

Calendar

[Have a safe day!](#)

Thursday, March 18
2 p.m.

Computing Techniques
Seminar - FCC1
Speaker: Andrew Baranovski,
Fermilab

Title: The Metrics Correlation
and Analysis Service
2:30 p.m.

[Theoretical Physics Seminar](#) -

Curia II

Speaker: Joachim Kopp,
Fermilab

Title: Moessbauer Neutrinos
3:30 p.m.

DIRECTOR'S COFFEE
BREAK - 2nd Flr X-Over
THERE WILL BE NO
ACCELERATOR PHYSICS
AND TECHNOLOGY
SEMINAR TODAY

Friday, March 19

3:30 p.m.
DIRECTOR'S COFFEE
BREAK - 2nd Flr X-Over
4 p.m.

[Joint Experimental-Theoretical Physics Seminar](#) - One West

Speaker: Jeter Hall, Fermilab
Title: New Dark Matter Limits
from COUPP

8 p.m.

[Arts and Lecture Series](#) -

Auditorium
Speaker: Dr. Martin Chalfie,
Columbia University
Title: GFP (Green Fluorescent
Protein): Lighting Up Life

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

[Upcoming conferences](#)

Campaigns

Feature

Fermilab honored to host SOI pixel workshop



KEK's Yasuo Arai, Fermilab's Grzegorz Deptuch, and OKI Semiconductor's Masao Okihara and Ikuo Kurachi look over design ideas during the recent SOI collaboration meeting.

From its inception, particle physics has confronted a Catch-22: how do you measure something without somehow altering it? A fresh-faced young German named Heisenberg published a paper on this conundrum in 1927, and the question has bedeviled scientists ever since.

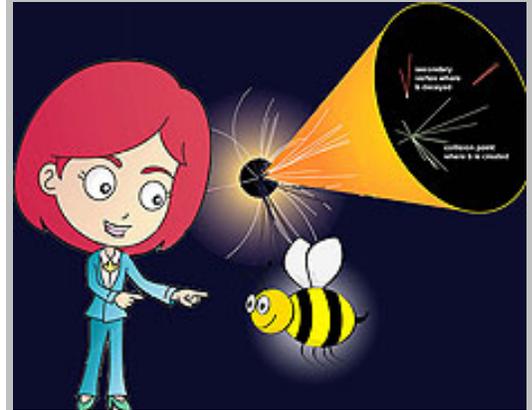
SOI (silicon on insulator) pixel detectors, a new technology in which Japan leads the world, may offer a dramatic solution to this problem by combining several functions in one slice of silicon, greatly reducing the mass interfering with a particle's path.

Minuscule chips only a few hundred micrometers thick, the SOI chips contain both electronic readout and sensors, demand little power, and provide two-dimensional readings of a particle's location. Although currently far from perfected, the chips offer several advantages over conventional (CMOS) pixel detectors; and if continuing R&D is successful, the technology could be used across myriad applications--especially large future undertakings like the ILC.

Recently, KEK's Yasuo Arai, the man behind SOI pixel technology for high-energy physics, asked Fermilab to host a two-day workshop so that all the key players could meet. In the past, most workshops were held in Japan, and collaborators attended via video conference.

Result of the Week

Finding b quarks



Identifying bees is easier than identifying b (quarks). In this image, we see how the delayed decay can be used to select events in which b quarks were present.

The bottom quark was discovered in 1977. So why does the DZero experiment still put so much effort into looking for a particle that was first seen 33 years ago and has been carefully studied in the intervening years?

It's because events in which bottom quarks are created can signal new and interesting physics. For example, the observation of the top quark in 1995 hinged on being able to identify the bottom quark into which the top quark always decays. Searches for the Higgs boson focus on events in which a Higgs boson decays into a pair of bottom quarks.

The best way to identify a bottom quark is to exploit its lifetime. Bottom quarks live long enough to travel several millimeters in the DZero detector before they decay. Experimenters use the very precise silicon vertex detector at the heart of DZero to look for particles such as this that have travelled and decayed relatively far from the position of the original collision. The figure above shows the basic idea.

