

Activity Highlights 2009-2010

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2009-2010 Highlights

- Eos: the iDataPlex 2592-core Cluster
- Advanced User Projects
- Day-to-day Operation

Contributors to Eos Purchase

MANY THANKS!

University Entity	Amount
VPAPIT/Supercomputing Facility	~\$1458K
Science (Dean, Katzgraber, Lucchese, Wheeler)	\$225K (50K, 75K, 50K, 50K)
Engineering (Dean)	\$100K
Geoscience (Dean, Chang, Yang, Quiring)	\$100K (25K, 25K, 25K, 25K)
Vice Pres for Research	\$92.5K
Total Cost	\$1975.50K

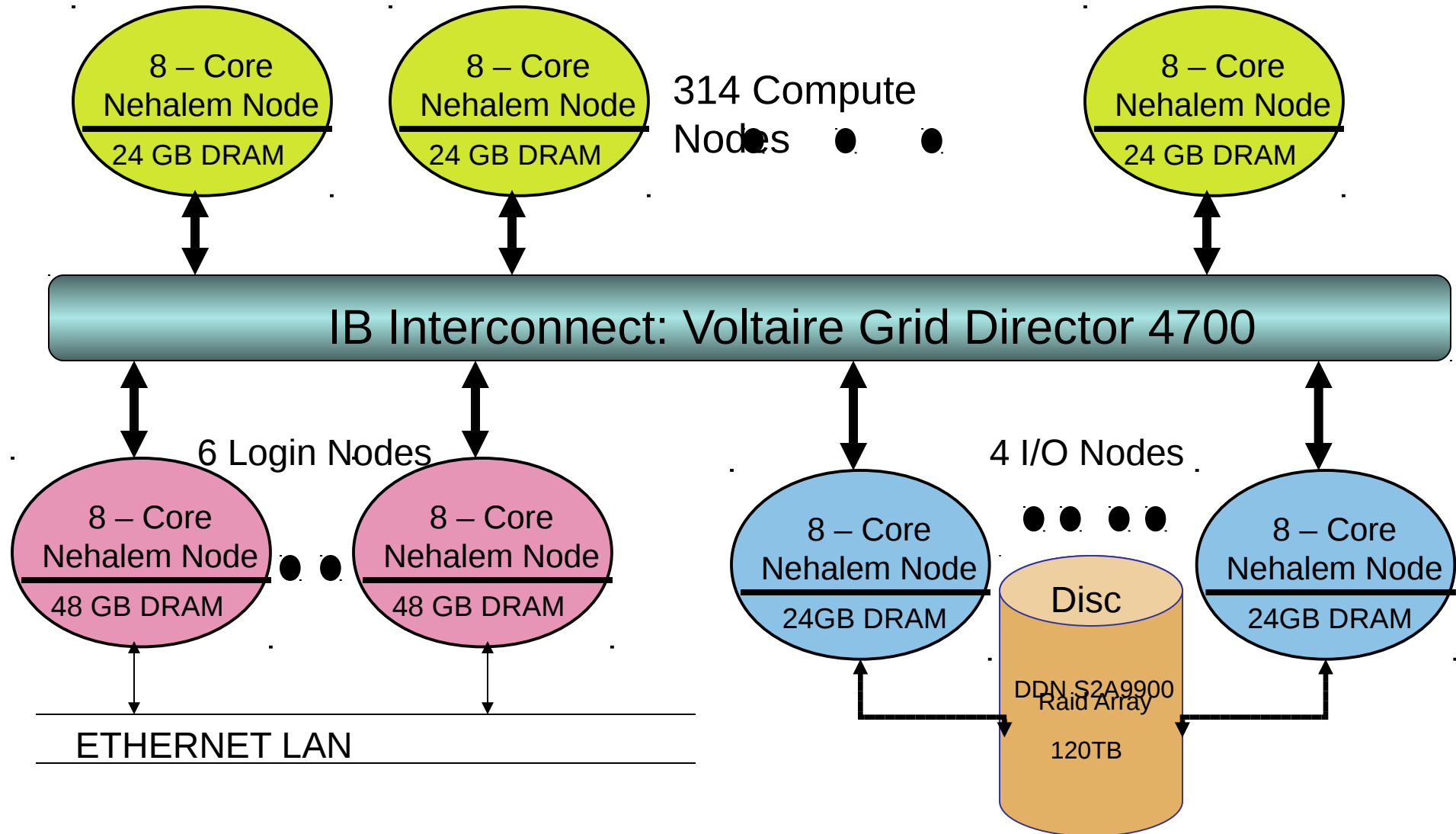
Special Rates for Contributors

- \$50K gets (i) priority access to 8 nodes (64 cores, 128 BG memory) (ii) 3-year warranty (iii) no AC, power, system administration
- Prices available through June 30
- Will discuss details

