2019

A Spotlight on the R&D of Federal Laboratories

VA | U.S. Department of Veterans Affairs

Natural Sensation for Lower Extremity Amputees with Multi-contact Peripheral Nerve Electrodes

See inside cover for details

FLC

Federal Laboratory Consortium for Technology Transfer

On the Cover

Improving Prosthetics

Using an implanted neural stimulation system, this below-knee amputee can feel sensations of touch and pressure applied to his prosthetic foot as if they originated in his missing limb. With this stimulation system and a specialized insole, lower-limb amputees can actually feel their “foot” touch the floor. This improves balance and walking, and provides a renewed sense of foot-to-floor contact and ankle load, which can prevent falls and enhance the ability to navigate complex environments without conscious attention.

Shaping the Future of Rehabilitative Care for Veterans with VA’s Advanced Platform Technology (APT) Center

The APT Center is a National VA Rehabilitation Research & Development Center, established January 2005 in collaboration with Case Western Reserve University, that focuses on serving veterans with sensorimotor dysfunction, cognitive impairment, or limb loss using cutting-edge technologies and rehabilitation techniques, and translating them from proof of concept to viable clinical options. Our research programs focus on: prosthetics and orthotics, health monitoring and maintenance, neural interfaces, and enabling technologies.

www.va.gov

www.aptcenter.research.va.gov

APT CENTER

TECHNOLOGY TRANSFER PROGRAM

VA | U.S. Department of Veterans Affairs

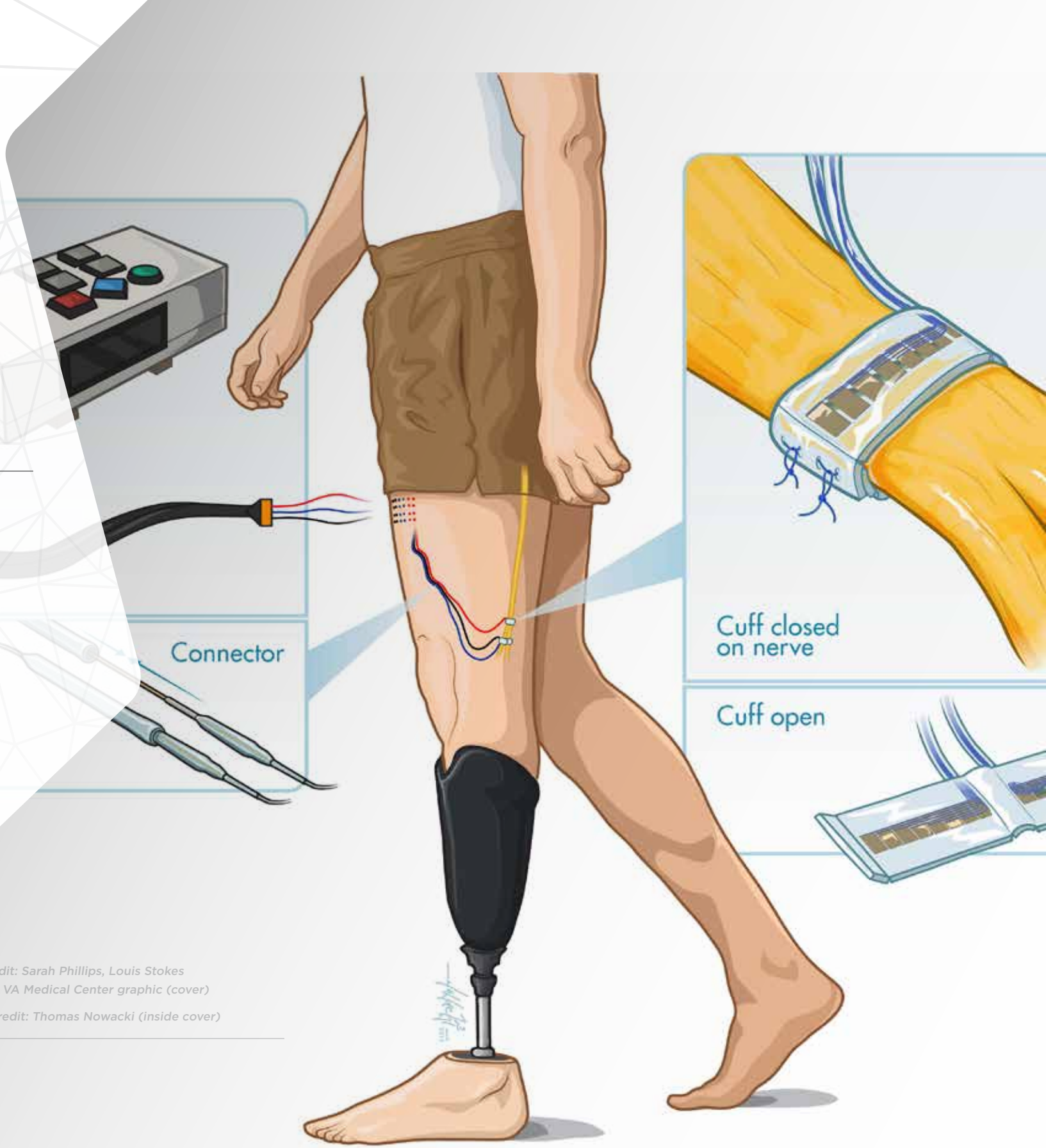

Photo credit: Sarah Phillips, Louis Stokes Cleveland VA Medical Center graphic (cover)

Graphic credit: Thomas Nowacki (inside cover)

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 technologies and create social and economic impacts with new innovative technologies. Through the various resources, education and training, tools, and services the FLC creates and provides for its members, 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 improving 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.

