Edison

NeRSC **40** YEARS at the FOREFRONT 1974-2014

2014 CALENDAR

NERSC: 40 YEARS AT THE FOREFRONT

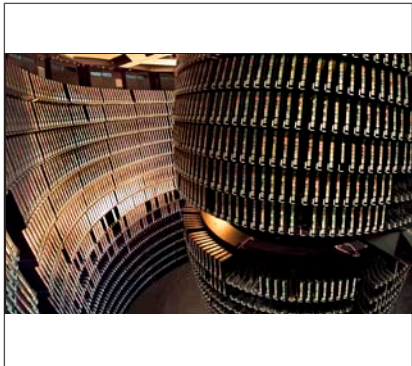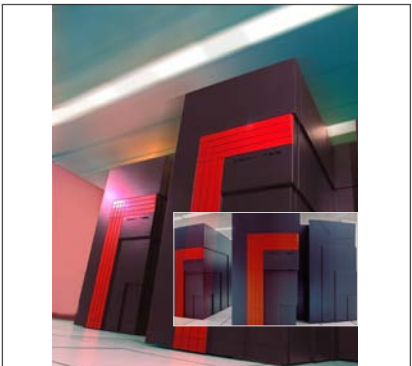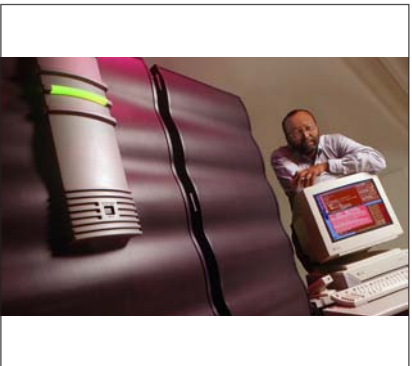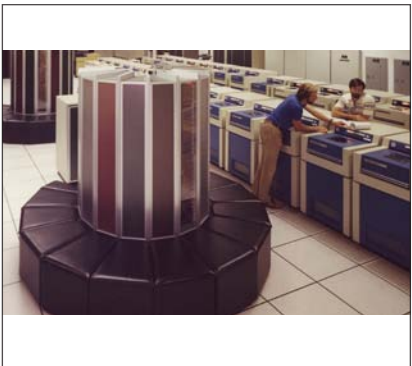In 1974, an almost-obsolete supercomputer once used for defense research was made available to support the fusion energy research community, the first time such a powerful computing resource was used for unclassified scientific computing. That start as the Controlled Thermonuclear Research Computer Center marked the launch of what today is known as the National Energy Research Scientific Computing Center at Lawrence Berkeley National Laboratory (Berkeley Lab).

Located at Lawrence Livermore National Laboratory from 1974-96, the center was renamed the National Magnetic Fusion Energy Computing Center (NMFECC) in 1976, and in 1983 it began providing a fraction of its computing cycles to other research areas. To reflect its increasingly broad scientific mission, the center was christened the National Energy Research Supercomputer Center in 1990. The center moved to Berkeley Lab in 1996 and, while keeping the acronym NERSC, was renamed the National Energy Research Scientific Computing Center.

Through the years, NERSC's mission has remained consistent: to accelerate the pace of scientific discovery by providing high-performance computing, information, data, and communications services to the DOE Office of Science community. NERSC supports large-scale, state-of-the-art computing, storage, and networking for unclassified research programs in high-energy physics, biological and environmental sciences, basic energy sciences, nuclear physics, fusion energy sciences, mathematics, and computational and computer science.

NERSC currently serves more than 4,700 users from universities, national laboratories, and industry worldwide, supporting one of the largest and most diverse research communities of any computing facility. Over its 40-year history, the facility and its staff have developed an outstanding reputation for providing both high-end computing systems and comprehensive scientific client services.

