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... for a brighter future

Argonne / Fermilab Interactions: The Three Accelerator Projects

prepared for

Argonne-Fermilab Collaboration Meeting



U.S. Department
of Energy

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U.S. DEPARTMENT OF ENERGY

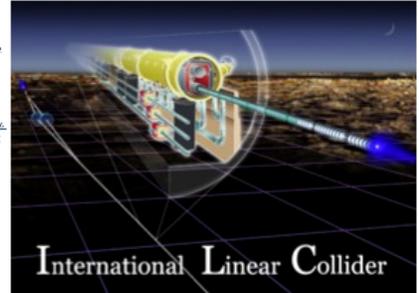
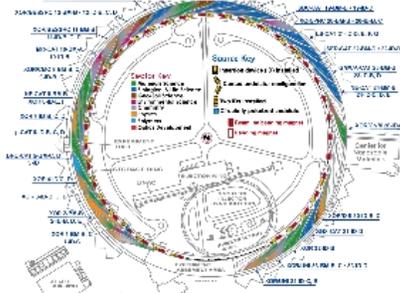
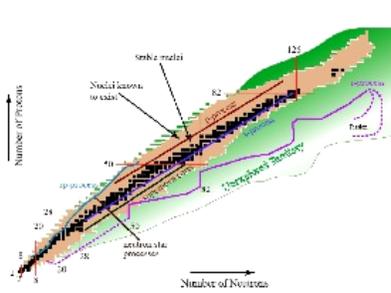
***Michael Turner
Chief Scientist
November 27, 2007***

***Many areas of important and exciting collaboration
for Argonne and Fermilab: Astrophysics,
Accelerator R&D, LHC Physics, Computing,
Phenomenology, Detector R&D, ...***

***Three “Billion Dollar Class” Accelerators Employing
Superconducting LINACs Are Critical to the Futures
of the Two Labs***

The Three Accelerators

Superconducting (SC) Linear Accelerators (LINAC)



| FACILITY FOR RARE-ISOTOPE BEAMS (FRIB)--ANL | | APS UPGRADE: ENERGY RECOVERY LINAC (ERL)--ANL | | INTERNATIONAL LINEAR COLLIDER (ILC)--FNAL | | PROJECT X --FNAL | |
|---|--------------------------|---|------------------------|---|-----------------------------------|---------------------------|----------------------|
| Cost in Billions | 0.550 | Cost in Billions | ~1 | Cost in Billions | ~20* | Cost in Billions | 0.5 - 1 |
| Initiation | 2009 (CD1) | Initiation | ~2011 (CD1) | Initiation | 2011 to 202x (CD1) | If ILC delayed or no ILC. | 2011? (CD1) |
| Continuous or pulsed | CW | Continuous or pulsed | CW | Continuous or pulsed | pulsed, 5 Hz | Continuous or pulsed | pulsed, 5 Hz |
| Energy | .2 GeV/nucleon | Energy | 7 GeV | Energy | 250 GeV | Energy | 8 GeV |
| | 400 kW | | 50 kW/ 700 MW | | 23 MW | | 400 kW |
| Particle | semi-relativistic nuclei | Particle | relativistic electrons | Particle | relativistic electrons, positrons | Particle | relativistic protons |

*(50% U.S.)

Synergies: SC cavities and RF, cryogenics, power, power supplies

Differences: Continuous vs. pulsed, particle speed, cavity frequency

Great opportunities to work together on these important projects to the benefit of both Labs and science

Some Issues:

- What are the opportunities for working together on these projects?
 - ANL role in Project X and ILC
 - FNAL role in FRIB and APS-ERL
- How do we optimally structure (for both Labs) the collaboration?
- How do we optimally phase/coordinate the 3 (4?) projects?
- What are the roles of the University of Chicago, other local universities and universities more broadly? How do we engage them?
- How do we coordinate on the political front (local, state, federal)? FRA and ANL BoG issue

