Argonne NATIONAL LABORATORY

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U.S. Department of Energy

THE UNIVERSITY OF CHICAGO

A U.S. Department of Energy laboratory managed by The University of Chicago

APS/User Monthly Operations Meeting

J. Murray Gibson

October 24, 2007

Agenda

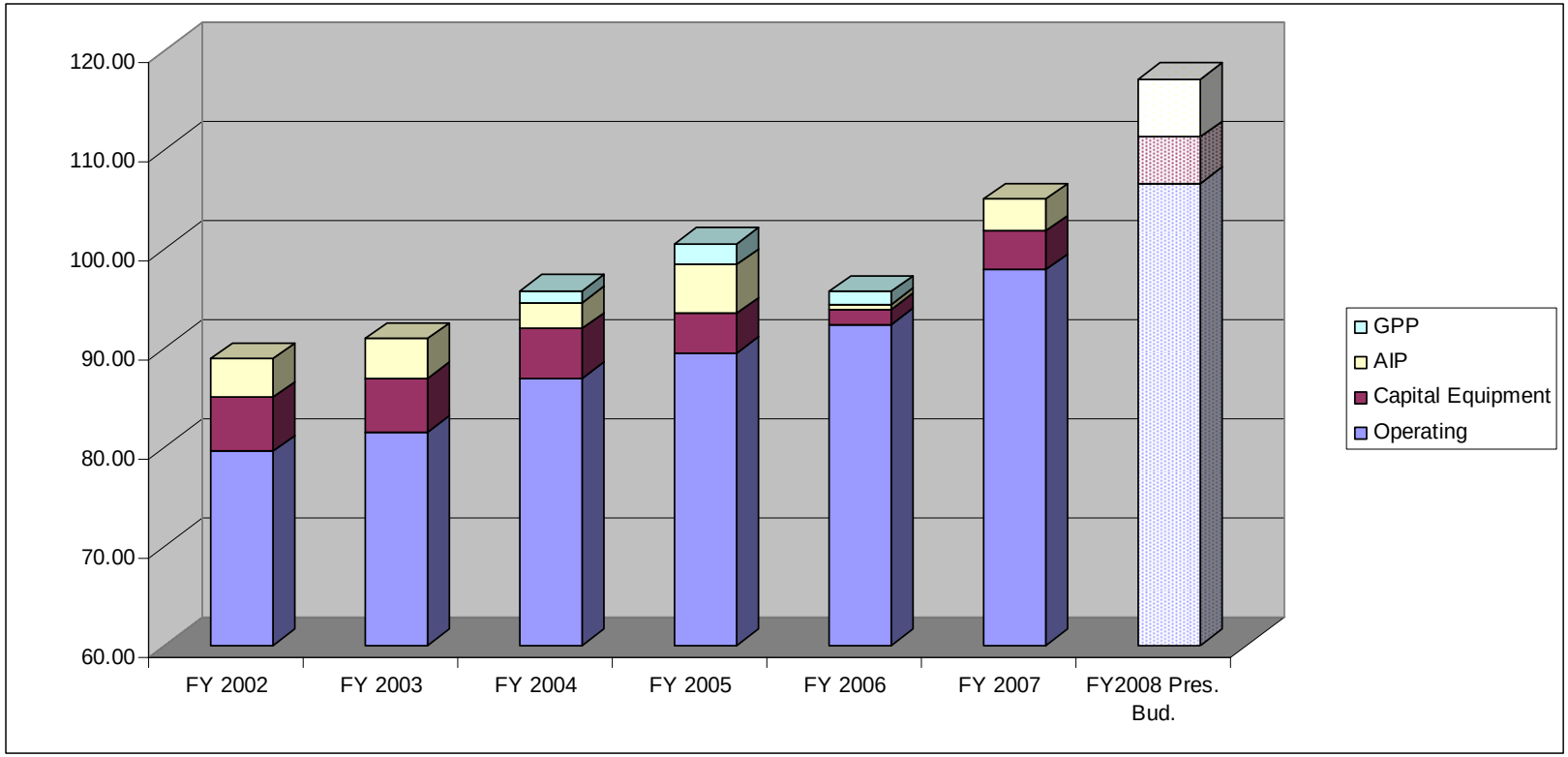
- 2:30 p.m. Refreshments
- 2:45 p.m. APS Update – Murray Gibson
- 3:05 p.m. ERL R&D Planning – Efim Gluskin
- 3:25 p.m. Advanced Protein Crystallization – Andrzej Joachimiak
- 3:45 p.m. Adjourn

Safety

- A consultant to the lab has inspected all sector space in 400 for potential OSHA deficiencies. All told, close to 1000 were identified. Fortunately almost all are not of great significance. But there are action items:
  - Formed an ad-hoc committee on use of extension cords and power strips. (Jim Lang, Bill Wesolowski, Tim Smith, Vern Stipp (IPNS)).
    - *Over 200 deficiencies were identified on this topic*

Budget picture – belt-tightening needed at least until Spring

While President's budget would be good, Congress is expected to operate under a Continuing Resolution (CR) until Jan-March?



Our initial allocation for FY2008 = FY2007 budget.

