

F N E R W M S I

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A U.S. DEPARTMENT OF ENERGY LABORATORY



Prehistoric Artifacts Tell Fermilab's Heritage **8**

Photo by Reidar Hahn

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PROFILE IN
PHYSICS

**New Computing
Division head
Vicky White aims
for a caring place
to work—and an
exciting one**



The Feynman Computing Center, headquarters of Fermilab's Computing Division.

ON THE WEB:

Fermilab Computing Division:
www.fnal.gov/cd/

**Scientific Discovery through
Advanced Computing:**
www.osti.gov/scidac/

UP with People

by Mike Perricone

Combine decades of cyber savvy with a grandmother's steadfast humanity, and the result is Vicky White, the new head of Fermilab's Computing Division. Not only did her formal remarks accepting the appointment emphasize her goal of making the division a caring place to work; her slides included a photo of her infant granddaughter as a symbol of the future, and she said her door was open if someone needed a hug.

"People did find it very unusual for that kind of presentation," White said in her soft but distinct British accent, "but I've gotten nothing but good comments on it. One of my roles is to set the tone of the division, and cooperation and respect will be very important."

White, whose Fermilab service dates back to 1973, will assume her new duties on November 1. She succeeds Matthias Kasemann, who is moving to CERN, the European Particle Physics Laboratory in Geneva, Switzerland. Culminating an 11-month effort by a search committee, White's appointment was announced on September 25 by Fermilab Director Michael Witherell, at an all-hands meeting of the Computing Division in Ramsey Auditorium.

"Division heads at Fermilab are given a task that is close to impossible," Witherell said. "They are asked to carry out a large number of demanding projects with resources that often are not quite up to the job."

Witherell said the search committee looked within the lab and outside the lab, seeking someone with management skills, technical expertise, a vision for the future, and "the ability to coordinate the many relationships with the outside world that are now an important part of Fermilab computing."

"The other directors and I were very pleased that the search concluded that one of our own provided the best match," Witherell continued. "With Vicky White, the Computing Division will keep Fermilab at the top of its game, and at the head of physics research."

White is still in transition from her duties as computing adviser to Peter Rosen, the U.S. Department of Energy's Associate Director of High-Energy and Nuclear Physics. In 3-1/2 years of commuting to Washington, White coordinated the high-energy and nuclear physics programs in SCIDAC—the DOE's Scientific Discovery through Advanced Computing initiative, a five-year program to develop computing software and hardware infrastructure needed to use terascale computers in advancing research programs in basic energy sciences, biological and environmental research fusion energy sciences, and high-energy and nuclear physics.

Specifically, White had major management responsibilities for the National Computational Infrastructure for Lattice Gauge Theory, focusing on simulations of Quantum Chromodynamics (QCD) at nine institutions including Fermilab; the Particle Physics Data Grid, developing a worldwide distributed computing model of current and future high-energy and nuclear physics experiments (Fermilab is one of 10 institutions involved); the advanced computing effort for accelerator simulations (14 institutions, including Fermilab), and two astrophysics simulations projects, as well as coordinating joint DOE-National Science Foundation efforts on LHC computing issues.

The transition between appointments is an active if not hectic one. Before being interviewed for this article on a Wednesday morning, White had returned from CERN late Tuesday evening; she boarded a flight for Washington early Wednesday evening after a close-scheduled day at the lab. After 3-1/2 years, she firmly states that she has "nothing but good things to say about the people at DOE," also lauding Marvin Goldberg, her NSF contact on LHC computing. At DOE, the feeling is mutual.

"Vicky did a truly outstanding job on computing for the Office of High Energy and Nuclear Physics," said Rosen. "Vicky organized our efforts in terascale computing for the SciDAC program, in such areas as Lattice QCD, accelerator systems simulation, supernova explosions, and the mammoth tasks of data management and mining for high energy physics. She has done a great deal for LHC computing, especially in the area of grids and networking.

"Fermilab is very fortunate indeed to have Vicky as the head of its computing division," Rosen continued. "Her knowledge, skill, and diplomacy will be a tremendous asset to the lab."

On Nov. 1, White begins her second tour in Computing Division management, though there's



Photo by Reidar Hahn

Vicky White takes over the Computing Division on November 1. She wants to set a specific tone for the Division. "How people feel about themselves and their work, their families, how they feel about coming to work each day—these are very important issues," she says. White helped develop the SAM distributed computing system while shuttling between Fermilab and DOE.

been no break in her involvement. She was deputy division head under Joel Butler from 1993 to 1996, a time of preparing for Run II computing, dealing with the expansion of desktop technology and upgrading the division's information systems. During her DOE appointment, she also worked on developing SAM-Grid, a distributed computing system for DZero, which is now being used at CDF as well. And already, she has asked people in the division for briefing papers on issues they will face—one-pagers in which she wants them to "tell me the message, get to the essence of the communication you want to make, not something that needs to be teased out of a presentation with 30 slides."

Grandmother, yes; pushover, no. But White has firm priorities, and she said one of them would be insisting on a sense of balance in the way the division operates.