Eos Cluster: Highlights

- Cost: ~\$1.975M (UNT's TALON, a Nehalem 1792-core cluster of comparable quality cost \$2.2M; <http://citc.unt.edu/hpc>)
- Model: IBM iDataPlex
- OS: Linux
- Parallel File System: GPFS
- Arrival: Jan 02 2010
- Installation completion by IBM: Mar 25
- User Friendly Operation started: April 02 2010
- 27.1 Tflops clocked (93% of peak perf.) on April 23 for the TOP500 HPC run

Eos: 2592-core IBM iDataPlex Cluster





CIS-SC-SC-8-F80

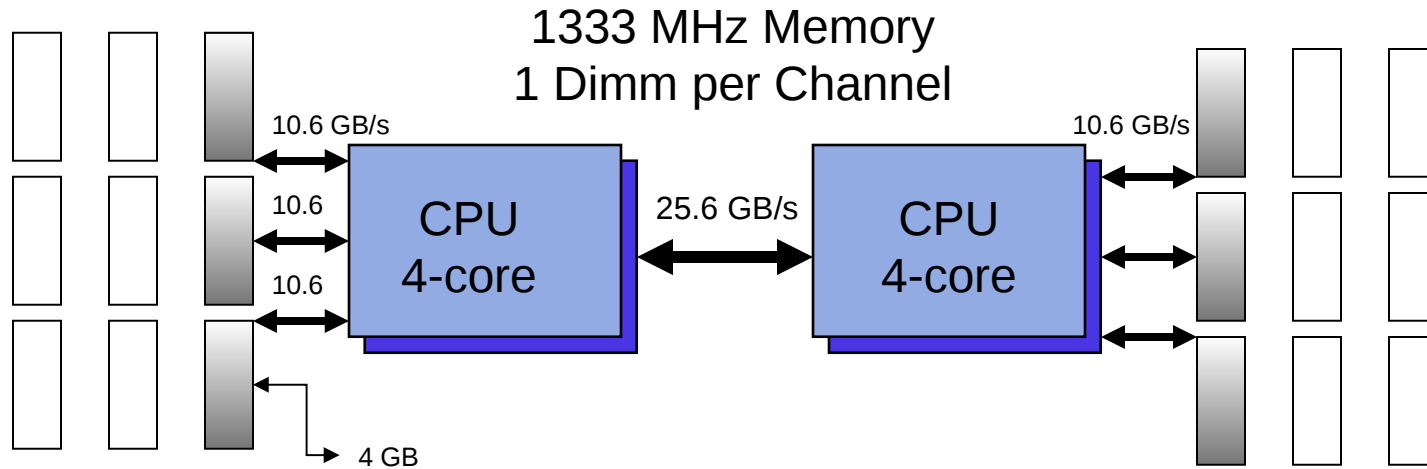
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65

64

Intel® Xeon® 5560 Node 2.8GHz



Performance: A Brief Look

The STREAM TRIAD Benchmark

$$a(i) = b(i) + q * c(i)$$

$$\text{Machine Balance (MB)} = \frac{\text{Peak Floating-point Performance}}{\text{Sustained TRIAD Memory Bandwidth (Dwords/s)}}$$