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FLC Regions

1 Far West
Regional Coordinator: Jennifer Stewart
Naval Surface Warfare Center,
Corona Division
www.flcfarwest.org

2 Mid-Continent
Regional Coordinator: Jackie Kerby Moore
Sandia National Laboratories
www.flcmidcontinent.org

3 Midwest
Regional Coordinator: Brooke Pyne
Naval Surface Warfare Center,
Crane Division
www.flcmidwest.org

4 Northeast
Regional Coordinator: Valerie Larkin
Naval Undersea Warfare Center
Division Newport
www.flcnortheast.org

5 Mid-Atlantic
Regional Coordinator: Robert Griesbach, Ph.D.
USDA-Agricultural Research Service
www.flcmidatlantic.org

6 Southeast
Regional Coordinator: Michael Merriken
Space and Naval Warfare Systems Center
(SPAWAR) Atlantic
www.flcsoutheast.org

Optimizing High Performance Fuels for Advanced Internal Combustion Engines

The Co-Optimization of Fuels & Engines (Co-Optima) initiative is providing industry with the scientific underpinnings needed to accelerate the development of high-performance fuels and engines to reduce energy consumption and harmful emissions. Co-Optima brings together the U.S. Department of Energy, 9 National Laboratories and 13 universities. Recent fundamental research by Co-Optima members identified representative blendstocks from five chemical families that improved engine performance when blended into gasoline. As part of this multi-lab effort, LLNL's combustion kinetics and numerics teams are developing chemical kinetic models for new high-performance fuels, and fuel models are being used by the broader Co-Optima team for co-optimizing new fuels and advanced internal combustion engines.

Lawrence Livermore National Laboratory

Photo credit: Adam Connell/LLNL

Lawrence Livermore National Laboratory (LLNL)

LLNL's defining responsibility is ensuring the safety, security and reliability of the nation's nuclear deterrent. Livermore'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

DECEMBER 2018

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SUN	MON	TUE	WED	THU	FRI	SAT
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NOVEMBER 2018

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JANUARY 2019

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QUICK REFERENCE

Federal Outdoor Impact Laboratory (FOIL)

The Federal Outdoor Impact Laboratory (FOIL), an ISO 17025-accredited (Cert. #AT-1565) research facility, is used to study crash events and dynamic loading that occur during impacts. The FOIL features a state-of-the-science hydraulic propulsion system that is the first of its kind in the United States. The system includes a computer-controlled linear accelerator that can accelerate a vehicle or bogie up to impact speeds of 121 kilometers (75 miles) per hour. A pendulum structure symbolizing both a small car and a large pickup truck is also available at the FOIL for impact testing of structural components.

Photo credit:
Eduardo Arispe, FHWA

U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration/Turner-Fairbank Highway Research Center

The Federal Highway Administration's Turner-Fairbank Highway Research Center (TFHRC), is a federally owned and operated national research facility located in McLean, Virginia. The center houses more than 16 laboratories, support facilities, and data sets; and conducts applied and exploratory advanced research in vehicle-highway interaction, nanotechnology, and a host of other types of transportation research in safety, pavements, highway structures and bridges, human-centered systems, operations and intelligent transportation systems, and materials.

www.fhwa.dot.gov

JANUARY

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DECEMBER 2018

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FEBRUARY 2019

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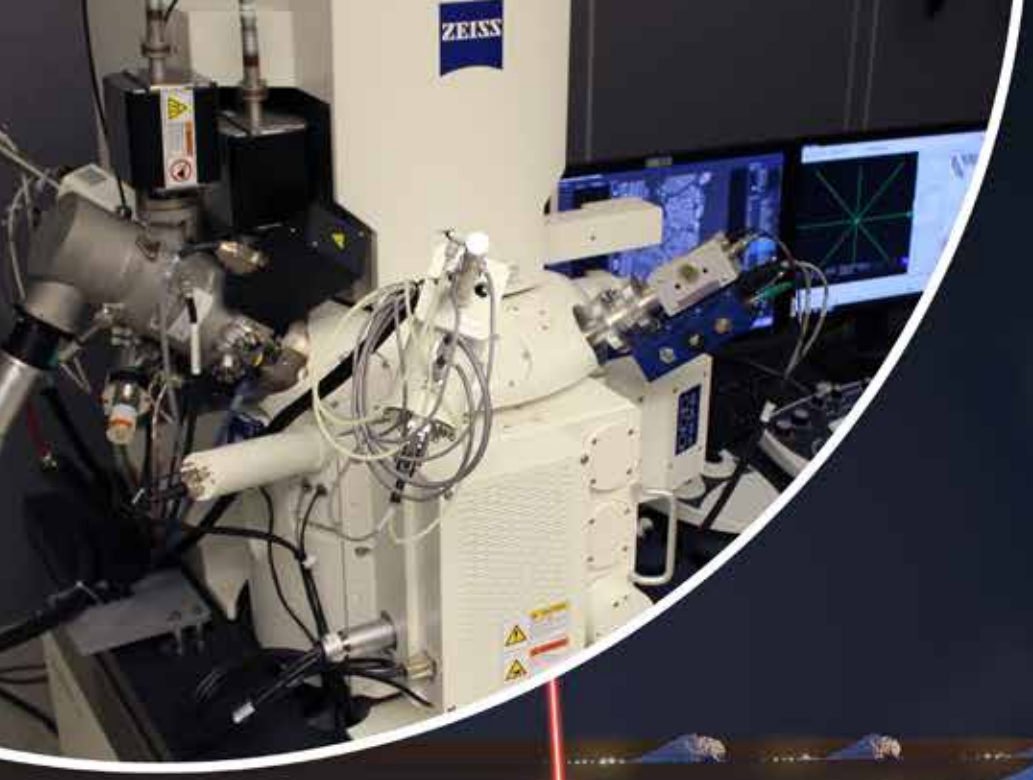
QUICK REFERENCE



