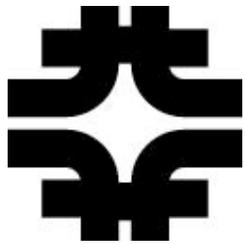


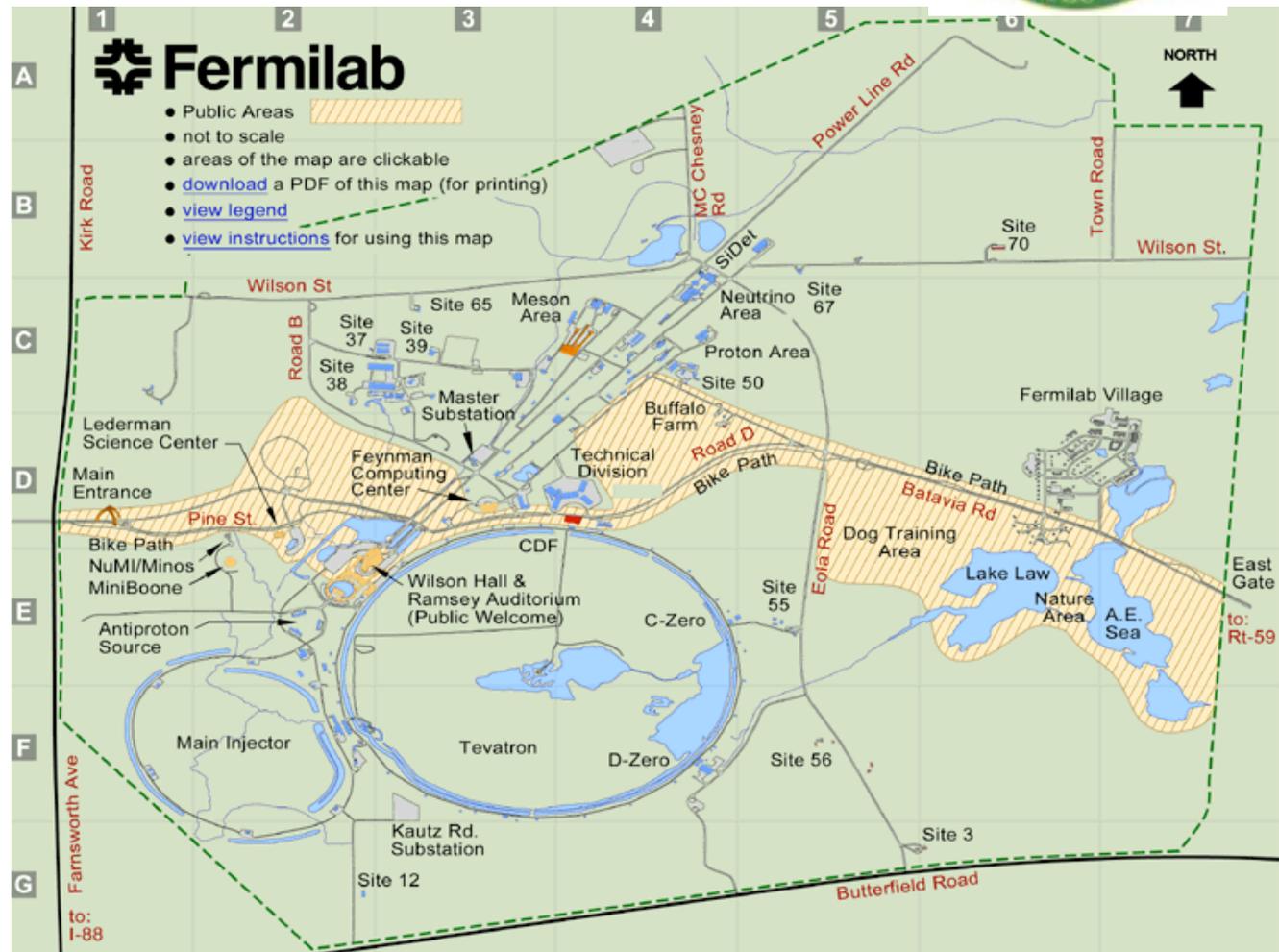
Overview of Computing at FNAL

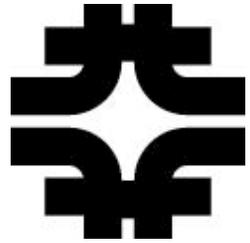
D. Petravick

November 9, 2005



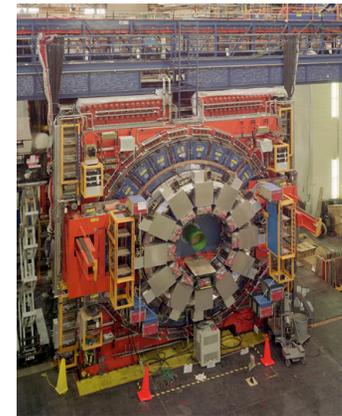
Fermilab

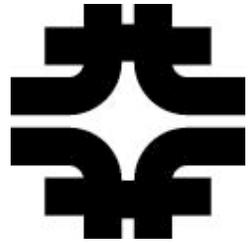




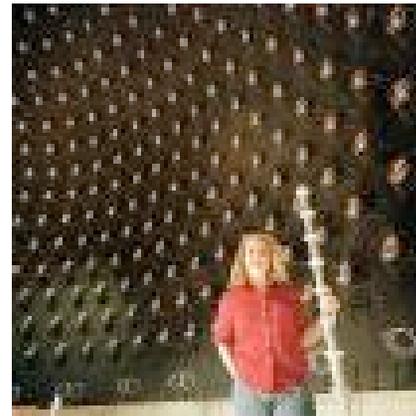
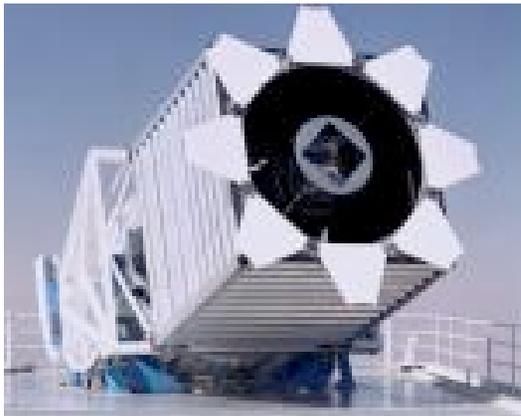
Hadron Physics

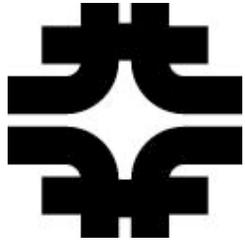
- Most powerful particle accelerator in the world.
- Host laboratory for US CMS T1 facility, LPC at FNAL
 - LHC particle accelerator at Geneva, Switzerland.





Broad Experimental Program

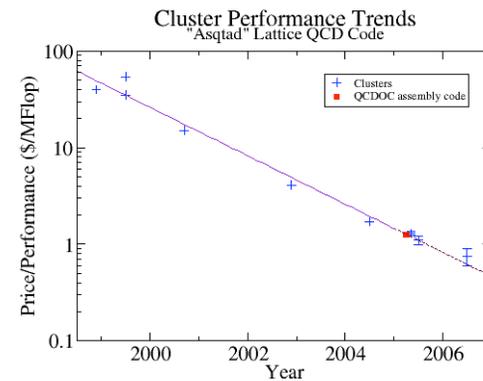


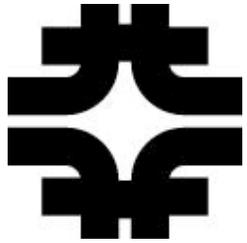


Lattice Quantum Chromodynamics

Part of the national computational infrastructure established by the Department of Energy.

