Astro-Particle Physics at DESY
IT Strategy

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User Meeting: IT Strategy Review – Feb 28, 2007

Astro-Particle Physics at DESY

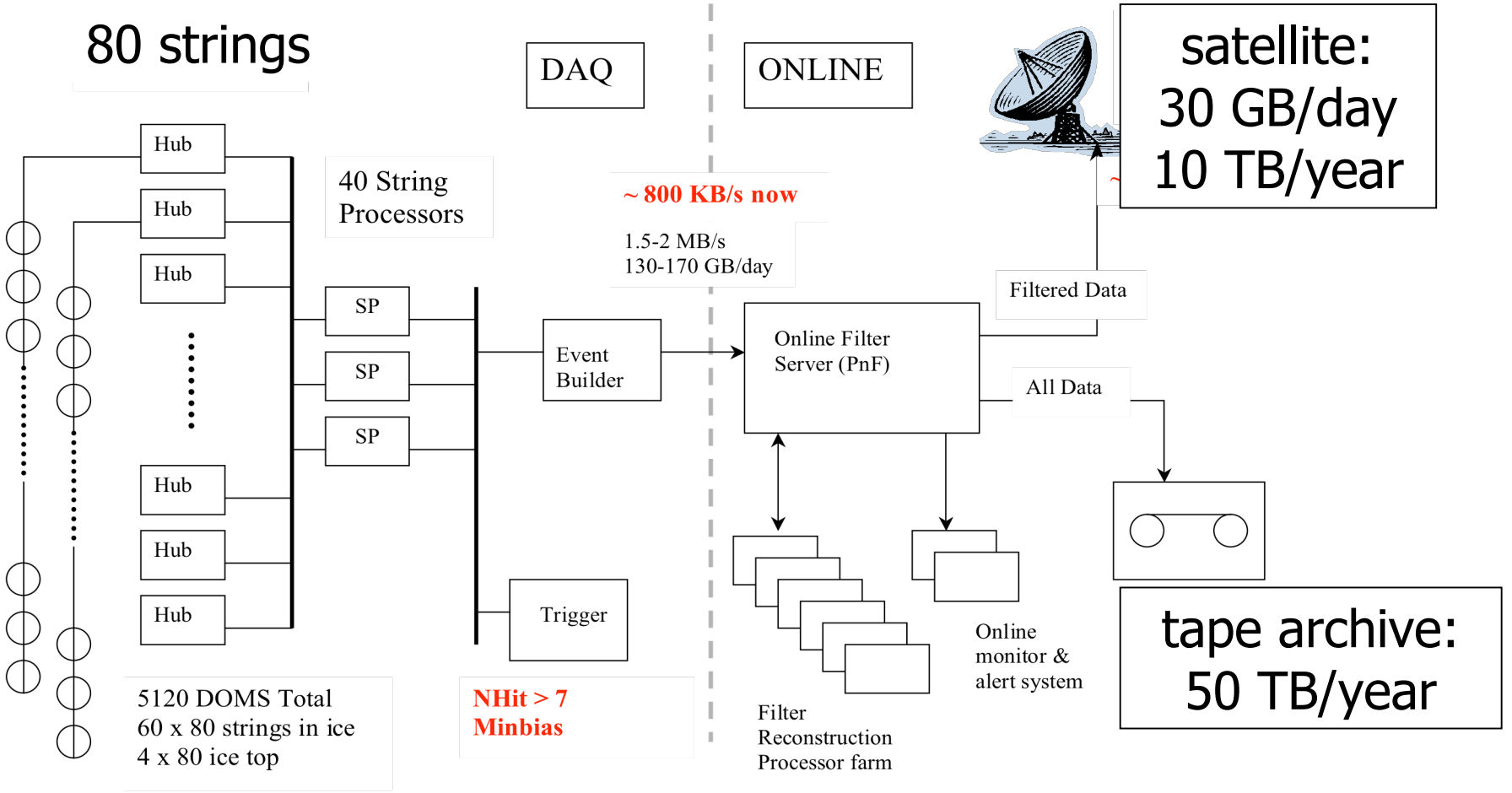
- Neutrino astro-particle physics with IceCube
  - 22 strings in the ice, 26 station (52 tanks) on top installed ⇛ with 14-16 strings per year finish construction 2010-11
  - DOM/DOR production, software management, MC centre
  - physics analyses with in-ice and IceTop: point sources, non-resolved sources, cosmic-ray physics, monopole search
  - acoustics R&D
- Gamma-ray astrophysics with MAGIC through Helmholtz-University Young Investigators Group "Multi-Messenger study of point sources of cosmic rays including data from IceCube"
  - plan running together with MAGIC (target of opportunity)
  - physics analyses
- Discussion started on the future of astro-particle physics @DESY

