

Lawrence Berkeley National Lab

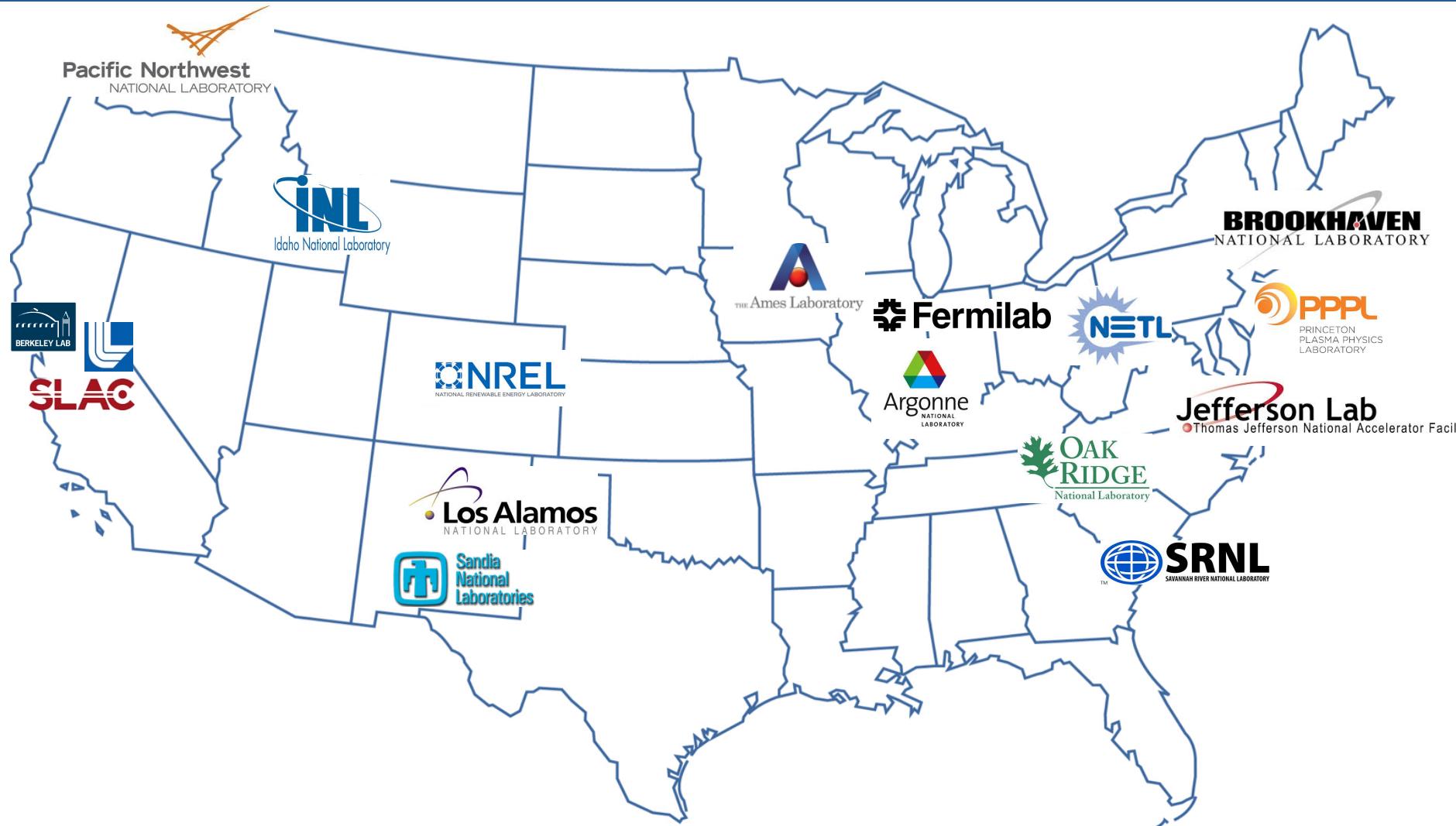
Presentation to the:

Secretary of Energy Advisory Board

Paul Alivisatos, Laboratory Director

January 26, 2016

DOE Accomplishes its Mission through its National Lab Network



LBNL is an integral part of the DOE-SC National Lab Network. We are the most open, sharing and connected.

