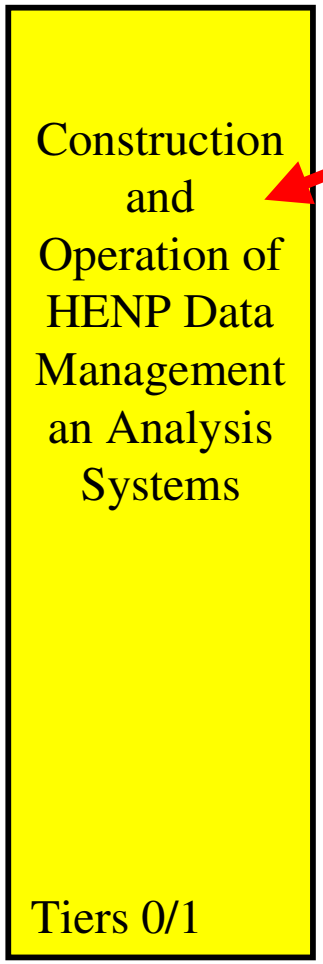
APOGEE
Manpower and Budget Analysis

Richard P Mount

Germantown, August 18, 1999

APOGEE in Context



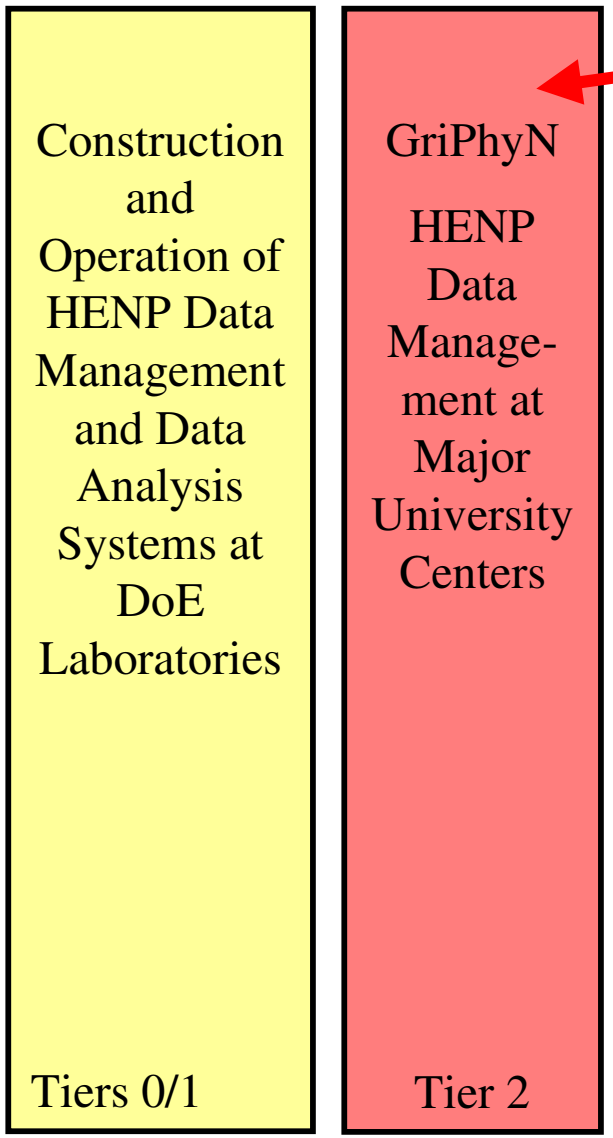
>> $20M/yr of existing funding at HENP labs.

e.g. SLAC FY1999

~$7M equipment (of which < $2M physics CPU);

~$3M labor, M&S.

APOGEE in Context



Proposal for $16M/yr of NSF funding:

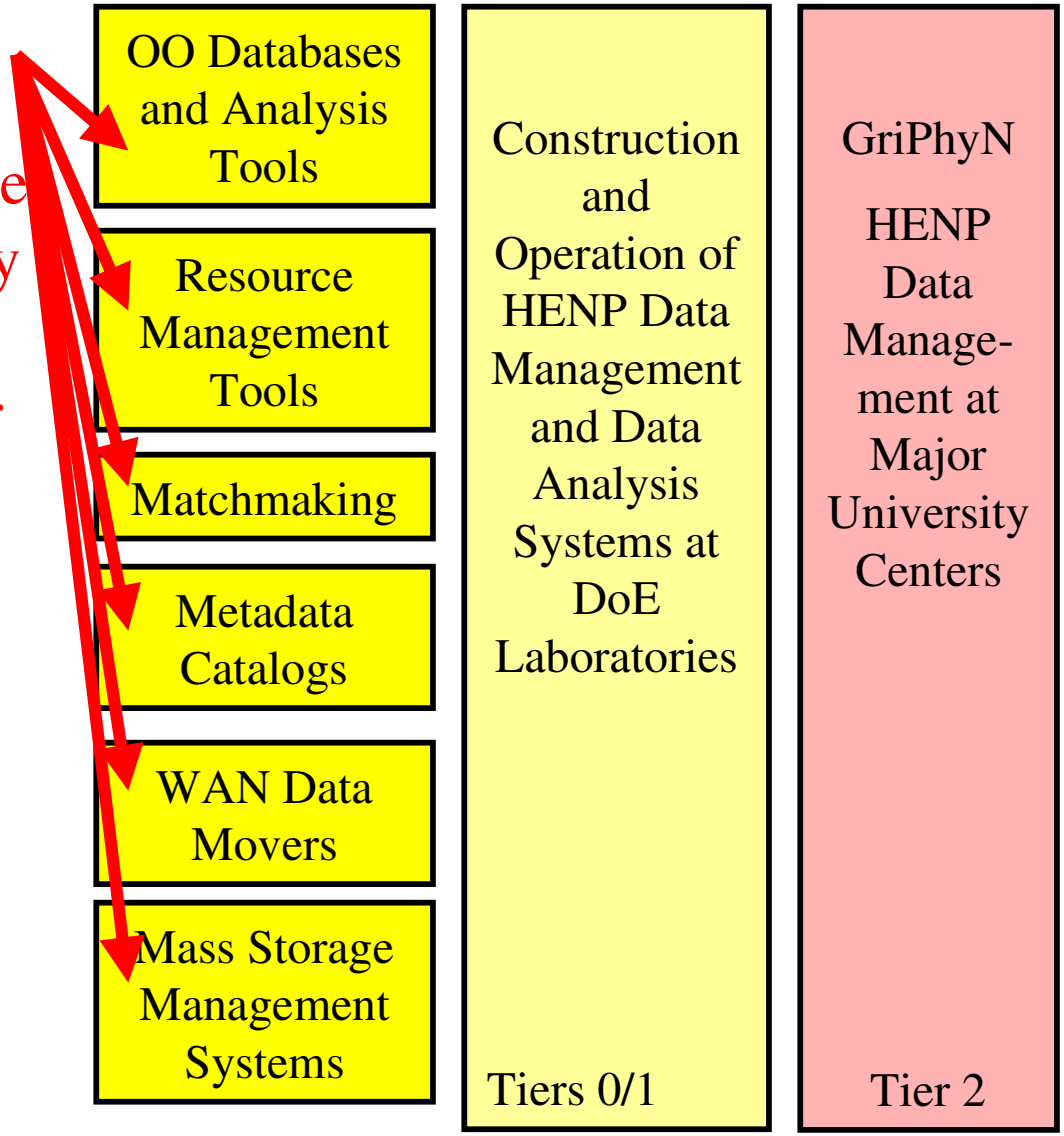
$8M hardware
$5M labor etc.
$3M network

APOGEE in Context

