CENTER FOR BEAM PHYSICS

OVERVIEW

Swapan Chattopadhyay

Director's Review of AFRD
Lawrence Berkeley National Laboratory
May 16 - 17, 2000

Accelerator & Fusion Research Division

General Sciences

1998 - 1999 - 2000

National Academy of Science

Wilson Prize

APS Fellowships

USPAS Award

Halbach Prize

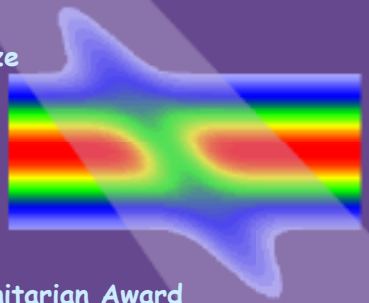
Simon Ramo Award

JAERI Distinguished Scientist of the Year

DOE Certificate of Distinction in Mentorship

E. O. Lawrence Post Doctoral Fellow

International FEL Prize



Faraday Cup

D.R. Nicholson Humanitarian Award

IEEE Particle Accelerator Prize

CENTER FOR BEAM PHYSICS

Ernest Orlando Lawrence Berkeley National Laboratory

LBNL-43492

CBP Roster

Scientific and Technical Staff

ARCHAMBAULT, Leon
BARRY, Walter
CHATTOPADHYAY, Swapan
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DIMAGGIO, Scott
DOUGHERTY, Jim
ESAREY, Eric
FURMAN, Miguel
KIM, Charles
LEEMANS, Wim
LI, Derun
LOZANO, David
RIMMER, Robert
SESSLER, Andrew
TURNER, William
VOLFBEYN, Pavel
XIE, Ming
YU, Simon
ZHOLENTS, Alexander
ZISMAN, Michael
ZOLOTOREV, Max

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WURTELE, Jonathan

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KIM, Eun San
OHGAKI, Tomomi
PENN, Gregory
SHADWICK, Bradley

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GOVIL Richa
LEE, Peter
LEUNG, Michael
LIDIA, Steve
LIE, James
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SALUR, Sevil
SCHROEDER, Carl

International and DomesticVisitors

FOREST, Etienne
GUO, Kang-Zhu
KRALL, Jonathan
KAR, Subal
KOSTA, Shakti
RAY, Ranjan
WATANABE, Y