Studying Cell Migration at High Resolutions

Many biological processes such as wound healing signal other cells to come assist. But how do responding cells choreograph their mass migration? Using focused ion beam scanning electron microscopy (FIB-SEM), we learned how the one-celled organism *Dictyostelium discoideum* coordinates movement toward a chemical signal. Each cell leaves a trail of tiny bubbles that reproduce a small amount of the original chemical signal. Trailing cells follow these bubbles, leaving their own trail for other cells to follow. Here we combine real 2-D images and 3-D reconstructions with an artist's rendering to portray *Dictyostelium discoideum* cells streaming toward a distant chemical signal.

Photo/image credit: Kedar Narayan, Center for Molecular Microscopy; and Joseph Meyer, Scientific Publications, Graphics and Media, Frederick National Laboratory for Cancer Research

NIH NATIONAL CANCER INSTITUTE

Frederick National Laboratory for Cancer Research

Frederick National Laboratory for Cancer Research

The Frederick National Laboratory for Cancer Research is dedicated to improving human health through discovery and innovation in the biomedical sciences, focusing on cancer, AIDS, and rapid response to emerging infectious diseases. We collaborate with academic, commercial, and nonprofit organizations, bringing expertise in genetics, genomics, protein science, proteomics, bioinformatics, high-performance biomedical computing, laboratory animal sciences, and clinical operations. We offer access to an array of leading-edge technologies, including ultra-high-resolution imaging.

frederick.cancer.gov

FEBRUARY

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JANUARY

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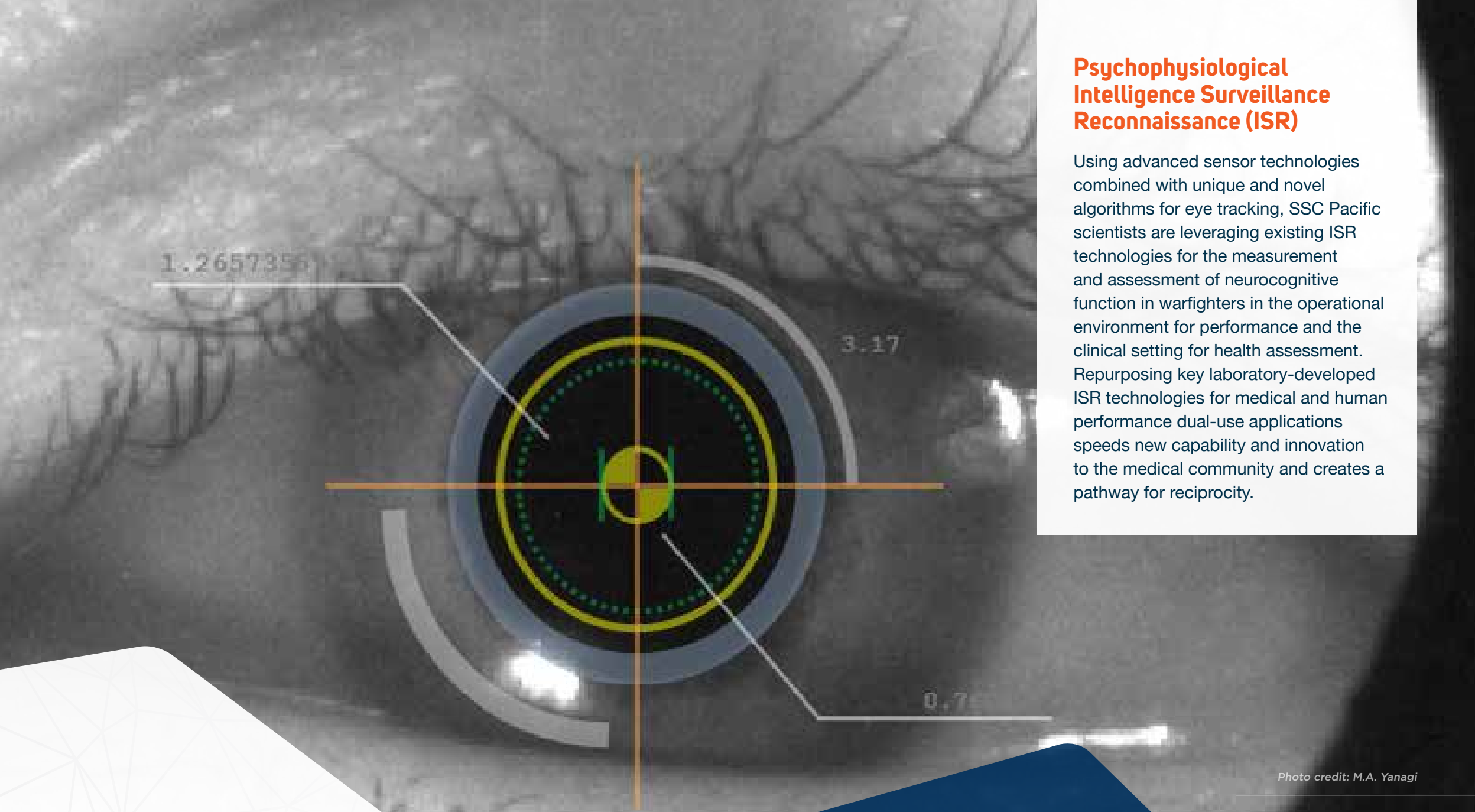
QUICK REFERENCE