UNIVERSITY
OF
CALIFORNIA



Most productive
integration with a
major research
university

253

JOINT
FACULTY

500

POST
DOCS

318

GRAD
STUDENTS

132

UNDERGRAD
STUDENTS

Berkeley Lab hosts 10,000 users per year –
1/3 of DOE total



NERSC
5,608 users



**The Advanced
Light Source**
2,443 users



**The Joint Genome
Institute**
1,000 users



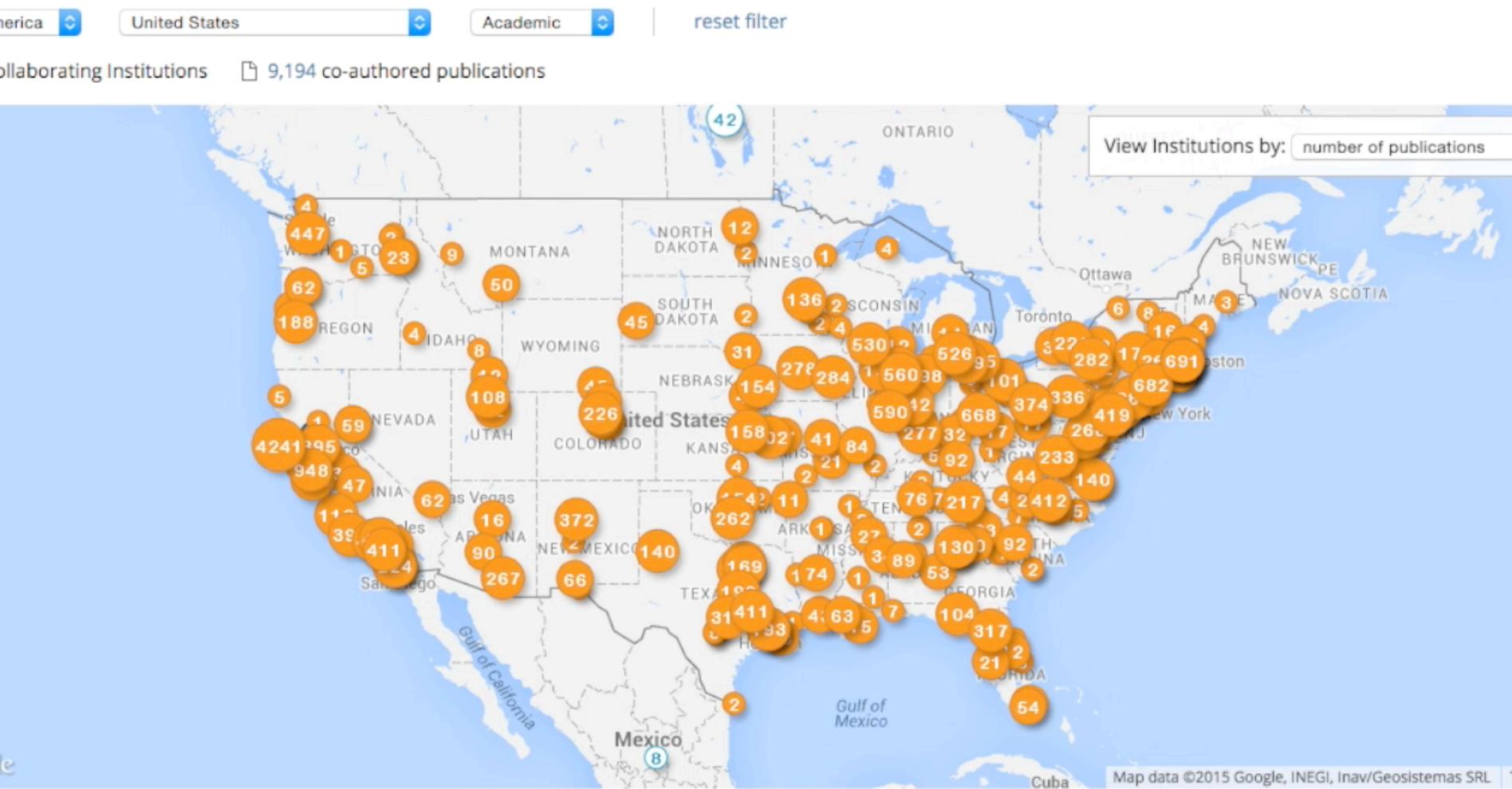
Energy Sciences Network
240 Petabytes/yr.