Here's to another 40 years at the forefront!
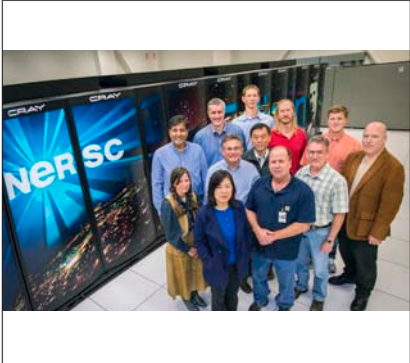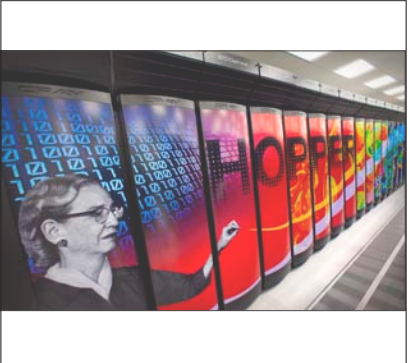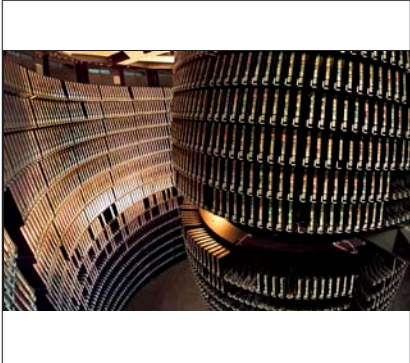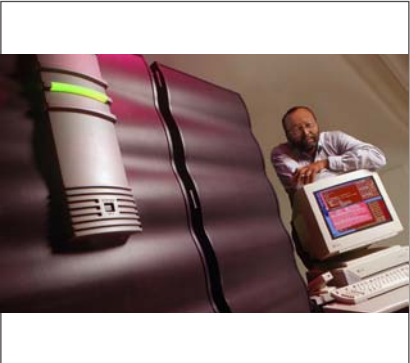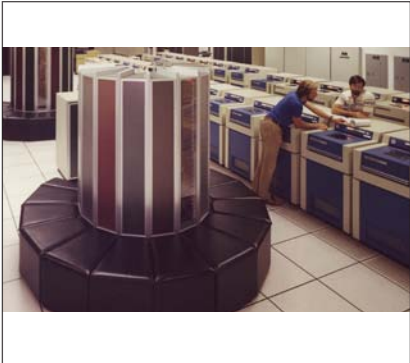
Moon phases (based on Universal Time):
- ● = New Moon
- ◐ = First Quarter
- ○ = Full Moon
- ◑ = Last Quarter

The Controlled Thermonuclear Research Computer Center — now known as NERSC — was established in 1974 and unveiled its first supercomputer that same year: a Control Data Corporation 6600 "borrowed" from the weapons program at Lawrence Livermore National Laboratory. The CDC 6600 is generally considered to be the world's first supercomputer and was the first supercomputer designed by Seymour Cray. It sold for $8 million when introduced — about $60 million in today's money.

JANUARY 2014

S	M	T	W	Th	F	S
			● 1 New Year's Day	2	3	4
5	6	7 ☽	8	9	10	11
12	13	14	15 ○	16	17 Benjamin Franklin's Birthday (1706)	18
19	20 Martin Luther King Jr. Day	21	22	23 ☾	24	25
26	27	28	29 ●	30	31	

A Cray XT4 installed at NERSC in 2007 and retired in 2012 was dubbed "Franklin" in honor of the pioneering scientist Benjamin Franklin.

NeRSC 40 YEARS at the FOREFRONT 1974-2014

In 1975, a CDC 7600 replaced the CDC 6600 at NERSC (still known then as the Controlled Thermonuclear Research Computer Center). The 7600 was about 10 times as fast as the CDC 6600 and was capable of performing up to 36 million mathematical operations per second (or 36 megaflop/s). It featured 65 KB of semiconductor memory and 512 KB of magnetic core memory.

FEBRUARY 2014

S	M	T	W	Th	F	S
						1
2 Groundhog Day	3	4	5 ◗ Horst Simon Is Hired as the Third NERSC Director (1996)	6	7	8
9	10	11 Thomas Edison's Birthday (1847)	12 Lincoln's Birthday	13 ○	14 Valentine's Day	15
16	17 Presidents' Day	18	19	20	21 ◗	22 Washington's Birthday
23	24	25	26	27	28	

In August 2013, NERSC unveiled its newest petaflop/s machine, "Edison," named after U.S. inventor and businessman Thomas Alva Edison.