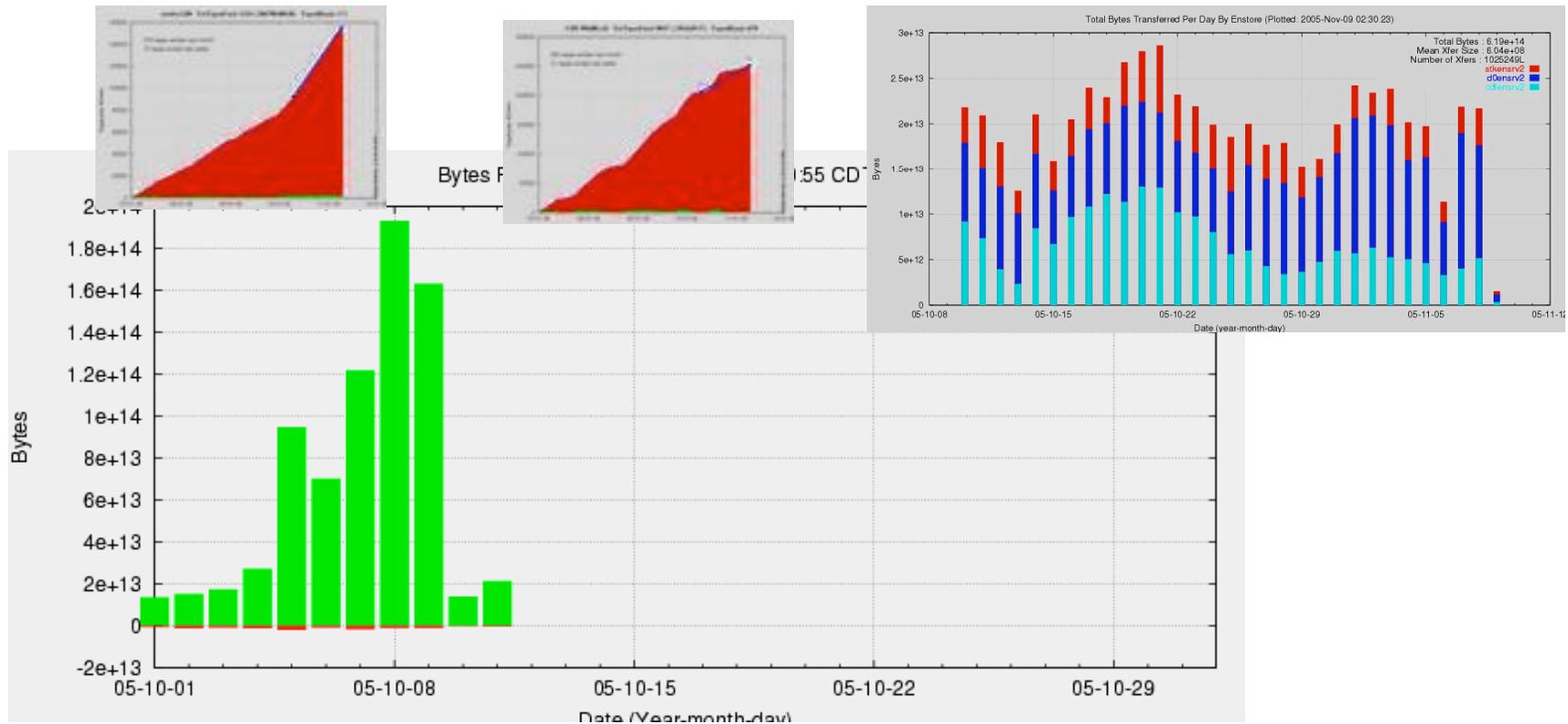
- One goal calculations required to extract from experiment the fundamental parameters of the Standard Model of particle physics
- The Lattice Gauge Computational Facility is in the New Muon lab at the north end of the site.