However, there are other particles that also can decay a similar distance from the collision point, complicating the analysis. It also is possible for the detector and algorithms to reconstruct a false decay that looks like a bottom quark signature.

Because of these complications, DZero scientists used a sophisticated statistical

[Take Five](#)[Tune IT Up](#)[H1N1 Flu](#)

For information about H1N1, visit Fermilab's flu information [site](#).

[Weather](#)

Breezy
56°/36°

[Extended Forecast](#)
[Weather at Fermilab](#)

[Current Security Status](#)[Secou Level 3](#)[Wilson Hall Cafe](#)

Thursday, March 18

- Tomato Florentine
- BBQ pork sandwich
- Kielbasa & sauerkraut
- Chicken marsala
- Smoked turkey melt
- Assorted sliced pizza
- SW chicken salad w/roasted corn salsa

[Wilson Hall Cafe Menu](#)

[Chez Leon](#)

Thursday, March 18

- Dinner
- Bacon, potato & gruyere soufflé
 - Medallions of beef with morel sauce
 - Parmesan orzo
 - Steamed asparagus
 - Creme brulee

Wednesday, March 24

- Lunch
- Catfish w/coarse ground mustard sauce
 - Collard greens
 - Parsley potatoes
 - Jalapeño cheese cornbread
 - Pecan pie w/ bourbon cream

Because of Fermilab's continuous contributions to developing the SOI pixel process, this year KEK brought the annual meeting to Illinois.

Lead by Grzegorz (Gregory) Deptuch, Fermilab electrical engineers and scientists talked with groups from KEK and Lawrence Berkeley National Laboratory, among others, along with leaders from Japan's OKI Semiconductor, the only foundry that makes the chips.

"It was good to meet here and exchange information," Arai said. "Fermilab proposed some modifications, so we wanted to discuss the best way to improve the design and production process."

Ray Yarema, head of the Fermilab microelectronics group, said the workshop was invaluable. "It's the first time we've had direct communication with the foundry," he said. "It resulted in great interactions between OKI and our people, and I hope it will lead to a closer working relationship with KEK."

OKI is planning to make new wafers this summer, which will incorporate design ideas from the meeting.

-- *Andrea Mustain*

[Feature](#)

Fermilab's Tingjun Yang wins APS dissertation award



Tingjun Yang

Fermilab postdoc Tingjun Yang was recently named the recipient of the Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics.

"I feel very lucky that I got this prestigious award," Yang said.

The award, given annually by the American Physical Society, recognizes an exceptional young scientist's outstanding doctoral thesis work in particle physics. Yang received [the award](#) for his doctoral research on "A study of muon neutrino to electron neutrino oscillations in the MINOS experiment."

Yang received his Ph.D. in physics in 2009 from Stanford University. He worked for seven years on the MINOS experiment and contributed to muon-to-electron neutrino

technique called a [Neural Network](#). This technique combines many parameters that are sensitive to observing bottom quarks, for example distance between the collision point and decay, uncertainty on the distance measurement, number of reconstructed tracks in the decay, the mass of the reconstructed object, and so on. This technique has resulted in excellent bottom quark identification.

Understanding how well experimenters can identify bottom quarks and reject false positives took an extraordinary amount of effort by dozens of people. A [detailed paper](#) describing the algorithm's performance has just been accepted for publication.

- *Don Lincoln*



Frank Filthaut of Radboud University Nijmegen was the lead author behind this comprehensive paper, although he had considerable help from the people who wrote and debugged the various algorithms.



Sebastien Greder
IPHC Strasbourg
France

Tim Scanlon
Imperial College
UK

Sebastien Greder and Tim Scanlon are the current group leaders of the DZero bottom quark identification group. They supervise contributing physicists who continue to work on improving the algorithms for observing bottom quarks.

[Accelerator Update](#)

[Chez Leon Menu](#)

Call x3524 to make your reservation.