BUT CR allocates only 86% of our operating budget on a monthly basis

In addition we had unexpected overruns from last year in AES

Upcoming DOE Review of the APS

- December 10-13th
- Program will involve external and internal speakers, posters and meetings with APSUO exec, PUC reps, SAC etc.
  - Details not yet set
- Written input being solicited now – thanks for your help

APS Upgrade

Status of Facilities for the Future: 20-Year Outlook – By the End of FY 2008

	Priority	Program	Facility	R&D	Conceptual Design	Engineering Design	Construction	Operation
Near-Term	1	FES	ITER					
	2	ASCR	UltraScale Scientific Computing Capability					
	Tie for 3	HEP	Joint Dark Energy Mission					
		BES	Linac Coherent Light Source					
		BER	Protein Production and Tags → Bioenergy Research Centers*					
		NP	Rare Isotope Beam Facility (previously RIA) #					
	Tie for 7	BER	Characterization and Imaging → Bioenergy Research Centers*					
		NP	CEBAF Upgrade					
		ASCR	ESnet Upgrade					
		ASCR	NERSC Upgrade					
		BES	Transmission Electron Aberration Corrected Microscope					
	12	HEP	BTeV #	Terminated				
	13	HEP	International Linear Collider					
Mid-Term	Tie for 14	BER	Analysis/Modeling of Cellular Systems → Bioenergy Research Centers*					
		BES	SNS 2-4 MW Upgrade					
		BES	SNS Second Target Station					
		BER	Whole Proteome Analysis → Bioenergy Research Centers*					
	Tie for 18	NP/HEP	Double Beta Decay Underground Detector					
		FES	Next-Step Spherical Torus					
		NP	RHIC II					
	Tie for 21	BES	National Synchrotron Light Source Upgrade*					
		HEP	Super Neutrino Beam					
Far-Term	Tie for 23	BES	Advanced Light Source Upgrade					
		BES	Advanced Photon Source Upgrade					
		NP	eRHIC or eLIC or Electron Ion Collider					
		FES	Fusion Energy Contingency					
		BES	HFIR Second Cold Source and Guide Hall					
		FES	Integrated Beam-High Energy Density Physics Experiment					

75-100% 50-75% 25-50% > 0% complete

Ray Orbach
9/21 update to
BESAC

*Technology readiness changed
Changed due to planned facility abroad

Priority: Tie for 23
Advanced Photon Source (APS) Upgrade

The Advanced Photon Source at Argonne National Laboratory is the brightest x-ray light source in the Western Hemisphere. These x-rays allow scientists to study the structure and function of materials. Knowledge gained from this research can impact the evolution of combustion engines and microcircuits, aid in the development of new pharmaceuticals, and pioneer nanotechnologies whose scale is measured in billionths of a meter, to name just a few examples. These studies already have had far-reaching impact on our technology, economy, health, and fundamental knowledge of the materials that make up our world. The Advanced Photon Source has the largest user base of any DOE scientific user facility, with 3,200 scientists from academia, industry, and government using it annually.

The APS Upgrade will greatly enhance the brilliance and power of the facility to enable scientists to study very small sample crystals—important for nanoscience research.

Update: The Basic Energy Sciences Advisory Committee currently is engaged in a study of Grand Challenge Science that spans all of the research supported by the Basic Energy Sciences program. An outcome of this study will be the delineation of research frontiers and the tools required to access those frontiers.

- One option being considered to upgrade the APS is through an energy-recovery linac (ERL). The ERL has been demonstrated at lower energy, but research and development of improved electron guns and superconducting linear accelerator technology is required. With sufficient R&D in the coming years, it could be possible to design and build an APS upgrade in the next decade.

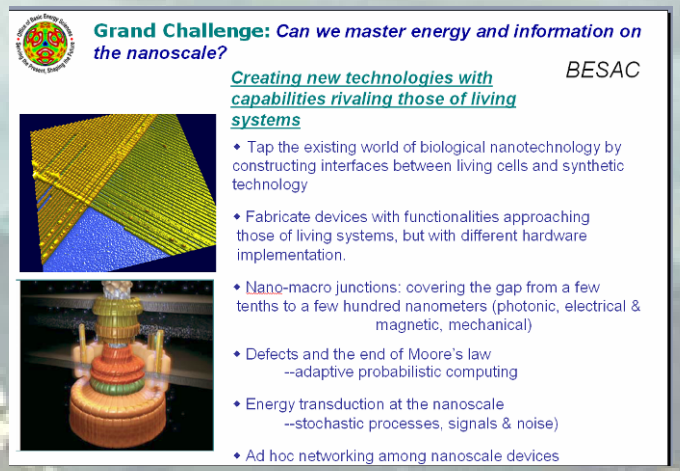
Ongoing BESAC study

Ray Orbach charges group to develop plan for 21st Century light sources in this context ('08)

Controlling Matter and Energy: Five Challenges for Science and the Imagination

Graham Fleming and Mark Ratner

September 20, 2007



****Please note: This material has not yet been reviewed or approved by BESAC.**

Upgrade Planning

- We have submitted an R&D proposal to BES.
- We want to hold a retreat next summer ("Strategic Planning Meeting on the APS Upgrade") – planning will begin with APSUO/PUC soon.
- BESAC will hold a workshop to address science-driven needs for new facilities, which is the next key step in their planning process.

ANL/APS efforts will be supported by LDRD in FY 2008

- Laboratory has made high-level strategic LDRD allocations.
  - Facilities LDRD (Denny Mills, coordinator) received the highest allocation ($4.3M).
    - *New ERL accelerator R&D funding*
    - *New science funding*
      - Imaging and ultrafast science
    - *Additional detector development*