NERSC acquired a Cray-1 in 1978 and converted the 7600 operating system, utilities, and libraries to the new machine, creating the Cray Time Sharing System (CTSS). The Cray-1, which cost about $8 million ($25 million in today's money), boasted 1 megabyte of memory and was featured in the 1982 Disney movie "Tron."
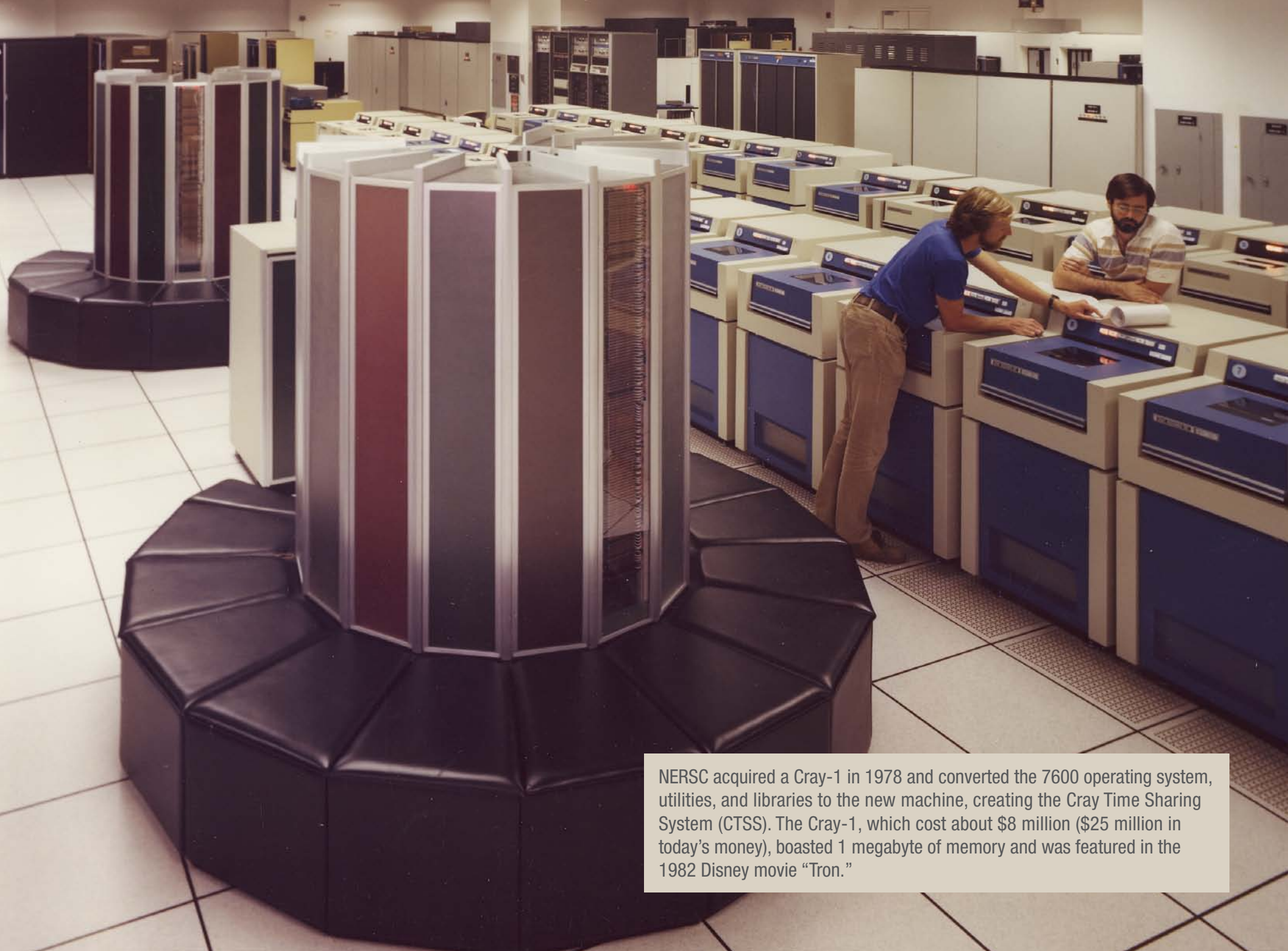
MARCH 2014

