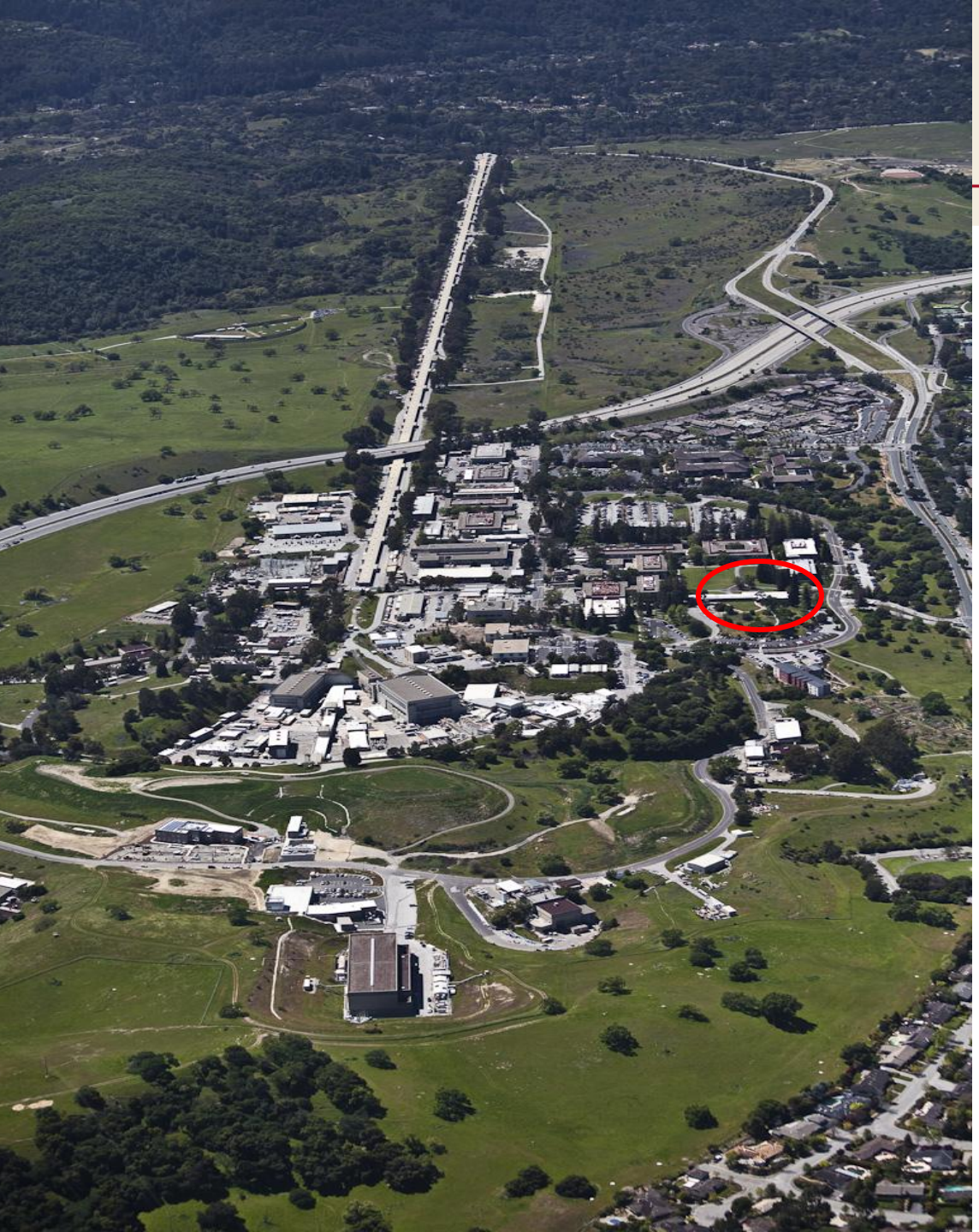
XLDB CONFERENCE WELCOME

James Williams – September 11, 2012

U.S. DEPARTMENT OF ENERGY
