

Summary and Outlook

Presented to
DOE HEP Annual Program Review

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Summary and Outlook

- we believe BNL has an outstanding HEP program and strong future potential
- we assert BNL's HEP program is completely aligned with DOE's program
- we are very concerned that HEP funding trends will damage this program
- our most threatened areas of research concentration are:

Experimental HEP Research - all the base program, including ATLAS phys.

Theoretical HEP research

Superconducting Magnet R&D

- we presented to DOE-HEP the specific impacts for FY03 and FY04 in Germantown in March but with no funding relief so far

however...

- we have a practical proposal for significant improvement within DOE's current decision-making capability

BNL HEP Programmatic Outlook

- *ATLAS Host Laboratory* role, with the *ATLAS Physics Analysis Center*, will provide a vital base for BNL and other U.S. physicists to pursue LHC frontier particle physics for ~20 years
- *RSVP* program at AGS expects to explore new physics in two directions:
 - *CP-violation in the quark sector (KOPIO)*
 - *non-SM physics via lepton flavor non-conservation (MECO)*
- *QCDOC* supercomputer at BNL could be a main lattice gauge resource for understanding soft QCD aspects of particle and nuclear topics
- *VLB Neutrino Exp. + 1MW AGS Superbeam* offers world-class ν physics
- *Linear Collider R&D* could lead to new HEP contributions from BNL

plus.....

- HEP Theory Group will work to maintain its world class ranking

Long Term BNL HEP Goals (>10 yrs)

T. Kirk - Snowmass 2001

⇒ Revisited April 2003 ⇐

- **Reaching to the Next Energy Frontier - new physics???**
 - ✓ LHC Luminosity upgrade, including detectors \Leftrightarrow extends LHC discoveries
 - ✓ Linear e^+e^- Collider (FNAL?) \Leftrightarrow extends LHC physics discoveries
 - ? VLHC \Leftrightarrow reaching beyond the few TeV mass scale!
- **Completing the neutrino story - advanced neutrino exps.**
 - ✓ Superbeam neutrino exps \Leftrightarrow complete the oscill. picture **& CP-viol.**
 - ? Muon Storage Ring (BNL) \Leftrightarrow CP-violation in the lepton sector
- **Understanding the patterns – theory**
 - ✓ Strong HEP Theory Group in then topical areas, including lattice gauge!
 - ✓ Riken BNL Research Center with N Pflops QCDxx Supercomputer?
- **Inventing the tools - future machines & technologies**
 - ✓ Accelerator Physics and Superconducting Magnet R&D

Revised Goal
BNL Goal!

BNL HEP Budget Outlook

- base program funding for HEP at BNL continues to *decline at a steep and alarming rate*; this is compromising all our research programs
- a slow startup of the LHC Accel. R&D (LARP) and no clear budget path for LC R&D, will force *damaging staff reductions* in the SMD
- the ATLAS Research Program is being *under-funded* relative to the needs of the program, even though LHC will be the center of the U.S. Energy Frontier Program for the next decade
- research staff support for the RSVP program is threatened even though RSVP construction and AGS operations costs will be fully funded by NSF

in short.....

- the BNL HEP program faces a *severe downward funding trend* that will impede or kill the exciting physics prospects that we presented today

“The breadth of the scientific problems we must attack requires, however, a diverse portfolio of experimental techniques.” HEPAP Chair, Fred Gilman, to SC Director, Ray Orbach, in a March 10, 2003 letter reporting the outcome of the Office of Science Facilities Review