Widely Applicable Technolgy and Computer Science

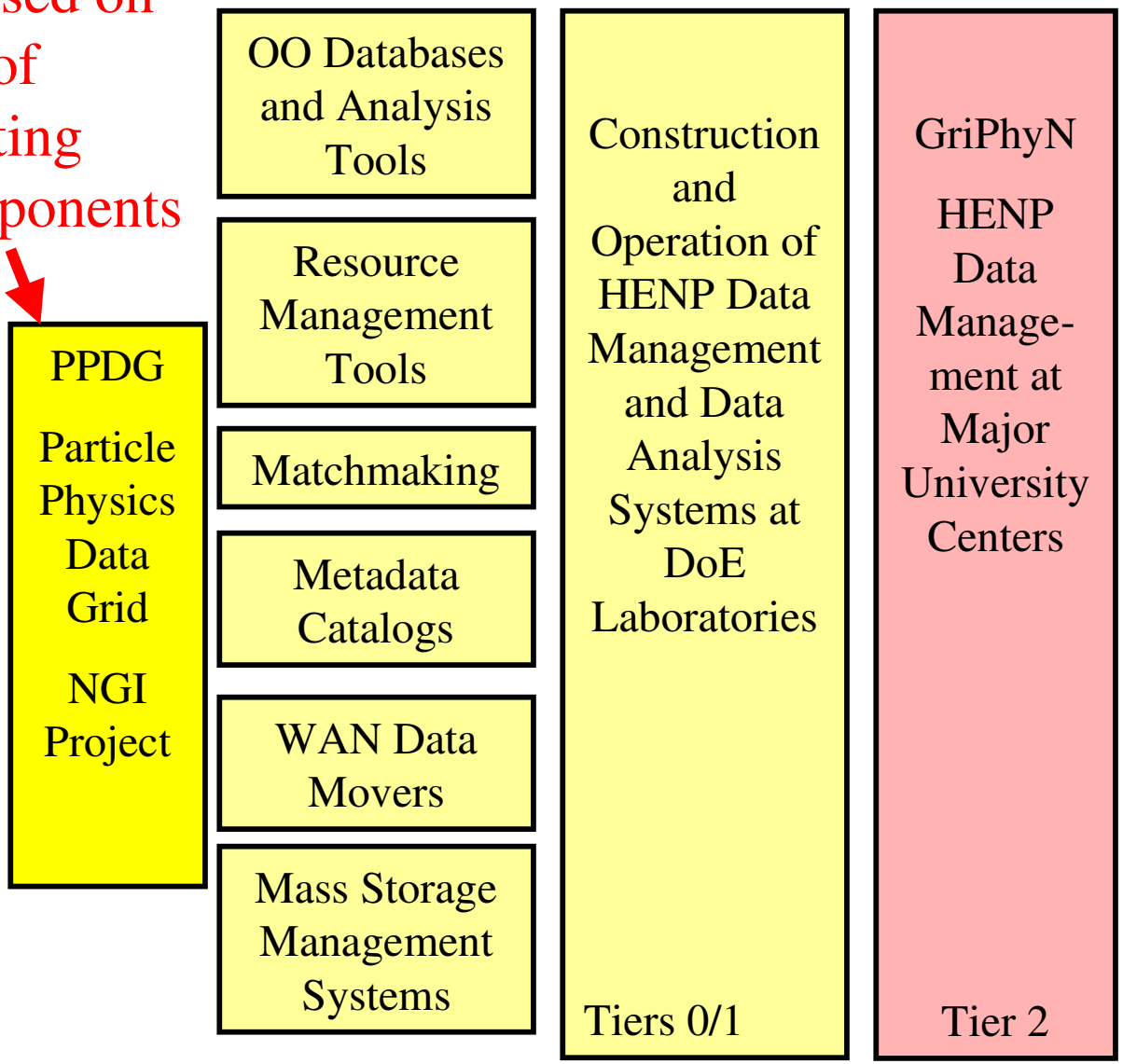
(not only from HENP;

100s of non-HEP FTEs)