S	M	T	W	Th	F	S
						● 1
2	3	4 John Killeen Is Named First Director of the CTRCC (1974)	5	6	7 ◖	8
9	10	11	12	13	14	15
○ 16	17	18	19	20 First Day of Spring	21	22
23 ◗	24	25	26	27	28 Cesar Chavez Day	29
● 30	31					

NERSC 40 YEARS at the FOREFRONT 1974-2014

NMFE COMPUTER CENTER
CRAY-2

The world's first Cray-2 was installed at NERSC – then known as the National Magnetic Fusion Energy Computer Center – in 1985. The computer, which earned the nickname "Bubbles" thanks to the heat exchanger water tank that came with the liquid cooling system, was considered the fastest computer in the world at the time. For comparison, Linpack tests conducted in 2011 showed that the iPad 2 could rival a four-processor version of the Cray-2 in terms of processing speed.

APRIL 2014

S	M	T	W	Th	F	S
		1	2	3	4	5
		April Fools' Day				
6	7	8	9	10	11	12
Cray Research Founded (1972)						
13	14	15	16	17	18	19
						Glenn Seaborg's Birthday (1912)
20	21	22	23	24	25	26
		First Cray-1 Ships to NMFECC				
27	28	29	30			

In 1999 NERSC installed an IBM RS/6000 SP supercomputer and named it "Seaborg" in honor of Berkeley Lab Nobel Laureate Glenn Seaborg.

NERSC 40 YEARS at the FOREFRONT 1974-2014

With its user base growing steadily, NERSC installed Cray's newest super-computer, the Y-MP C90, in 1992. It was the first C90 to be installed in the United States at a nonclassified research site. The C90 featured a central processor with sustained performance of 1 gigaflop/s. A Y-MP even shared a scene with Robert Redford and Ben Kingsley in the 1992 movie "Sneakers."

40 YEARS at the FOREFRONT 1974-2014

MAY 2014

S	M	T	W	Th	F	S
				1	2	3
4	5 Cinco De Mayo	6 ◐	7	8	9	10
11 Mother's Day	12	13 ○	14	15	16	17
18	19	20 ◑	21	22	23	24 Oakland Scientific Facility Dedication (2001)
25	26 Memorial Day	27 ●	28	29	30	31

NERSC

The Cray J90 series (code-named "Jedi" during development) was an air-cooled vector processor supercomputer first sold by Cray in 1994. NERSC installed its first J90 in 1996 at its future location at Berkeley Lab. The systems were up and running before the NERSC supercomputers at LLNL were shut down for the move, giving NERSC users uninterrupted access to HPC. By 1997, there were four systems in NERSC's Cray J90se cluster: Killeen, Watson, Krick, and Bhaskara.

JUNE 2014

S	M	T	W	Th	F	S
1	2	3	4 ◗	5	6	7
8	9	10	11	12 ○	13	14
15	16	17	18 ◗	19	20	21
Father's Day						First Day of Summer
22	23	24	25	26 ●	27	28
29	30					

In June 1983, the MFECC began allocating 5 percent of its computing time to other disciplines under DOE's Supercomputer Access Program. The time was immediately filled, as the number of hours requested exceeded those available by an order of magnitude.

NERSC **40** YEARS at the FOREFRONT 1974-2014

In July 1997, NERSC became the proud owner of a 512-processor Cray T3E-900 supercomputer, which offered 1.5 terabytes of disk storage, a read/write capability of 800 megabytes per second, and 128 gigabytes of memory. Named "MCurie," NERSC's T3E-900 was ranked No. 5 on the November 1997 TOP500 list of the most powerful computers in the world. One year later, a joint scientific team from NERSC, Oak Ridge National Laboratory, Pittsburgh Supercomputing Center, and the University of Bristol leveraged their work on NERSC's T3E and achieved the first sustained teraflop/s performance of a science application using a T3E-900 in the Cray factory.

JULY 2014

S	M	T	W	Th	F	S
		1	2	3	4 ◑	5
					Independence Day	
6	7	8	9	10	11 ○	12
		Control Data Corporation Founded (1957)				
13	14	15	16	17	18 ◗	19
20	21	22	23	24	25 ●	26
		C. William McCurdy Takes Over as NERSC's Second Director (1991)				
27	28	29	30	31		

In July 1974, researchers began using computing resources at the Controlled Thermonuclear Research Computer Center — now known as NERSC — for the first time.