“It’s very easy for people to run themselves ragged,” she said. “This is a very exciting place to work, and people work their tails off. But it’s important that no one is working so hard that they take off in a direction that perhaps they shouldn’t. I want the mission statement of the division to make it clear that nothing will get done without a very good atmosphere of cooperation. How people feel about themselves and their work, their families, how they feel about coming to work each day—these are very important issues. The world around us is moving and changing. To succeed, we must be able to grow and change with it. We need to put people where they are needed, and we need to make sure that the message gets out to all our people about why their job counts in the mission of the laboratory.”

White is married to theoretical physicist Alan White of Argonne National Laboratory. They live in

Wheaton and have two grown children: Bruno, 26, and Natasha, 22. Bruno has a physics degree and works in financial computing; he and his wife, Banu, are the parents of Lara Elizabeth, featured prominently in White’s introductory talk. Natasha, a cellist, has recently completed a degree in music.

White was born in Bromley, Kent in England. She grew up in South London, and attended Cambridge University with a degree in math. She taught high school math in Cambridge before joining Fermilab (then the National Accelerator Laboratory) in 1973 as a scientific programmer, then moved on to Lawrence Berkeley Lab and CERN, and resettled at Fermilab in 1981. That experience is now prologue for the Computing Division future.

“We have a huge and exciting program, with LHC, Run II, MINOS, our accelerators, and many other important physics and astrophysics experiments,” White said. “We have an enormously important role to play in physics. We must serve everyone better so that we can position ourselves better for the future.” 🌟



Members of the Computing Division gather outside the Feynman Computing Center.

Photo by Reidar Hahn

HELPING HANDS

HEP LABS

COLLABORATE

FOR TEVATRON

RUN II LUMINOSITY

MILESTONES

ON THE WEB:

Tevatron luminosity

<http://www.fnal.gov/pub/now/tevlum.html>



Photo by Reidar Hahn

During his six-week stay at Fermilab, Frank Schmidt, an accelerator physicist from CERN, took shifts in the main control room and helped analyze data from the Tevatron. Fermilab plans to maintain this physicist exchange program by sending Fermilab scientists to CERN to contribute to the commissioning of the Laboratory's Large Hadron Collider when it comes online later in the decade.

by Elizabeth Clements

In high-energy physics, friends don't let friends run at low luminosity.

And with more than a little help from HEP friends, Fermilab's Tevatron has set a series of luminosity records, culminating at 8:50 a.m. on Wednesday, October 9. The world's most powerful particle accelerator achieved an unprecedented luminosity of $3.61 \times 10^{31} \text{ cm}^{-2}\text{sec}^{-1}$, a measure of the number of high-energy particle collisions per second, also characterized as the beam's brightness.

In addition the Tevatron set a record for weekly integrated luminosity, the total number of collisions produced in a single week. For the week ending Sunday, October 13, the integrated luminosity reached 6.7 inverse picobarns (pb^{-1}), exceeding previous standards by a wide margin.

The luminosity breakthroughs came at a time when the particle physics world is closely watching Collider Run II of the Tevatron, the world's best opportunity for particle physics discoveries at the energy frontier for much of the next decade. Collision rates at the proton-antiproton accelerator have been slow to reach anticipated levels since Run II began in March 2001. But the Oct. 9 record brought the accelerator significantly closer to its near-term luminosity goal of $4.0 \times 10^{31} \text{ cm}^{-2}\text{sec}^{-1}$. Reaching this goal requires not only Fermilab's best efforts, but also physicists from outside the laboratory to lend a hand. Indeed, if there is a silver lining in the struggle to reach the Tevatron's luminosity potential, it is the opportunity for collaboration and pooled insights among the world's experts in accelerator physics and technology.

HELPING HANDS



Photos by Reidar Hahn

Frank Schmidt, an accelerator physicist from CERN, (left) and Dean Still of Fermilab's Tevatron Department, (right) took shifts together in the main control room at Fermilab. "This is a very hard-working team here, and [the collider run] is moving along well," Schmidt said.

Doug McCormick works in the Next Linear Collider (NLC) research and development group at the Stanford Linear Accelerator Center. He will be responsible for the application of the hardware that has been developed for the NLC project. McCormick set up the electronics that his group from SLAC developed for accelerator subsystems. These electronics facilitate beam transfers between links in the accelerator chain at Fermilab.

Fermilab has called on its friends for help, and friends have answered the call from around the world: from nearby Argonne National Laboratory, from Stanford Linear Accelerator Center in California, from Brookhaven National Laboratory in New York, from Lawrence Berkeley Laboratory in California, and from CERN, the European Particle Physics Laboratory in Geneva, Switzerland.

Scientist Yunhai Cai of SLAC is developing simulations of beam effects in the Tevatron to help elucidate the lifetime of the accelerator's particle beams. Physicist Marc Ross, also from SLAC, is providing electronics to facilitate beam transfers between links in the accelerator chain. Ross describes the collaboration between Fermilab and SLAC as a "perfect marriage" because both groups speak the same language of accelerator science.

"It is to my benefit to get to know people at Fermilab and to understand the problems of the

Tevatron," Ross said. "The technology and science of what people do is unique here, and I am fascinated by that. The collecting of antiprotons, and treating them gingerly because they are so delicate, is fascinating. I hope that we can have a positive impact on the Tevatron, and we realize that a lot of people have been working hard on Run II."

