Fermilab Today

Wednesday, May 19, 2010

Calendar

Have a safe day!

Wednesday, May 19
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
THERE WILL BE NO FERMILAB COLLOQUIUM THIS WEEK

Thursday, May 20
1:30 p.m.
Accelerator Physics and Technology Seminar - Curia II
(NOTE TIME & LOCATION)
Speaker: Tim Maxwell, Northern Illinois University
Title: Optical Beam Position Monitor for Sub-Picosecond Spatio-Temporal Correlation Monitoring
2:30 p.m.
Theoretical Physics Seminar - Curia II
Speaker: David Reeb, University of Oregon
Title: Gauge Coupling Unification in Non-Supersymmetric GUTs Through Gravitational Effects
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

Click here for NALCAL, a weekly calendar with links to additional information.

Upcoming conferences

Campaigns

Take Five

Tune IT Up

H1N1 Flu

Feature

Stuart Henderson appointed associate director for accelerators

Stuart Henderson

Accelerator scientist Stuart Henderson has accepted an appointment as Fermilab's associate director for accelerators. He will start his new job at Fermilab in August.

Henderson, a world-renowned accelerator physicist, is currently director of the Research Accelerator Division of Oak Ridge National Laboratory in Tennessee, a position he has held since 2006. In that role he led the ramp-up to high-power, high-availability operation of the laboratory's Spallation Neutron Source, the world's most power spallation neutron facility. Previously, as accelerator physics group leader at ORNL, he played key roles in the successful design, construction and commissioning of the SNS.

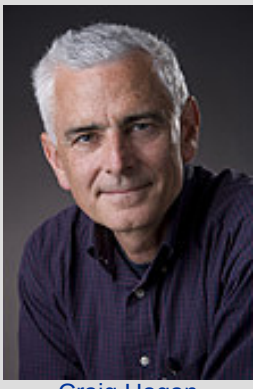
"I am delighted that Stuart is joining Fermilab in one of our most important leadership positions," said Fermilab Director Pier Oddone. "Stuart is recognized across the world as one of the foremost accelerator experts. Beyond his technical abilities, he has great qualities as a manager and a leader. We are fortunate to have him join us." Henderson replaces current Associate Director for Accelerators Steve Holmes, who will become the full-time project manager for the proposed Project X.

"It is hard to think of anyone better suited to this position than Stuart," Holmes said. "He is an internationally recognized accelerator scientist with a wealth of relevant experience, and he is well acquainted with the Fermilab program. The accelerator staff is going to love him. I am personally looking forward to working with Stuart to bring to Fermilab the accelerator facilities that will define our future." Henderson describes his enthusiasm for the position that Holmes has held since 1999.

From the Center for Particle Astrophysics

Measuring the tick-tock of space-time

Craig Hogan, head of the Center for Particle Astrophysics, wrote this week's column.



Craig Hogan

These days, nobody can escape the space-time grid. Your cell phone's GPS knows time to sub-microsecond precision, and hence can pinpoint your position in space and time to a few meters. (Cell phones transmit signals at the speed of light, which translates the uncertainties in seconds to uncertainties in meters.)

However, no clock is perfect; even timekeeping on the best atomic clocks drifts randomly by a few parts in a million billion, or 10^{15}, every second.

That raises the question: could there ever be a perfect clock? A blend of quantum mechanics and gravity theory suggests that there is a minimum time period associated with the Planck scale, about 5.39×10^{-44} seconds long. If that is the minimum length it takes to transmit a bit of information, then the maximum transfer rate for nature's best Internet connection would have a bandwith of 10^{44} bits per second. It would also be the maximum tick rate of any clock.

If both space and time are subject to this limit, it's possible that you only get to achieve this bandwidth in one direction at a time. If so, this would mean that measurements oriented in different directions randomly drift apart due to a fundamental noise of space-time. That drift in space-time would be about one part in 10^{22} every second—a lot longer than the one-dimensional minimum time period but a lot smaller than atomic clocks can measure.

The good news: we might be able to build a machine that can detect this fundamental jitter in space-time, if it exists. As a matter of fact, over the space of less than a microsecond, we

For information about H1N1, visit Fermilab's flu information site.