NERSC 40 YEARS at the FOREFRONT 1974-2014

In 1999, NERSC installed an IBM RS/6000 SP supercomputer as its flagship system and named it "Seaborg" in honor of Berkeley Lab Nobel Laureate Glenn Seaborg. Over the years, the system expanded to 6,656 processors. At its peak it performed about 10 trillion calculations per second, or 10 teraflop/s. Seaborg was decommissioned in 2007 after providing 25 million CPU hours to users, which resulted in some 7,000 published scientific results.

AUGUST 2014

S	M	T	W	Th	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
					Sudip Dosanjh Named Fifth Director of NERSC (2012)	
24 ●	25	26	27	28	29	30
31						

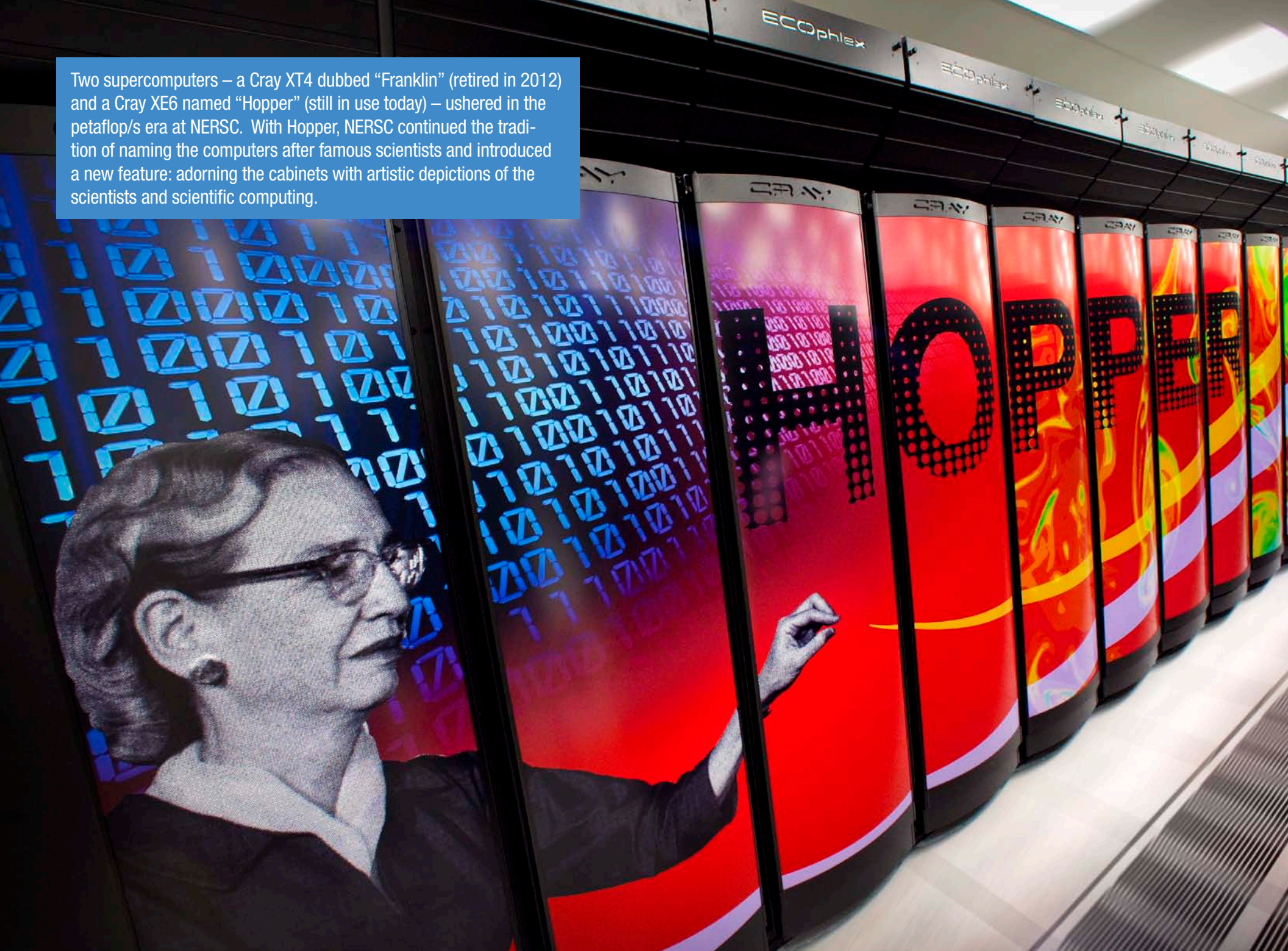NERSC 40 YEARS at the FOREFRONT 1974-2014

