from conception to deployment through applied research, testing and evaluation, and certification testing.

[www.dhs.gov](http://www.dhs.gov)

## NOTES

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## Rain Enhancement Technology

Scientists with the U.S. Department of Agriculture's Southern Plains Agricultural Research Center, part of the Agricultural Research Service (ARS), have been investigating a novel technique to enhance rainfall from convective clouds by releasing electrically charged water droplets into clouds. As the environment and climate continue to change, the ability to augment natural rainfall will be vital to sustainable agricultural production, especially during droughts. ARS partnered with the Texas Weather Modification Association and Advanced Weather Modification Solutions to conduct field trials over two years, which showed a doubling of the amount of rain produced when compared to conventional cloud seeding technology.



# JUNE



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## Southern Plains Agricultural Research Center

The mission of the USDA Southern Plains Agricultural Research Center, Aerial Application Technology Research Unit, is to develop and implement new and improved aerial application technologies for safe, efficient, and sustainable crop production and protection. Research focuses on optimizing aerial spray technologies for a number of applications.

[www.ars.usda.gov](http://www.ars.usda.gov)  
[www.texasweathermodification.com](http://www.texasweathermodification.com)  
[www.weathermod.org](http://www.weathermod.org)

SUN	MON	TUE	WED	THU	FRI	SAT
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### NOTES

MAY							JULY						
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16	17	18	19	20	21	22	18	19	20	21	22	23	24
23/30	24/31	25	26	27	28	29	25	26	27	28	29	30	31

### QUICK REFERENCE

## Characterization of Solid Oxide Fuel Cells by Electrical Conductivity Relaxation

Beom-Tak Na, a National Energy Technology Laboratory (NETL) researcher, inserts a solid oxide fuel cell (SOFC) sample into an atmosphere-controlled chamber to be characterized using a technique called Electrical Conductivity Relaxation (ECR). The ECR technique allows NETL to obtain conductivity parameters of novel SOFC materials with high accuracy. Reliable materials characterization is critical for understanding how SOFC developed with these materials will behave over long-term operation. NETL's research on SOFC technology, which converts the chemical energy of a fuel cell and an oxidizing agent into electricity, holds the potential to dramatically reduce greenhouse gas emissions while using our nation's fossil fuel resources.



# JULY



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## National Energy Technology Laboratory (NETL)

The U.S. Department of Energy’s (DOE) National Energy Technology Laboratory (NETL) develops and commercializes advanced technologies that provide reliable and affordable solutions to America’s energy challenges. NETL’s work supports DOE’s mission to advance the national, economic, and energy security of the United States.

[www.netl.doe.gov](http://www.netl.doe.gov)

SUN	MON	TUE	WED	THU	FRI	SAT
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Independence Day						
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JUNE

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AUGUST

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## QUICK REFERENCE

## NOTES



## Remotely Operated Vehicle Deep Discoverer

From providing food, energy, and medicines to support maritime shipping, national defense, and recreation, the ocean impacts every American – yet remains largely unexplored. The National Oceanic and Atmospheric Administration's (NOAA) remotely operated vehicle Deep Discoverer, equipped with high-definition video cameras capable of delivering stunningly detailed imagery from 3.7 miles below the ocean surface back to shore, provides scientists with unprecedented access to the deep ocean. With each Deep Discoverer dive, we increase our baseline understanding of ocean resources – what is out there, where to find it, and how to manage it sustainably to protect the economy, health, and security of our nation.

# AUGUST



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SUN	MON	TUE	WED	THU	FRI	SAT
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29	30	31				

## National Oceanic and Atmospheric Administration (NOAA)

By leading national efforts to explore our ocean and making ocean exploration more accessible, the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean Exploration and Research is filling gaps in the basic understanding of U.S. deep waters and seafloor, providing critical deep-ocean data, information, and awareness needed to sustain and accelerate the economy, health, and security of our nation.

[www.noaa.gov](http://www.noaa.gov)

## NOTES

### JULY

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### SEPTEMBER

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12	13	14	15	16	17	18
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## QUICK REFERENCE

## Helping Protect Medical Professionals

When the COVID-19 pandemic struck, Sandia National Laboratories decided that the New Mexico Small Business Assistance Program could make a difference. Projects were fast-tracked to get results to businesses quickly. Medical device manufacturers Marpac, Sierra Peaks, and Sew-EZ needed help testing materials outside the typical N95 supply chain when medical respirators ran low in hospitals. Examples included materials used for heating systems, air conditioning systems, and vacuum bags. A Sandia team rapidly modified existing aerosol and filtration systems used for nuclear nonproliferation work. The materials Sandia tested are now being manufactured into N95-like respirators that could be used in local medical facilities.



