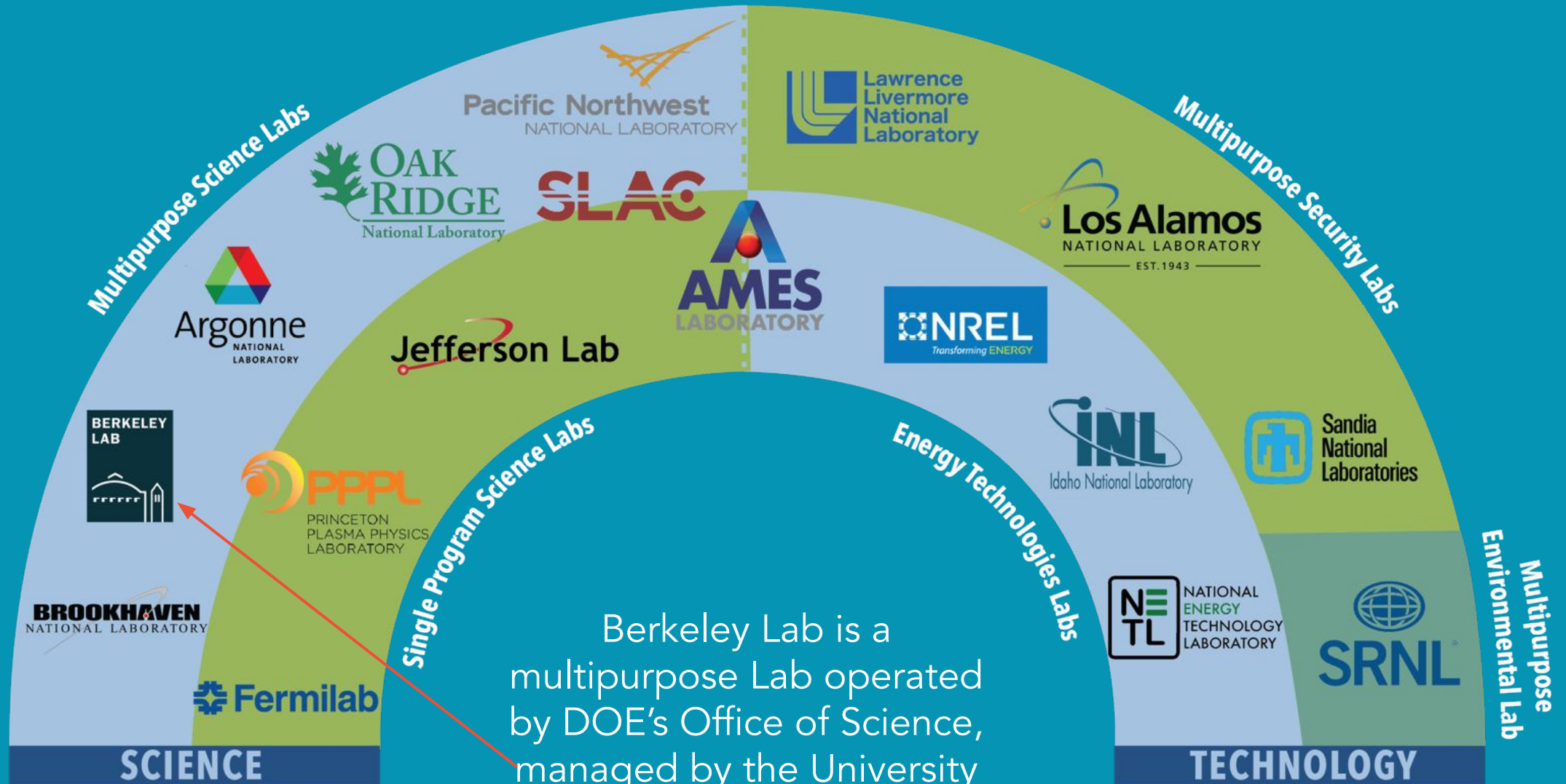


Welcome to Berkeley Lab



Aug. 7, 2023

The Department of Energy National Labs



Radiation
Lab staff on
the magnet
yoke for the
60-inch
cyclotron,
1939, with:

E. O.
Lawrence

Edwin
McMillan

Luis Alvarez

J. Robert
Oppenheimer

Robert R.
Went



Lawrence's Successful Legacy of Team Science

Why the Nation Needs Berkeley Lab

- Scientific solutions addressing national priorities: energy, health, resilience, the environment, and the economy
- Discovery science
- Unique scientific capabilities and facilities
 - National user facilities
 - Advanced instrumentation
- Managed, large research teams
- Important technologies with long, risky R&D paths
- Response to national emergencies
- A diverse group of highly trained, creative individuals committed to working together in teams on these grand national challenges

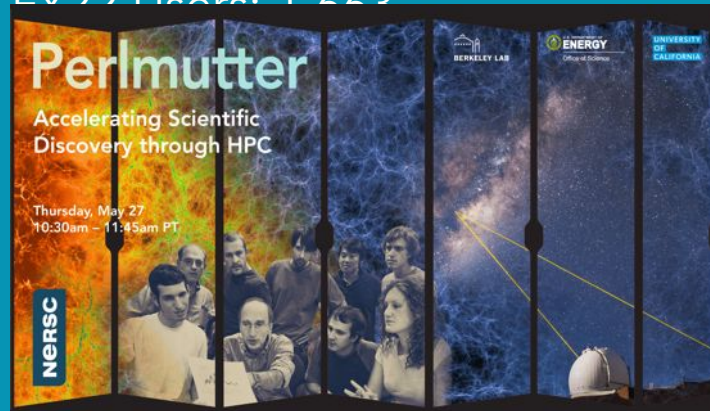


User Facilities Benefit Provide Tools and Expertise to More Than 14,000 Researchers



Bright x-ray beams and leading instruments for chemistry, materials, biology, and more.

FY22 Users: 1,442



HPC for all DOE science: simulation, data analytics, and machine learning.

FY22 Users: 9,793

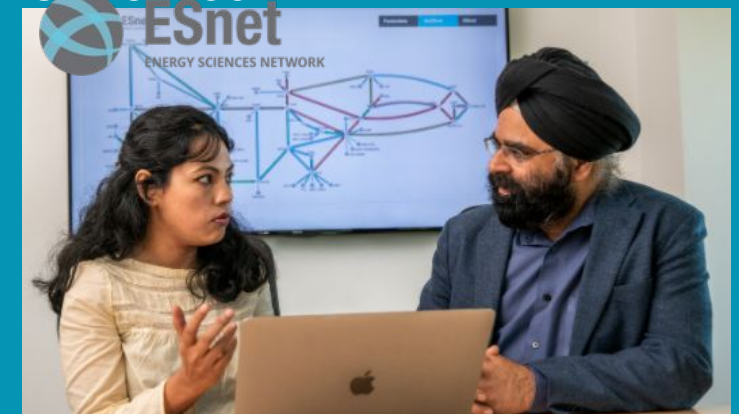


Integrative and collaborative genome science. FY22 Users: 2,243



Expertise and instruments for nanoscale science, QIS, and electron microscopy. FY22

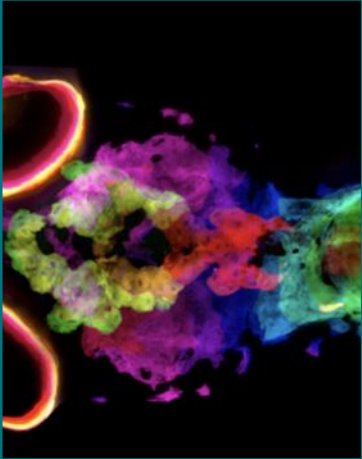
Users: 968



The leading research network connecting DOE labs and experiments.