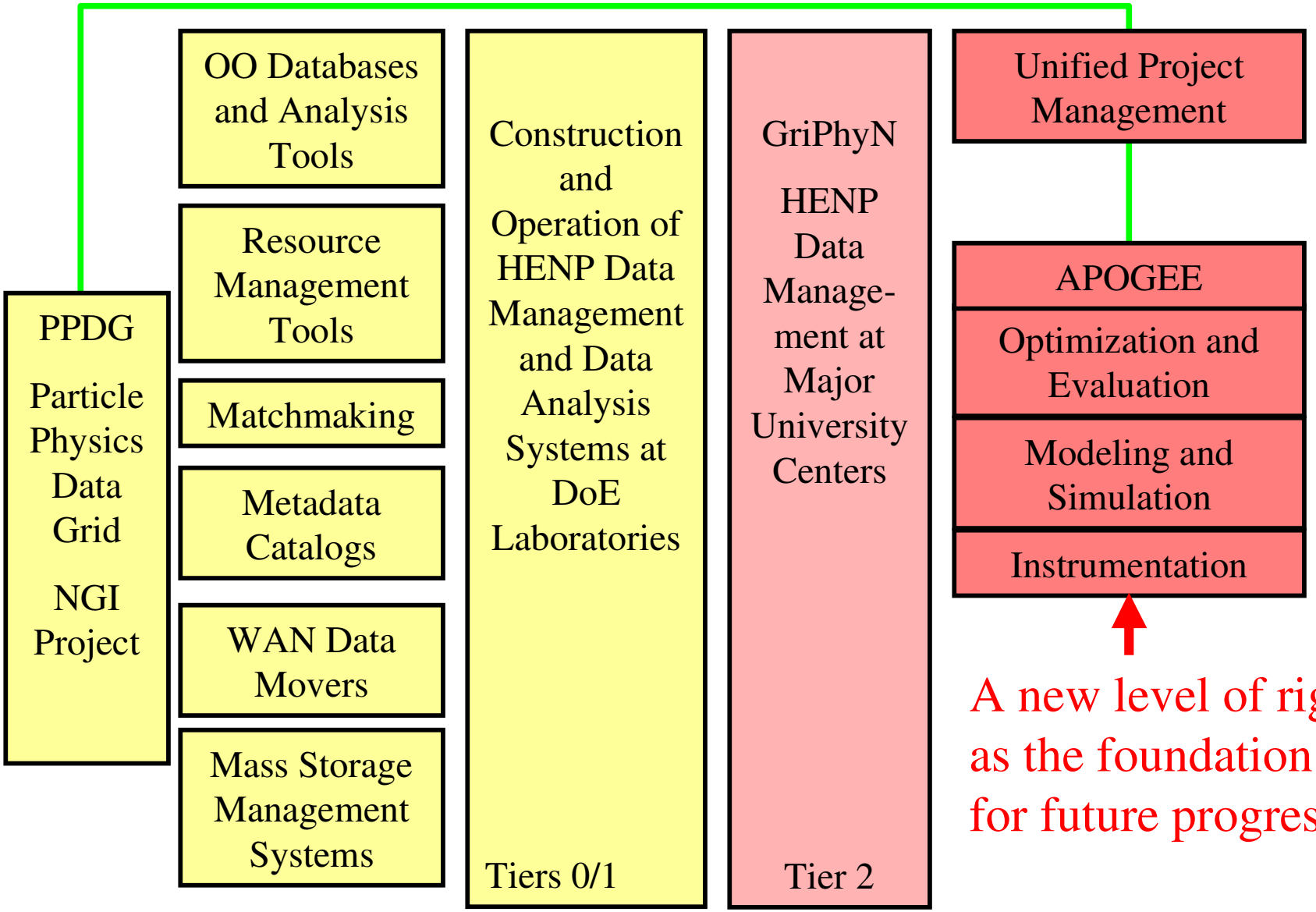


APOGEE in Context

Large-scale tests/service focused on use of existing components

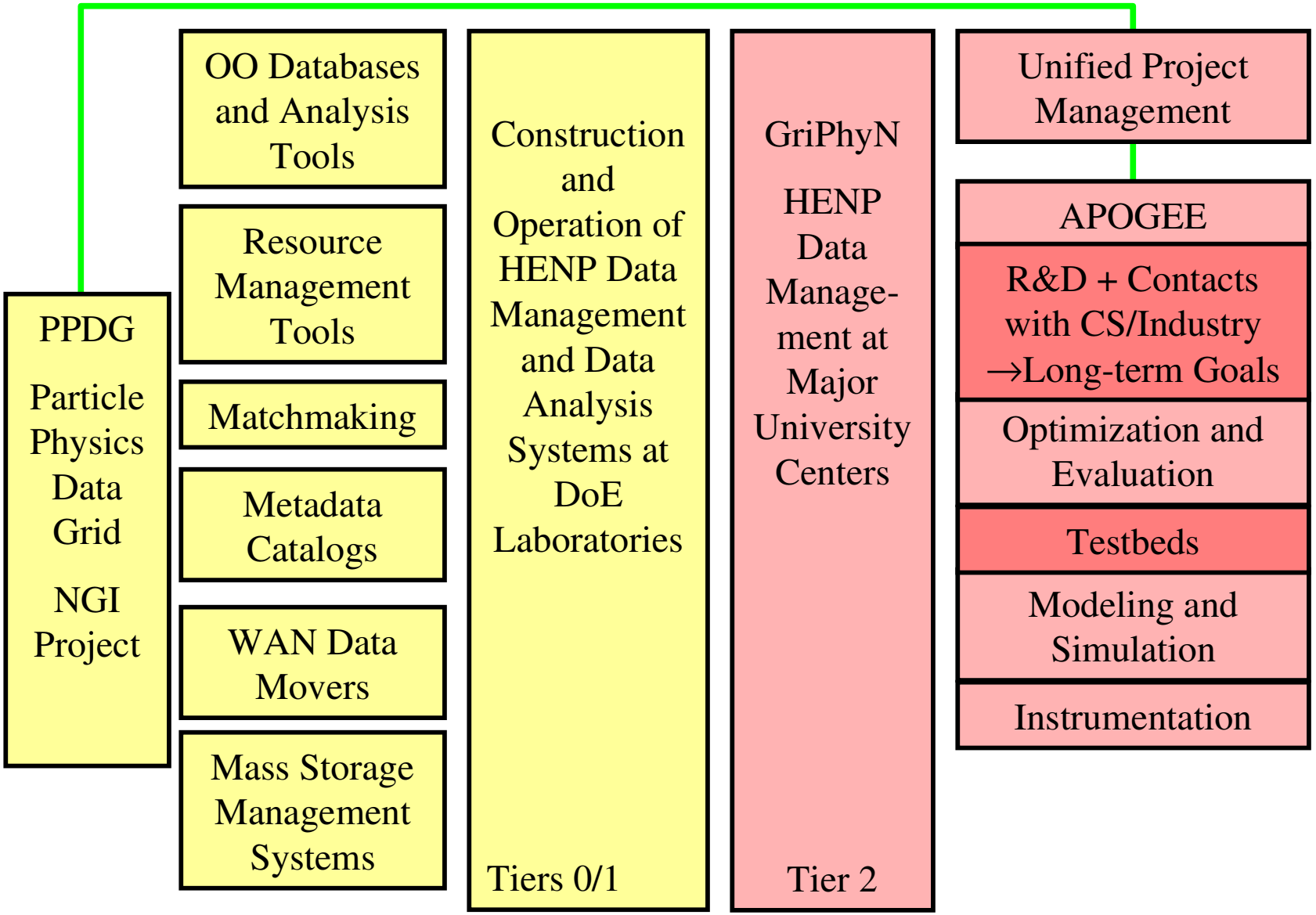


APOGEE in Context



A new level of rigor as the foundation for future progress

APOGEE in Context



APOGEE Planning: Caveat

- APOGEE must fill the scientific, technical and management gaps left between > $20M/year of HENP activity and >$30M/year of relevant CS/Industry activity;
- Planning is based on our present understanding of a very dynamic area of Information Technology;

APOGEE Manpower Requirements

		FTE FY00	FTE FY01	FTE FY02	FTE FY03	FTE FY04
Instrumentation						
	Low-level data capture	0.5	1	0.75	0.75	0.75
	Filtering and collecting agents	0.5	1	1	1	1
	Data analysis and presentation	0.5	1	1	0.75	0.75
	HENP workload profiling	0.5	1	0.5	0.5	0.5
Simulation						
	Framework design and development	1	2	1.5	1	0.5
	User workload simulation	0.5	1	0.75	0.75	0.5
	Component simulations (network, mass-storage system, object database etc.)	1.25	2.5	2	1.5	1
	Site simulation packages			1	1	1
Instrumentation/Simulation Testbed						
	Instrumentation of existing experiment(s) (e.g.PPDG)	0.5	1	1	1	1
	Acquire and simulate performance measurements	0.25	0.5	0.5	0.75	1
	Acquire user workload profile	0.25	0.5	0.5	0.25	0.25
	Test prediction and optimization			0.5	0.75	0.75
Evaluation and Optimization						
	Quantify evolving needs of physics (including site policies etc.)	0.25	0.5	0.5	0.5	0.5
