

Snowmass 2001



E7: Particle Physics and Technology Working Group

http://snowmassserver.snowmass2001.org/Working_Group_E7/

Mid-Term Report

Organizers:
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E7 Charge:

Review leading-edge technologies recently developed (or in need of development) for new experiments and theoretical or computational investigations.

Examine developments related to particle detectors, accelerators, online data acquisition systems, offline data analysis systems and networked "Grid" systems, or other areas for their impact on experimental, theoretical, and computational investigations in particle physics.

Examine technologies developed, or to be developed, within particle physics for their potential impact on society.

Review the demands for computer science expertise and software engineering in the current and future programs.



E7 Activities

Reviewing the present state and future directions of particle physics detector, computing, and accelerator technology.

Studying 5 areas of R&D where technological advances are needed:

- **Particle detectors**
- **Electronics**
- **Trigger & DAQ**
- **Computing (algorithms & hardware)**
- **Accelerators & Interaction Regions**

Subgroups formed to work on these

E7 Schedule

First 2 weeks: Sinclair Room

Tue. 3-Jul	9:00 - 12:00	Organizational Discussion Roundtable Discussion Wilson	European Data Grid
Wed. 4-Jul	9:00 - 12:00	No Meeting	
Fri. 6-Jul	9:00 - 12:00	Reports on "visits" Bishai Cremaldi Ruchti Whiteson Organization of Assignments	Silicon Vertex Detectors Pixel Detectors Scintillation Calorimetry Algorithms
Sat. 7-Jul	9:00 - 12:00	No Meeting	
Mon. 9-Jul	9:00 - 12:00	Reports on Assignments Roundtable Discussion Magill Rusack	Calorimetry Segmentation APDs
Tue. 10-Jul	14:00 - 18:00	Breidenbach Jackson Marchioro Procario	NLC Detector R&D Accelerator R&D Future Rad. Hard Electr. DOE R&D Program
Wed. 11-Jul	9:00 - 12:00	Mid-course Discussion Ryne Stern	Hi Perf. Comp. for Accel. National Scalable Cluster
Fri. 13-Jul	9:00 - 12:00	LeDu Butler Kaplan	Next Gen. Trig. & DAQ Fault Tol. Computer Trigs. BTeV Trigger



R&D Needed

So far, we have identified a number of areas of R&D that need work in order for progress in particle physics, e.g.

- **Energy flow calorimetry**
- **Radiation hard electronics**
- **Stretched CCDs & low mass support structures**
- **Pixel & CCD readouts**
- **Alignment technology**
- **Databases & Networked Dataflow**
- **Fast timing & triggering**
- **Much more (accelerator R&D, etc.)**
- **Suggestions? Join us! (Sinclair 9-12)**



Benefits from Particle Physics Technology

Our group has also identified areas where particle physics technology has benefited society at large, e.g.

- Medical treatment with particle beams
- Medical imaging, Radio-Pharmaceuticals
- Synchrotron light sources
- Computing & data mining
 - e.g. National Digital Mammography Archive
- Terascale simulation
- Nanolithography, ion implantation,
- Spallation sources, Pulsed neutron sources
- And of course the web.....and more....
- Suggestions? Join us! (Sinclair 9-12)