

An extraordinary event...

A CONVERSATION WITH NINE LLNL DIRECTORS

THURSDAY, SEPTEMBER 8, 2022

 **Lawrence Livermore
National Laboratory**



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Celebrating 70 years of making
the impossible possible



Livermore Lab
FOUNDATION

PROGRAM

3:30-4:00

Reception & LLNL Displays

Musical performance by the
Matt Finders Trio

4:00-4:15

Welcome

Sally Allen, Executive Director -
Livermore Lab Foundation

Opening Remarks

Chung Bothwell, Chairman of the
Board - UNCLE Credit Union

Special Guest

Jill Hruby, Under Secretary of
Nuclear Security - United States
Department of Energy

4:15-5:45

Our Main Event

LLNL Directors - Panel Discussion

Introduction

Dona Crawford, Board Chair -
Livermore Lab Foundation

Moderator

The Honorable Ronald F. Lehman II,
LLNL Counselor to the Director and
former Ambassador

5:45-6:00

Closing Remarks

THANK YOU TO OUR SPONSOR

As a credit union founded 65 years ago for employees of the Lab, we are honored to continue this support today via the Livermore Lab Foundation. We believe in the Foundation's mission to provide even greater opportunities for promoting scientific advancement and STEM education for our next generations. Both LLF and UNCLE share a guiding principle and culture that places high value on creating a positive impact and in strengthening our communities. Happy 70th Anniversary, LLNL!



Chung Bothwell, JD, LLM
Chairman of the Board



Harold Roundtree
President & CEO

WELCOME

Thank you for joining us! On behalf of our Foundation team, we are thrilled to welcome you to this special public celebration of the 70th anniversary of Lawrence Livermore National Laboratory. As a retiree, community leader or current employee, we know the Lab is as special to you as it is to our Foundation. We're honored to be the host of what we know will be a very spirited conversation (as if there was any doubt!), and hope this afternoon will also provide you with an opportunity for great camaraderie and renewed connections. Today's complimentary event is made possible thanks to the exclusive support of UNCLE Credit Union – a valued partner of both LLNL and LLF. Enjoy!



Dona L. Crawford
Board Chair



Livermore Lab
FOUNDATION



Sally Allen
Executive Director

OUR LEADERSHIP

BOARD OF DIRECTORS:

Dona Crawford, *Board Chair*
Greg Suski, *Board Secretary/Treasurer*
Catharine Baker, *Director*
Kim Budil, *Ex Officio Director*
Michael Carter, *Director*

Brett Henrikson, *Director*
Anantha Krishnan, *Director*
Craig Leasure, *Director*
Emily Wu, *Director*
Charlene Zettel, *Director*

OUR TEAM:

Sally Allen, *Executive Director*
Emily Pezzutti, *Development Associate*
Susan Houghton, *Communications Consultant & Project Manager - Carbon Cleanup Initiative*
Lori Taylor, *Operations and Marketing Consultant*

MEET THE MODERATOR & PANEL



RONALD LEHMAN II

Counselor to the LLNL Director & Panel Moderator

The Honorable Ronald F. Lehman II is the counselor to the director of Lawrence Livermore National Laboratory. For many years, he was the director of the Center for Global Security

Research at LLNL. For the State Department, Lehman chairs the Governing Board of the International Science and Technology Center, an intergovernmental organization. For the Defense Department, he was one of the original members of the Defense Threat Reduction Advisory Committee and was its chair from 2014– 2019, having previously served as Vice Chair. Lehman was director of the U.S. Arms Control and Disarmament Agency from 1989 until 1993, when START I, START II and other historic agreements were concluded. Previously, he served in the U.S. Department of Defense as Assistant Secretary for International Security Policy, in the State Department as Ambassador and U.S. Chief Negotiator on Strategic Offensive Arms (START I), and in the White House as Deputy Assistant to the President for National Security Affairs. He has also served on the National Security Council staff as a senior director, in the Pentagon as deputy assistant secretary, on the senior professional staff of the U.S. Senate Armed Services Committee, and in Vietnam was commissioned in the United States Army.