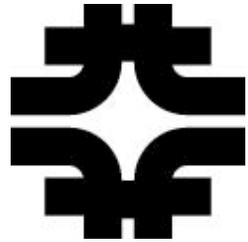




Massive Data Handling

Total User Data on Tape) : 3376.901 TB

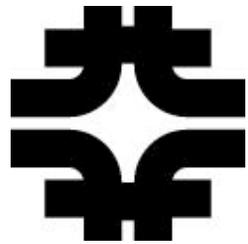




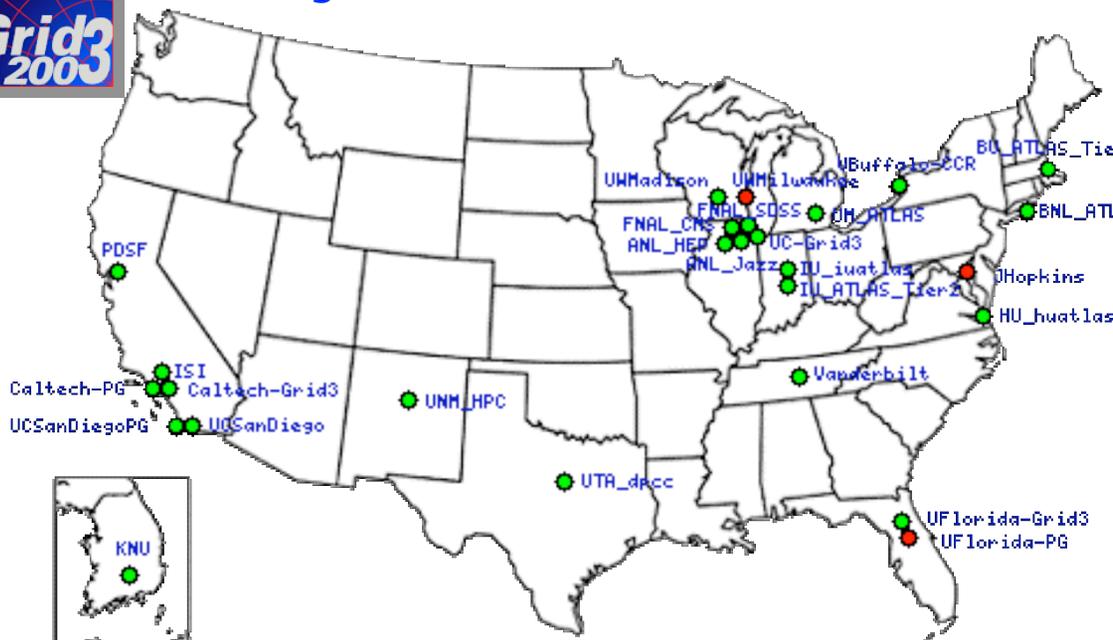
Computing goes Global with Grid

- Increasingly part of the computing for Fermilab experiments is provided off-site
- Fermilab has been in the lead in Grid Computing (even before it became a household word)
 - D0 SAMGrid (now adopted by CDF and MINOS)
 - DOE and NSF funded Grid projects
 - <http://www.ppdg.net>
 - <http://www.ivdgl.org>
 - <http://www.griphyn.org>

Grid3/OSG



- Fermilab and US LHC facilities available through shared Grid
- Massive CMS production of simulated events and data movements
- Hugely increase CPU resources available to CMS through opportunistic use, running on Grid3!

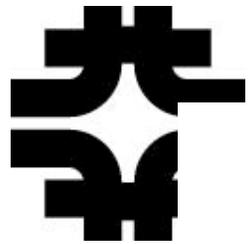


South Korea

Wed Nov 19 22:20:18 EST 2003

Grid2003: An Operational Grid - Huge Success !