Psychophysiological Intelligence Surveillance Reconnaissance (ISR)

Using advanced sensor technologies combined with unique and novel algorithms for eye tracking, SSC Pacific scientists are leveraging existing ISR technologies for the measurement and assessment of neurocognitive function in warfighters in the operational environment for performance and the clinical setting for health assessment. Repurposing key laboratory-developed ISR technologies for medical and human performance dual-use applications speeds new capability and innovation to the medical community and creates a pathway for reciprocity.

Photo credit: M.A. Yanagi

SPAWAR Systems Center PACIFIC

SPAWAR Systems Center Pacific

Space and Naval Warfare Systems Center Pacific (SSC Pacific) provides the U.S. Navy and military with essential capabilities in the areas of command and control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), cyber, and space. A recognized leader in C4ISR, SSC Pacific is providing the technological and engineering support critical to naval information warfare through basic research, prototype development, system development, systems engineering and integration.

www.public.navy.mil/spawar/pacific

MARCH

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APRIL

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QUICK REFERENCE

The Plasmonic Gap Resonator

In this illustration, laser light detects vibrations in a plasmonic gap resonator, a miniature device designed at NIST to precisely measure the motion of nanoparticles that are embedded within it. The device's potential applications include sensing trace amounts of hazardous biological or chemical agents, perfecting the movement of miniature robots, and accurately deploying airbags.

Illustration by Brian Roxworthy/NIST

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

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.
To learn more about NIST, visit:

www.nist.gov

APRIL

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MARCH

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MAY

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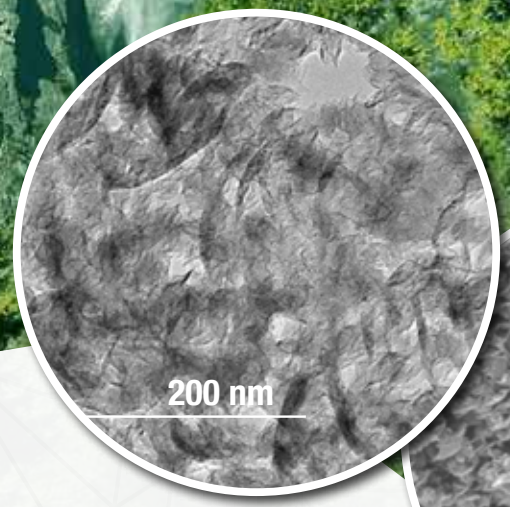
QUICK REFERENCE

Graphene from Low-Cost Lignin

Measuring one million times less than the width of a human hair, graphene is harder than diamonds and 200 times stronger than steel. Small, strong and flexible, it is the most conductive material on earth and has the potential to charge a cell phone in just five seconds. With its incredible properties, graphene has captured the attention of scientists and industry around the world. Under a Cooperative Research and Development Agreement (CRADA), scientists at the USDA Forest Service's Forest Products Lab worked with Domtar, Inc.—a sustainable pulp, paper, personal care company—to develop a cost-effective process for the production of high-value graphene from low-cost lignin.



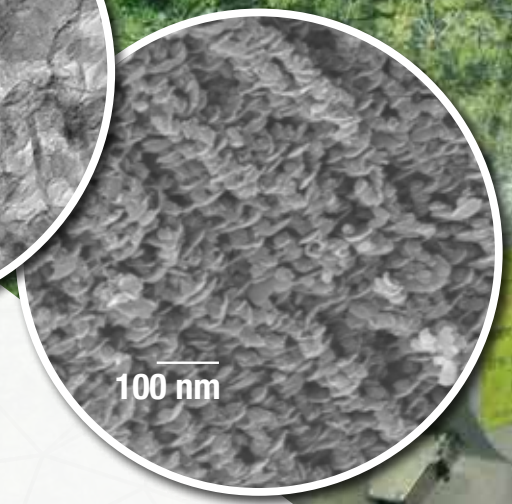


Photo credit: Zhiyong Cai

USDA | FOREST SERVICE US DEPARTMENT OF AGRICULTURE

Forest Products Laboratory – Madison, Wisconsin

Since 1910, the Forest Products Laboratory (FPL) has used science and technology to conserve and extend our nation's forest resources. Many everyday products and processes have been improved through FPL research, such as building products (structural and composite), housing, paper, bridges, adhesives, packaging, recycling, biofuels, and wood preservatives, to name a few.

www.fpl.fs.fed.us

MAY

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Memorial Day

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APRIL

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QUICK REFERENCE

PRANDTL-D: It's a Bird. It's a Plane. It's a New Twist on Aircraft Design.

Since the Wright Brothers, airplanes have had a vertical tail for control during turns. Taking a lesson from birds such as the albatross, researchers at NASA's Armstrong Flight Research Center have eliminated the vertical tail, dramatically reducing drag, fuel consumption, and aircraft production complexity.

Developed by Armstrong's Al Bowers and his team of interns, the innovative design called PRANDTL-D twists the wing into a bell shape to optimize flight performance. Now, California-based Chase Boats, LLC, has licensed PRANDTL-D for use in recreational ultralight aircraft.