Center Affiliates

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BYRD, John (LBNL/ALS)
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FAWLEY, William (LBNLDARHT)
FOREST, Étienne (KEK)
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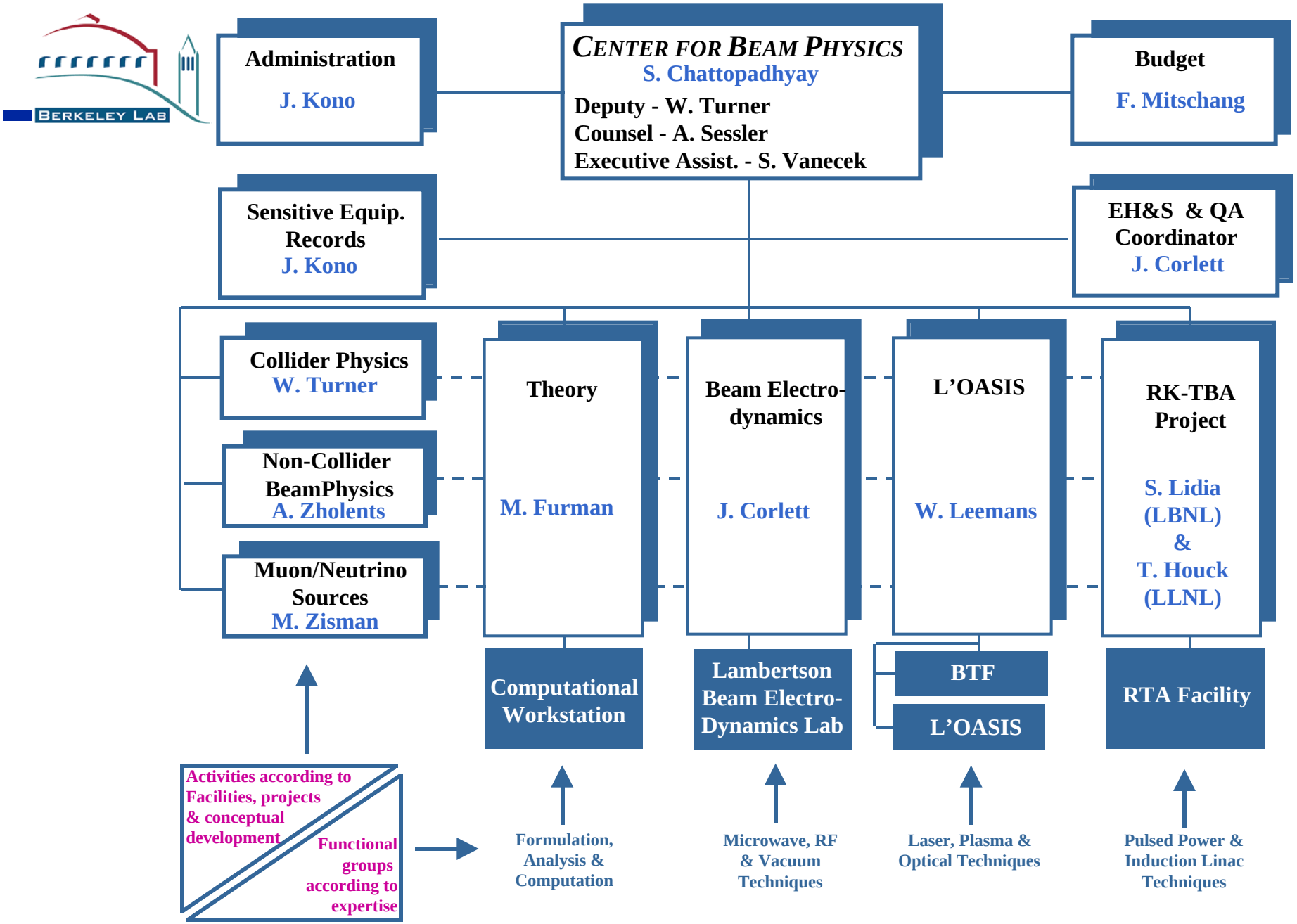
SCHOENLEIN, Robert (LBNL/MSD)
SHANK, Charles (LBNL/MSD)
TAJIMA, Toshiki (LLNL)
VAN BIBBER, Karl (LLNL)
VANECEK, David (LLNL)
WESTENSKOW, Glen (LLNL)
VERBONCUER, John (UCB)

Administrative Support

KONO, Joy
FIKE, Cyndi
VANECEK, “Sam”
WONG, Olivia


Administration
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Deputy - W. Turner
Counsel - A. Sessler
Executive Assist. - S. Vanecek
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EH&S & QA Coordinator
J. Corlett
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W. Turner
Non-Collider BeamPhysics
A. Zholents
Muon/Neutrino Sources
M. Zisman
Theory
M. Furman
Beam Electro-dynamics
J. Corlett
L'OASIS
W. Leemans
RK-TBA Project
S. Lidia (LBNL) & T. Houck (LLNL)
Computational Workstation
Lambertson Beam Electro-Dynamics Lab
BTF
L'OASIS
RTA Facility
Activities according to Facilities, projects & conceptual development
Functional groups according to expertise
Formulation, Analysis & Computation
Microwave, RF & Vacuum Techniques
Laser, Plasma & Optical Techniques
Pulsed Power & Induction Linac Techniques

Laser Plasma Acceleration

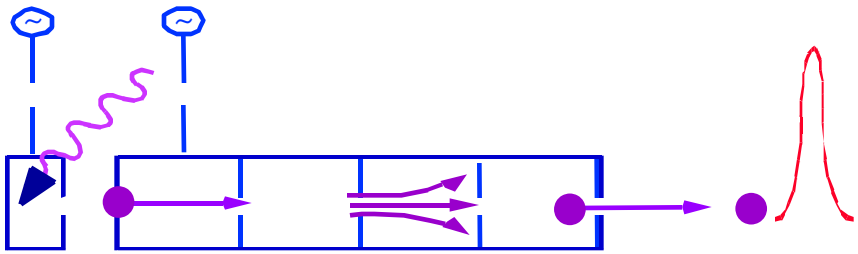
Presented by

Wim Leemans

Today's technology :