# SEPTEMBER



## Sandia National Laboratories

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC (NTESS), a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration. Major research and development responsibilities include nuclear deterrence, national security, defense nuclear nonproliferation, energy technologies, and advanced science and technology, with main facilities in Albuquerque, New Mexico, and Livermore, California.

[www.sandia.gov](http://www.sandia.gov)  
[www.energy.gov/nnsa](http://www.energy.gov/nnsa)

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
	Labor Day					
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### AUGUST

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### OCTOBER

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24/31	25	26	27	28	29	30

## QUICK REFERENCE

## NOTES

## Miniaturized Modulated X-ray Source (MXS)

The National Aeronautics and Space Administration Goddard Space Flight Center's X-ray laboratory develops X-ray optics (such as this one from the International Space Station's Neutron star Interior Composition Explorer [NICER] mission), detectors, and astrophysics missions that provide insight into the high energy universe. NICER's X-ray concentrator optics were inspected under a black light for dust and foreign object debris that could impair functionality once in space. The payload's 56 mirror assemblies concentrate X-rays onto silicon detectors to gather data that probe the interior makeup of neutron stars.

*Goddard*  
SPACE FLIGHT CENTER



# OCTOBER



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## Goddard Space Flight Center

NASA's Goddard Space Flight Center is home to the nation's largest organization of scientists, engineers and technologists who build spacecraft, instruments and new technology to study Earth, the solar system and the universe. Goddard manages communications between mission control and orbiting astronauts aboard the International Space Station. Goddard engineers construct sensitive instruments, build telescopes that peer into the cosmos, and operate the test chambers that ensure those satellites' survival.

[www.nasa.gov/goddard](http://www.nasa.gov/goddard)

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
	Columbus Day					
17	18	19	20	21	22	23
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### SEPTEMBER

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### NOVEMBER

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## QUICK REFERENCE

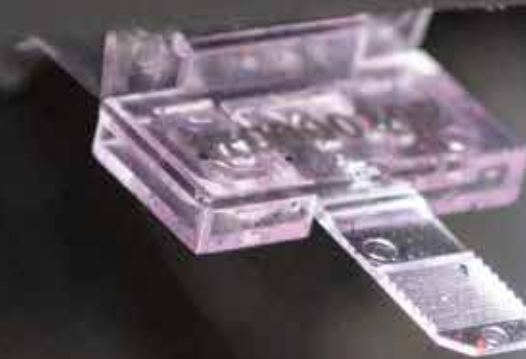
## NOTES

## Protecting Ports in Vehicles

A vehicle's On-Board Diagnostics (OBD) port provides a convenient way to access information specifically associated with the vehicle, its components, and its computer system. While useful for diagnostics and repair assessment, it also provides an easy means for gaining unauthorized access to, and potential control, of the vehicle itself. With the National Security Agency (NSA)-developed port protector locked in place, the device denies, deters, and indicates unauthorized access to a vehicle's OBD ports. Other NSA-developed tamper-evident port protectors protect HDMI, USB ports, and D-sub ports in vehicles. Potential uses include security of vehicle ports when out of sight and tamper evidence when traveling.



**NATIONAL SECURITY AGENCY**  
**TECHNOLOGY TRANSFER PROGRAM**  
*Office of Research & Technology Applications*



# NOVEMBER



SUN	MON	TUE	WED	THU	FRI	SAT
	1	2 Election Day	3	4	5	6
7 Daylight Saving Time ends	8	9	10	11 Veterans Day	12	13
14	15	16	17	18	19	20
21	22	23	24	25 Thanksgiving	26	27
28 Hanukkah (begins at sundown)	29	30				

## National Security Agency

The National Security Agency Technology Transfer Program's (NSA TTP) portfolio of patented technologies can be leveraged by companies of any size to build or enhance their businesses. The NSA TTP establishes partnerships that help accelerate mission goals, advance science, foster innovation, and promote the growth and commercialization of technology originally created for the agency's mission.

[www.NSA.gov/techtransfer](http://www.NSA.gov/techtransfer)

## NOTES

### OCTOBER

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17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

### DECEMBER

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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## QUICK REFERENCE



## Innovative Grid Burner

The innovative Grid Burner, developed by a team at Lawrence Berkeley National Laboratory's Energy Technologies Area, consists of a layout of individual flame ports that can be arranged in a variety of patterns – to match particular cookware or even produce a flame in the shape of a logo. The individuality and marketing twist is appealing to designers of kitchen ranges. The burner can boil water 25% faster than conventional burners, heat food more uniformly, and sear food more easily. The Grid Burner improves upon the conventional stove burner, enhancing the cooking experience, improving indoor air quality, and reducing fuel costs.