Photo credit:

PRANDTL-D images by NASA photo/Bridget McBride
Albatross photo by Eric VanderWerf, U.S. Fish and Wildlife Service Pacific Region

NASA's Armstrong Flight Research Center

Located in California's western Mojave Desert, NASA's Armstrong Flight Research Center researches and tests advanced aeronautics, space, and related technologies that are critical to agency missions. Researchers test some of the nation's most unique aircraft and aeronautical systems, and they conduct flight operations for a wide variety of airborne science missions. Research at Armstrong has led to major advancements and breakthroughs in many state-of-the-art civil and military aircraft.

www.nasa.gov/centers/armstrong

JUNE

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JULY

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QUICK REFERENCE

Photo credit: Jason Richards, ORNL

Quantum Dot Visualization

A method to produce significant amounts of semiconducting nanoparticles for light-emitting displays, sensors, solar panels and biomedical applications has been demonstrated by researchers at the Department of Energy's Oak Ridge National Laboratory. In this image, the simulated characteristics of various quantum dot compositions are displayed in the laboratory's immersive visualization facility.

OAK RIDGE National Laboratory

Oak Ridge National Laboratory (ORNL)

Oak Ridge National Laboratory 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

JULY

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JUNE

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QUICK REFERENCE

FAA National Laboratory Resource S76A Helicopter (N38)

In collaboration with industry, academia and government partners, the FAA operates this one-of-a-kind national resource located at the WJHTC in Atlantic City, N.J. The S76A helicopter performs flight testing in support of aviation research activities to improve helicopter safety. Research projects using the S76A support FAA and United States Helicopter Safety Team initiatives, including Helicopter Flight Data Monitoring for Aviation Safety Information Analysis and Sharing, Enhanced Helicopter Vision Systems, etc. The helicopter is instrumented with the latest in audio/video/flight data recording technology, including dozens of cameras, cockpit microphones, flight data recorders, enhanced vision systems, and head-worn displays.

Photo credit: Dennis Flath

DEPARTMENT OF TRANSPORTATION · UNITED STATES OF AMERICA

FEDERAL AVIATION ADMINISTRATION

FAA William J. Hughes Technical Center

The FAA William J. Hughes Technical Center is the nation's premier air transportation system laboratory. The Tech Center's workforce conducts test and evaluation, verification and validation, and sustainment of the FAA's full range of aviation systems, and 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.tc.faa.gov

AUGUST

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QUICK REFERENCE

Autonomous Cyber Security Detective

The growing threats to national and personal cyber security increase the need for novel methods of protecting networks, systems, and devices. An NSA-developed invention takes cyber security to a new level by detecting unauthorized devices and activities as well as adversarial changes, activations, and interactions with devices over time. Potential uses for this technology include anti-hacking monitoring, cell phone usage tracking, and home or office security systems. NSA's Tracking Activity of Removable Electronic Components technology is one of many patented NSA technologies available for license.

Photo credit:
Charles Robinson and Violet Adams

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

National Security Agency Technology Transfer Program (NSA)

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

www.nsa.gov/techtransfer

SEPTEMBER

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AUGUST

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OCTOBER

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QUICK REFERENCE

Unmanned Maritime Systems Used for U.S. Coast Guard Arctic Missions

The unmanned maritime system (UMS), which is composed of three pieces when combined together, obtains imagery from the surface of the water. Built by RDC staff and powered by batteries and solar panels, the UMS can either be operated by remote controls or in autonomous mode to execute preprogrammed missions. Testing in the harsh and remote Arctic waters demonstrated:

- Remote-controlled operations of a UMS in open water areas in the Arctic
- Autonomous operations of a UMS
- Detection of oil in the water using a fluorometer sensor with a UMS.

Pictured below, a “Minion” UMS maneuvers nearby the USCGC HEALY in Arctic waters during the Arctic Technology Evaluation 2017.

Photo credit:
Jason Story, USCG RDC

United States Coast Guard (USCG) Research & Development Center (RDC)

The RDC, located in New London, Connecticut, conducts research for the purpose of improving Coast Guard operational and mission performance across all mission areas for the 88,000-member force stationed around the globe.

www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Research-Development-Test-and-Evaluation/Research-and-Development-Center/

OCTOBER

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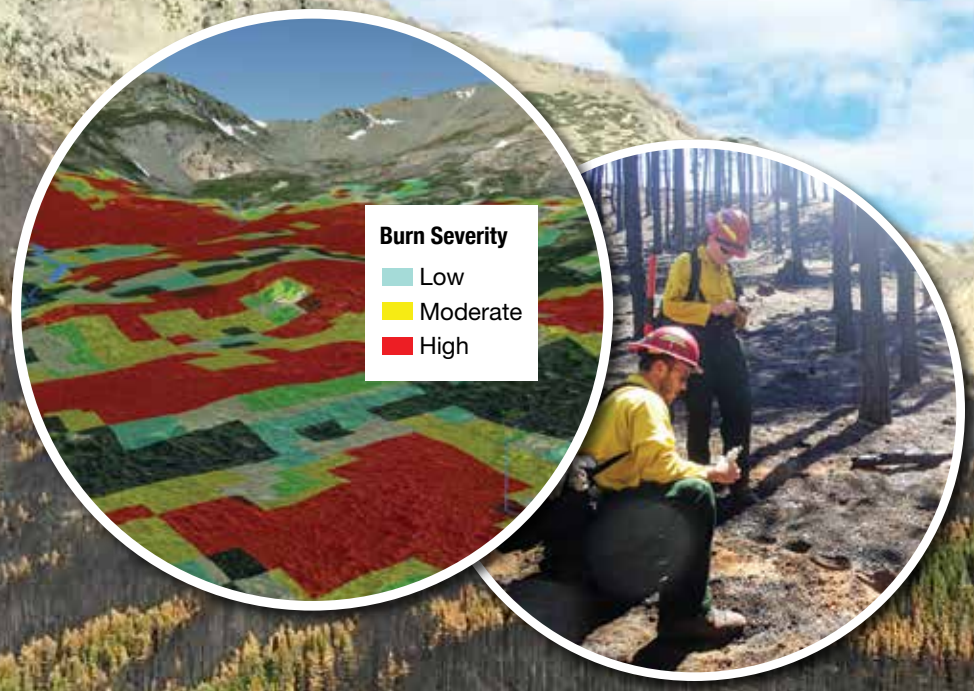
QUICK REFERENCE



