

Calendar

Tuesday, September 5

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-over

4:00 p.m. Accelerator Physics and

Technology Seminar - 1 West

Speaker: X. Yang, Fermilab

Title: Simulation of Transition Crossing in the Fermilab Booster

Wednesday, September 6

11:00 a.m. Fermilab ILC R&D Meeting - Curia II (note location)

Topic: To Be Announced

3:30 p.m. Director's Coffee Break - 2nd floor crossover

4:00 p.m. Fermilab Colloquium - 1 West

Speaker: D. Groom, Lawrence Berkeley National Laboratory

Title: A Simplistic View of Hadron Calorimetry

[Click here](#) for a full calendar with links to additional information.

Weather



Showers Likely **71°/55°**

[Extended Forecast](#)

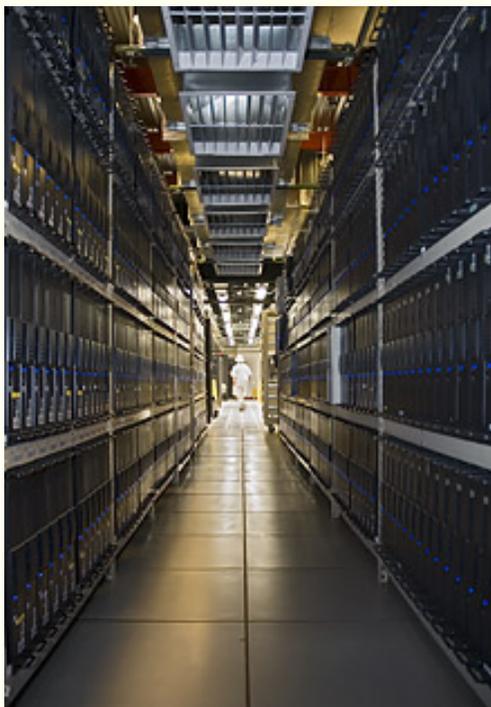
[Weather at Fermilab](#)

Current Security Status

[Secou Level 3](#)

Wilson Hall Cafe

New computer cluster to crunch QCD equations



This September a new computer cluster will be added to the Lattice Computing Center. The older "Pion" computing cluster, pictured above, will share a recently-renovated room with the new "Kaon" cluster.

Studying particles in virtual reality demands powerful computing. Because linking desktop computers together is more cost-effective than buying one large supercomputer, Fermilab will install "Kaon"--a cluster of 600 units--in the Lattice Computing Center this September. "Together these computers will be as powerful as any cluster in the world dedicated to this type of work," said Fermilab's Andreas Kronfeld, an expert in lattice gauge theory.

Physicists use Lattice Quantum Chromodynamics to determine properties of quarks and gluons, particles fiercely bound together as hadrons in nature--

Director's Corner

Meson Lab



We are about to embark on the repairing and repainting of the Meson building roof. This landmark structure is not just a roof; it is one of Bob Wilson's creations, a piece of sculpture that is supposed to be visually engaging, structurally sound, support the internal crane (why waste all that steel?) and also, more mundanely, keep the rain out. Over the years it has succeeded admirably in the first three tasks but it has failed miserably in the fourth. To keep the rain out has been a formidable challenge that has defeated all previous intrepid souls that have attempted it.

We must make the Meson lab habitable, because it will become once again an important center of activity for the laboratory. After the completion of almost all fixed target programs, a lot of equipment and shielding was left behind in the floor and needed to be cleared out--a monumental task that we accomplished a year ago. Since then, we have placed a substantial fraction of our superconducting radio frequency work in the building. In addition, with the expansion of the particle beams that now supply the Meson lab, we plan to accommodate two world-class test

Tuesday, September 5

- Creamy Turkey Vegetable
- Chicken Gyros
- Salisbury Steaks w/Mushroom Au Jus
- Chicken Cacciatore
- Italian Panini w/Provolone
- Assorted Slice Pizza
- Super Burrito

[Wilson Hall Cafe Menu](#)

Chez Leon**Wednesday, September 6****Lunch**

- Salmon Fillet w/Watercress Sauce
- Orzo w/Pine Nuts, Tomatoes and Arugula
- Chocolate Raspberry Cake

Thursday, September 7**Dinner**

- Melon and Prosciutto
- Pork Tenderloin w/Madeira Sauce
- Vegetables of the Season
- Marzipan Cake

[Chez Leon Menu](#)

Call x4598 to make your reservation.