He was a public affairs fellow at the Hoover Institution on War, Revolution, and Peace at Stanford University and an adjunct professor at Georgetown University. Lehman serves on the Board of Governors of the Keck Center for International and Strategic Studies at Claremont McKenna College, having served previously as its board chair.



The Honorable Ronald Lehman, II, at the Directors Distinguished Lecture Series, circa 1988.



KIMBERLY BUDIL

LLNL Director, 2021-Present

Dr. Kim Budil is the 13th director in the history of Lawrence Livermore National Laboratory. She also serves as president of Lawrence Livermore National Security (LLNS), LLC. Budil leads a workforce of approximately 7,400 employees and manages an annual operating budget of approximately \$2.7 billion.

As director, Budil sets the strategic vision for the Laboratory and exercises broad delegated powers to ensure successful execution of programs and operations to advance science and technology for the nation and to maintain an outstanding and diverse workforce. The director leads the development and implementation of the Laboratory's scientific vision, goals and objectives, and serves as the Laboratory's highest-level liaison with DOE, NNSA, the LLNS Board of Governors, the University of California and other government, public and private organizations.

She shares the responsibility, along with the directors of Los Alamos and Sandia national laboratories, of providing the president, through the secretaries of Energy and Defense, an annual institutional assessment of the state of the nuclear weapons stockpile in terms of safety, security and effectiveness, and whether confidence in the stockpile can be maintained without a nuclear test.

Budil came to the Lab in 1987 as a graduate student in Laser Programs and became a postdoc in the weapons program in 1994. Over her career she has held roles of increasing management responsibility across LLNL programs, including Weapons and Complex Integration, in which she served as principal associate director, as well as Global Security, the National Ignition Facility and Physical and Life Sciences. Budil served twice as a detailee in Washington, D.C., first at the NNSA in the Office of Defense Science and then as a senior adviser to the undersecretary for Science in the Department of Energy. She was the vice president for national laboratories in the UC Office of the President, in which she was responsible for the governance and oversight of Lawrence Livermore, Lawrence Berkeley and Los Alamos national laboratories, as well as development of strategic partnerships between the 10 UC campuses and the laboratories. She also was the executive committee governor on the LANS and LLNS Boards of Governors, and she is a Hertz Foundation Fellow and board member.

Budil received her Ph.D. in engineering/applied science from the University of California, Davis in 1994 and obtained her bachelor's degree in physics from the University of Illinois at Chicago in 1987. She has published extensively in scientific and programmatic contexts and participated in numerous professional and community outreach activities.



Director Kim Budil served as moderator for the opening panel of the White House Fusion Summit, circa 2022.



WILLIAM GOLDSTEIN

LLNL Director, 2014-2021

Dr. William H. Goldstein was the 12th Director of the Lawrence Livermore National Laboratory (LLNL) from 2014 until 2021.

Goldstein previously served LLNL as Deputy Director for Science and Technology (DDST), where he led the strategic deployment of the Laboratory's portfolio of world-class science, technology, and engineering (ST&E) capabilities and managed the long-term health of ST&E at the Laboratory.

He had line responsibility for the Laboratory's internal ST&E investment portfolio, which includes the Laboratory Directed Research and Development (LDRD) Program, and oversaw collaborative research with academia and private industry, and institutional planning activities. Between 2001 and 2012, as associate director, Goldstein led the Laboratory's Physics and Advanced Technologies Directorate, which later became the Physical and Life Sciences Directorate, performing research in condensed matter and materials science, chemical and biological science, atmospheric and earth systems science, high energy density physics, nuclear science and high energy physics in support of LLNL's energy, nuclear, and international security missions.

Goldstein has been a leader in the establishment and management of the Department of Energy's stockpile stewardship program. He formulated and initially led LLNL's Physical Data Research Program, with responsibility for providing experimentally validated equations-of-state, material properties, opacities, and nuclear cross section and transport data for nuclear design. He received his doctorate in theoretical physics from Columbia University in New York and a bachelor's degree in physics from Swarthmore College in Pennsylvania.