Automated Geospatial Watershed Assessment (AGWA) Tool

The Automated Geospatial Watershed Assessment (AGWA) tool is a GIS interface that helps manage and analyze watershed water quantity and quality. The tool has been used in over 50 national Burned Area Emergency Response (BAER) efforts, on over 3.8 million acres, to speed post-fire watershed assessments, reduce remediation expenses, and focus mitigation efforts where they're needed most. AGWA helps BAER teams prioritize initial field work to verify soil burn severity, pictured here. Incorporating their field data, BAER then uses AGWA to model risks of post-fire erosion, flooding and sedimentation, and design treatments to protect life, property, water quality and ecosystems.

Photo credit:
Adam Springer (burned land background);
Shea Burns (burn map inset);
Scott Sheppard (field work inset)

USDA | United States Environmental Protection Agency

The University of Arizona | U.S. Department of the Interior

U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) | Environmental Protection Agency (EPA) | University of Arizona | U.S. Department of the Interior

AGWA was developed as a partnership between USDA, EPA and the University of Arizona, and has been applied by many federal partners, including NIFC, BLM, NWS, NPS, FWS, BIA, and the Department of Interior national BAER team. These organizations have made AGWA a valuable tool through their in-kind support, extensive interagency communication, and passion to improve the nation's response to increasing numbers of wildfires.

www.ars.usda.gov | www.epa.gov | www.arizona.edu | www.doi.gov

NOVEMBER

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

NOTES

OCTOBER

S	M	T	W	T	F	S
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27	28	29	30	31		

DECEMBER

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29	30	31				

QUICK REFERENCE

Cancer Biomarker Research

Droplets form on pipettes after filling trays that are part of the effort to identify cancer biomarkers. Once the trays are filled, Pacific Northwest National Laboratory researchers test the samples, checking the levels of proteins and peptides needed to study the difference between cancerous and healthy cells using LC-MS/MS (liquid chromatography-tandem mass spectrometry) analysis.

Photo credit: Andrea Starr, Pacific Northwest National Laboratory

U.S. DEPARTMENT OF ENERGY | Pacific Northwest NATIONAL LABORATORY

Pacific Northwest National Laboratory (PNNL)

Drawing on distinguishing capabilities in chemistry, earth sciences and data analytics, Pacific Northwest National Laboratory researchers advance scientific discovery and create solutions to the nation's toughest challenges in energy resiliency and national security. PNNL was founded in 1965 and is operated by Battelle for the U.S. Department of Energy's Office of Science. The national lab employs about 4,500 professionals and has an annual operating budget of nearly $1 billion.

www.pnnl.gov

DECEMBER

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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	21
22 Hanukkah (begins at sundown)	23	24	25 Christmas Day	26 Kwanzaa	27	28
29	30	31				

NOTES

NOVEMBER

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JANUARY 2020

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QUICK REFERENCE

Explosives Detection System Validation & Verification

A researcher at the Transportation Security Laboratory (TSL) fills a pressurized metered-dose canister (pMDC) with a dilute solution of an explosive. The TSL is repurposing technology from the pharmaceutical industry to make test kits for trace explosive detection systems used at security checkpoints. The pMDC delivers a precise amount of a material onto a surface, which the detection system operator can use to verify that the system is functioning correctly.

Photo credit:
FAA/WJHTC Advanced Imaging (L. Zaleski, M. Gross)

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, test and evaluation, assessment, and certification testing.

www.dhs.gov/science-and-technology/transportation-security-laboratory

JANUARY 2020

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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
19	20 Martin Luther King, Jr. Day	21	22	23	24	25
26	27	28	29	30	31	

NOTES

DECEMBER 2019

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FEBRUARY 2020

S	M	T	W	T	F	S
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16	17	18	19	20	21	22
23	24	25	26	27	28	29

QUICK REFERENCE

OUR FEDERAL LABS AT WORK

Photo credit:
James Gathany

CDC Ebola Virus Detection

A Centers for Disease Control (CDC) biologist removes a cell culture with potentially deadly pathogens like Ebola from a 37°C incubator in CDC's biosafety-level 4 (BSL-4) lab.