Argonne National Laboratory is working with the Tevatron Department to develop a plan to improve the vacuum in the Tevatron by a factor of two. Argonne scientists are also studying the need for beam diagnostics to improve proton beam stability as well as beam stability in one of the Tevatron's feeder accelerators. An accelerator expert, Wolfram Fischer of Brookhaven Laboratory, recently spent a month at Fermilab to help analyze Tevatron performance.

CERN sent Frank Schmidt to Fermilab for six weeks to work with the Tevatron and to take shifts in the control room. Despite the setbacks of Run II,



Photos by Reidar Hahn

Jim Sebek (left), an accelerator physicist at the Stanford Synchrotron Radiation Lab (SSRL), Marc Ross (middle), a physicist and group leader from the Stanford Linear Accelerator Center, and Till Straumann, an accelerator physicist and controls system specialist at SSRL, recently visited Fermilab to contribute their accelerator expertise to the Tevatron. "I hope that we can have a positive impact on the Tevatron, and we realize that a lot of people have been working hard on Run II," Ross said.

Schmidt maintains a positive attitude. "This is a very hard-working team here, and [the collider run] is moving along well," Schmidt said. "I still think that the intermediate goals of Run II can be reached."

On his last day in the main control room, Schmidt reflected on his visit at Fermilab. CERN's Large Hadron Collider will take over the energy frontier from the Tevatron later this decade, but Schmidt emphasized the importance of the machines feeding off each other's success.

"I would like to come back to Fermilab," Schmidt said. "It is fun and important for Large Hadron Collider people to learn from the Tevatron. The success of the Tevatron is an issue for the world community in accelerator physics." He added jovially, "Let's see who finds the Higgs first!"

Additional visitors from CERN are expected at Fermilab in the upcoming months. And just as CERN has sent physicists to contribute to Run II, Fermilab plans to return the favor by sending Fermilab scientists to CERN to contribute to the commissioning of the Laboratory's Large Hadron Collider when it comes online later in the decade.

Meanwhile, discussions continue with the Department of Energy's Berkeley Lab about how their world-class accelerator expertise might lend Tevatron support.

Each hard-won increase in the Tevatron's luminosity represents more data for Fermilab experiments CDF and DZero—and a greater chance for discoveries in Run II that will change the understanding of particle physics. The world's high-energy laboratories are not only watching with interest but are also providing invaluable help.

"It has been extremely gratifying to be fielding offers of support from other labs," said Steve Holmes, Fermilab's Associate Director for Accelerators and Interim Head of the Beams Division. "It really shows us that there is a widespread feeling that this endeavor is important to everybody, not just Fermilab. We have a lot of experience here, but there are also strong capabilities outside. And new eyes on the collider often provide insights to help us overcome our problems. The most important thing is that people really want to rally around and help the Tevatron."

After all, that's what friends are for. ☺



Marc Ross, a physicist from Stanford Linear Accelerator Center (SLAC), started his career in high-energy physics at Fermilab twenty-five years ago. He is currently a group leader at SLAC, and is responsible for the development of the Next Linear Collider technology. Ross said, "We always seem to end up with some of the most interesting challenges."

Prehistoric Artifacts

tell Fermilab's heritage



August Mier collection reaches nearly 10,000 years into the past

by Kurt Riesselmann

Few people can claim to have been collectors for more than 80 years. August Mier, born in 1892, was one of them.

From the age of six, "Augie" collected archaeological artifacts in the Batavia area as well as across the United States. According to his own estimates, Mier collected more than 6,500 spear- and arrowheads. Among his favorite areas for finding Native American artifacts were the farms that, in 1967, became part of the national laboratory now known as Fermilab.

In March of 1978, Mier donated a part of his impressive collection—about one hundred items—to Fermilab, where they've been on display for most of the past 24 years.

According to Michael Wiant, curator of anthropology at the Illinois State Museum, three quarters of the items of the Mier exhibit at Fermilab are from what experts call the Archaic time period, spanning from 3,000 to 10,000 years ago.

"It looks like a lot of people were living here [at what is now Fermilab] during that time," said Wiant during a lecture at Fermilab on September 25. "These were small groups of people staying for short periods of time. Most likely, these people were heavily engaged in hunting activities. I would suspect that many of the main villages of these people were closer to the [Fox and DuPage] river valleys."



Wiant has explored Native American culture and history in Illinois for more than 30 years. He has participated in several large-scale excavation projects, most notably the Koster site near where the Illinois River meets the Mississippi.

"Prairies are bad places to get a meal," Wiant said. "We see sites that—rather than being broadly distributed across Illinois' landscape—are concentrated along waterways, around upland kettles and other locations."



COVER PHOTO:

A selection from the August Mier collection of more than 6,500 artifacts



Fermilab photos

In 1978, August Mier previewed the exhibition of the highlights from his collection of Native American artifacts on the 15th floor of Fermilab's Wilson Hall. The collection has been on display for almost 25 years. Due to the renovation of the exhibition area, the collection is temporarily in storage.

Archaeologists believe that the first Native Americans came to the Midwest more than 12,000 years ago, with some evidence even hinting at a 15,000-year history. Taking a quick inspection of the Mier collection, Wiant identified five pieces that are perhaps more than 10,000 years old, dating back to the Paleo-Indian time period. This makes Fermilab one of only 400 sites in Illinois with archaeological artifacts dating back to the earliest time of Native American culture in the state.