Node Type	Cores/Node	Peak Mflop/s	TRIAD (MBytes/s)	MB
Nehalem 2.8 GHz	8	89,600	37,122	19.32
Istanbul 2.6 GHz	12	124,800	20,534	48.63

Data Source: Advanced Clustering Technologies
(<http://www.advancedclustering.com/company-blog/stream-benchmarking.html>)

Eos: Application Software

- Engineering: Ansys; Abaqus; Fluent; Starcd; Starccm; Saturn; Vasp; Lammmps
- Weather: WRF; CCSM4; ROMS; Netcdf/Pnetcdf
- Chem/Physics: Gaussian; nwchem
- Statistics: R; SAS (?)
- Matlab; Mathematica
- Math Libs: MKL; gotoblas; fftw; petsc; boost; ...

Eos: Where Are We?

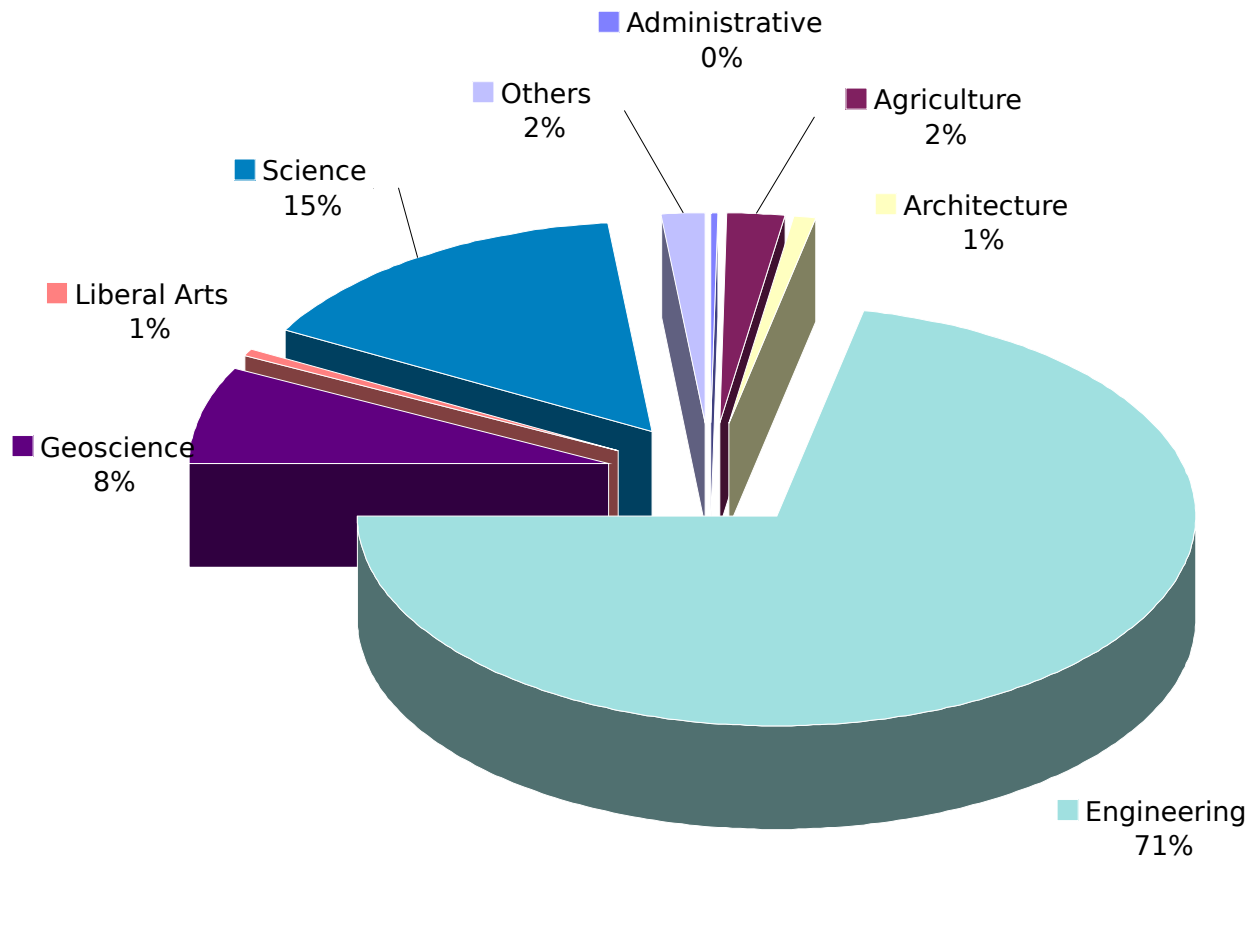
- Operating in user friendly mode since April 02
- Production date: May 10-14
- Still working on
 - which batch, PBS or LSF, and what Queues
 - user accounting
 - useful documentation
 - installing more applications