Weather

Sunny
72°/48°

Extended Forecast
Weather at Fermilab

Current Security Status

Secon Level 3

Wilson Hall Cafe

Wednesday, May 19
- Breakfast: English muffin sandwich
- Portabello harvest grain
- Santa Fe chicken quesadilla
- Hoisin chicken
- Parmesan fish
- Cuban panini
- Assorted sliced pizza
- Pesto shrimp linguini w/leeks & tomatoes

Wilson Hall Cafe Menu

Chez Leon

Wednesday, May 19
Lunch
- Assortment of quiches
- Salad of field greens with raspberry vinaigrette
- Fresh fruit plate

Thursday, May 20
Dinner
- Gazpacho
- Paella
(Saffron rice with seafood & chicken)
- Torta moca

Chez Leon Menu
Call x3524 to make your reservation.

Archives

"Steve may not agree, but I have often felt that he has the best accelerator job in the country," Henderson said. "As far as I'm concerned, Fermilab is the center of the accelerator universe. Fermilab has it all going on, in a world-class accelerator complex with an incredibly creative and talented staff."

Read more

-- Judy Jackson

In the News

Milestone

Ron Moore, Tevatron Department head, took third place overall and first place in the age 40 and over division in the Ice Age Trail 50K race in Southern Kettle Moraine in Wisconsin. He ran the race in 4:03:16 and was considered a master's champion. Congratulations, Ron!

Ron Moore with his trophy.

In the News

Fermi's Tevatron finds another bias against antimatter

From ***Ars Technica***, May 18, 2010

We tend to view antimatter as exotic and unstable, prone to annihilation when it combines with the vast excess of normal matter present in our Universe. But it didn't have to be that way; most behavior of subatomic particles shows no preference for matter over antimatter, and calculations suggest the two should have been produced in roughly equal proportions during the Big Bang. Figuring out why we live in a matter-filled Universe has been one of the nagging questions facing physicists.

Over the last couple of decades, a few cases of what are called C-P violations have been identified. These are cases where a particle decay that should, in theory, produce equal amounts of antimatter and matter, doesn't. These few instances, however, don't occur with sufficient frequency to explain why the Universe has its current abundance of regular matter. That has kept physicists looking and, this morning, Fermilab announced that research performed in its Tevatron accelerator has provided strong evidence for another C-P aim to detect drifts of about 10^{-25} seconds---about the time it takes a single pair of particles at the Tevatron to interact.

At Fermilab, we have begun to build a prototype of such a machine. We call the machine a holographic interferometer, or holometer. Our holometer will measure time by measuring the phases of laser light. We will send light through 40-meter tubes in two different directions and compare their "tick-tocks" (the phases of the laser light waves) when the reflected light comes back, a fraction of a microsecond later. The phases should disagree, due to nature's bandwidth limit, by a very small amount. The holometer will compare the jitter in two pairs of tubes to check that the effect is caused by space-time and not some other source of noise.

Of course, we might see no effect at all. We could take comfort in that, too, since it would mean that nature is a faster information service provider than we thought.

Safety Update

ES&H weekly report, May 18

This week's safety report, compiled by the Fermilab ES&H section, includes five incidents, one of which is currently recordable. Find the full report here.

Safety report archive

Announcements

Employee Health & Fitness Day is today

News at Toastmasters

Sign up for summer Science Adventures classes

News for Cigna plan participants

May habitat restoration - May 22

May "Benefits Bulletin" now available

Argentine Tango Wednesdays through May 26

Pool memberships available now

NALWO Spring Tea - May 20

Sand Volleyball Tuesdays begin May

Fermilab Today

Result of the Week

Safety Tip of the Week

CMS Result of the Month

User University Profiles

ILC NewsLine

violation.

Fermi has posted a copy of a paper that has been submitted for publication in *Physical Review D*, which means that the paper hasn't been through peer review yet. The huge number of authors (it takes nearly three pages to list them all and their affiliations) suggests that there's a reasonable chance that one of them might have caught any errors. In addition, the analysis simply involves performing a new analysis of several years' worth of data obtained by the DZero collaboration at Fermi.

Read more

25

43rd Fermilab Users' Meeting - June 2-3, register now

SciTech summer camps start June 14

Employee discount at Batavia Rosati's

Fermilab Arts Series presents Corky Siegel and Chamber Blues - June 26

ANSYS Mechanical Application classes offered in May

Additional activities

Submit an announcement

Info

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