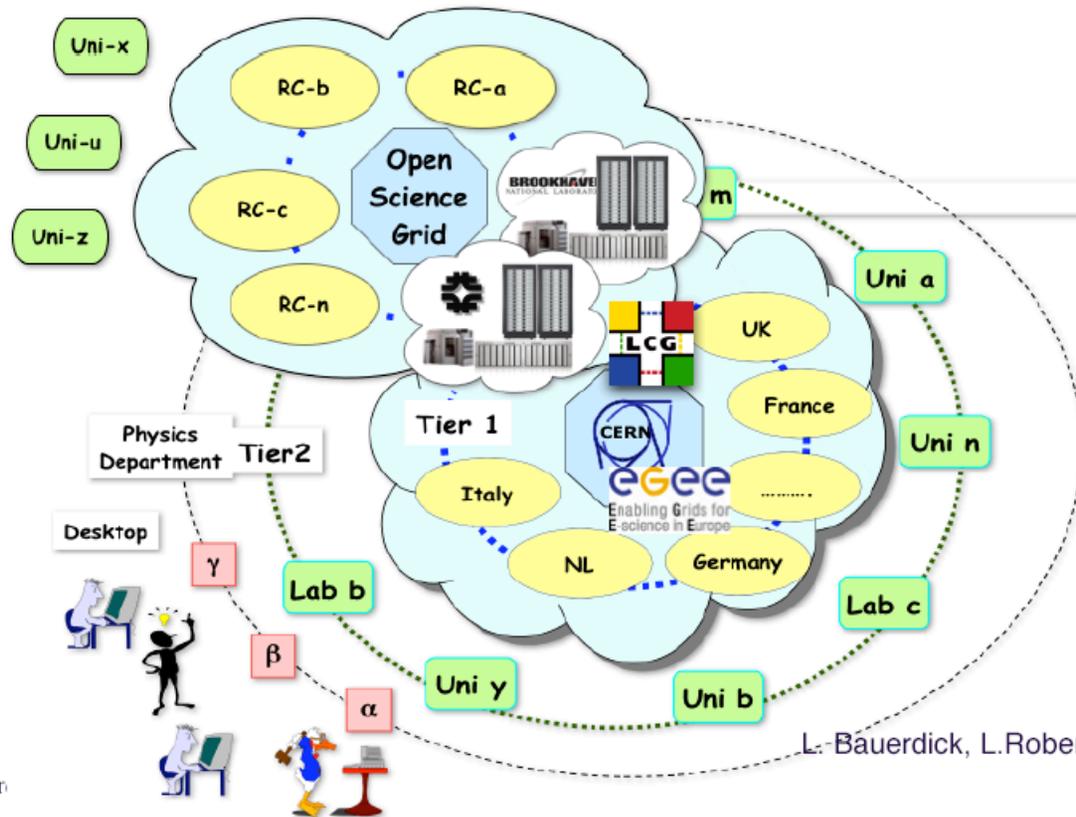
- 28 sites (2100-2800 CPUs)
- 400-1100 concurrent jobs
- 10 applications
- Running since October 2003



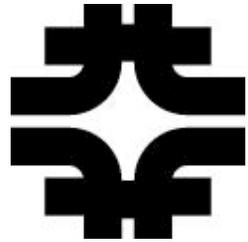
US OSG + European

OSG Grid as part of Global LCG

EGEE- OSG Partnership

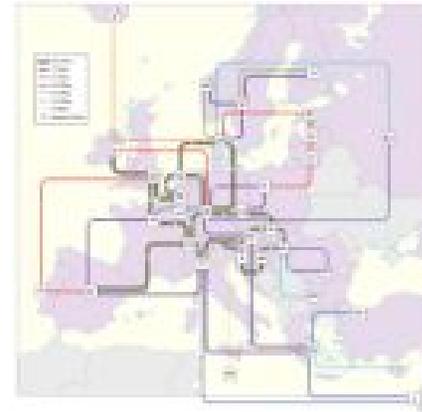
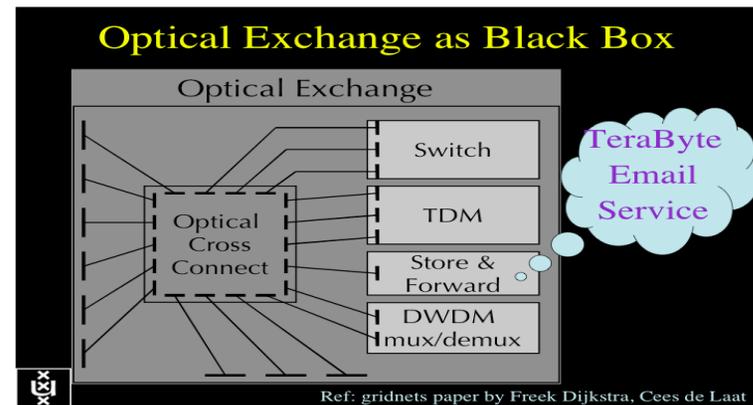