Office of Science

SLAC NATIONAL ACCELERATOR LABORATORY

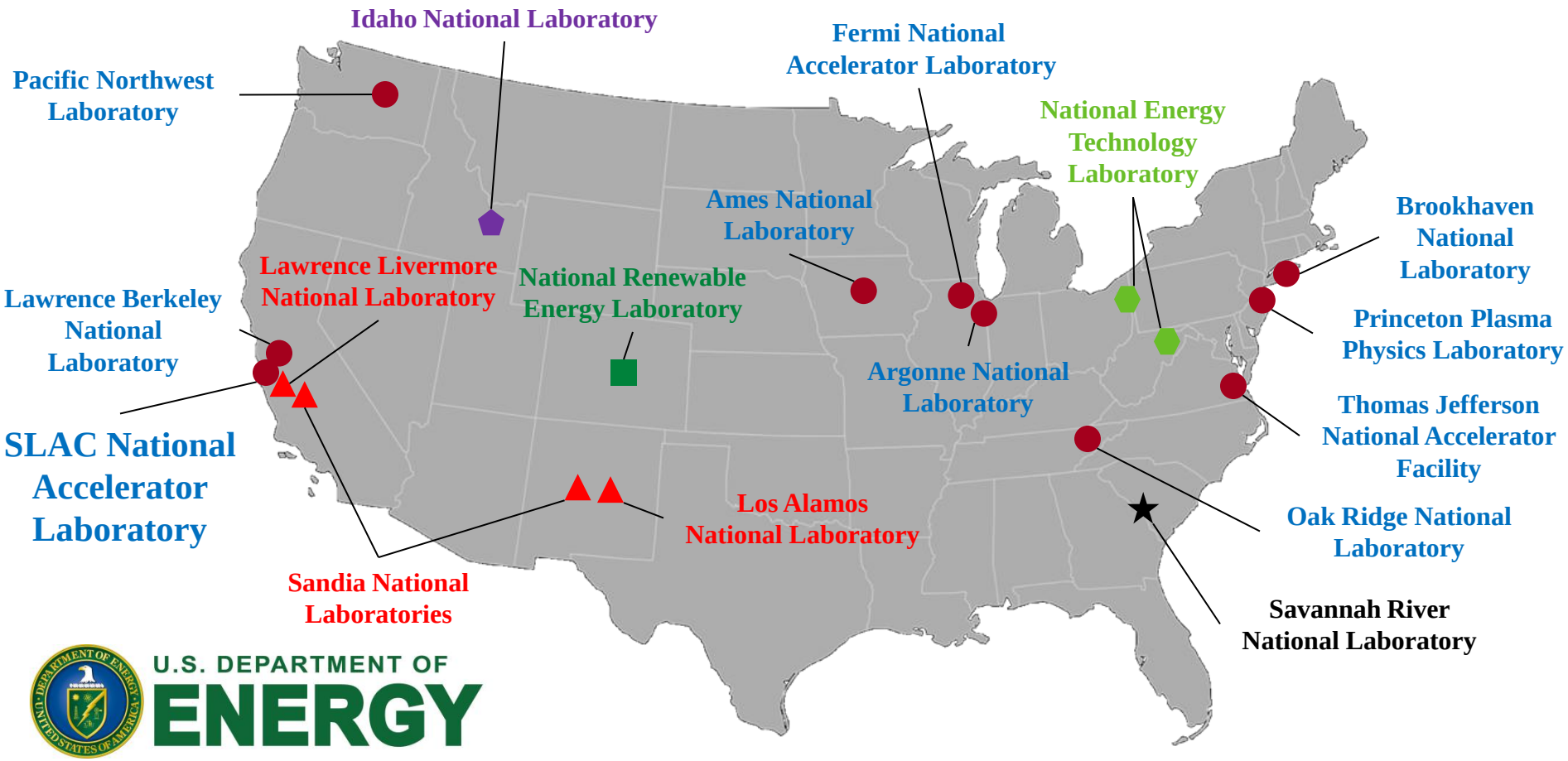
50 SLAC



Welcome!