Director Bill Goldstein signs a Memorandum of Understanding with Georgetown University, circa 2014.



PENROSE ALBRIGHT

LLNL Director, 2011-2014

Dr. Parney Albright was the 11th Director of Lawrence Livermore National Laboratory (LLNL), from 2011 until 2014. Albright previously served as the principal associate director for Global Security at LLNL, where he broadened the Laboratory's engagement with the national security and energy communities. Albright successfully developed strong programmatic partnerships with Sandia and Los Alamos national laboratories.

Before arriving at LLNL, Albright was President of Civitas Group, LLC, where he led high-profile projects, such as providing a net assessment of the nation's biodefense enterprise and conducting critical analyses of the first Quadrennial Homeland Security Review.

Prior to Civitas, Albright was confirmed by the Senate to the position of Assistant Secretary of the Department of Homeland Security in 2003. Under his leadership and guidance, major new national efforts were created in radiological and nuclear security; biological, chemical, and explosives defense; border security, trade and travel facilitation; aviation and other aspects of transportation security; national incident emergency response and consequence management; and critical infrastructure protection.

Albright concurrently held the positions of senior director for research and development in the Office of Homeland Security and assistant director for Homeland and National Security within the Office of Science and Technology Policy. Within the White House, he was responsible for providing advice to the Executive Office of the President on science and technology issues surrounding homeland security, and on the threat of biological, nuclear, and chemical terrorism. Past accomplishments include working at the Defense Advanced Research Projects Agency and the Institute for Defense Analyses. Albright holds a bachelor's degree in physics and applied mathematics from The George Washington University, and a master's and Ph.D. in physics from the University of Maryland. He currently is the president and chief executive officer of HRL Laboratories, LLC.



Director Parney Albright with Mayor John Marchand at the naming of Livermorium Plaza, circa 2013.



GEORGE MILLER

LLNL Director, 2006-2011

Dr. George Miller was the 10th Laboratory director from 2006 to 2011, first under the management of the University of California. In 2007, he also was named Lawrence Livermore National Security (LLNS) president when NNSA awarded the contract to manage LLNL to LLNS. As the first president and director under the LLNS contract, Miller guided the Laboratory through transition to a new management system, cutting operating costs while seeking ways to improve on the Lab's mission of science in the national interest.

Miller joined the Laboratory as a physicist and was later promoted to program leader for all thermonuclear design and computational physics development. In 1985, he became an associate director in charge of the nuclear weapons program at the Laboratory. He left LLNL in 1989 to serve as the special scientific adviser on weapons activities to Secretary of Energy Adm. James Watkins. Miller returned to the Lab in 1990, serving as associate director for Defense and Nuclear Technologies, associate director for National Security and associate director for National Ignition Facility Programs.

Since stepping down as Laboratory director, Miller has continued to be active in the national security arena, principally through his STRATCOM Strategic Advisory Committee membership. He has continued to chair the Science, Technology and Transformation Panel and is a member of the Nuclear Command, Control and Communications Panel. Miller received his bachelor's degree with high honors, his master's and his Ph.D. in physics from the College of William & Mary. In 2021, he was named the sixth recipient of the John S. Foster Medal for his contributions to U.S. national security.



Director George Miller in a media interview with CNBC's John Fortt to discuss LLNL's capabilities, circa 2011.



MICHAEL ANASTASIO

LLNL Director, 2002-2006

Dr. Michael Anastasio was the ninth director of Lawrence Livermore National Laboratory, as well as a former director of Los Alamos National Laboratory — the only person to hold both positions. He is the recipient of the 1990 DOE Weapons Recognition of Excellence Award for technical leadership in nuclear design. The award acknowledged Anastasio's outstanding theoretical and experimental contributions to understanding boost physics.

