

## Calendar

### Mon., December 11

**3:30 p.m.** Director's Coffee Break - 2nd floor crossover  
**4:00 p.m.** All Experimenters' Meeting - Curia II  
 Special Topic: Meson Test Beam Upgrade

THERE WILL BE NO PARTICLE ASTROPHYSICS SEMINAR TODAY

### Tue., December 12

**3:30 p.m.** Director's Coffee Break - 2nd floor crossover  
**4:00 p.m.** Accelerator Physics and Technology Seminar - 1 West  
 Speaker: X. Yang, Fermilab  
 Title: Results in the 3-D Simulation for Booster

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

## Weather

 **Drizzle 45°/40°**

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

## Current Security Status

Secou Level 3

## Wilson Hall Cafe

### Monday, December 11

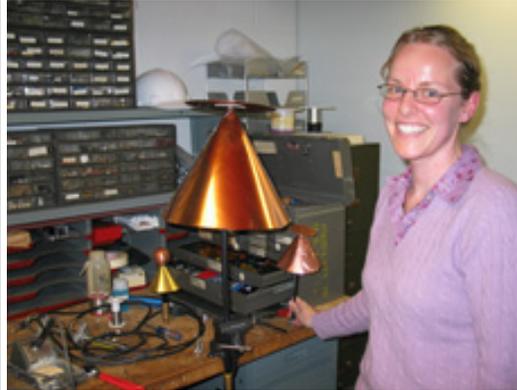
Minestrone  
 Chicken and Mushroom  
 Cheese Steak  
 Baked Chicken Enchiladas  
 Pot Roast  
 Garden Turkey  
 Assorted Slice Pizza  
 Szechwan Green Bean with Chicken

[Wilson Hall Cafe Menu](#)

## Chez Leon

## Feature Story

### A simple plan to spot leaks



Amber Johnson is welding copper cones to be used as antennas.

Beauty is in the simple, not the complex. At a lab that uses some of the most complicated machinery in the world, the simplest instruments have a novel elegance. Amber Johnson, in the Accelerator Division, constructs monitoring equipment made of two basic ingredients: a disc and a cone.

"Anyone at home can make these. They're so simple," said Johnson. "All you need to know is the frequency you are working with to know the size of the cone you need."

The High Intensity Neutrino Source accelerates particles by radio frequencies. Leaking radio waves could damage the machine. What is the perfect tool for spotting a leaking RF cavity? A radio antenna of course.

Johnson is welding copper cone and disc antennas. The cone collects the radio waves and the disc transmits them. The copper is a good conductor. To capture a radiowave, the cone-length must be at least one fourth the wavelength. Cones of different sizes detect different frequencies--smaller cones are sensitive to higher frequencies for example. If the signal is too strong a switch will shut down the accelerator.

Radio antennas are already in use in the Linac. However, for Johnson, this is her first encounter with them. She started as an electronics technician in the Accelerator Division two months ago, after working as an accelerator operator at Fermilab for three years. "It was a good project to start with," she

## Safety Tip of the Week

### Snow shoveling



Certain snow removal products are purported to reduce the risk of injury. Left is an ergonomic shovel that reduces the need for bending motions. Right is a wheeled plow that eliminates the need for lifting. Products similar to these are available from several manufacturers.

Winter is still eleven days away and many of us have already had all the snow we can handle. Unless you just got a new snow blower, the idea of shoveling is like getting a root canal. At Fermilab, Roads & Grounds has a major responsibility for snow control. The manager of this Department, Mike Becker, reminds his workers that the hazards of snow shoveling go beyond back and slip-fall injuries. Shoveling heavy snow can require as much energy as running 9 miles an hour ([according to the American Academy of Orthopedic Surgeons](#)).

Here are some tips to help you prevent injuries from shoveling snow.

**Fitness** - Are you over 45 and sedentary? Then avoid shoveling unless you get approval from your physician. If you smoke, have heart disease, high blood pressure, are overweight, or on chemotherapy you should also avoid shoveling, regardless of age.