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oscillation analyses. Since the MINOS experiment wasn't really designed to search for electrons from electron neutrinos, Yang and colleagues created an event selection algorithm to pick out the electrons from similar backgrounds in the detector.

"Tingjun was involved at every level of analysis," said MINOS co-spokesperson Rob Plunkett. "He was an outstanding graduate student in every way."

Stan Wojcicki, MINOS co-spokesperson at the time and Yang's advisor at Stanford University, nominated Yang for the award because of the graduate student's excellent thesis and quality of work.

"His contributions were crucial to the experiment," Wojcicki said. "I expect Tingjun has a great career ahead of him."

In October 2009, Yang was hired as a post doc research associate on the CDF experiment. He also works on research and development of liquid argon detectors for future experiments.

"He's a very impressive physicist. Tingjun does very good work and he catches on to things quickly," said Brian Rebel, a Fermilab scientist who worked with Yang on MINOS and now works with him in liquid argon R&D.

"I decided to work on CDF because I wanted exposure to something that was new for me," Yang said. "But I also wanted to get involved at the Intensity Frontier."

-- *Rhianna Wisniewski*

[In the News](#)

Hunt for the sterile neutrino heats up

From *Nature News*, March 17, 2010

The elusive particles, if they exist, could help solve some of the most pressing problems in astrophysics.

Neutrinos like to keep to themselves. These ghostly particles are so reluctant to interact with ordinary matter that billions zip harmlessly through each person every day, and it takes giant, specialized detectors to capture even a handful of them. Now astronomers are finding hints of an even more elusive type of neutrino, one so shy that it could never be detected directly: the sterile neutrino.

[Read more](#)

March 15-17

- Three stores provided 43.25 hours of luminosity
- High voltage personnel repaired the cause of the Kautz Road substation trip
- H⁻ source output dropped – I⁻ source brought online
- Booster accessed for RF and 400 MeV water skid maintenance
- NuMI accessed for fan work
- MI accessed to repair LCW leak
- MTest interlock problems

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

[Announcements](#)

[2009 Flexible spending account claim filing](#)

[SciTech Night at the Museum - March 20](#)

[Robert Oppenheimer play at Waubensee in Sugar Grove - March 20](#)

[Influence and Motivation: The Empowering Leader course - March 24](#)

[PowerPoint 2007 Advanced course - March 25](#)

[Blackberry Oaks Monday night golf league](#)

[Watch your mail station for Fermilab Statement of Benefits](#)

[Qi Gong, Mindfulness and Tai Chi Easy for Stress Reduction](#)

[Fermilab Management Practices seminar began in February](#)

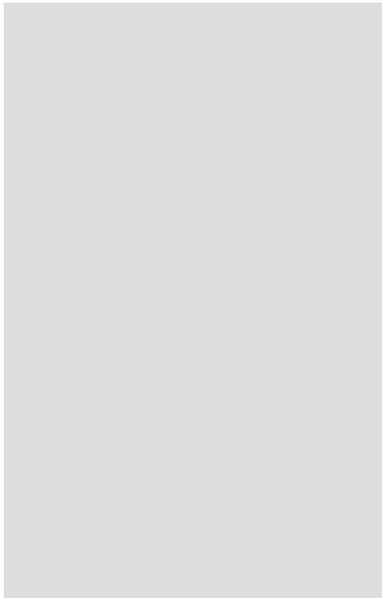
[International Folk Dancing, Thursday evenings at Kuhn Barn](#)

[Argentine Tango through March 31, student discount](#)

[English country dancing - March 28](#)

[Excel Programming with VBA class - March 30 and April 1](#)

[March 31 deadline to enroll young adult dependents](#)



[Harlem Globetrotters special ticket price - April 15](#)

[Requesting donations for Fermi Maternity Closet](#)

[Hiring summer students for 2010](#)

[Calling all softball players](#)

[Intermediate/Advanced Python Programming - May 19-21](#)

[Additional activities](#)

[Submit an announcement](#)