L. Bauerdick, L. Robertson

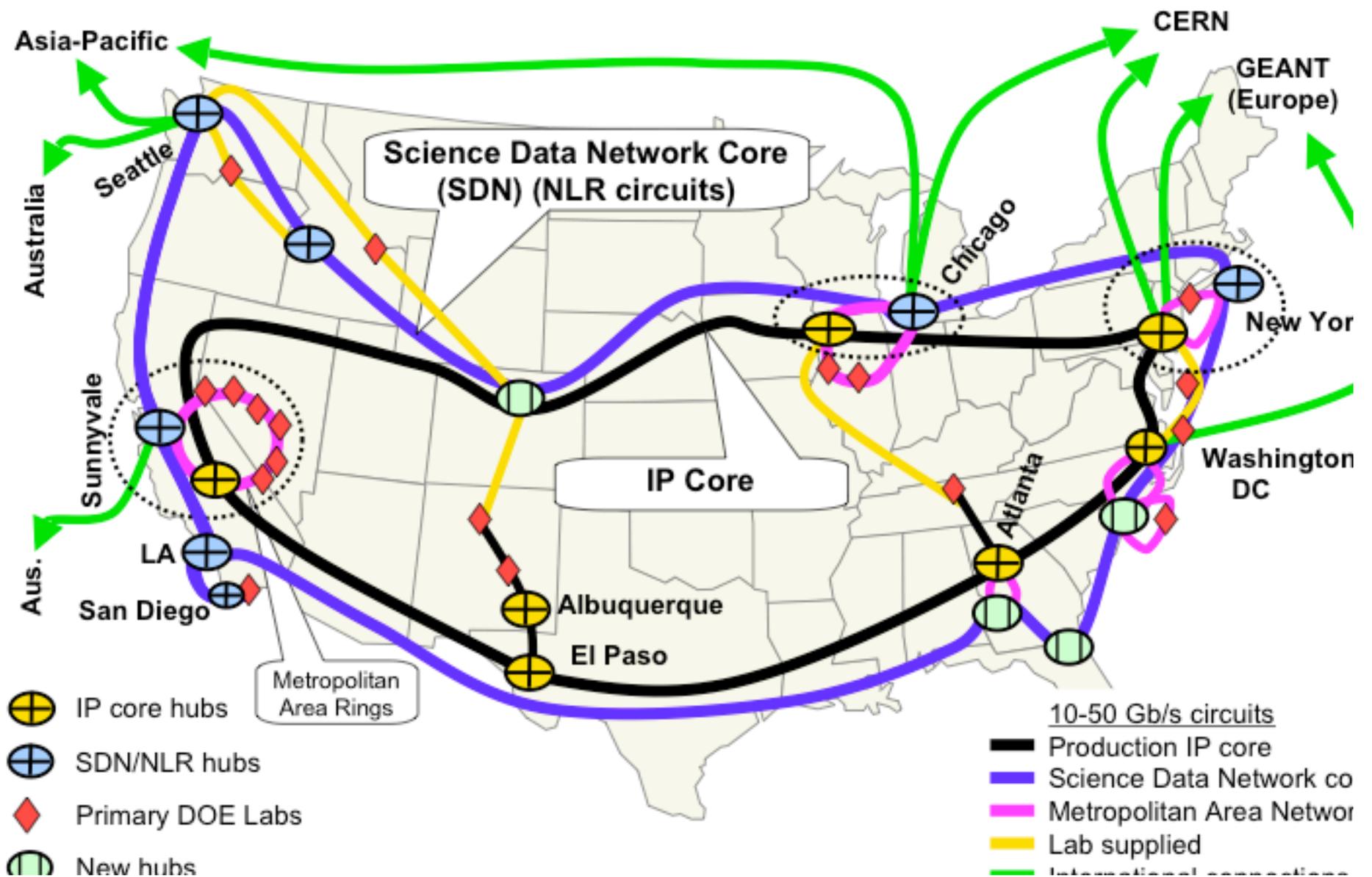


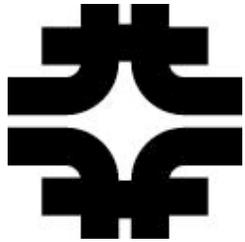
Open Optical Exchange

- Places that many “optical” networks gather.
- R&E emphasis