Neutrino astro-particle physics at Baikal (NT200+) will end 2008

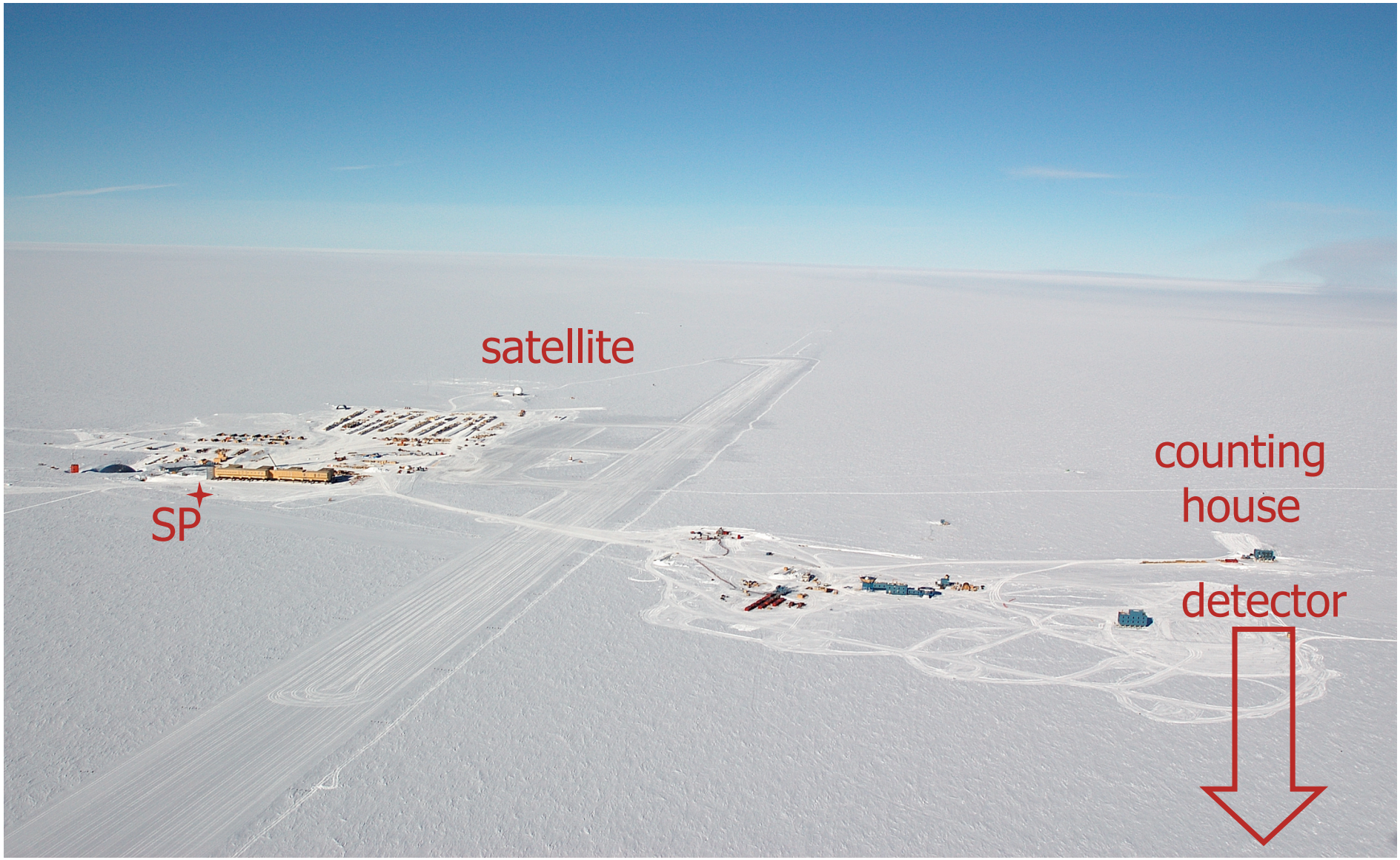
IceCube Online Computing Model

In-ice physics flux:
atmospheric μ > 5 10^{10} events/a
atmospheric ν ~ 8 10^{5} events/a