He began his career at the Lab as a physicist in B Division, one of the two nuclear weapons design physics divisions. He later was named leader of the division before serving as associate director for Defense and Nuclear Technologies, responsible for all activities in the Laboratory's nuclear weapons program. During his tenure, he was an instrumental leader in the development and execution of the national Stockpile Stewardship Program (SSP), designed to sustain the safety, security and reliability of America's nuclear weapons stockpile. He was also the deputy director for Strategic Operations, responsible for all Laboratory and national security operations, and served in Washington as a scientific adviser at the Department of Energy, providing advice to senior members of the department on a variety of SSP issues.

Anastasio led the successful University of California / Bechtel team in the first-ever contract competition to manage the Los Alamos National Laboratory, becoming director there after his 25 years at LLNL. He graduated from The Johns Hopkins University with a bachelor's degree in physics and went on to Stony Brook University, where he earned his master's degree and Ph.D. in theoretical nuclear physics.

Dr. Anastasio is currently serving as chair of the United States Strategic Command Strategic Advisory Group Stockpile Assessment Team, as President of the TRIAD National Security, LLC Board for Los Alamos National Laboratory, and as a Member of the Board of Governors for Lawrence Livermore National Security, LLC. He has also served on other boards and committees including the Defense Department Defense Science Board, the State Department International Security Advisory Board, the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise, as a member of the Corporation of the Draper Laboratory, and the National Academy of Sciences Committee on Peer Review and Design Competition in the NNSA National Security Laboratories.



Director Michael Anastasio with astronaut John Glenn and local students at the Lab's 50th anniversary celebration, circa 2002.



C. BRUCE TARTER

LLNL Director, 1994-2002

Dr. C. Bruce Tarter was the eighth director to lead Lawrence Livermore National Laboratory. His career at the Laboratory began as a staff member in the Theoretical Physics Division,

concentrating on supercomputer calculations of the properties of matter at high temperatures and densities, with applications to nuclear weapons, fusion, energy, and astrophysics. He went on to become head of Theoretical Physics and later, associate director for Physics.

Prior to his selection as director, Tarter served as deputy director and acting director. In these roles, he led the Laboratory through the transition to a post-Cold War nuclear weapons world, helping to set the foundation for current programs in stewardship of the U.S. nuclear stockpile and nonproliferation, energy and environmental science, and bioscience and biotechnology.

Tarter has also served in a number of outside professional capacities, including a six-year-period with the Army Science Board, service as an adjunct professor at the University of California at Davis, and membership on the California Council on Science and Technology, the University of California President's Council on Human Resources and Benefits, the Laboratory Operations Board (Secretary of Energy Advisory Board), Pacific Council on International Policy, Nuclear Energy Research Advisory Committee, and the Council on Foreign Relations. He received his bachelor's degree in physics from the Massachusetts Institute of Technology and a Ph.D. from Cornell University. The author of over 50 articles and reports, Tarter is a fellow of the American Physical Society and received the Roosevelt Gold Medal Award for Science in November 1998. After his retirement as director, he researched and then published a history of the Laboratory, "The American Lab: An Insiders History of the Lawrence Livermore National Laboratory".



Director Bruce Tarter with Secretary of Energy Federico Pena and Congresswoman Ellen Tauscher at the groundbreaking of the National Ignition Facility (NIF), circa 1997.



JOHN NUCKOLLS

LLNL Director, 1988-1994

John Nuckolls was the Lab's seventh director, taking office during a time of unprecedented change and addressing the end of the Cold War, the transition to the post-Cold War world.

With the breakup of the Soviet Union and the end of nuclear testing, the Lab's work on nuclear weapons declined, but efforts in arms control, nonproliferation and advanced conventional weapons were growing. Nuckolls grew the Laboratory's collaborations and created new organizations in the nonproliferation, environmental, and energy areas.

Nuckolls was employed by Livermore in 1955 at age 24. A nuclear designer, he invented high efficiency fusion explosives, including laser fusion targets. In Livermore's new laser fusion program, (1970s) Nuckolls was the founding leader of X division, which designed fusion targets for LLNL lasers. Nuckolls was appointed leader of the Lab's Physics department in 1983. After serving as Director in the 1990s, UC appointed Nuckolls Director Emeritus.