- Examples : [Starlight in Chicago](#), [MANLAN in NYC](#), [AMSTERDAM \(Netherlight\)](#)



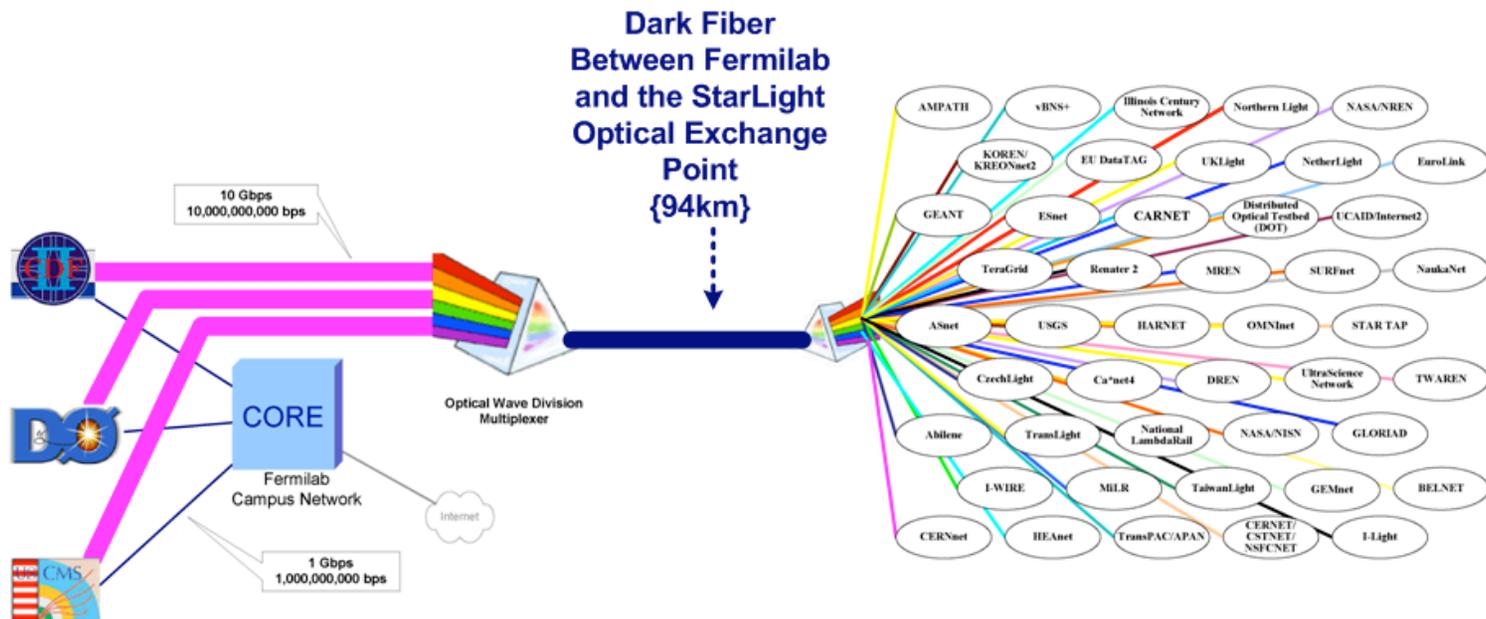
ESnet Target Architecture: IP Core+Science Data Network Core+Metro Area Rings