Conventional rf linacs, kms in length

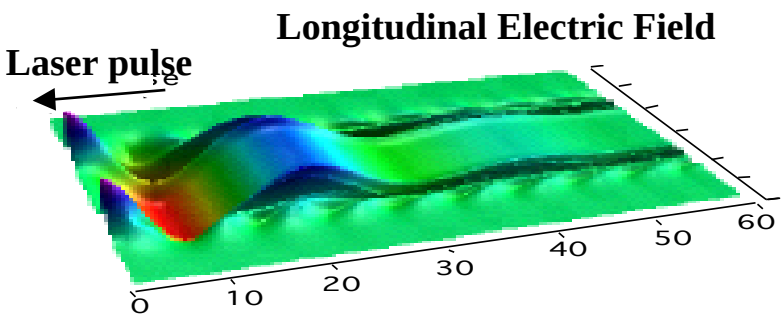
E_z: 10 - 200 MV/m



Future potential :

Laser-driven, plasma-based linac, cms in length

E_z:10-100 GV/m

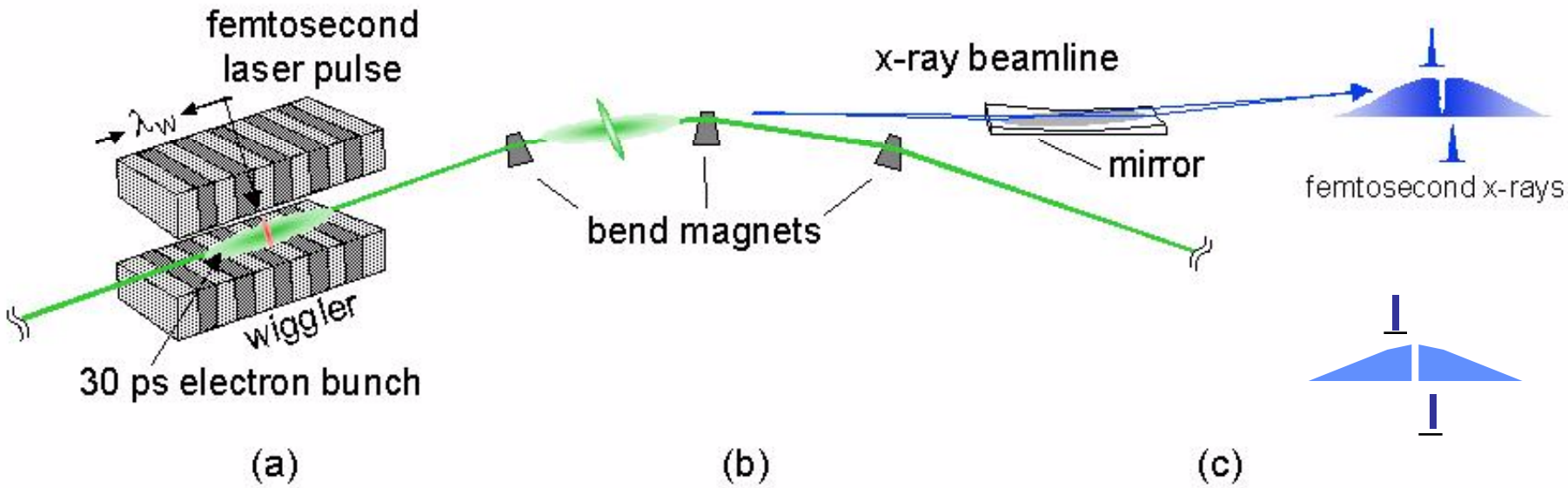


Femtosecond Techniques in Rings

Laser Femto-slicing of Electron Beams

Presented by

A. Zholents



Reference:
Generation of Femtosecond Pulses of Synchrotron Radiation
R. Schoenlein, S. Chattopadhyay, H.H.W. Chong, T.E. Glover, P.A. Heimann, C.V. Shank, A.A. Zholents, M.S. Zolotorev
Science, Vol. 287, No. 5461, March 24, 2000, p. 2237.

→ **Unique experiment in the world.**

→ **Berkeley Lab pioneering a new field Research: Optical Manipulation of Beams**

