

High Energy Physics at Hampton University

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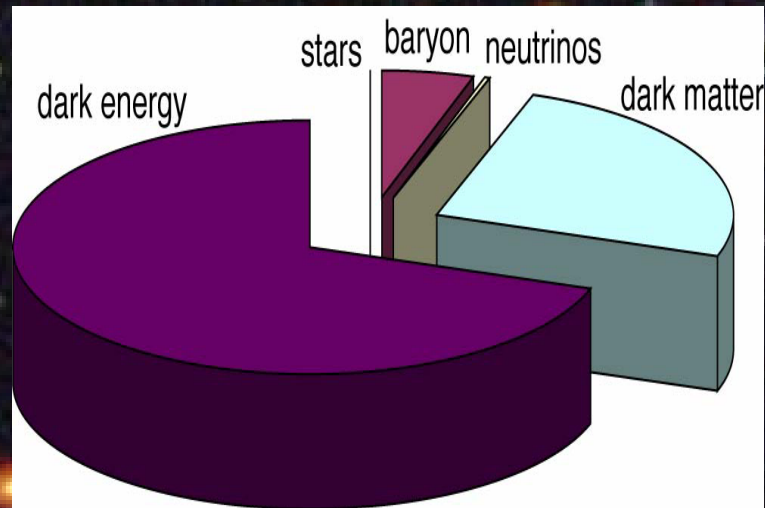
Hampton University and Jefferson Lab