**BERKELEY LAB**

# DECEMBER



SUN	MON	TUE	WED	THU	FRI	SAT
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
						Christmas Day
26	27	28	29	30	31	
Kwanzaa					New Year's Eve	

## Lawrence Berkeley National Laboratory

Lawrence Berkeley National Laboratory researchers develop sustainable energy and environmental solutions, create useful new materials, advance the frontiers of computing, and probe the mysteries of life, matter, and the universe. Scientists from around the world rely on the lab's facilities for their own discovery science. Berkeley Lab is a multiprogram national laboratory, managed by the University of California for the U.S. Department of Energy's Office of Science.

[www.lbl.gov](http://www.lbl.gov)

## NOTES

### NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

### JANUARY 2022

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

## QUICK REFERENCE



## 3D-Printed Materials Made for Impact

Marcos Reyes-Martinez, a Materials Research Engineer with the National Institute of Standards and Technology (NIST), tests how a cube's dimensions change when stretched or compressed.

Together, scientists from NIST and the Center for Hierarchical Materials Design (CHiMaD), which is a NIST Center of Excellence, are building polymer-based materials with properties that do not exist in nature, but that could mitigate the damage from an impact or collision. These materials, designed with computer simulations and 3D-printed, may one day prove useful when protecting fragile items in transit, spacecrafts surrounded by stellar debris and athletes at risk of traumatic brain injury.

**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce

# JANUARY 2022



## National Institute of Standards and Technology (NIST)

NIST promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards and technology in ways that enhance economic security and improve our quality of life. NIST is a non-regulatory agency of the U.S. Department of Commerce.

[www.nist.gov](http://www.nist.gov)

SUN	MON	TUE	WED	THU	FRI	SAT
						1 New Year's Day
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17 Martin Luther King, Jr. Day	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

### DECEMBER 2021

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

### FEBRUARY 2022

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

## QUICK REFERENCE

## NOTES

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# LAB TECH EXTRAS

## OrganiCam: First Camera for Noncontact Biodection in Space



Los Alamos National Laboratory (LANL) and the University of Hawai'i designed a compact laser-induced fluorescence imaging camera with Raman spectrometer to identify organic molecules and biosignatures in Martian caves, icy-moons, and asteroid surfaces. OrganiCam is the primary instrument on the Laser-Induced Fluorescence Exploration of Caves for Organics and Volatiles using an Elevated Platform (LIFE COVE) mission concept for the National Aeronautics and Space Administration (NASA). OrganiCam could determine if instruments being sent into space for NASA are sterile and analyze samples returned to Earth. OrganiCam's robust design for extreme environments, portability, simple operation, and low power requirement build on LANL's 50+ years designing robotic instruments for space applications. [www.lanl.gov](http://www.lanl.gov) [www.hawaii.edu](http://www.hawaii.edu)

## Free Space Optical Data Transmission



The primary objective of Optical Data Transmission is to secure computers from non-secure networks by exploiting the benefits of free space optical communications nanotechnologies to isolate the vulnerable elements of computers. Free Space Optical Communications have already been explored for next-generation military networks, and are recognized as having the potential to provide fundamental improvement to the ability to support high-capacity links for network-centric operational concepts like widespread sensor data dissemination. [www.afrl.af.mil](http://www.afrl.af.mil)

## Underwater C4



The Navy is testing the effect of underwater explosions against newly developed robotic systems, which in this photo are not visible because they are under water. This is being done in the early development stages to help guide requirements for future expeditionary robotics and autonomous programs. The goal of the tests is to learn the how new sensors and autonomy react to shock and harsh environments. The Naval Surface Warfare Center (NSWC) Crane provides full spectrum life cycle support for special missions, including weapons, munitions, and electronic systems for multi-domain special operations and expeditionary forces. [www.navsea.navy.mil](http://www.navsea.navy.mil)



## Scaling up Production of a CRISPR-based COVID-19 Testing System



Laura Fernandez,  
a researcher with  
Lawrence Berkeley

Laboratory's Advanced Biofuels and Bioproducts Process Development Unit (ABPDU), works on a 250 mL automated, high-throughput bioreactor platform for fermentation process development. ABPDU is working with Caspr Biotech to scale up production of their CRISPR-based COVID-19 testing system, a new technology that could provide extremely accurate results much faster than current methods. [www.abpdu.lbl.gov](http://www.abpdu.lbl.gov)  
[www.caspr.bio](http://www.caspr.bio)



## Sub-Surface Automated Dual Water Sampler (SAS)



The sub-surface automated dual water sampler (SAS) was designed by researchers at the National Oceanic and Atmospheric Association (NOAA) Atlantic Oceanographic and Meteorological Laboratory (AOML) and the University of Miami to help scientists study water chemistry on shallow reef habitats. It was also created to minimize some of the financial hurdles in marine research by serving as a low-cost open-source alternative to existing water samplers. The SAS allows for accurate, high-frequency water sampling to characterize variability and monitor ocean acidification trends in economically important shallow-water ecosystems. [www.aoml.noaa.gov](http://www.aoml.noaa.gov) [www.miami.edu](http://www.miami.edu)