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particle accelerators can break these connections, but only briefly. Lattice QCD enlists computers to get around this problem by simulating four-dimensional vacuum for quark and gluon fields to play in. "We live in an average of these fields, which is what we're trying examine," Kronfeld said. The answers derived from the simulations will help physicists better understand particle behavior.

But how powerful will Kaon be? When the cluster is connected by a high-speed network, it will have the computing muscle of 1,200 dual-core processors that can render the complexity of space and time. A single-processor desktop computer can handle the information of a 10 MB image in about five seconds--the new cluster, if physicists wanted it to, could process the same file 1,600 times faster. "This power will enable us to meet our aims in a reasonable amount of time," Kronfeld said.

Don Holmgren of the Computing Division says simulating the vacuum will occupy much of the cluster's computing time.

Each chunk of four-dimensional space will have 48 points to a side and 144 instants of time for a total of 15,925,248 lattice points. For each point, Kaon will store detailed information about quarks and gluons to create what is called a configuration, once all of the data is put together. Getting significant results and exploring new territory with Kaon will require the analysis of 3000 such configurations. "With this new cluster, we'll be able to generate perhaps 10 configurations per day," Holmgren said.

--Dave Mosher

Readers Write**Young scientist?**

beams with a broad range of particles and energies for the development of detector technology. These beams will be essential to test the performance of detectors at very high energies, especially the new concepts in hadron calorimetry that will be essential for ILC experiments.

Changing the roof--the best solution--would be prohibitively expensive, so we are doing the repairs economically within the constraints that exist. The repair and repainting will be done using technology different from those tried in the past, one that addresses the weakness of the present roof design but attempts to preserve it. The technique involves placing an under-layer of foam in the bottom ridges of the culvert pipes that make up the roof. The entire roof is then covered with a colored elastomeric membrane that is sprayed on to provide a smooth run-off surface and one flexible enough to allow the expansion and contraction of the roof under the severe temperature changes the building experiences over the course of a year. The Office of High Energy Physics has provided very important help that allows us to do this work without adversely affecting the scientific program of the laboratory.

The Meson lab will be an exciting place to be on the first rainy day after the repairs!

Announcements

[Linear Collider News archive](#)

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Fermilab astrophysicist Scott Dodelson wrote in response to [Friday's story](#) about a new podcast featuring his voice.

Dear FT:

Thanks for putting in the line about those "young scientists." I'll show it to my wife.

Best,

Scott

If you would like to submit a letter, write to us at today@fnal.gov.

In the News

SLAC today August 31, 2006:

Still Running at SSRL

The annual shutdown of SPEAR3 brings anything but idleness to SSRL. Having the storage ring switched off gives engineers and scientists time to make upgrades and repairs, keeping the beehive of activity at the lab humming. And just because no x-rays shine down SPEAR3's beamlines, that doesn't mean scientific research comes to a halt.

[Read More](#)

Nominations Requested for Job Profiles

Do you know an employee who exemplifies what it means to work at Fermilab? The Employment department is developing an Employee Profile link on our website to provide applicants with insight on what it is like to work at Fermilab. The profile may include first name, job title, duties, special projects and career path. Please e-mail your nominations of fellow employees for Employee Profiles to hsidman@fnal.gov by September 15.

Learn demos, eat free lunch

Veteran, novice and brand new science presenters are invited to a luncheon today, September 5, between 11:30 and 1:00 pm at the Lederman Science Center in the Ideas Room. You'll learn about the classroom presentations you can join in on, meet presenters, sign up for equipment open house times and hear some exciting news about presentations first hand. Bring a friend. [Learn More](#)

[Upcoming Activities](#)