

# SEVENTY YEARS OF INNOVATION



During Employee Engagement Day, staff members toured the supercomputer rooms within the Livermore Computing facility.

**T**he Livermore branch of the University of California Radiation Laboratory at Berkeley opened for operation on September 2, 1952. Co-founders Ernest O. Lawrence and Edward Teller; Livermore's first director, Herbert York; and a remarkable group of young scientists set out to be a "new ideas" laboratory. They were committed to pursuing innovative solutions to the nation's pressing needs to advance nuclear weapons science and technology.

## INNOVATION SINCE 1952

"Making the impossible possible" was the theme for the Laboratory's celebration of its 70<sup>th</sup> birthday. The outstanding efforts by a dedicated workforce have led to many remarkable accomplishments by creative individuals and multidisciplinary teams. Automated computing topped the list of needs identified by the forward-thinking founders, and a UNIVAC 1 computer was ordered even before the official opening of the "Rad Lab." Livermore has provided leadership in high-performance computing for scientific applications ever since. Innovative approaches to nuclear weapons design failed in the Laboratory's first nuclear test in 1953 but led to a strategic breakthrough later in the 1950s that made possible compact thermonuclear weapons for ballistic missiles. Other examples of the Laboratory's technological innovation that have made the impossible possible include rapid

## Celebrating the 70<sup>th</sup> year since the founding of LLNL and other notable anniversaries in 2022



Former Laboratory Directors and innovators (from left) John Nuckolls (laser fusion) and John S. Foster Jr. (compact nuclear weapons) converse at the Directors' Symposium.

flow cytometry needed to pursue the Human Genome Project, adaptive optics for the study of exoplanets from ground-based observatories, extreme ultraviolet lithography technologies that are

extending the long life of Moore's Law, and most recently, fusion ignition and burn in a laboratory setting.

In September 2022, the nine living Laboratory directors held a panel discussion attended by more than 200 staff members, former employees, community leaders, and other distinguished guests including DOE Under Secretary for Nuclear Security and NNSA Administrator Jill Hruby. The panelists reflected on past successes and discussed the importance of carrying forward the Laboratory's tradition of "making the impossible possible." Celebrating his 100<sup>th</sup> birthday that month, former director John "Johnny" Foster Jr. spoke of the characteristics that made Laboratory founder Ernest O. Lawrence great—his vision, persuasion skills, and leadership—all qualities LLNL will need to continue as a "big ideas" laboratory.

## FIFTIETH ANNIVERSARY OF THE LASER PROGRAM

In July 2022, LLNL's National Ignition Facility & Photon Science (NIF&PS) Principal Directorate celebrated the 50<sup>th</sup> anniversary of the Laser Program with a series of presentations about past successes, current challenges, and future opportunities. The formation of Y Division in July 1972 consolidated laser research at the Laboratory, which began with the inventions in 1960 of lasers and the concept of inertial confinement fusion. Featured speaker John Emmett, the first Y Division leader and later associate

director for Lasers, spoke about the early organizational and technical challenges. Emmett brought in laser experts to join the Laboratory and reached out to industrial partners to continually advance the state of the art. He challenged the audience, "The Laboratory is for big steps, and big risks, and accomplishing big things." NIF&PS presenters discussed breakthrough advances in laser and optics technologies and research activities that contributed to achieving fusion ignition in December.

## THREE DECADES OF EXPLOSIVE INNOVATION

In June 2022, LLNL's Energetic Materials Center (EMC) celebrated its 30<sup>th</sup> anniversary. Since its inception, EMC has brought together a multidisciplinary team of Laboratory researchers who are among the nation's leaders in understanding, synthesizing, formulating, testing, assessing, and modeling energetic materials. An NNSA-recognized center of excellence, EMC combines core scientific expertise, experiments at the High Explosives Applications Facility (HEAF)



and Site 300, and high-fidelity modeling and simulations. As the center's director said at the celebratory event, "EMC is ready and agile for whatever comes next."

Distinguished speakers at the event—attended by collaborators from partnering institutions, current and former Laboratory employees, and other invited guests—highlighted many past accomplishments and stressed the important contributions EMC is making today and in the future. The center is engaged in its greatest challenge yet in supporting the nation's strategic modernization programs (p. 6) and efforts to accelerate the adoption of new explosive materials and production capabilities within NNSA. EMC scientists also apply their expertise to develop solutions for the Department of Defense's conventional weapons and explore new ways to detect and defeat homemade and improvised explosive devices for homeland security and counterterrorism applications.

## CELEBRATING THE SEVENTIETH ANNIVERSARY

"Making the impossible possible" was celebrated on October 11, 2022, with the Laboratory's first-ever Employee Engagement Day. More than 5,000 employees participated in the event, with dozens of the Laboratory's facilities and programs opening their doors for employees to get a close-up look at Livermore's cutting-edge science and technology. In the (presumed) wake of the COVID-19 pandemic, it was the largest gathering of Laboratory staff in years and an excellent opportunity for the many new Livermore employees to discover the breadth of ongoing on-site activities. More than 20 facilities were open for

tours—including the NIF, HEAF, and Livermore Computing's largest machine room. Exhibits and demonstrations were presented by more than a dozen other programs and operational support areas.

Activities paused at noontime for a grand BBQ lunch, which included a keynote address by the Laboratory Director and provided opportunities for staff to meet and greet her and other members of the senior management team. Director Budil, who engaged with employees throughout the day, concluded her keynote address, "I hope you've learned something new, I hope you've been somewhere you've never been before, and I hope you've met many new people."



Experimental capabilities to create advanced materials were on display during Employee Engagement Day.