LINAC: Linear Accelerator
It has driven SLAC
science for 50 years

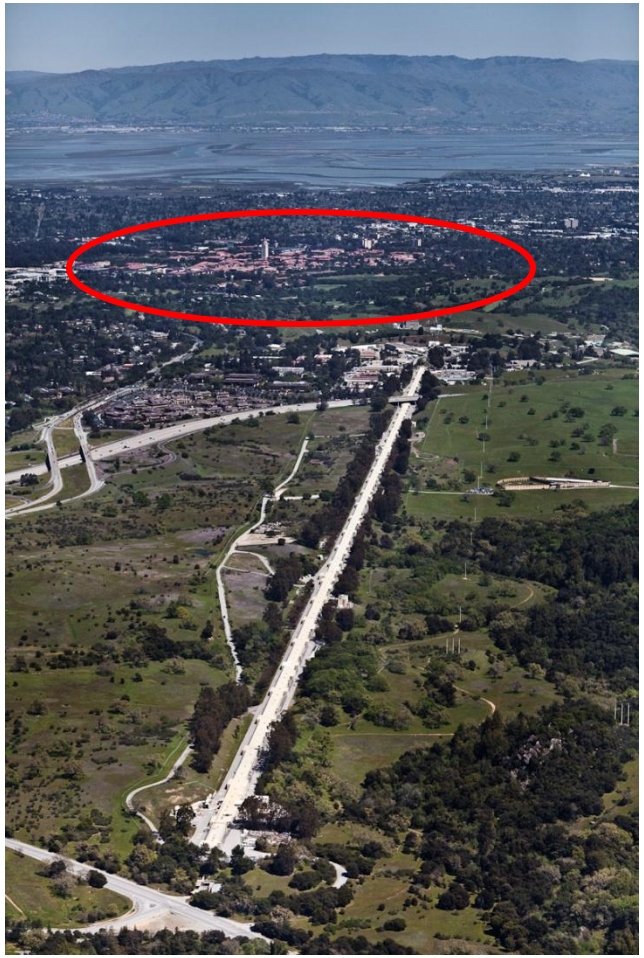
Department of Energy
Office of Science
National Laboratories



U.S. DEPARTMENT OF ENERGY

- ▲ National Nuclear Security Administration Lab
- ■ Office of Energy Efficiency and Renewable Energy Lab
- ★ Office of Environmental Management Lab
- ⬢ Office of Fossil Energy Lab
- ⬟ Office of Nuclear Energy, Science and Technology Lab
- ● Office of Science Lab

Stanford University



DOE pays Stanford $1 per year to lease 426 acres of land

240 Universities worldwide use our resources

1,600 Employees from 36 Countries

-205 Postdocs and Grad Students ; 3,100 Facility Users & Visiting Scientists

142 Buildings

1,000 Scientific Papers published each year in peer-reviewed journals

6 Scientists awarded the Nobel Prize for work done at SLAC

1st North American Website

$400,000,000 Budget (10% of this goes for energy consumption)

SLAC NATIONAL ACCELERATOR LABORATORY

Jan 26, 2012

Nobel Prizes

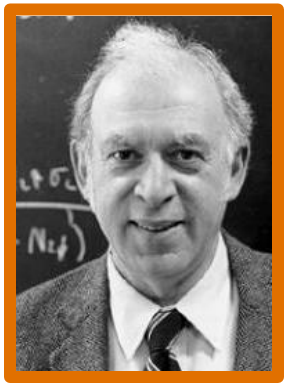
Burton Richter

Samuel C.C. Ting

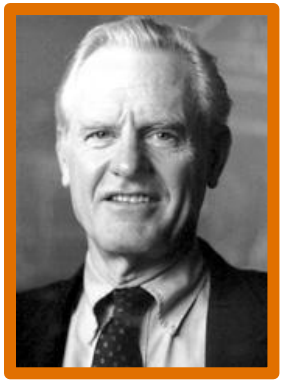
Physics, 1976

Pioneering experimental contributions to lepton physics.