Advanced User Projects

- 3 Bioinformatics: 1 completed; 2 on-going
- 5 Engineering: 1 completed (nuclear); 2 on-going (nuclear); 2 not-started (chem)
- 3 Geoscience: 1 completed; 2 on-going

How Many Users and Which Part of A&M

FY 2009 Supercomputing Facility Report for Total SC Users

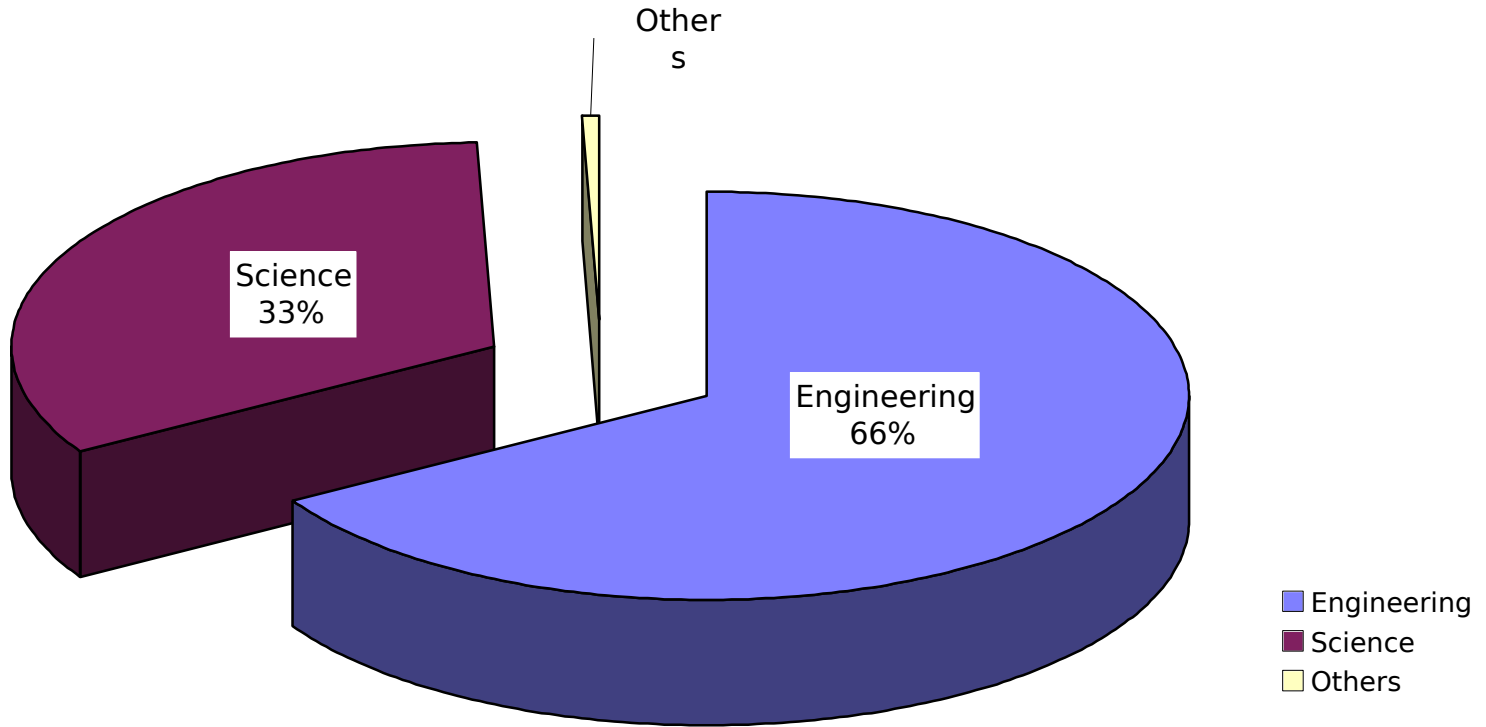


Number of SC Users by College	
Administrative	1
Agriculture	13