In addition to his more than 45 years at Livermore, Nuckolls has also served as consultant to the Department of Defense, a member of the US Strategic Command Strategic Advisory Group, and adviser to the director of Central Intelligence. Since the 2000s, Nuckolls has focused on laser fusion, including the ultimate success of laser fusion energy.

He received his B.S. in physics in 1953 from Wheaton College in Illinois, and an M.A. in physics in 1955 from Columbia University. Nuckolls' contributions to national security and the development of fusion energy have been recognized by awards and citations, including the 1969 Ernest O. Lawrence Memorial Award presented by the Atomic Energy Commission, the Lifetime Achievement Award by Fusion Power Associates, the Secretary of Defense Medal for Outstanding Public Service and the Department of Energy Distinguished Associate Award. In 2018 he became the fourth recipient of the Laboratory's John S. Foster, Jr. Medal.

Nuckolls is a Fellow of the American Physical Society and American Association for Advancement of Science. He was awarded the APS James Clerk Maxwell Prize, and the American Nuclear Society Edward Teller Medal. Nuckolls is a member of the National Academy of Engineering.



Director John Nuckolls visits the Russian "Los Alamos" as part of a DOE Weapons Lab Directors meeting, circa 1992.



MICHAEL MAY

LLNL Director, 1965-1971

Dr. Michael May was the fifth director of Lawrence Livermore National Laboratory. While at LLNL, he held a variety of research and development positions and was a technical adviser to the

Threshold Test Ban Treaty negotiating team; a member of the U.S. delegation to the Strategic Arms Limitation Talks; and at various times has been a member of the Defense Science Board, the General Advisory Committee to the AEC, the Secretary of Energy Advisory Board, the RAND Corporation Board of Trustees, and the Committee on International Security and Arms Control of the National Academy of Sciences. He is a member of the International Institute on Strategic Studies, and a Fellow of the American Physical Society and the American Association for the Advancement of Science.

Recent work also includes a study of nuclear postures in several countries, an article on nuclear disarmament and one on tactical nuclear weapons; and a report with Kate Marvel for the American Academy of Arts and Sciences on possible transformations in the nuclear energy industry.

He is Professor Emeritus (Research) in the Stanford University School of Engineering and a senior fellow with Stanford's Freeman Spogli Institute for International Studies (FSI). He is the former co-director of FSI's Center for International Security and Cooperation. May received his B.A. in 1944 in physics/math from Whitman College in Washington. He served in the U.S. Army from 1944–46, and then briefly attended the University of Washington in Seattle before moving to the University of California at Berkeley, where he received his Ph.D. in physics in 1952.

May has received the Distinguished Public Service and Distinguished Civilian Service Medals from the Department of Defense, and the Ernest Orlando Lawrence Award from the Atomic Energy Commission, as well as other awards.



Director Mike May with California Governor Ronald Reagan during a visit to LLNL, circa 1967.



JOHN FOSTER

LLNL Director, 1961-1965

Dr. John S. “Johnny” Foster was the fourth director of Lawrence Livermore National Laboratory. At the Laboratory, Foster led team efforts that made a major breakthrough in nuclear weapon design

that is the basis for all modern U.S. nuclear weapons. He also led efforts to improve weapon safety and include security features in deployed nuclear weapons.

As director, Foster established a formal relationship with the intelligence community and formed Z Division at the Laboratory to analyze and understand the Soviet threat and develop innovative technologies for intelligence agencies. In addition, the Laboratory established a biomedical division, which cast attention on radiation damage at the cellular level and, over time, led to the Human Genome Project and development of DNA analysis systems for biosecurity and human health applications. Research programs also began on laser technologies for inertial confinement fusion.

Foster was later called to Washington, D.C., where he became Director of Defense Research and Engineering for the Department of Defense and served for eight years, under presidents Lyndon B. Johnson and Richard Nixon. In 1973, he left Washington to become a vice president of TRW, Inc.