Dating artifacts is the first step in unfolding the history of humanity. Under the right circumstances, artifacts get buried in different layers of soil—as evident at the 35-foot-deep excavation of the Koster site—with each layer providing information on the age of an item.

The landscape on which Fermilab is located doesn't provide such clues. It has basically remained unchanged for more than 10,000 years. When the last glacier, perhaps more than 3,000 feet thick, melted away, it left behind the landscape seen today.

For amateur archaeologists like Mier, this has presented a tremendous opportunity. With little digging, they have had access to artifacts from many different time periods.

"If one looks at the Mier collection, one immediately sees that there is a whole lot of time represented, sort of compressed on this landscape," explained Wiant. "If a tool was dropped, it essentially laid there in place. If something else was dropped there later, it stayed there, too."

Lacking geological markers, archaeologists and anthropologists apply their knowledge of historical developments and technological advances to separate artifacts of different time periods from each other. The change from spearhead to arrowhead, for example, represents a big technological leap in Native American history.

"About 500 years A.D. this technology moved across this country with lightning speed from an archaeological perspective," Wiant explained. "The nature of the conditions that led to this invention is not clear to us. But once people got wind of it, it spread from the east coast to the west coast in just a few hundred years."

Scientists are also aware that the shape of artifacts is influenced by the person who made them, as well as the tribe and culture a craftsman lived in. Most importantly, each artifact has a story to tell about the people that used it.

“If one looks at the **MIER COLLECTION**, one immediately sees that there is a **WHOLE LOT** of time represented, sort of **COMPRESSED ON THIS LANDSCAPE.**”

—Michael Wiant, curator of anthropology at the Illinois State Museum



Michael Wiant

Photo courtesy Illinois State Museum

“When [experts] look at a collection like this, it is not a pristine collection,” said Wiant. “It’s a collection that has been used, and it reflects use over time. Each one of those pieces has a history. We try to tell time, we try to tell something about the technology, we try to tell something about the group of people, the culture that was involved in the manufacturing of these pieces and the use of them. All of those things become part of the formula of looking at a body of artifacts and trying to draw conclusions about who lived here.”

The Late Prehistoric time period, ranging from 700 to 300 years ago, right before the arrival of European settlers, seems to be underrepresented in the Mier collection. Wiant, however, attributed this fact to Mier’s preference for collecting arrowheads rather than broken pieces of pottery, which are almost absent from the Fermilab exhibit.

Archaeological studies, initiated by Fermilab’s first director Robert Wilson, support this view. In the early 1970s, when construction of the first accelerators at Fermilab was already underway, archaeologist Ann Early and a group of students from Northwestern University carried out systematic studies of five prehistoric Indian campsites that had been discovered during survey work. Keeping track of every tiny fragment, the excavations revealed a much stronger presence of Native American life on the Fermilab site than indicated by the Mier collection alone.

“Results of the survey conducted during 1970 clearly indicated that the National Accelerator Laboratory property had, on several occasions, been used as a hunting and camping ground for a variety of prehistoric Indian groups,” Early wrote in her report. “The Bartelt site [a farm located in the northwest corner of the lab] had been occupied by four different groups of people over a period of perhaps 8,500 years.”

Examining artifacts such as arrowheads is only one aspect of archaeology. To learn about agricultural methods, for example, scientists not only look for prehistoric tools but also seeds that were used. Dating those small objects requires modern analysis tools, some of which are based on technology used by particle physicists.

“Accelerator methodology has now been applied in anthropology and archaeology,” Wiant said. “It has revolutionized how we tell time. Prior to this, using standard radiometric assay, it would require something like nine grams of charcoal to be able to get a date with a standard error of something like a hundred years. Using accelerator methodology, we can take tiny pieces of charcoal and assay the radiocarbon fraction of them and get ideas about dating. We actually can pick up a seed and date the seed to give us ideas about the origins of agriculture.”



Photos by Reidar Hahn

For 80 years August Mier collected Native American artifacts, keeping detailed records of when and where he found a total of more than 6,500 items. The arrowheads on these pages come from the Schimelpfenig farm (see aerial photo), which in 1967 became part of the national laboratory now known as Fermilab.




Fermilab photos

The Schimelpfenig farm, viewed from the southwest, was one of 56 farms located on the Fermilab site prior to the start of construction of accelerators. It was located on the corner of Giese and Kautz Road. Scientists built Fermilab's Booster accelerator at the center of the circular area just above the farm.

Using accelerator technology, scientists have dated the introduction of corn to the Midwest at about 600 years A.D. Two hundred years later, Native Americans planted the first beans in Illinois. These new sources of food, which could be stored for consumption during the winter, led to the development of larger villages with populations of about one thousand people.

The most profound change in Native American life, however, began in 1673, when French settlers arrived in Illinois. Less than 175 years later, government agents forcibly removed the last members of the Potawatomi tribe from the state.

Today, Native Americans again call Illinois home. In the Chicago community alone, there are about ten thousand people from a variety of different tribes, representing the broad heritage of Native American people.

"There is a remarkable record of human history," Wiant concluded his lecture at Fermilab. "A part of the story is told right here on this landscape." 