Strategic Priorities to Shape the Future of the Laboratory

CHEMISTRY and
MATERIALS
SCIENCE
with the ALS
and Molecular



COMPUTING
SCIENCES
ENABLING
SCIENTIFIC
DISCOVERY

NEW
CAPABILITIES
in BIOLOGICAL
and
ENVIRONMENT



DISCOVERY
SCIENCE in
FUNDAMENTAL
PHYSICS

ATTRACT,
RECRUIT and
RETAIN THE
DIVERSE
WORKFORCE
OF THE FUTURE

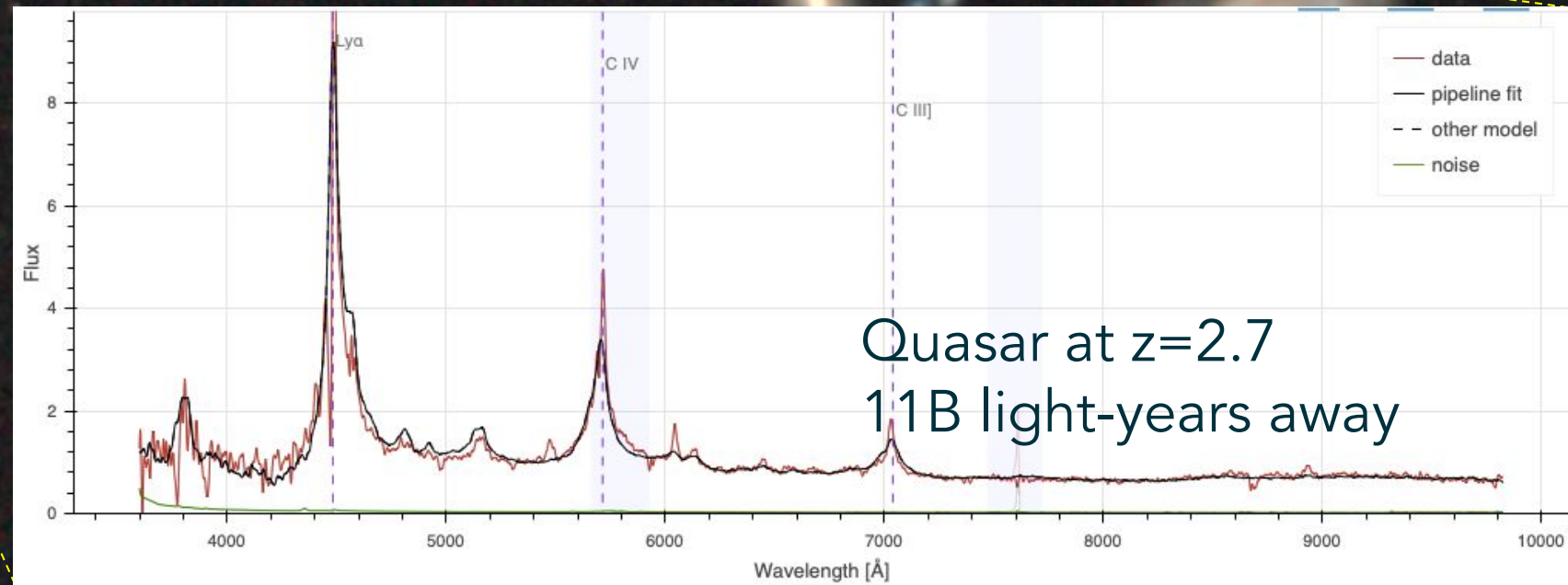


INFRASTRUCTURE
RENEWAL



ACCELERATING DECARBONIZATION: A strategic priority that draws on all of the capabilities across the Laboratory

DESI is well along in assembling a 3D map
from 40M galaxies and quasars out to 12 billion light-years