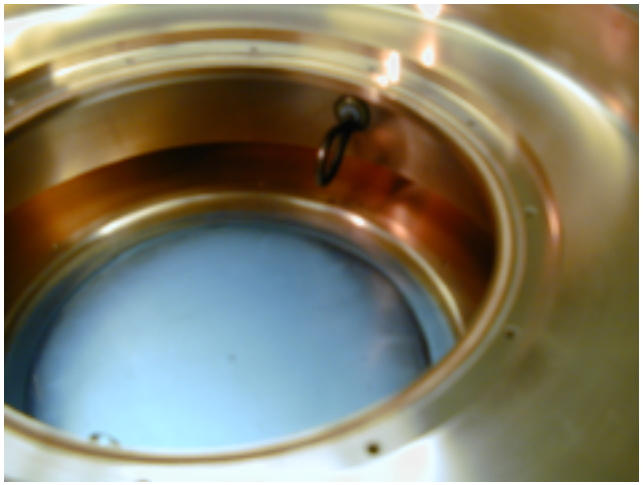
RF Technology

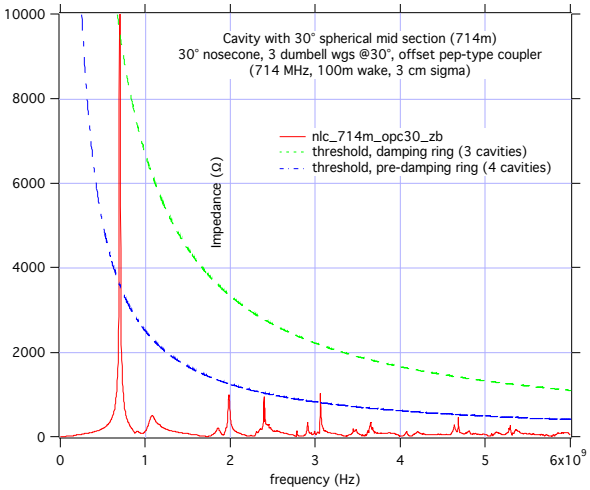
Beam Electrodynamics Group

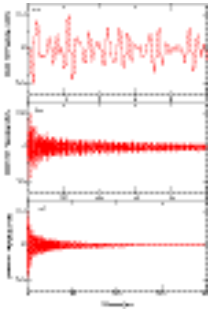
Presented by

John Corlett

- **Radiofrequency and microwave components and systems**
  - **Control of charged particle beams**
  - **Diagnostics and instrumentation**