Architecture	4
Engineering	397
Geoscience	42
Liberal Arts	3
Science	84
Others	10
Total	554

- Administrative
- Agriculture
- Architecture
- Engineering
- Geoscience
- Liberal Arts
- Science
- Others

Use of Cosmos by College

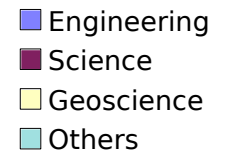
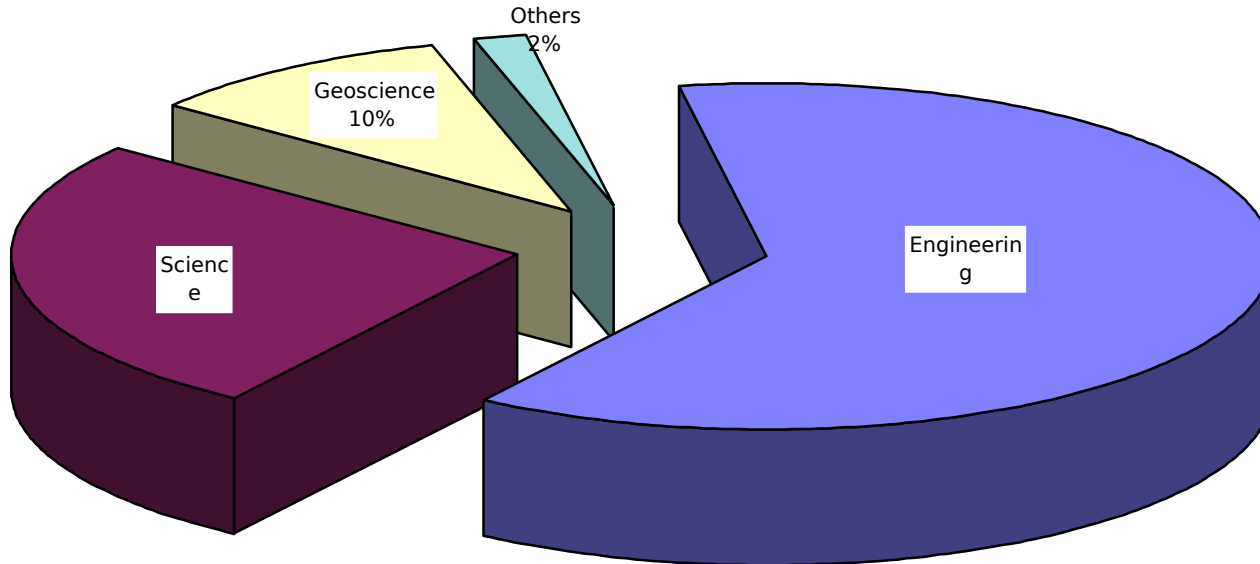
FY 2009 Supercomputing Facility Report for cosmos CPU usage by college