**Preparation** - Warm up for 5-10 minutes. Engage in a full-body activity such as brisk walking. Then gently stretch your low back and hamstring muscles. Limber up your arms and shoulders with a body hug. Drink water before and after shoveling to avoid dehydration.

**Technique** - Get a good footing and lift with

**Wednesday, December 13****Lunch**

Roast Pork Loin with  
Lingonberry Sauce  
Braised Red Cabbage  
Dilled New Potatoes  
Spiced Honey Cake

**Thursday, December 14****Dinner**

Coquille St. Jacques  
Medallions of Pork Tenderloin  
with Port Mushroom Sauce  
Corn Risotto  
Vegetable of the Season  
Chocolate Fondue with  
Assortment of Fruit

[Chez Leon Menu](#)

Call x4598 to make your  
reservation.

**Archives**[Fermilab Today](#)[Result of the Week](#)[Safety Tip of the Week](#)[ILC NewsLine](#)**Info**

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[www.fnal.gov/today/](http://www.fnal.gov/today/)

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suggestions to:  
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said.

While Johnson is pleased with her little "family" of copper antennas, her affection has not spilled over in to her personal life. "Since I've begun making these, I've been asked a couple times if I want to join the ham radio club," she said. "So far I've declined."

--D.A. Venton

**In the News****Nature, News and Views,  
December 7, 2006:****Plasma physics: On the node of a wave**

*A compact electron accelerator can be made by the cunning use of laser pulses to let electrons 'surf' on a plasma wave. The problem has been controlling exactly how much the electrons are accelerated.*

In the early 1990s, off the north shore of Maui, Hawaii, Laird Hamilton and Buzzy Kerbox invented the sport of tow-in surfing, using jet skis to propel themselves into particularly large or fast waves. Catching these waves by paddling would have been impossible without becoming caught up in the waves' white water. On page 737 of this issue, Faure and colleagues<sup>1</sup> describe a similar technique to inject electrons into a plasma wave created in the wake of a propagating laser pulse. The end result is a compact electron accelerator of astonishing stability that could one day find applications in fields from radiation therapy to radiography and femtosecond chemistry.

The authors' result is an improvement on the principle of the 'laser wakefield accelerator', which was used in 2004 to produce electron beams of a single defined energy. The laser wakefield accelerator works by first using a single intense laser pulse to ionize a passive gas such as helium, forming a plasma of charged electrons and ions. Much in the manner of a speedboat passing through water, this pulse creates a wake as it displaces plasma electrons from its path. The wake can gain such a large amplitude that it 'breaks', forming the plasma equivalent of white water--electrons that move with the wave, rather than just supporting it as it propagates.

[Read More](#)

your legs instead of your back. Face the load and avoid twisting your back. Keep loads light with the heaviest part close to your body. Carry snow, rather than reaching or tossing. Better yet, push the snow rather than lift it. Take a 1-2 minutes stretch break every 10-15 minutes.

[Safety Tip of the Week Archive](#)**Accelerator Update****December 6 - 8**

- Three stores provided 26 hours and 13 minutes of luminosity
- MI suffers from NuMI beam fall out
- Switchyard 120 gets OK to take beam
- Store 5008 lost due to power supply trip
- I- Source trips; H- brought online
- MiniBooNE begins horn off running mode

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

**Announcements****Professional Development**

New classes are always being added to the professional development schedule. For the most up-to-date course offerings, go to [the web page](#).

**Entertainment Books**

This is your last chance to buy an entertainment book for 2007 in the Recreation Office (WH15W). If you register with the company that prints the books after your purchase, you'll receive a \$25.00 restaurant gift certificate. Need a gift for someone out of town? Books are available to more than 156 cities. We can order the books for you or you can order them online at Entertainment.com using the Fermi code "338935." Books cost \$20; the sale ends December 12!

**Blood Drive**

Did you know that a single pint of blood can help three different patients? Donate today, December 11 and tomorrow, December 12 at Fermilab, from 8:00 a.m. to 2:00 p.m. This year, each donor will receive a Heartland Blood Center jacket. Visit the [ES&H website](#) to sign up.

[Upcoming Activities](#)