The High Performance Storage System has been used at NERSC for archival storage since 1998. Although the hardware has changed over the years, the system's hierarchical storage management software – developed through a collaboration of DOE labs and NERSC in conjunction with IBM – remains. The software enables all user data to be ingested onto high-performance disk arrays and automatically migrated to a large enterprise tape subsystem for long-term storage.

SEPTEMBER 2014

S	M	T	W	Th	F	S
		1 ◖	2	3	4	5	6
		Labor Day				
7	8 ○	9	10	11	12	13
14	15 ◗	16	17	18	19	20
21	22	23 ●	24	25	26	27
		First Day of Autumn				
28	29	30				
Seymour Cray's Birthday (1925)						

NERSC 40 YEARS at the FOREFRONT 1974-2014

Two supercomputers – a Cray XT4 dubbed "Franklin" (retired in 2012) and a Cray XE6 named "Hopper" (still in use today) – ushered in the petaflop/s era at NERSC. With Hopper, NERSC continued the tradition of naming the computers after famous scientists and introduced a new feature: adorning the cabinets with artistic depictions of the scientists and scientific computing.

OCTOBER 2014

S	M	T	W	Th	F	S
			◐ 1	2	3	4
5	6	7 ○	8	9	10	11
12	13 Columbus Day	14 ◑	15	16	17	18
19	20	21	22 ● NERSC Facility at Berkeley Lab Dedicated (1996)	23	24	25
26	27	28	29 Kathy Yelick Named Fourth Director of NERSC (2007)	30 ◐	31 Halloween	

NERSC **40** YEARS at the FOREFRONT 1974-2014

In August 2013, NERSC installed its newest petaflop/s machine: "Edison," a Cray XC30 with a peak performance of 2.39 petaflop/s, 124,800 compute cores, 332 terabytes of memory, and 6.4 petabytes of disk. Edison and the rest of NERSC's supercomputers now support more than 4,700 users worldwide each year.

NOVEMBER 2014

S	M	T	W	Th	F	S
						1
2 Daylight Savings Time Ends	3	4 Election Day	5 ○	6	7 Marie Curie's Birthday (1867)	8
9	10	11 Veterans Day	12	13 ◗	14	15
16	17	18	19	20	21 ●	22
23	24	25	26	27 Thanksgiving Day	28 ◖	29
30						

In 1997, NERSC named its new Cray T3E-900 supercomputer "MCurie" in honor of Marie Curie, the Polish-born French physicist who was the first woman to win a Nobel Prize.

NERSC **40** YEARS at the FOREFRONT 1974-2014

In November 2000, NERSC's computing and storage systems moved from Berkeley Lab's main site to the Oakland Scientific Facility in downtown Oakland. In early 2015, the center will relocate back to "the Hill" to the new Computational Research and Theory facility, which will also house the Computational Research Division and the Scientific Networking Division.

DECEMBER 2014

S	M	T	W	Th	F	S
	1	2	3	4	5 ○	6
7 Pearl Harbor Remembrance Day	8	9 Grace Hopper's Birthday (1906)	10	11	12	13
◗ 14	15	16	17	18	19	20
21 ● First Day of Winter	22	23	24 Christmas Eve	25 Christmas	26	27
◖ 28	29	30	31 New Year's Eve			

"Hopper," a Cray XE6 installed at NERSC in 2010, is named in honor of Grace Hopper, a pioneer in the field of software development and programming languages.

NERSC **40** YEARS at the FOREFRONT 1974-2014