November 30, 2004

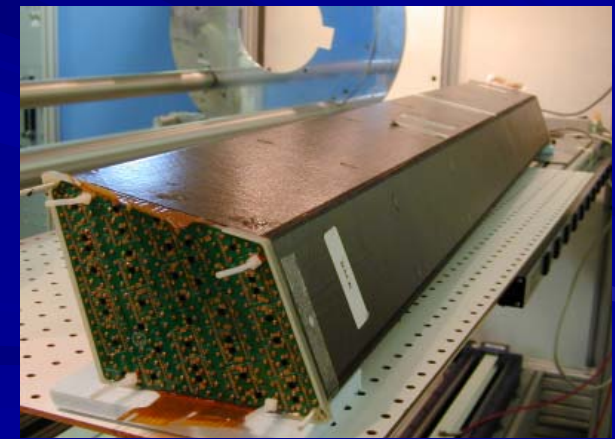
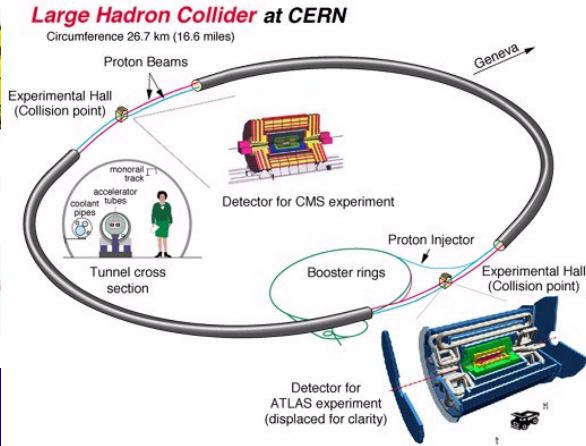
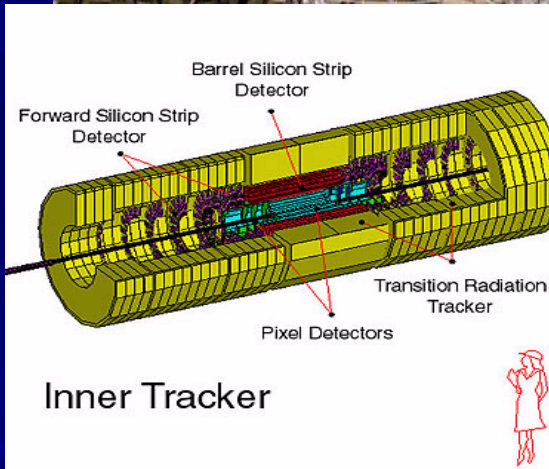
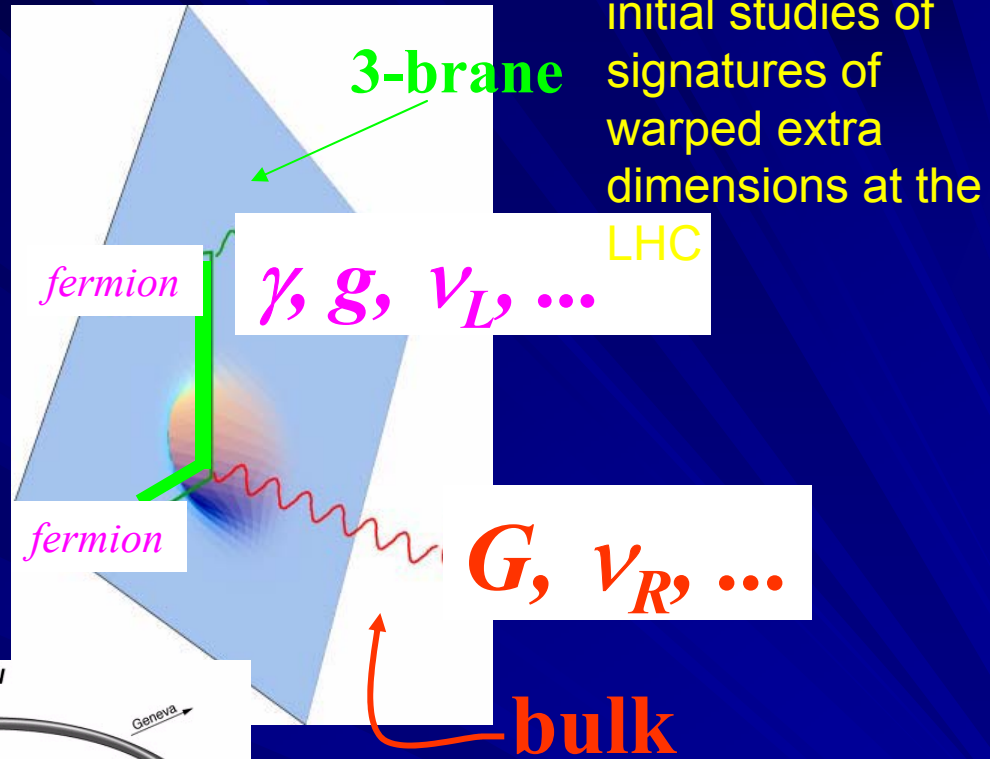
The Quantum Universe . . .

- a revolution in particle physics !!
 - Hampton University role: one example

- stars and galaxies are only ~0.5%
- neutrinos are ~0.3–10%
- rest of ordinary matter (electrons and protons) are ~5%
- dark matter ~30%
- dark energy ~65%
- anti-matter 0%



Hampton University in ATLAS



NSF-funded Physics Frontier Center in Particle and Nuclear Physics at HU (COSM)



■ ATLAS TRT construction on the Hampton University campus.