The Molecular Foundry
616 users

Berkeley Lab's Public-Spirited Approach: Open, Sharing, Connected, Networked

Institutions collaborating with Lawrence Berkeley National Laboratory

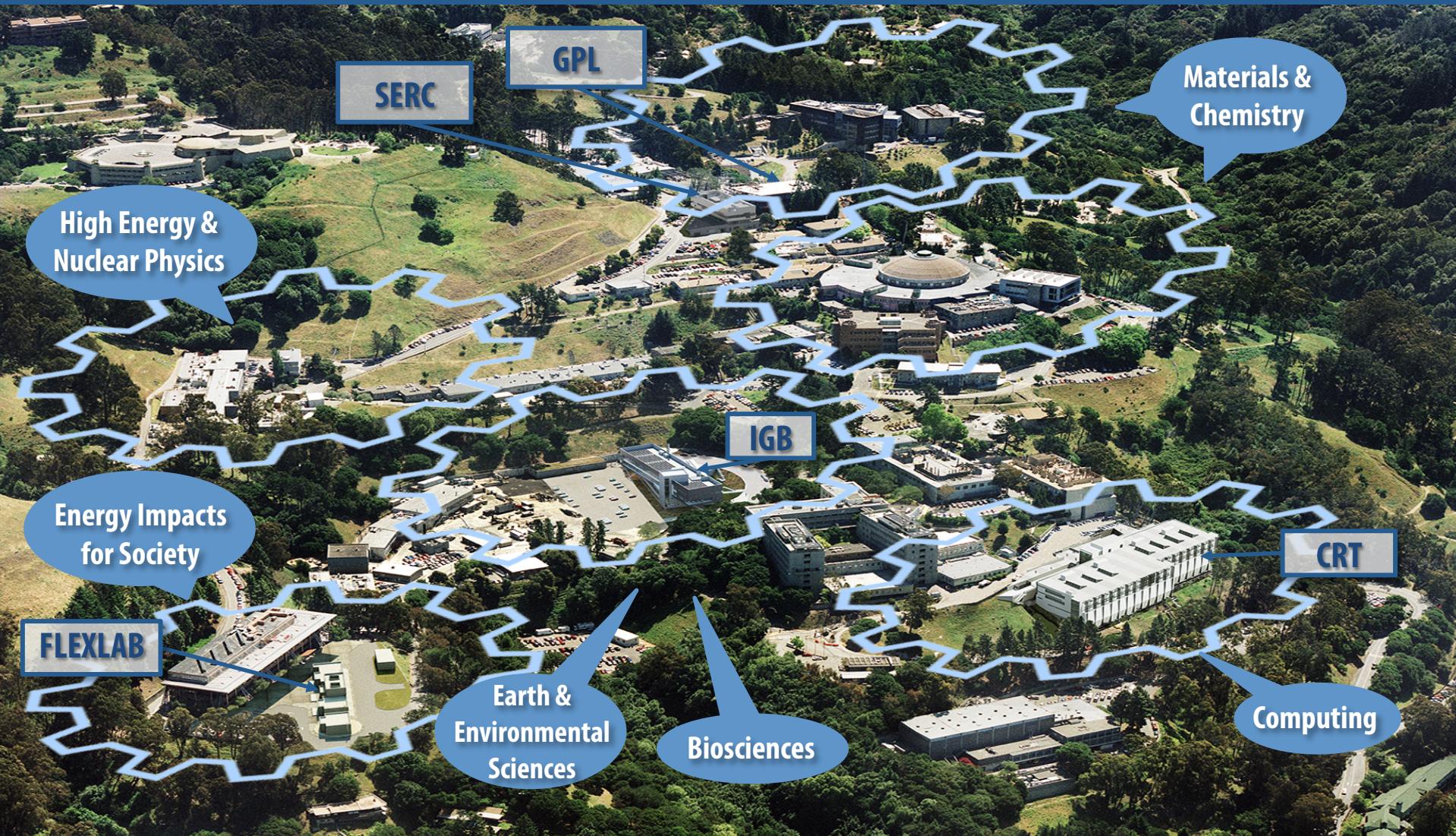


A model for how a national lab can connect DOE's basic and applied programs to society