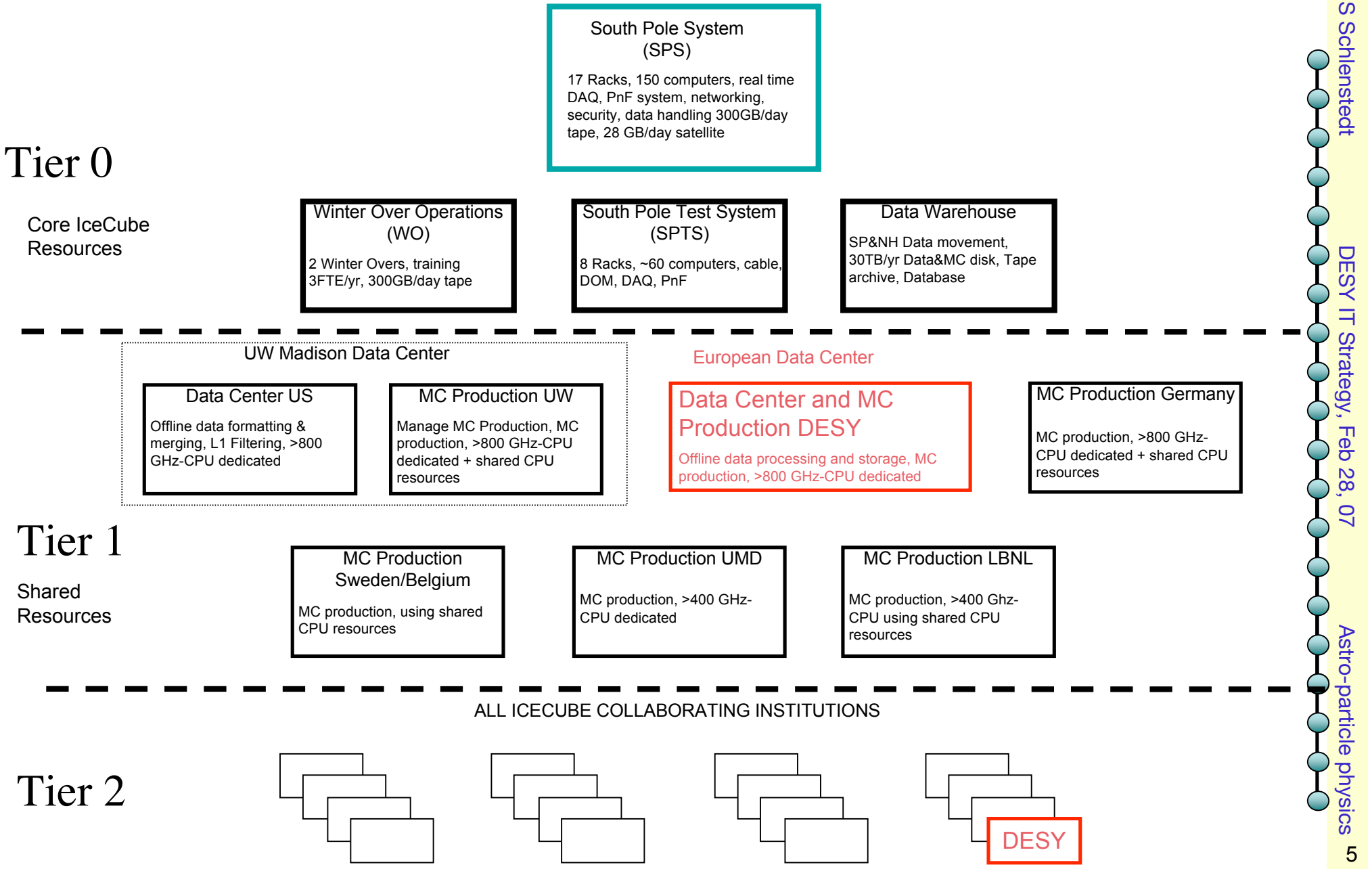
Level1 triggered:
~ 10^{9} events/a
~ 10^{5} events/a