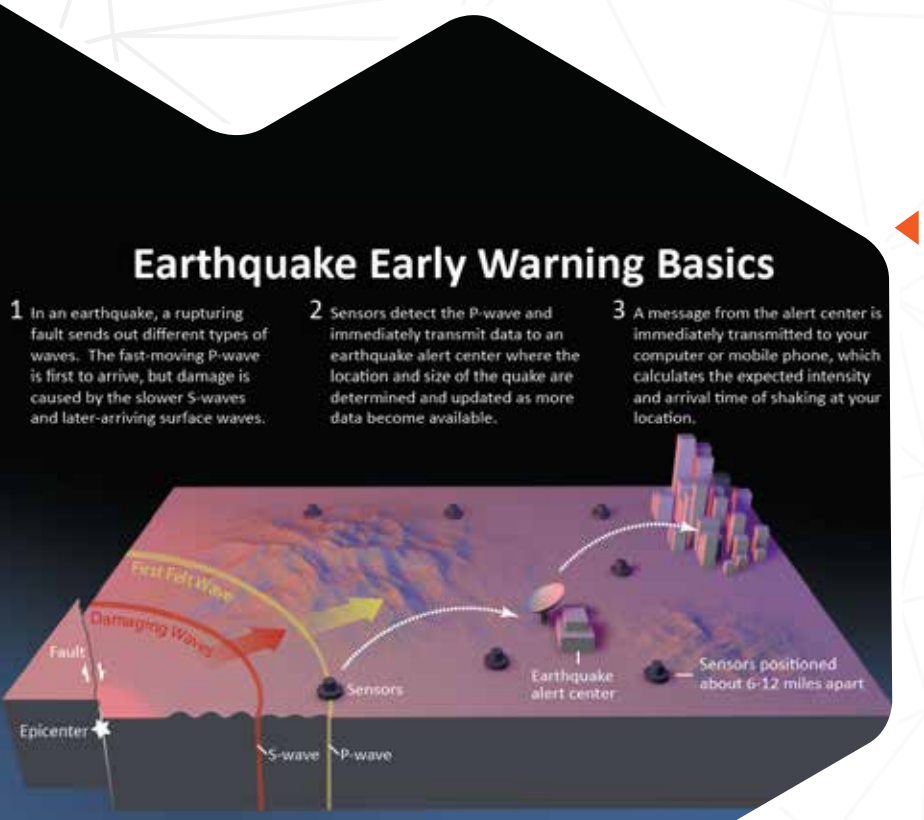
CDC developed a real-time PCR (polymerase chain reaction) test that detects genetic evidence of Ebola virus infection within just a few hours. The U.S. Food and Drug Administration approved the assay under Emergency Use Authorization. CDC worked with several companies to develop and distribute molecular detection tests, and to field test a rapid Ebola diagnostic for fingerstick or whole blood samples. The test can provide results in as few as 4 minutes.

Multiphysics Object Oriented Simulation Environment (MOOSE)

Modeling and simulation is standard practice in nearly every branch of science. The Multiphysics Object Oriented Simulation Environment (MOOSE) has transformed approaches to predictive simulation — making it quicker, adaptable and more accessible. MOOSE enables development of state-of-the-art simulation tools in a fraction of the time previously required. The simplicity has bred dozens of MOOSE-based modeling applications spanning nuclear engineering, material science and geology. The growing MOOSE user community includes domestic or foreign laboratories, universities and companies.

Multilayered Fire Protection System

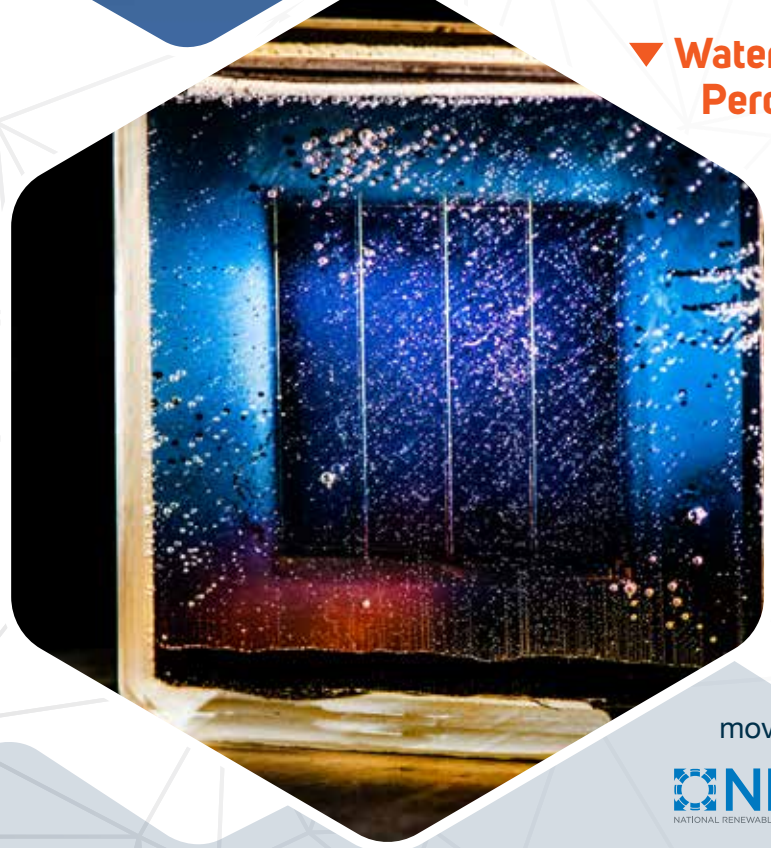
NASA Langley has developed a flexible, lightweight and portable thermal protection system. The system is multilayer thermal blankets that are designed to handle external temperatures of up to 2000 degrees Fahrenheit. Field tests clearly demonstrate how these new heat-retardant materials can protect from the extreme conditions. This system creates an environment for protecting equipment, facilities, and people from a high intensity incident heat source, such as a fire. The system can be formed as a sleeping bag, a tent, a blanket, a vertical barrier, a curtain, a flexible rollup doorway, or a wrap.