Engineering	369,276 hrs.	66.3%
Science	184,543 hrs.	33.1%
Others	3,306 hrs.	0.6%

Use of HYDRA by College

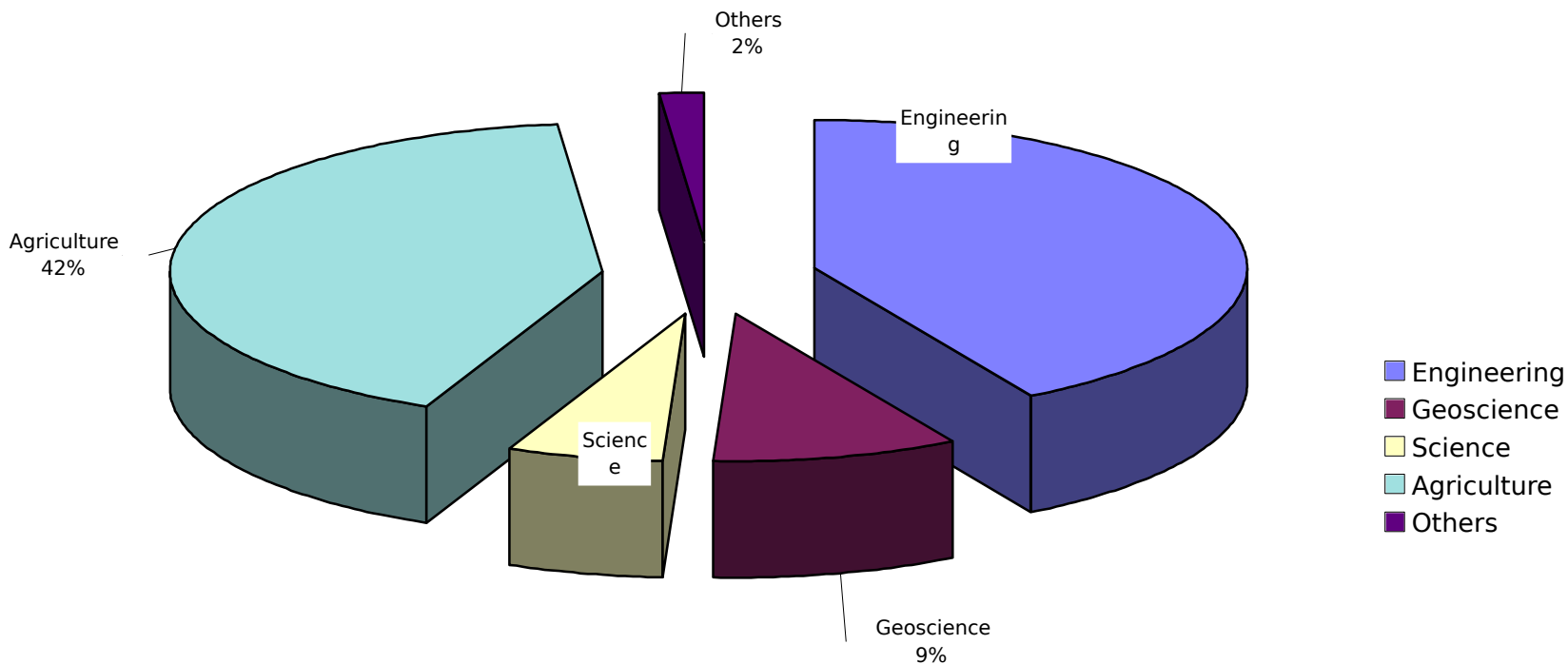
FY 2009 Supercomputing Facility Report for hydra CPU usage by college



Engineering	2,604,134 hrs.	62.2%
Science	1,084,053 hrs.	25.9%
Geoscience	421,085 hrs.	10.1%
Others	68,445 hrs.	1.6%

Use of Helpdesk by College

FY 2009 Supercomputing Facility Report for Helpdesk Time by college



Engineering	842hrs.	41.7%
Agriculture	841hrs.	41.6%
Geoscience	187hrs.	9.3%
Science	119hrs.	5.9%
Others	32hrs.	1.6%
TOTAL	2079hrs.	