IceCube Counting House and Site

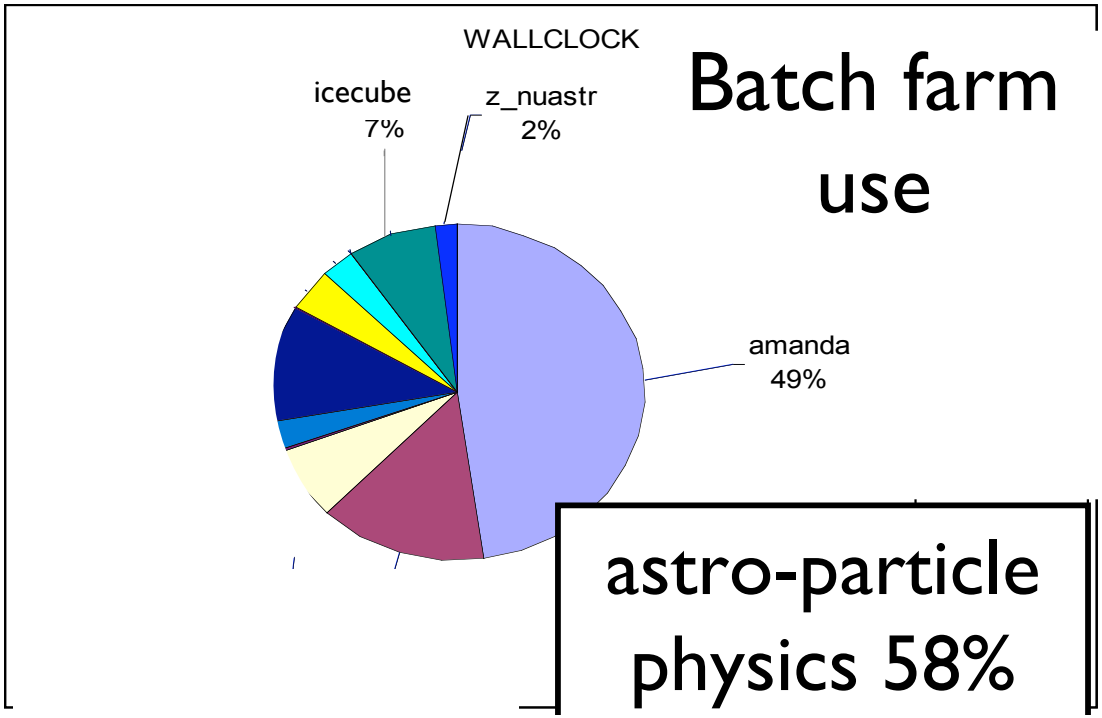


IceCube Offline Computing Structure

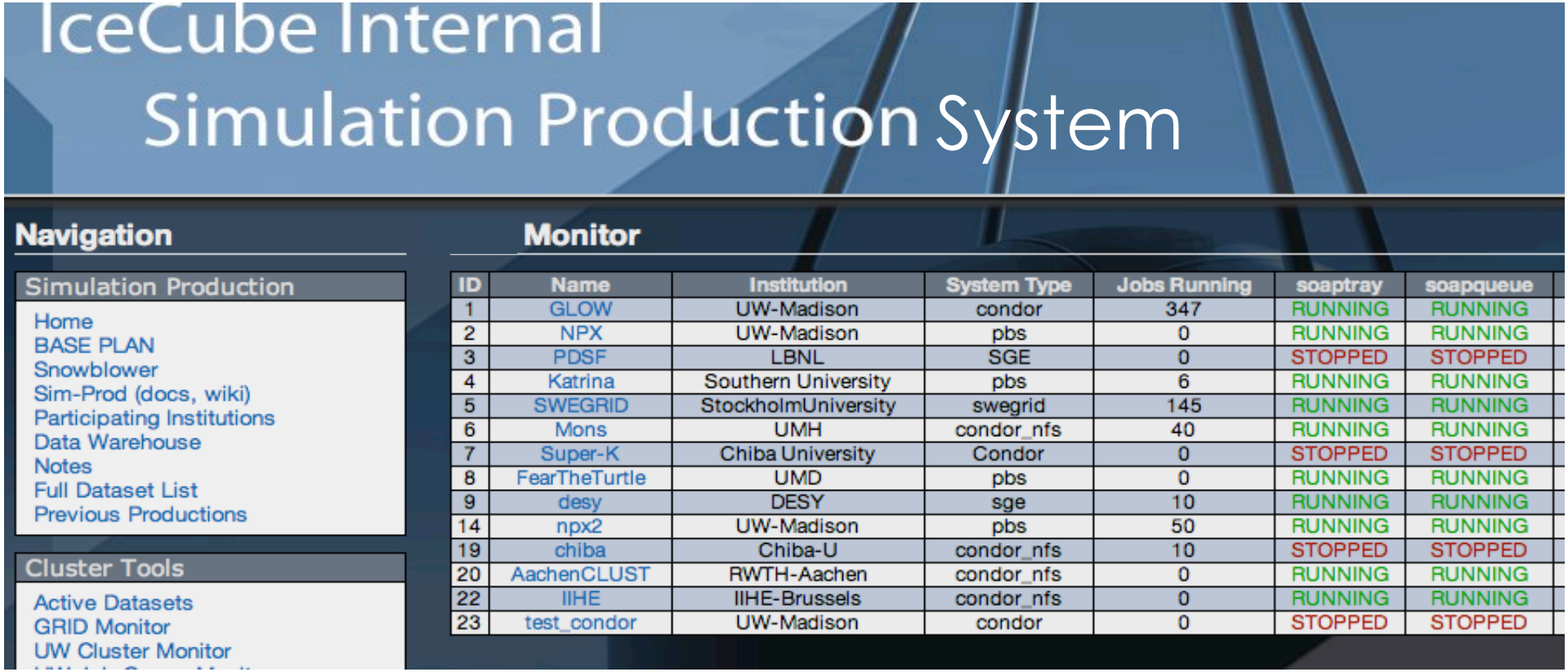


AT Computing Status at DESY

- AMANDA data centre and major MC production site, e.g. 2000-04 grand data processing and 1/3 AMANDA MC production
- Astro-particle physics on Zeuthen batch farm (2006) with
  - 140 cores (via fair scheduling)
  - wall clock-time 95 years (CPU-time 90 years)
  - storage: 23 TB afs/nfs, 4 TB panfs, dcache: 3 TB (read pool) + 22 TB (tape)
- Computing need driven by 10^14…19 eV air showers: simulation of one trigger live-day needs 150-400 core-days
- Software in C++, ROOT and python



Interplay of batch farm and grid computing



ID	Name	Institution	System Type	Jobs Running	soaptray	soapqueue
1	GLOW	UW-Madison	condor	347	RUNNING	RUNNING
2	NPX	UW-Madison	pbs	0	RUNNING	RUNNING
3	PDSF	LBNL	SGE	0	STOPPED	STOPPED
4	Katrina	Southern University	pbs	6	RUNNING	RUNNING
5	SWEGRID	StockholmUniversity	swegrid	145	RUNNING	RUNNING
6	Mons	UMH	condor_nfs	40	RUNNING	RUNNING
7	Super-K	Chiba University	Condor	0	STOPPED	STOPPED