He received his undergraduate degree from McGill University in Montreal and continued to earn his Ph.D. in physics from the University of California, Berkeley in 1952. Foster has won many awards for service to the nation, among them the E.O. Lawrence Award, the James Forrestal Memorial Award, three Department of Defense Distinguished Public Service Medals, the Founders Award from the National Academy of Engineering, the Enrico Fermi Award, the H. H. Arnold Award from the U.S. Air Force, and the Department of Defense Eugene G. Fubini Award.






In 2015, the John S. Foster, Jr. Medal was established to commemorate the exceptional and inspirational career of Johnny, who received the inaugural medal.



Director Johnny Foster pictured with summer students, circa 1961.

SCIENCE ON A MISSION

Lawrence Livermore National Laboratory has been at the forefront of science and technology for 70 years, with an outstanding workforce pursuing multidisciplinary research in the national interest. In 1952, the University of California's Radiation Lab chose an abandoned Navy airfield in Livermore for its "new ideas" laboratory, founded to pursue innovations in nuclear weapons science. In the ensuing seven decades, Livermore's scientists have made important breakthroughs, including:

-  In 1962, revolutionizing the nation's nuclear deterrent with a warhead design for the Polaris missile;
-  In the late 1970s, developing the technologies that led to the Human Genome Project and bringing it to completion with its sister laboratories in 2003;
-  In 1993, recognizing the importance of understanding climate and establishing a center for evaluating and comparing climate models;
-  In 2021, reaching the threshold of fusion ignition with the world's most energetic laser — building on decades of accomplishments by the Lab and collaborators; and
-  In 2022, preparing for arrival of the exascale supercomputer El Capitan — continuing the legacy of high-performance computing that started at the Lab with UNIVAC-1 in 1953.

Technologies developed at the Lab have been commercialized and put to wide use, from crash testing cars with computer simulations to rapid detection of pathogens. As LLNL succeeds, so does the United States: ongoing efforts at the Laboratory strengthen deterrence, increase preparedness to deal with future threats, and enhance climate and energy resilience. For nearly three-quarters of a century, LLNL has pushed the boundaries of what's possible, all in service to our nation.



**Lawrence Livermore
National Laboratory**
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INNOVATION MEETS IMPACT

Established in 2016, the Livermore Lab Foundation (LLF) is a 501(c)(3) independent nonprofit organization (Federal Tax ID# 81-2567763) created to advance scientific knowledge, support research initiatives and inspire the next generation of science and technology leaders at Lawrence Livermore National Laboratory. Founded by a group of Laboratory employees, with the support and assistance of the University of California, LLF is a strong external partner to the Lab, providing a pathway for private philanthropy and grants and engaging diverse audiences as they learn and leverage the Lab's well-known expertise for broader societal benefit.

To date, LLF has raised over \$3-million to support LLNL research initiatives in climate resiliency and neurodegenerative disease, as well as in STEM programs. The Foundation has served more than 2,000 students through fellowships, internships, and educational programs since its inception.

JOIN US IN MAKING THE IMPOSSIBLE POSSIBLE



Our **70 for 70 campaign** celebrates the **past, present, and future** of how LLNL has and will continue to provide 'science in the national interest.' As private philanthropists change the paradigm of how grand science challenges and national research initiatives are funded, it's more important than ever for LLNL to stay in that arena. The Livermore Lab Foundation allows individuals, foundations and other grant makers to pursue tax-deductible opportunities to celebrate science.

We invite you to join us in our journey. All donations are welcome and tax deductible. **Your contribution will support** the **STEM** workforce pipeline, as well as innovative **research** and **strategic science** initiatives.

Our goal today is to increase our partner community via **70 new donors**. We also welcome our existing donors to celebrate the Lab's remarkable anniversary. Together we can make an impact and continue 'making the impossible, possible.'

HISTORY IN THE MAKING



Lawrence Livermore
National Laboratory
1952 - 2022



Livermore Lab
FOUNDATION



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