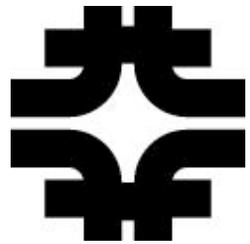




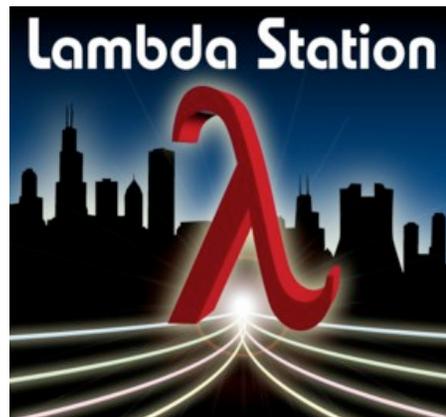
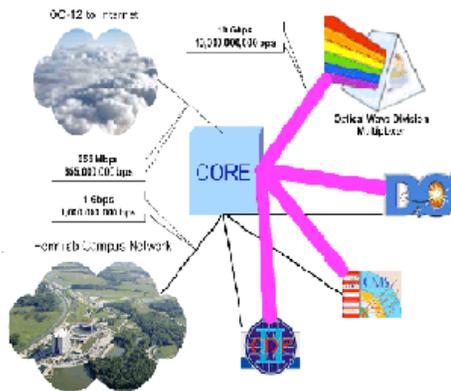
Current Research Potential

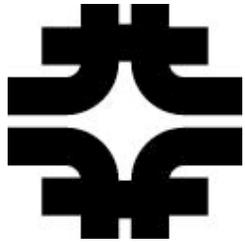
Fermilab's StarLight Dark Fiber Infrastructure





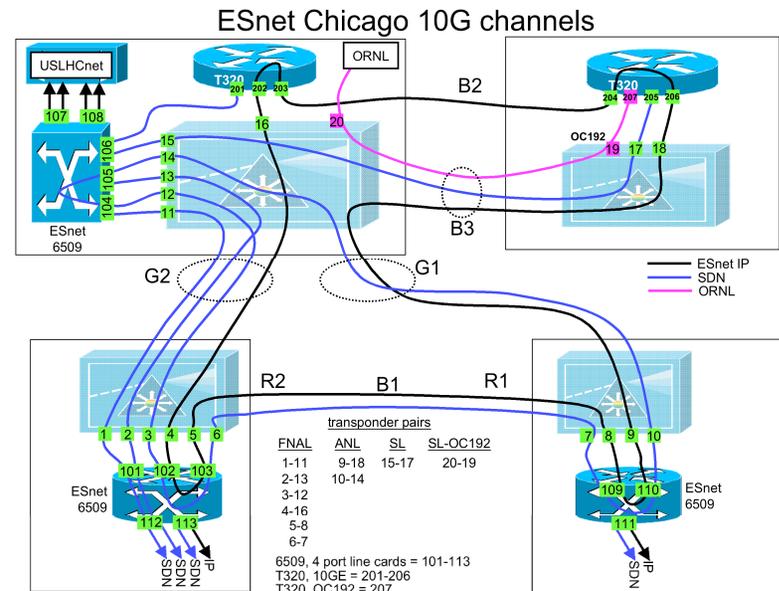
Global Research Networks

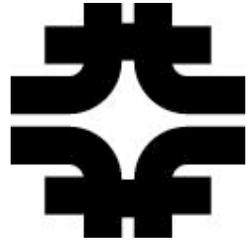




Local Aspects

- FNAL RTU on Dark Fiber to Starlight facility
- NIUNET relationship
- ESNET Chicago MAN
 - Lab operated Dark Fiber Ring.
- DNTP Relationship.
- Starlight(NU) Presence
- MREN





Summary

- Fermilab Science is data and network intensive.
- FNAL seeks reliable connections to world-wide production and research networking.
- FNAL works with regional partners to secure robust connections to metropolitan exchanges, including the open optical exchange at the Starlight Facility in Chicago.