8	FearTheTurtle	UMD	pbs	0	RUNNING	RUNNING
9	desy	DESY	sge	10	RUNNING	RUNNING
14	npx2	UW-Madison	pbs	50	RUNNING	RUNNING
19	chiba	Chiba-U	condor_nfs	10	STOPPED	STOPPED
20	AachenCLUST	RWTH-Aachen	condor_nfs	0	RUNNING	RUNNING
22	IIHE	IIHE-Brussels	condor_nfs	0	RUNNING	RUNNING
23	test_condor	UW-Madison	condor	0	STOPPED	STOPPED

Proof of concept in 2006:
Usage of IceCube offline software components
on the grid (VO icecube) demonstrated

AT Computing Strategy at DESY

- Computing model: farm computing, local disk access to data and MC samples, fast connection to Germany, Sweden, US (data warehouse in UW Madison)
- 2007: provide permanently 260 cores for MC production (IceCube collaboration contract)
- Analysis capacity needs to grow with group and amount of data
- Support for German universities, in particular Berlin and Potsdam
- Grid prototype exists, establish data exchange with grid tools

	available	installed in	planned		
	2006	2007	2008	2009	2010
#CPU cores	140	400*	450	500	550
Disk (TB)	25	40*	45	50	60

* YIG application to HGF: additional 8 TB disk and 120 cores