ON THE WEB:

Pictures of the Mier collection

<http://www.fnal.gov/projects/history/augie1.html>

Dr. Michael Wiant about the Mier collection (streaming video)

http://vmsstreamer1.fnal.gov/VMS_Site_02/Lectures/colloquium/Wiant/index.htm

On-line exhibits at the Illinois State Museum

<http://www.museum.state.il.us/exhibits/>

Due to the renovation of the exhibit area on the 15th floor of Fermilab's Wilson Hall, the Mier collection has been in storage since 2001. Fermilab officials plan to make the collection available to the public again by the end of 2003. Recognizing the value of cultural resources on the site, Fermilab and the Department of Energy have prepared a Cultural Resources Management Plan to direct the handling of discoveries such as the Mier artifacts. They are to be administered in a spirit of stewardship for future generations, in accordance with the National Historic Preservation Act.

LAB

SCHOOL

FERMILAB VISIT OFFERS NEW VIEW OF SCIENCE FOR ALABAMA HIGH SCHOOL

by Mike Perricone

Their whirlwind tour took in Fermilab and Blue Man Group, particle adventures and deep-dish pizza, neutrino experiments and Chicago's Navy Pier, cosmic rays and a stellar presentation of "Leon Lederman Explains It All."

Then it was back to Altamont School in Birmingham, Alabama, for 10 high-schoolers and two teachers who had the run of the laboratory—or at least, were running all around the laboratory—from Monday to Wednesday, September 30 to October 2 with representatives of Fermilab's Education Office as their tour guides.

It was the second Fermilab visit for students from the private school with an enrollment of about 400. The first, a year ago at around the same time, came about by way of the Web. Each department of the school has a week-long trip in the autumn for a direct look at a relevant area of study (the French Department, for example, goes to France), with the students paying their own way.

Chemistry teacher Donna Kentros was browsing the Web, looking for a destination for a science trip last year, when her interest was piqued by the Fermilab home page. Kentros contacted Fermilab education director Marge Bardeen, who put her in touch with education specialist Tom Jordan, who began working on the logistics.

"We corresponded by email to plan the trip," Kentros said. "Email is a wonderful thing."

This year's trip had an extra-added attraction: spending Wednesday morning in a chat with Lederman, Fermilab director emeritus and 1988 Nobel Prize winner. Kentros took the suggestion of educational consultant Alan November, of Wilmette, Ill., who offered a workshop presentation at Altamont on using computer technology in the classroom. November suggested linking up with Lederman for a visit at Fermilab, and Kentros again made the connection by email.

Lederman took the students on a grand tour of the growth of scientific thought, culminating in the "shower curtain" model of the Higgs field. The Greek philosophers, he said, always wanted to know: Where is the simplicity?

"A theory is only good if it fits on a T-shirt," Lederman said. "The Greeks thought that when we find what we're ultimately looking for, we'd be rolling on the floor with laughter because it would be so simple, we'd wonder why it took us so long to find out."



Leon Lederman signed copies of his book, *The God Particle*, for students from Altamont School during their visit to Fermilab.

ON THE WEB:

Altamont School

www.altamontschool.org

Fermilab Education Office

http://www-ed.fnal.gov/ed_home.html



Photos by Reidar Hahn

Students from the Birmingham, Alabama school began their tour with the site model on the 15th Floor of Wilson Hall.

Case in point: viewing the Higgs, postulated as the source of mass for the other elementary particles, as a rippled shower curtain. Our world looks complicated, Lederman proposed, because we see it through the Higgs field and its ripple effect.

“It’s like looking through a lucite shower curtain,” he said. “If you turn on the bathroom light and look through the shower curtain, you might see three different points of light. Look through 10 shower curtains and turn on the light, and you might see a thousand points of light.”

Illustrating a point, Lederman drew a chart of the Standard Model, circling the bottom quark and muon neutrino, commenting: “By the way, I discovered those two particles...”

“Dr. Lederman was definitely the highlight of the trip,” said student Evan Calker. “He explains physics in way that’s simple and fun. And when we were eating lunch in the cafeteria, I looked around and thought, ‘This is, like, the top five percent of intelligence in country.’”

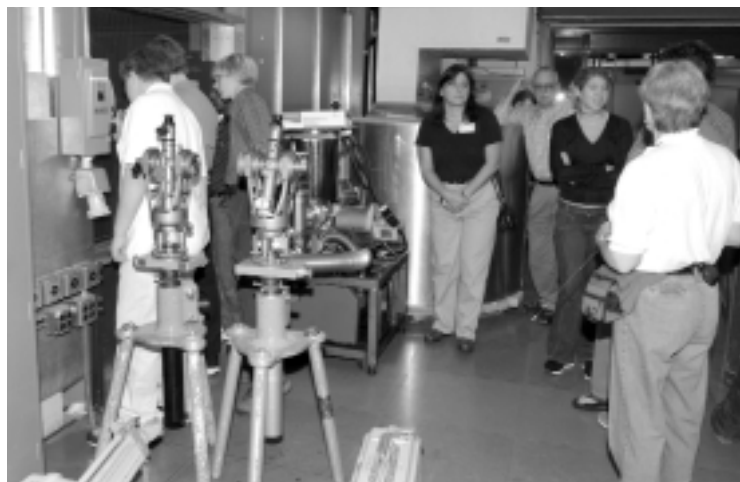
Lederman took the opportunity to present one of his favorite themes, restructuring the high school science sequence to offer conceptual physics first, as a foundation for chemistry and then biology, which he termed the most complicated of the three areas. A more advanced physics course could then follow as an elective. He’s adamant about trying to change the current sequence of biology, chemistry and physics.