USGS
science for a changing world

ShakeAlert®—An Earthquake Early Warning System for the United States West Coast

Earthquake early warning systems use earthquake science and the technology of monitoring systems to alert devices and people when damaging waves produced by an earthquake are expected to arrive at their location. The seconds to tens of seconds of advance warning can allow people and systems to take actions to protect life and property from destructive shaking. The U.S. Geological Survey (USGS), in collaboration with several public and private partners, has been working to develop the ShakeAlert® Earthquake Early Warning System for the United States. ShakeAlert® is currently being implemented in Washington, Oregon and California.



Water-Splitting Hybrid Perovskite Solar Cell

National Renewable Energy Laboratory (NREL) researchers have developed a hybrid perovskite solar cell integrated with an electrolyzer, where the high voltage generated by these emerging, scalable photovoltaics is applied to water electrolysis to make hydrogen, a storable solar fuel. The small bubbles are the hydrogen being produced. This hybrid solar cell can convert sunlight directly into hydrogen, which promises to be a key method of storing and moving energy in the future.

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Sandia National Laboratories

IR Dynamics/Thermochromic Materials

Sandia National Laboratories' original goal was to develop a self-resetting circuit breaker using vanadium dioxide. But through the creativity and partnership of Sandia scientist Paul Clem and New Mexico company IR Dynamics, this technology has been transferred to the private sector, taking advantage of the material's unique tunable optical properties for energy conservation. After three years of development, a new smart window coating and smart window film are poised to enter the marketplace, reducing energy needs for consumers across the U.S. This team received a national Federal Laboratory Consortium Excellence in Technology Transfer Award in 2018.

THE STEPS FOR LAB-TO-MARKET SUCCESS

Each year, billions of taxpayer dollars go into funding research and development (R&D) at federal laboratories, where innovative technologies, methods and ideas are created to fulfill public and private needs and have the power to boost our economy.

Before those innovations can make it out of the lab and into the marketplace, interested industry parties and lab professionals must go through a process called **technology transfer (T2)—the means by which knowledge, facilities, or capabilities developed under federal R&D funding are utilized or accessed through collaborative partnerships, licensing, agreements, etc., between businesses and federal labs.**

MEET YOUR INNOVATION GOALS BY FOLLOWING OUR T2 SUCCESS TRACK!

1

STEP 1: IDENTIFY YOUR R&D NEEDS

Do you have an idea, invention, or product you'd like to further develop? Our federal laboratories have a wealth of resources and expertise that innovators can access to support various R&D or business needs.
Visit federallabs.org to get started!

2

STEP 2: SEARCH LABORATORY RESOURCES & TECHNOLOGIES

Locate thousands of federal lab resources and techs by searching FLC Business—a unique database that provides innovators the ability to easily find and access lab information, technologies, facilities, equipment, funding and programs.
Start your search at FLCBusiness.org!

SEARCH → *CONNECT* → *ENGAGE*

3

STEP 3: FIND A SUITABLE T2 PROCESS

After you've found the lab resources you're looking to access or utilize, check out the FLC's Learning Center and T2 Toolkit to learn the ins and outs of the T2 process, how to license a technology, or the best ways to get started working with a federal lab!

FLC LEARNING CENTER: → E-Learning Courses & Webinars → *T2 TOOLKIT* → T2 Mechanisms Database and Playbook

STEP 4: ASSESS THE NEXT STEPS FOR INNOVATION

4

Visit the T2 Mechanisms Database to get familiar with the various types of T2 agreements federal labs have available to meet your R&D needs. Then, assess suitable sample agreements to determine what information you'll need to disclose before reaching out to a laboratory representative and moving forward in the T2 process.

STEP 5: CONTACT A LABORATORY REPRESENTATIVE

5

Now that you've determined your ideal commercialization path, it's time to reach out to the lab. The laboratory representative will help you determine the best route for accessing the lab, facility, equipment or expertise you wish to utilize. Lab rep info is kept current on every lab profile in FLC Business.

NEED HELP CONNECTING? Contact the Tech Locator! locator@federallabs.org

STEP 6: NEGOTIATE AN AGREEMENT PATH

6

It's time to initiate, negotiate, and complete an agreement between you and a federal laboratory. Given the mechanism path agreed upon, this stage in the process can take some time to complete so both the laboratory and you (the private party) can achieve what they hoped to gain from the initiated agreement. The agreement will take into account all of the complex factors both parties need to consider during negotiations, such as:

THE DEVELOPMENTAL STAGE

ADDITIONAL PARTNERS

RISK VS. POTENTIAL

ROI

STEP 7: COMMERCIALIZE!

7

You've reached the end of the transfer process, and it's now time to commercialize your innovation! You're now on the path to access technology and facilities never before utilized. The lab's T2 office will follow up to ensure quality control, resolve any issues that may arise, and introduce potential third-party partners for sublicensing or joint development, among other administrative procedures.

END OF T2 SUCCESS TRACK

VISIT WWW.FEDERALLABS.ORG TO LEARN MORE ABOUT WORKING WITH FEDERAL LABS AND ACCELERATE YOUR INNOVATIONS INTO THE MARKETPLACE!

December 2018

January

February

March

April

May

June

July

August

September

October

November

December

January 2020

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