	Develop metrics for usefulness of data management facilities	0.5	1	1	1	1
	Optimize model systems			0.5	1	1.5
Long-Term Strategy (Towards "Virtual Data")						
	Tracking and testing HENP/CS/Industry developments	1	2	1.5	1.5	1.5
	Development projects in collaboration with HENP/CS/Industry where possible			0.5	1	1.5
Project Management (APOGEE and PPDG)						
	Project leader (physicist)	0.5	1	1	1	1
	Lead computer scientist	0.5	1	1	1	1
TOTALS		**8.5**	**17**	**17**	**17**	**17**

APOGEE Funding Needs

	FTE FY00	FTE FY01	FTE FY02	FTE FY03	FTE FY04
Manpower					
Instrumentation	250	500	406	375	375
Simulation	344	688	656	531	375
Instrumentation/Simulation Testbed	125	250	313	344	375
Evaluation and Optimization	94	188	250	313	375
Long-Term Strategy (Towards "Virtual Data")	125	250	250	313	375
Project Management (APOGEE and PPDG)	225	450	450	450	450
Commercial Software	100	250	375	500	500
Testbed hardware (in addition to parasitic use of production systems)	150	400	400	400	400
Workstations, M&S, Travel	128	255	255	255	255
TOTALS	**1540**	**3230**	**3355**	**3480**	**3480**

APOGEE: Conclusions

- HENP at the frontier of Information Technology
  - Collaboration with Computer Science;
  - Collaboration with industry;
  - Outreach to other sciences.
  - Visibility (and scrutiny) of HENP computing;
- Enabling revolutionary advances in data analysis for LHC
  - Increasing the value of the vital investment in experiment-specific data-analysis software