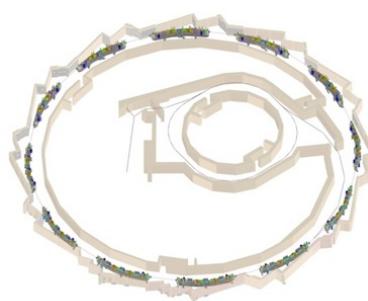
Berkeley Lab is pioneering creative ways to break down silos and move technology to the marketplace

Interlocking & Re-enforcing Facilities & Programs

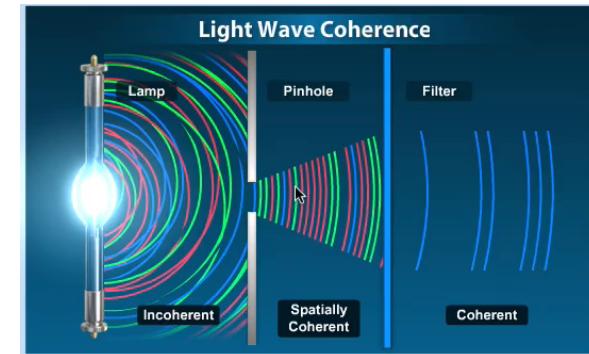
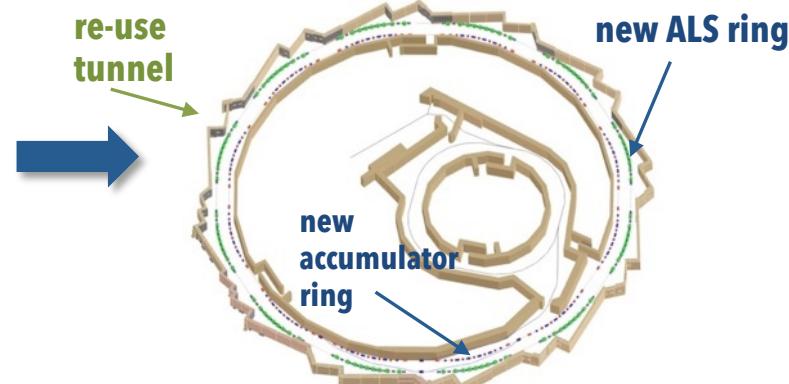


Coherence will revolutionize the Light Source Network: ALS-U and (Soft) X-Ray Science

ALS 2015: World class
soft x-ray science



ALS-U 2020s: A new era
of SXR leadership



Diffraction Limit and Spatial
Coherence Enabled by ALS-U

DESIGNING THE WORLD'S BEST SOFT X-RAY SYNCHROTRON

- New multi-bend achromat lattice
- Cost effective upgrade
- Fully coherent beam
- Opportunities: novel undulators

NEW SOFT X-RAY SCIENCE

- Chemical, electronic and functional mapping with \sim nm resolution in four dimensions
- Dramatic expansion of accessible time scales, from picoseconds to minutes
- Interferometry in the X-ray regime

A Plan for Berkeley Lab to Effectively Contribute Over the Coming Decades



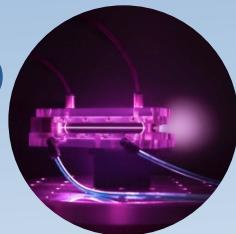
Biocampus

The world's leading center for study of how biology and the environment interact



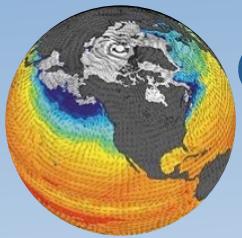
Cosmology @ Berkeley

Experiments in Dark Energy and Dark Matter, and a Cosmic Frontier Data Facility help to understand the Universe



Exascale Computing

Thousandfold expansion of computing capability will transform fields of science



Future Accelerators

Berkeley Lab leads in creating ultra compact accelerators and advanced magnets



Advanced Light Source Upgrade

The world's leading soft X-ray light source will provide qualitatively new ways of seeing in the energy world



Berkeley Lab as Catalyst

for energy innovation ecosystem, market translation for entrepreneurial energy technologies



Thank You