Richard E. Taylor



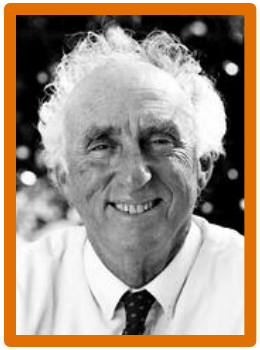
Jerome I. Friedman



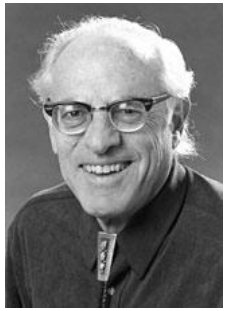
Henry W. Kendall

Physics, 1990

Deep inelastic scattering of electrons on protons and bound neutrons Essential for the development of the quark model



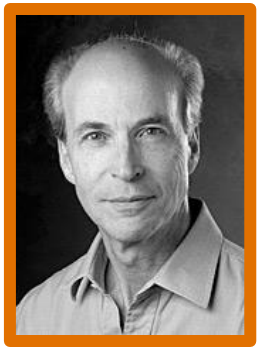
Martin L. Perl



Frederick Reines

Physics, 1995

Discovery of the tau lepton



Roger Kornberg

Chemistry, 2006

Studies of the molecular basis of eukaryotic transcription

Yoichiro Nambu, Makoto Kobayashi, Toshihide Maskawa

Physics, 2008

Theory of broken symmetries later observed by BaBar

Ada Yonath

Chemistry, 2009

Studies of the structure and function of the ribosome, foundation studies at SSRL

Our Mission Today

Our programs explore the ultimate structure and dynamics of matter and the properties of energy, space and time - at the smallest and largest scales, in the fastest processes and at the highest energies - through robust scientific programs, excellent accelerator based user facilities and valuable partnerships.

- Build and operate world leading Photon Science Facilities-LCLS (LINAC Coherent Light Source) and SSRL (Stanford Synchrotron Radiation Lightsource)
- Perform world leading science at these facilities
- Maintain our position as the premier accelerator laboratory
- Strategic programs in particle physics, particle astrophysics and cosmology

What happened from actualizing this mission……

- Production: 1999-2008
- ~5 PB raw data
- 1 PB database (in 2002)


CNN.com / SCI-TECH

SEARCH GO

MAIN PAGE
WORLD
U.S.
WEATHER
BUSINESS

Stanford researchers may have largest database

April 18, 2002 Posted: 8:15 a.m. EDT (1215 GMT)

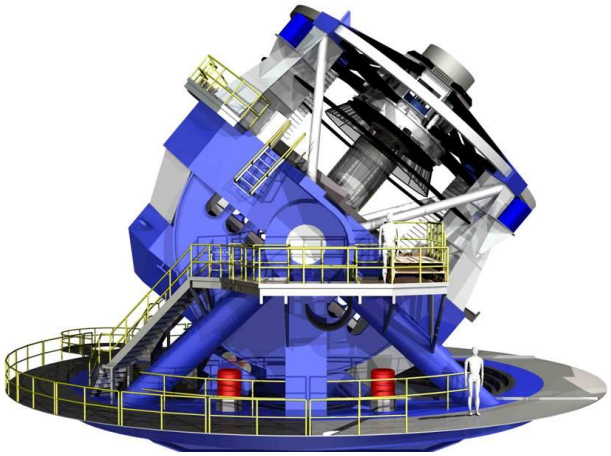
- http://www-public.slac.stanford.edu/babar/

BABAR is a particle physics experiment designed to study some of the most fundamental questions about the universe by exploring its basic constituents - elementary particles.

What will happen from actualizing this mission……

Operations: 2022-2031
50+ PB images
45 PB database

- Image metadata consisting of 700 million rows
- An object catalog with 20 billion rows each with 200+ attributes
- 30+ trillion object detections
- Alert count: 2 million / night
- 3.2 gigapixel image every 15 sec
- Complex n-point correlations, including near neighbor searches at petascale



- http://lsst.org/lsst/about/technology

The LSST is a new kind of telescope. With a light-gathering power among the largest in the world, it can detect faint objects with short exposures.

Goals for the XLDB Conference

Exchange Information

Identify trends, commonalities and major roadblocks related to building extremely large data stores

Bridges

Bridge the gap between users trying to build extremely large data stores and solution providers worldwide

Development & Growth

Facilitate development and growth of practical technologies for extremely large data stores

PRACTICAL SOLUTIONS: Our Recipe for XLDB Events

SLAC

- Ingredients
  - Big science
  - Data-intensive industries
  - Vendors
  - Academia
- Directions
  1. Mix together
  2. Repeat yearly