DARK ENERGY
SPECTROSCOPIC
INSTRUMENT

U.S. Department of Energy Office of Science

Discovery of a Giant Bacteria

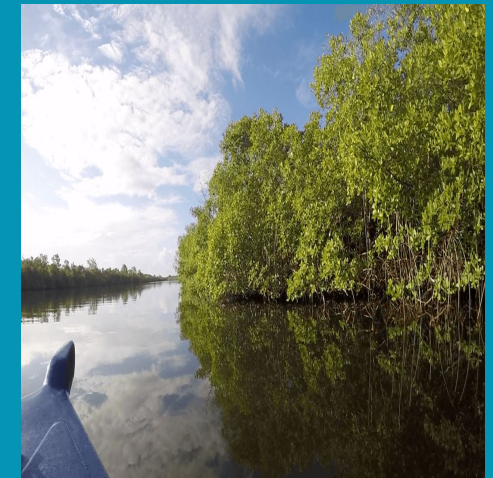
Challenges the current paradigm of what constitutes a bacterial cell and advances microbial research

Ca. *Thiomargarita magnifica*

...a prokaryote that oxidizes sulfur and fixes carbon

5,000 times bigger than most bacteria...like a human encountering another human as tall as Mount Everest
Contains three times more genes than most bacteria

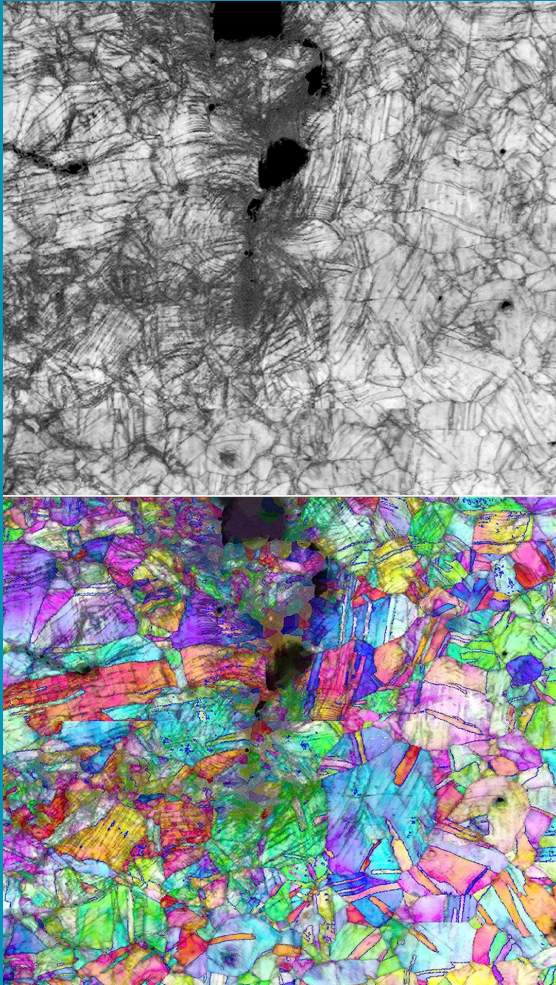
Hundreds of thousands of genome copies are spread throughout the entire cell.



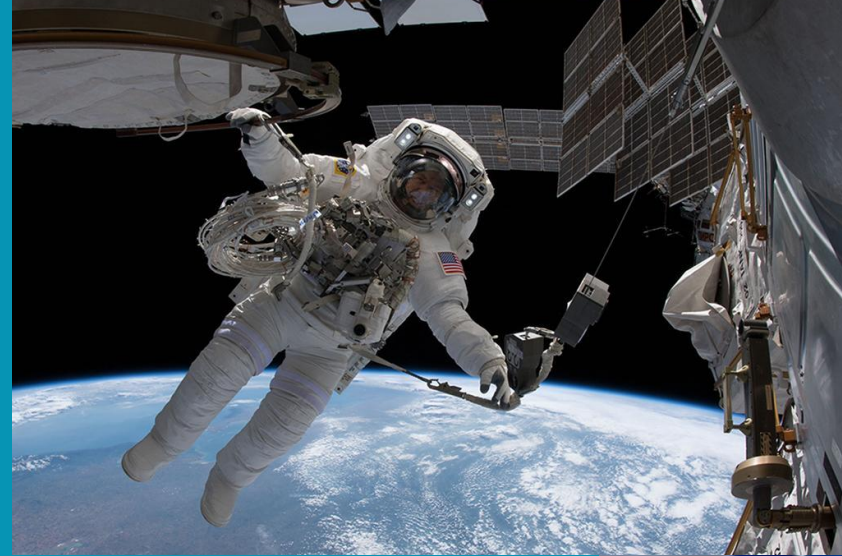
Views of the sampling sites amidst the mangroves in Guadeloupe. (Credit: Olivier Gros)