NLC
- **Damping rings**

Muon Collider & Neutrino Factory
- **RF structures**

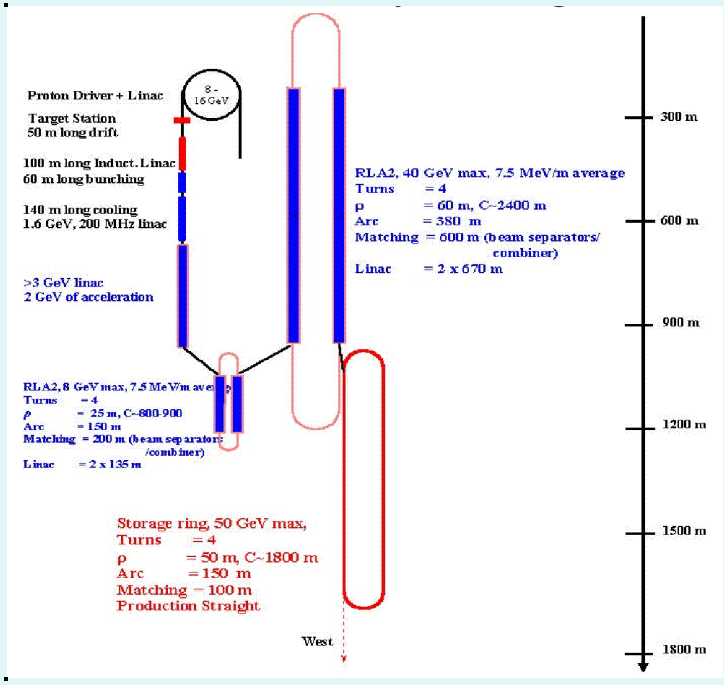
LEDA project (LANL)
- **RF structures**

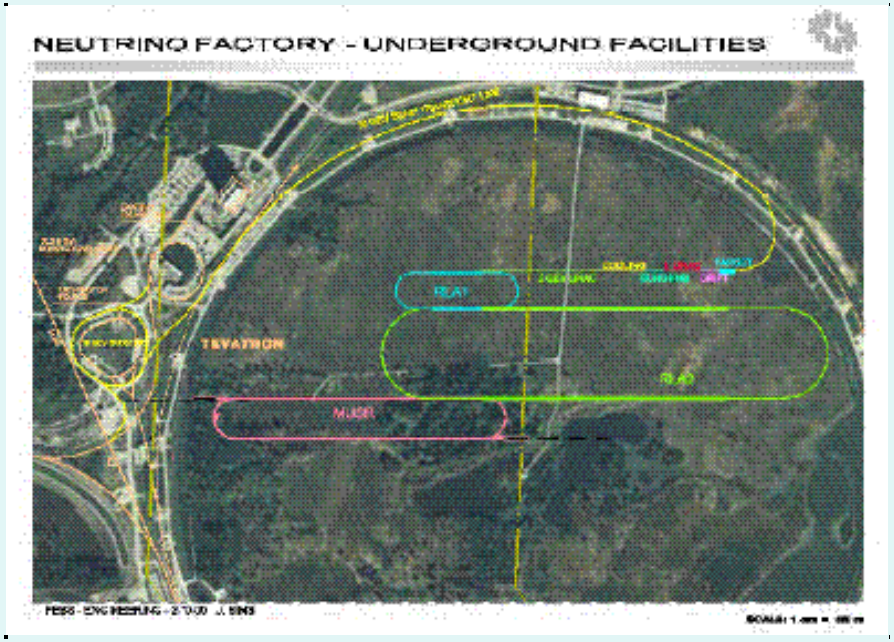
RK-TBA
- **BPM's**

Muons
Neutrino Factories

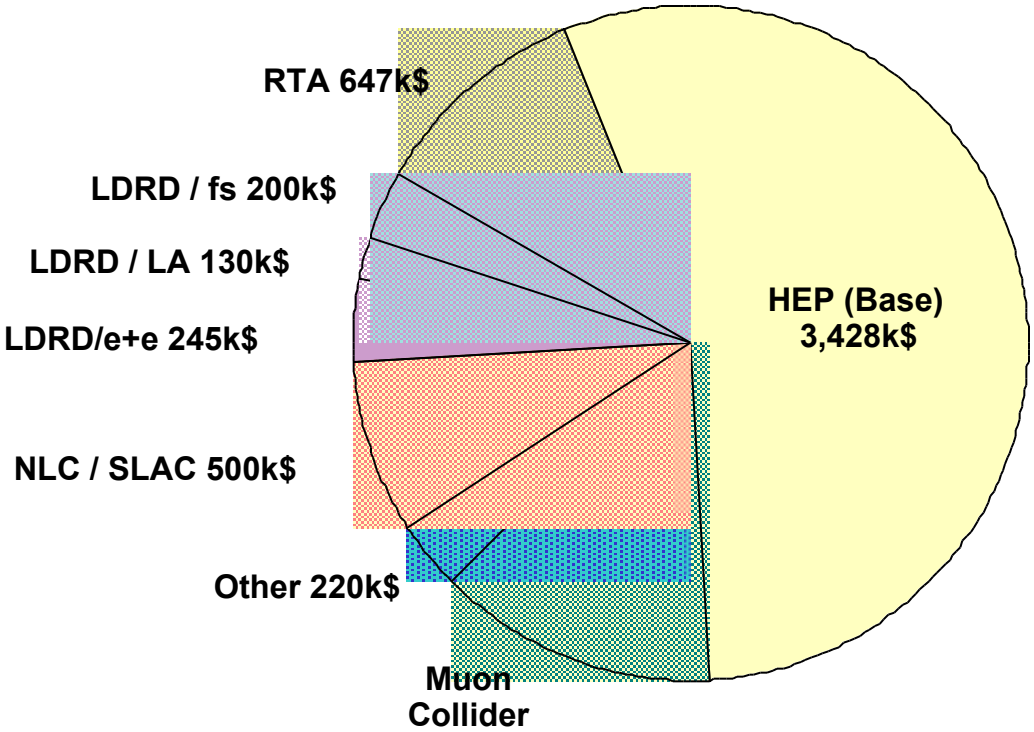
Presented by

Mike Zisman



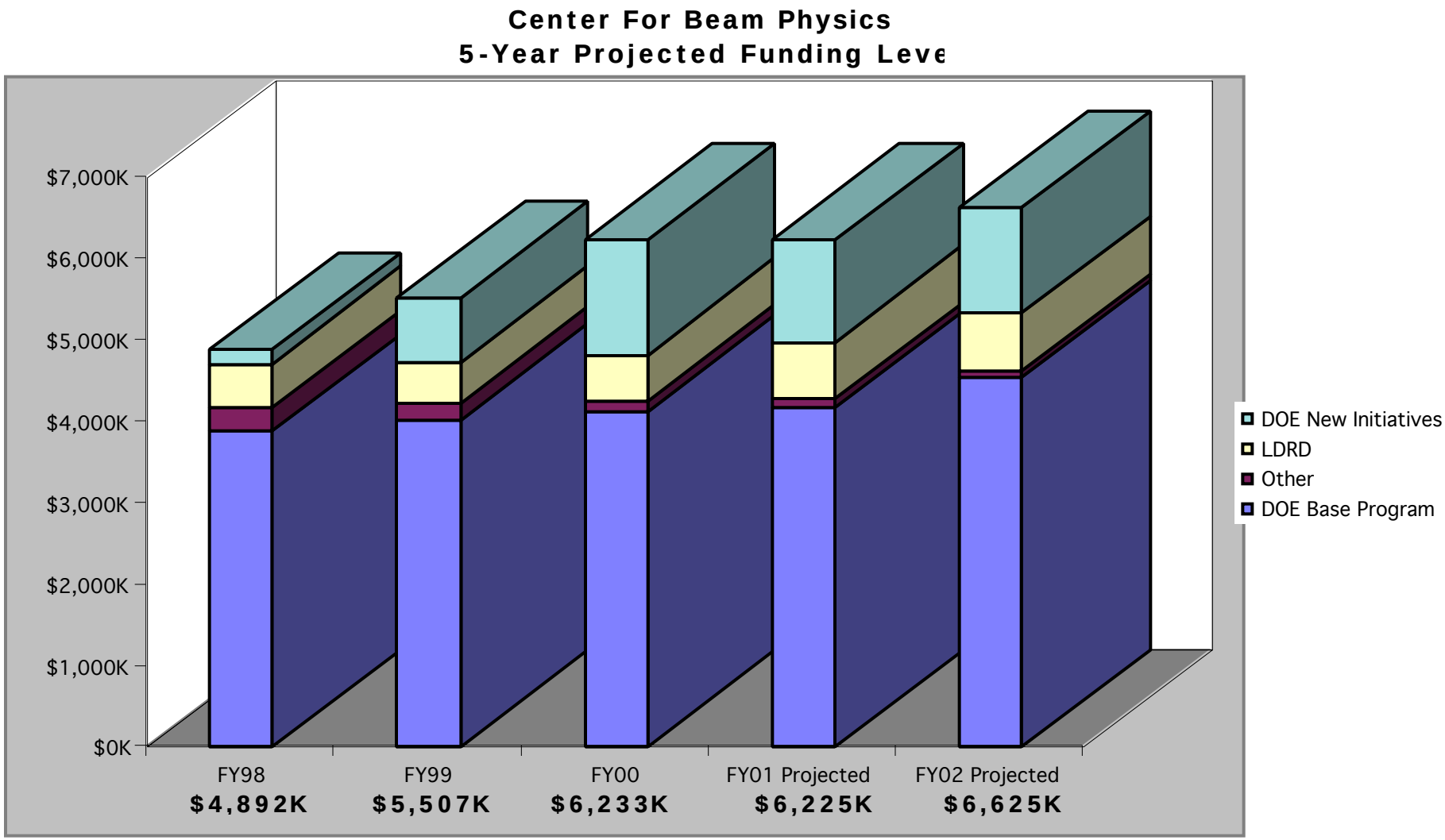


CBP Budget: FY 2000



Operating:
~ 5,273 k$
Equipment:
~ 915 k$

RTA:	**Relativistic-Klystron Two-Beam Accelerator**
LDRD/fs:	**Laboratory Directed Research and Development (Femtosecond Pulses)**
LDRD/LA:	**Laboratory Directed Research and Development (Laser Acceleration)**
LDRD/e+e-:	**Laboratory Directed Research and Development (electron-positron collider)**
NLC/SLAC:	**Funding through SLAC towards NLC design studies**
Other:	**Accelerator Simulation, Proton Storage Ring Instability, 700 MHz RF Window Design**



Legend Key

DOE New Initiatives: Laser Accelerator; Muon Collider; Next Linear Collider; Transient Ion Facility

LDRD: continuation--Laser Driven Acceleration of Particles, IP Performance of e+e- Linear Collider; new--Next Linear Collider

Other: Power Beaming project; funds from DOE's Initiatives for Proliferation Prevention; funds from other LBNL centers/programs

DOE Base Program: HEP operating and equipment funds to CBP