“It’s alphabetically correct,” Lederman said, “but that sequence was designed in 1893, long before

what we know now of all those disciplines. We recently had a time traveler from 1893 visit the lab, and he was overwhelmed by the science and technology, the cars, the cell phones, the computers. He was in shock. So we took him to a local high school, and when he saw the science sequence, he calmed down and felt like he was back home in 1893.”

Altamont physics teacher Warren Kinney enthusiastically seconded the change in sequence.

“As a physics teacher, I want them to take physics as soon as possible,” Kinney said, “so they can make intelligent decisions about advanced topics courses they might want to take. This year three of my seniors are taking calculus-based physics,



Visiting the Linac gallery, students found it hard to keep their eyes off the Cockcroft-Walton preaccelerators.

LAB SCHOOL



Photos by Reidar Hahn

The Altamont students worked with cosmic ray data, and wound up their visit with a special presentation from Lederman.

which is essentially independent study, but I would like them to get conceptual physics in the eighth grade.”

Kinney also identified a key source of inertia.

“Some folks feel that because physics is a challenging subject, it hurts the grade point average of some children,” he said. “They’re concerned about information going out to colleges. So they feel students shouldn’t take physics until their senior year. Also, we have to gear our teaching to the Advanced Placement tests, which are given at that time.”

But for three days in Batavia, the Altamont students had their own “special topics in physics” mini-course. On Monday the students toured the 15th floor of Wilson Hall with its view of the Tevatron and much of the site. They visited the Linac and Main Control Room, and made measurements with the QuarkNet classroom cosmic ray detector. Later, they visited the MiniBooNE neutrino experiment, hosted by experiment collaborators Jocelyn Monroe of Columbia University and Jennifer Rath of the University of Cincinnati.

On Tuesday, they visited the Central Helium Liquefier, guided by Jerry Makara. (“The group showed a great interest in our large helium and nitrogen liquefier plants, with very good questions,” said Makara. “They’ll have a good future with their inquisitive minds.”) Then they spent time analyzing data from the cosmic ray detectors and from accumulated data at the QuarkNet Online Cosmic

Ray Detector. They spent the afternoon viewing NuMI detectors being assembled at the New Muon Lab, with Cat James. (“This was a bright bunch of kids. [They were] a lot of fun for me,” James said, “because of their interest and the really good questions they asked. Heck, I didn’t know this stuff when I was in high school.”) They toured the Feynman Computing Center with Lisa Giacchetti. (“They were knowledgeable about computer issues,” Giacchetti said. “When I said the PCs ran Linux, they asked if it was RedHat.”) They finished their Fermilab stay by spending the morning with Lederman. Thursday was a Chicago day to enjoy sights, sounds and tastes before flying back early Friday morning.

“I think it’s like going to a foreign country,” Kentros said of the experience. “The trip takes some of the romance out of it in a way. They think a foreign country is going to be a certain way in your mind, where everything is different. But when you get there, you find out that it’s really just a lot of normal people doing normal things. When they see the way real science is done, perhaps they’ll think, ‘Hey, I could do this.’ In way, it does get them to realize that science is something they can do, something they can accomplish.”

And it sounded as if the message did hit home, with a twist.

“This is where the stuff you learn in school really happens,” said student Nirmal Choradia. “So instead of learning in school, you can come here and learn.” 🧩

CALENDAR

OCTOBER 25, 2002 NALWO

cordially invites all Fermilab women to the Annual Autumn potluck luncheon, noon at Chez Leon.
<http://www.fnal.gov/orgs/nalwo/lunchoct.html>

MILESTONES

NAMED

■ By the American Physical Society, as winner of the 2002 Robert R. Wilson Prize: Helen Edwards (BD-A0 Photoinjector Group, ID 00761N), "for her pivotal achievement and contribution as the leader in the design, construction, commissioning and operation of the Tevatron, and for her continued contributions to the development of high gradient superconducting linear accelerators as well as bright and intense electron sources."

AWARDED

■ Fermilab Employee Performance Recognition Award: to Elvin Harms (BD-BS-Antiproton Source Department, ID 03996N) for his work as deputy Run II coordinator for the Tevatron.

Website for Fermilab events: <http://www.fnal.gov/faw/events.html>

MEET SCIENTISTS

at Wilson Hall The popular Ask-a-Scientist program has returned to the 15th floor of Wilson Hall, every Sunday from 1:30 to 3:30 p.m. Scientists will meet

visitors to answer questions ranging from "What is dark matter?" to "How do you accelerate a particle close to the speed of light?" Visitors must use the Pine Street entrance, and obtain the special "Ask-A-Scientist" pass to proceed to Wilson Hall.

CORRECTION

■ In "FYI: An abbreviated look at the alphabet soup of HEP-speak" (*FERMINES*, vol. 25, no. 15, Sept. 20, 2002), the initials for Italy's *Istituto Nazionale di Fisica Nucleare* (INFN) were mistakenly omitted through an editing error. *Scusa!* Also, the correct original designation of CERN, when formed in 1951, was *Conseil Européen pour la Recherche Nucléaire*. The laboratory's official name is now *Organisation européenne pour la recherche nucléaire*, though it is still referred to as "CERN." Pardon!