Discovery of the Toughest Material: A metallic alloy of chromium, cobalt, and nickel (CrCoNi)

Displays outstanding damage tolerance, especially at cryogenic temperatures



Important for fields such as space exploration and a range of cryogenic



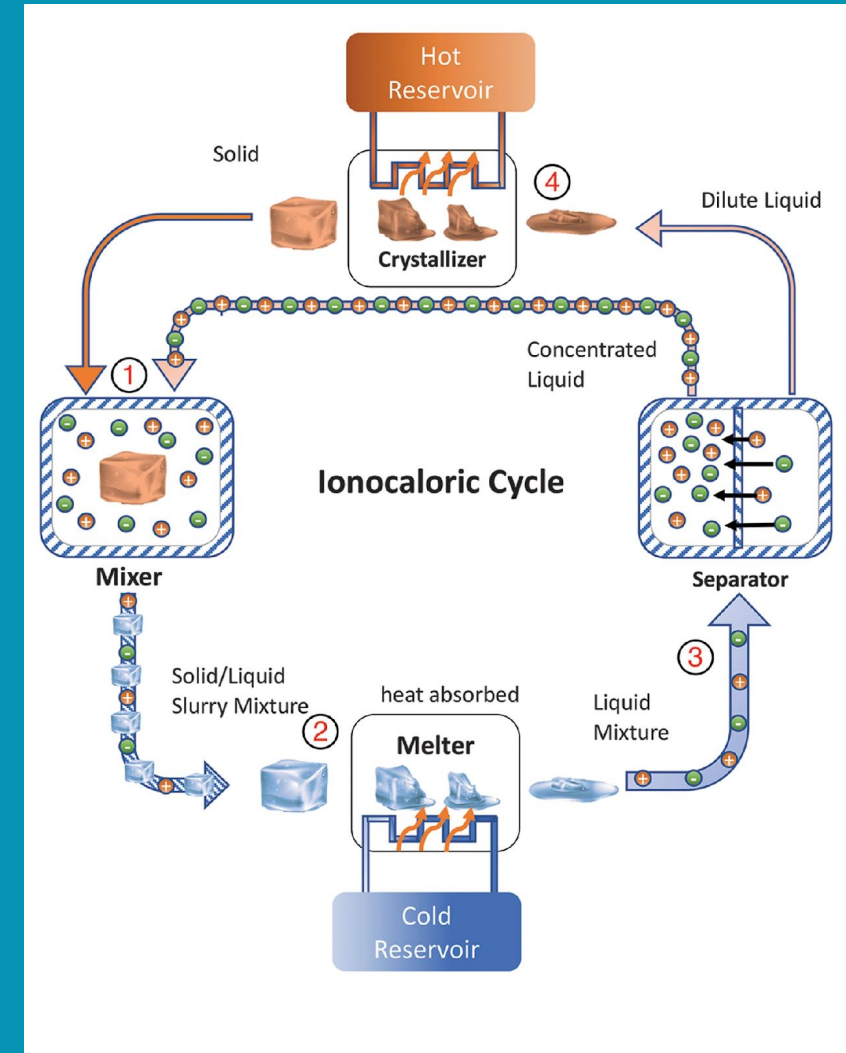
Berkeley Lab Scientists Develop a Cool New Method of Refrigeration

Developing high-efficiency cooling with safe, low-global warming potential refrigerants is a grand challenge for tackling climate change.

LBNL demonstrated the viability of a practical system using an ionocaloric Stirling refrigeration cycle.



Ions in solution can be used to control the melting and crystallization of a material, creating an ionocaloric cycle which could drive refrigeration that is competitive with other caloric cooling strategies.



Thank You