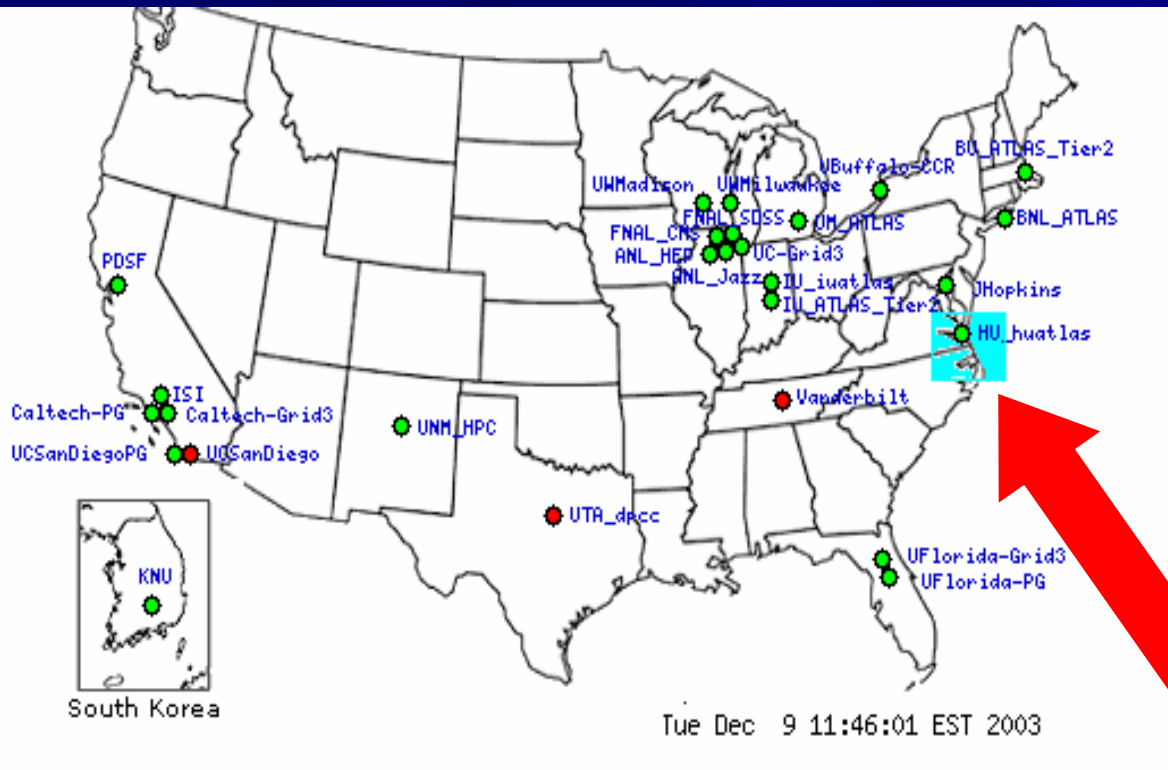
□ class 10k clean room, ~3k ft² of laboratory space



■ HU part of ~all of the barrel TRT mechanical construction

COSM Physics spinoff – Grid Computing

- data rates enormous - measured in petabytes per year!!
- need new way of handling and analyzing data.
- grid computing e.g. International Virtual Data Grid Laboratory (iVDGL).



- Hampton University participated in the GRID3 demonstration at Grid Computing Conference 2003!!
- HU cluster (5 nodes) built and tested by students!

Hampton University

- one of the nation's Historically Black Colleges and Universities (HBCUs)
 - One of just over 100
- ~ 6000 students
 - graduate and undergraduate
 - mostly African-American
- private, coeducational
- doctoral degree program in Physics
 - first to be offered at the university
 - more than 30 doctoral degrees conferred so far
- particle and nuclear physics
 - ATLAS and Jefferson Lab

“The single most important factor that determines whether or not an undergraduate student at an HBCU goes on to graduate school is whether they participated in undergraduate research”

F. Humphries, Director of NAFEO
and
N. Francis, Xavier University
President



Some ATLAS students at Hampton University

■ the very best students want to work at the frontier of the field!!!

■ okb observation



COSM Summer undergraduate students
■ seven students in '04; seven students in '03
■ acceptance rate ~50%
■ from HBCUs in VA, LA, NC
■ average gpa is 3.8/4.0
■ three students had perfect gpa's in '03 ; four students had perfect gpa's in '04

doctoral degree program at Hampton University attracting some of the best and brightest students and scientists in the field

attracting job offers in high energy physics (Brookhaven National Lab example)

summary

- Hampton University is one example of an institution playing a role at the front lines of the revolution in particle physics.
 - ATLAS at the LHC; hardware and software
 - technical spinoffs
 - education of next generation of scientists