## Next Generation of Concrete



U.S. Department of Transportation  
**Federal Highway Administration**

Ultra-high performance concrete (UHPC) is the next generation of concrete, offering strength and resiliency far exceeding conventional concrete. The Federal Highway Administration (FHWA) is developing recommended practices for the design of UHPC bridges, opening the door to the use of UHPC by partners across the country. As part of that work, the Turner-Fairbank Highway Research Center Structures Laboratory is testing full-scale UHPC bridge girders as shown here, where a 62-foot long, 35-inch deep prestressed girder is being loaded to failure. <https://highways.dot.gov>





# Get Ahead While You're at Home!

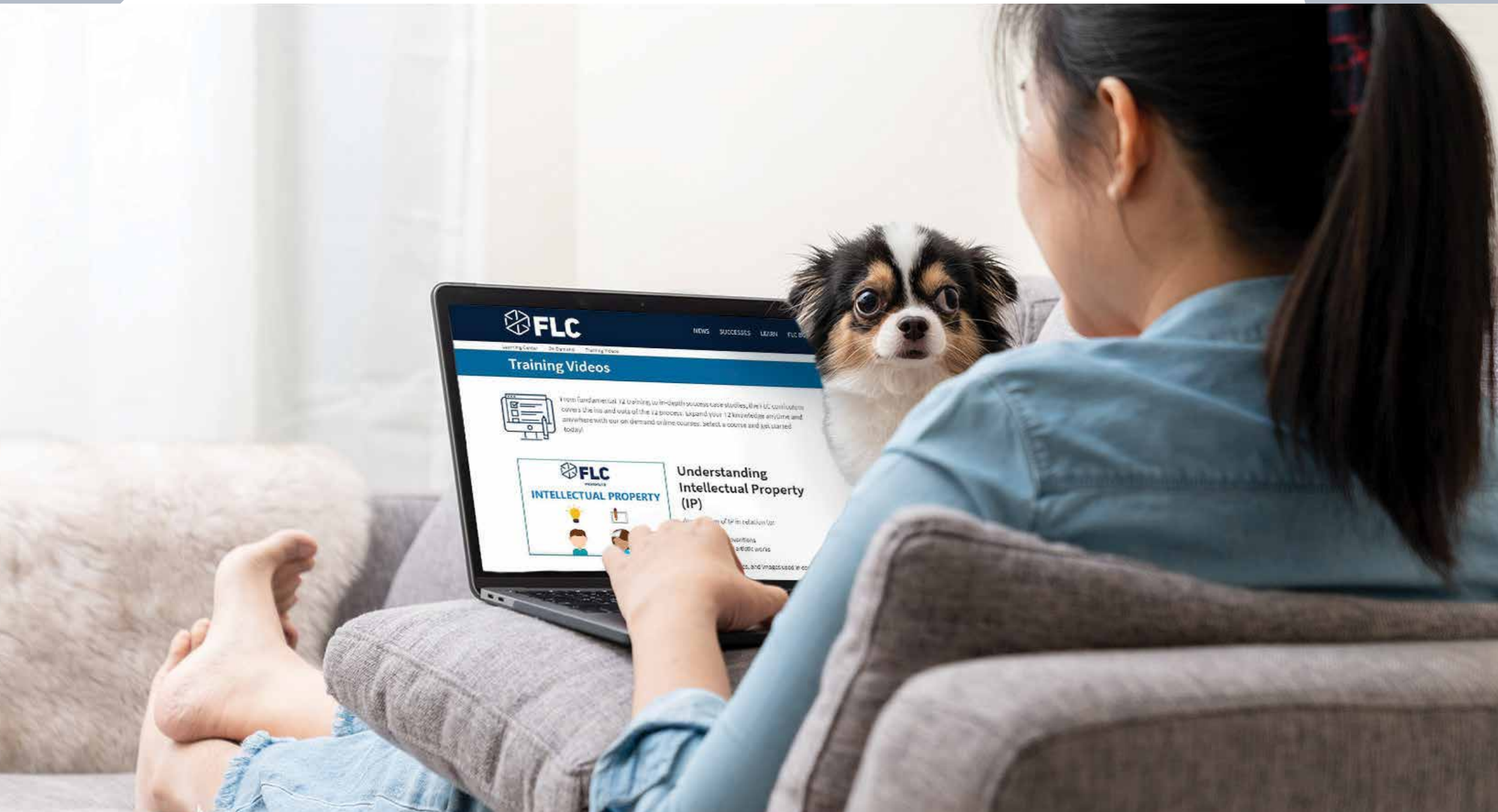
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