INDUCTED

■ Rocky Kolb (PPD-Theoretical Astrophysics, ID 06056N), into the American Academy of Arts and Sciences, on October 5, at Harvard University's Sanders Theater in Cambridge, Mass. Kolb also addressed the gathering, sharing the stage with U.S. Senator Edward Kennedy, NPR News Senior Analyst Daniel Shorr and novelist Chinua Achebe.

RETIRED

■ James Banks, ID 6226, FESS-Infrastructure Mgt. Group, October 31, 2002.
■ Charles Nila, ID 1533, PPD-Mechanical Dept., November 1, 2002.
■ Ann Reidl, ID 3799, BS-AD-Section Office, December 31, 2002.

FERMILAB ARTS SERIES 2002-2003 SEASON

Russian State Chorus

October 26, 2002
Tickets - \$20 (\$10 ages 18 and under)

Battlefield Band

November 23, 2002
Tickets - \$19 (\$10 ages 18 and under)

Windham Hill's Winter Solstice

Liz Story, Will Ackerman, and Samite of Uganda
December 7, 2002
Tickets - \$25 (\$13 ages 18 and under)

Libana

February 8, 2003
Tickets - \$17 (\$9 ages 18 and under)

Dragon's Tale: Nai-Ni Chen Dance

March 8, 2003
Tickets - \$19 (\$10 ages 18 and under)

Quartetto Gelato

April 5, 2003
Tickets - \$21 (\$11 ages 18 and under)

Orquesta Aragon

May 10, 2003
Tickets - \$26 (\$13 ages 18 and under)

Gallery Chamber Series

Sunday afternoons at 2:30 p.m.
Three Concert Series - \$36

Tickets for all Fermilab Events are available now. For further information or telephone reservations, call 630/840-ARTS weekdays from 9 a.m. to 4 p.m. Additional information is available at www.fnal.gov/culture.

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11:30 A.M. TO 1 P.M.
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DINNER SERVED AT 7 P.M.
\$23/PERSON

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[HTTP://WWW.FNAL.GOV/FAW/EVENTS/MENUS.HTML](http://www.fnal.gov/faw/events/menus.html)

LUNCH

WEDNESDAY, OCTOBER 23

Rouladen
Egg Noodles with Dill
Buttered Rum Baked Apples

DINNER

THURSDAY, OCTOBER 24

Grilled Vegetable Salad
with Grilled Goat Cheese
Crab Stuffed Fillet of Sole
Wilted Spinach
Lemon Scented Rice
Chocolate Souffle
with Frangelico Cream

LUNCH

WEDNESDAY, OCTOBER 30

Meat and Vegetable Paella
Mocha Layer Cake

DINNER

THURSDAY, OCTOBER 31

Midnight Ghoul
Skeleton Bones
Frankenstein Fingers
Ghost Clouds
Dracula's Dream

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**The deadline for the Friday, November 1,
issue is Tuesday, October 22, 2002.**

Please send classified ads and story ideas
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CLASSIFIEDS

FOR SALE

- '00 Dodge Ram conversion van 1500, 20K miles. 4 captain chairs and a bench that folds into a bed. A/C, auto, cruise \$12,000. bianchiaj@fnal.gov or x4148, x3700.
- '98 Honda CRV LX, red, 4-dr., air conditioning, dual airbags, automatic, cruise, power steering, power locks, power mirrors, tilt, power windows. Just 26K miles, driven mostly inside Fermilab. Looks and runs like new. \$13,200. Contact Sandra Padula at padula@fnal.gov or x5527.
- '95 GMC Sierra 4X4 pickup, white with cap and liner, 5.7L V8, HD trailer package, elect. trailer brakes, tilt, cruise, ABS, PS, P/locks and windows, 6 CD changer. Call Larry at x4386 or 630-879-7494
- '94 Mercury Villager LS, air conditioning (front and rear control), automatic, cruise, power steering, power locks, rear defogger and wiper, intermittent wipers, privacy glass, two-tone metallic paint (red & silver), power brakes, power mirrors, tilt, luggage/roof rack, power windows, ABS. \$5,800. o.b.o. Contact: Sergio Novaes at novaes@fnal.gov or x2454.
- '94 Pontiac Grand Am SE sedan 4D, 64K miles, automatic, cruise, air conditioning, PS, power door locks, AM/FM stereo, cassette, ABS. \$3,750 o.b.o. Call Emanuela at x3466.
- '92 Nissan Sentra, red, 4 door, good condition, great gas mileage. \$1,000 wkelly@fnal.gov or x3699.
- '92 Ford Tempo GL, 60K miles, runs well, 4 door, auto w/cruise and a/c, am/fm cassette, green, \$1,000 o.b.o. 630-803-7332, Tennis@fnal.gov
- '89 Dodge Grand Caravan LE, 3L V6, 160K miles runs well, rear heat, 7 passenger, \$900 o.b.o. Dane at x4730 or dane@fnal.gov.
- '89, Plymouth Acclaim 62K miles, good condition, well maintained. Blue book value \$1,300 o.b.o. balm@fnal.gov.
- Tires: Four 215/75 R14 steel belted radial snow tires, less than 5K, \$60 for all 4. Two 205/60 R15 steel belted all season radials, new, less than 1K, \$50 for both. Jim x3374, mulvey@fnal.gov.
- Dismantling large office/whse facility, staggering variety of workstations, desks, cabinets, credenzas, secretarial chairs, conference chairs etc. too much to list. Call Albert x3863.
- Solid hard wood desk for sale in good condition. Has 4 drawers and a nice large surface area (44" x 32"). Plenty of room for a computer and work area. Reasonably priced at \$35. Call Karen at 208-1751.

- Rowing machine, \$15. Wood computer monitor stand w/sliding drawer for keyboard, \$10. Lightweight Izzo golf bag, \$15. Padded carrying case for shotgun/rifle, \$20. All good condition. Call x6342 or 708-645-1168.
- Queen-size bed: Sealy Posturepedic "Devotion" mattress, box springs, and metal frame. Excellent condition (only 5 years old). \$325 o.b.o.
- Twin bedroom set, creme with hand carving. Double dresser with matching mirror, 4 drawer chest, footboard and headboard with frame. Excellent condition, \$175. Pictures available. Call Ken x4225.
- Well expansion tank. 80 gal., precharged bladder style. Like new, \$75. Mark x4776, markl@fnal.gov.
- Die Walkure opera tickets. Two Lyric Opera, Dress Circle, tickets for Sunday, November 10th, 1:30 p.m. Subscription price. Call Jeff at x3922 days, or 630-293-9349 evenings.
- Electric Guitar and Amp: Epiphone Les Paul, 1 year old, excellent cond, hard case included, \$200 o.b.o. Peavey 15 watt practice amp, \$75 o.b.o. Email jaysonh@fnal.gov.

FREE

- Cat, free to good home, comes with all equipment, has had shots. Tennis@fnal.gov
- Cut pile carpet with pad, neutral colors, good condition except for smoke smell, from 6 rooms. Move it and it's yours. Big old chest freezer, some rust, works. Move it and it's yours. Joy, 630-788-5839.

HOUSES FOR SALE

- Townhouse in North Naperville. Great location, walk to downtown Naperville, District 203 schools, 15 minutes to Fermilab. Neutral and immaculate with many upgrades. 1900 sq. ft., 2 bedroom, 3.0 baths, large covered deck, patio, fireplace, 2.5 car garage, built in 1996. \$218,900. Call x8779 or 630-416-3721.
- Brick ranch in West Aurora, 3 large bedroom home with 2.5 updated baths, 3 season room, new Pergo flooring in laundry room, country kitchen, see thru fireplace in formal living room and kitchen, oversized 2 car garage, new roof, windows. Perennial gardens, mature trees. \$224,900. treend@fnal.gov. or x6633.

FOR RENT

- Back apartment in Batavia. 1 bedroom, office, living room, kitchen and porch. \$675 per month plus utilities. Available Oct. 1, security deposit required. Call 630-879-7747 between 8:00 a.m. and 5:00 p.m.

- 3BR duplex located in the Naperville 204 school district. Freshly painted, new carpet, new ceiling fans, refrigerator, stove, dishwasher, washer/dryer. Fenced in backyard with large storage shed. Attached garage with EDO. Low utilities. One-month security deposit. Rent \$1,275. Available immediately. Call 630-840-3499.
- Duplex in Aurora, 2 bdrm, 2.5 bath, deep one car garage, private deck, fenced in back yard, 1,550 sq. ft, 2 miles from Fermilab, \$1,050 a mo, plus deposit, utilities. Marty 826-4377 or 907-1510.
- Half of duplex, 3 bedroom, 1.5 bath, family room. In Oswego, close to Routes 31, 30 and 34. Available 11/1/02. \$1,000 per month. Contact George at x8630 or jorgem@fnal.gov

CHESS CLUB

- Interested in chess? The Fermilab Chess Club meets for casual games and also participates in league matches in the Far West suburbs and Internet matches with our counterparts at CERN. For more information view our web page. <http://www.fnal.gov/orgs/chess/> or contact Lenny Spiegel (lenny@fnal.gov, x2809).

DANCING

- The next Fermilab Folk Club Barn dance is Sunday, Oct. 13 at 6:30 p.m. with music by Bob, Lynn, & Howard and calling by Dan Saathoff. Barn dances are held in the Warrenville Community Building and feature traditional square and contra dances. Admission is \$5 for adults, \$2 for age 12-18, and free for under 12 years old. Come with a partner or without; bring the family or not. For more information contact Dave Harding (x2971, harding@fnal.gov) or Lynn Garren (x2061, garren@fnal.gov) or check the webpage at <http://www.fnal.gov/orgs/folkclub/>.

WANTED

- Seeds from mature trees: Burr Oak, White Oak, Red Oak, Shagbark, Hickory, Bitternut Hickory, to be planted by Fermilab's Road and Grounds Department. Seeds should be separated by species, dried and kept cool. Drop off seeds at Roads and Grounds, or call Bob Lootens x3303 for pickup. The donated seeds from previous years are growing beautifully.
- Used laptop computer in good condition and reasonable price. Call Bud 630-584-1263. lyon@fnal.gov or x5522.
- Looking to rent an apartment or home in Italy to rent during February/March and April of 2003? Please contact treend@fnal.gov or x6633.

<http://www.fnal.gov/pub/ferminews/>



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