FERMI NEWS

FERMILAB A U.S. DEPARTMENT OF ENERGY LABORATORY

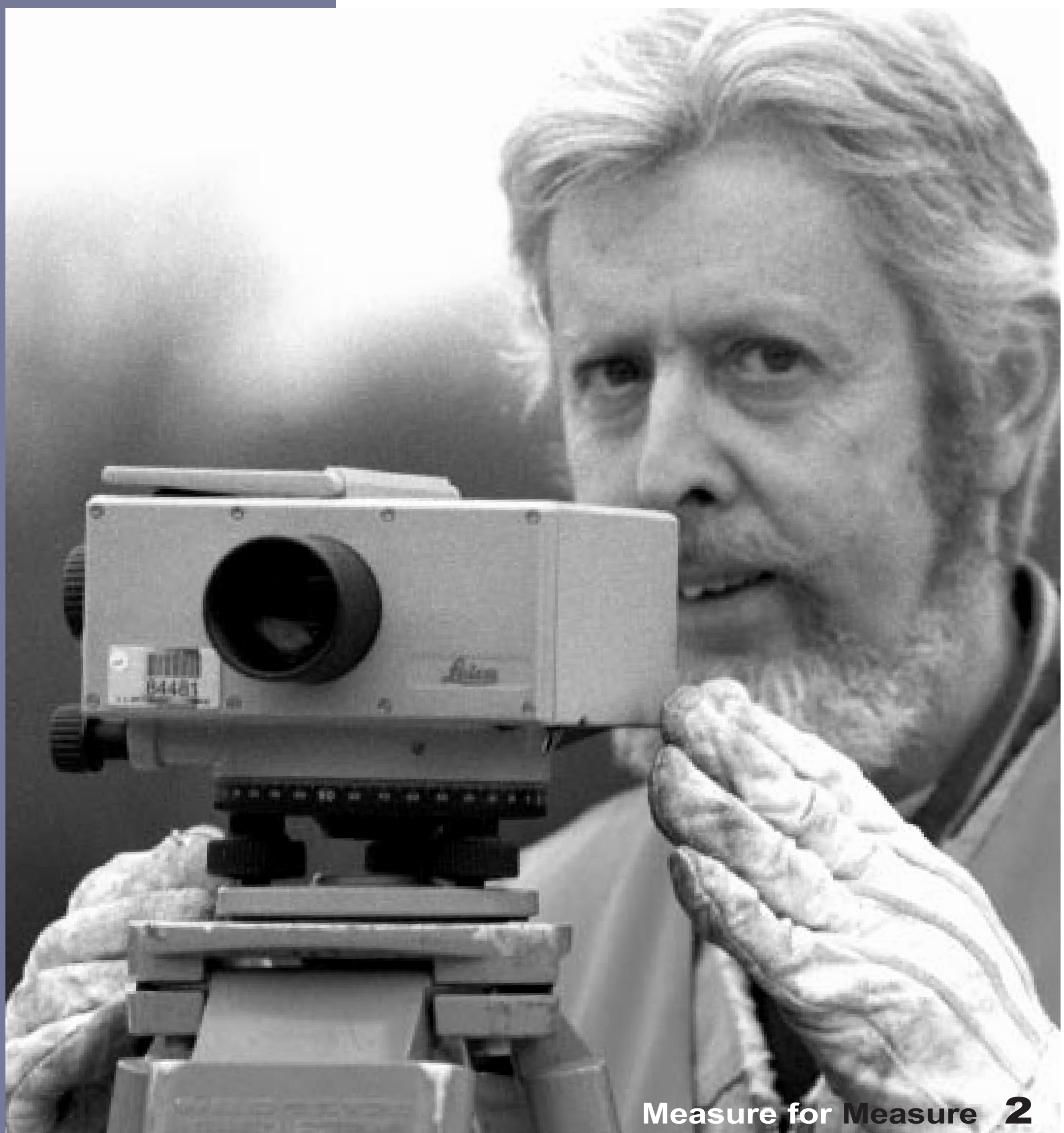

Photo by Reidar Hahn

Measure for Measure 2

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INSIDE:

Measure for Measure

Alignment and **Metrology Group** keeps lab on **level footing—** relatively speaking

Ed Dijak sights through a gyrotheodolite, which uses an internal gyroscope to determine location on the earth's surface and the direction of true north.

Cover: Jackie Smith of the Alignment and Metrology Group uses an NA3000 digital level to measure relative heights on the Fermilab site.

["I feel the earth move under my feet…"

—Carole King, "I Feel The Earth Move" (from the album "Tapestry," 1971)]

by Mike Perricone

When—not if—the earth moves, Fermilab's Alignment and Metrology Group can measure the effects to within two-tenths of a millimeter.

That's approximately 0.0078 inches, a measurement on the order of magnitude of the dot over the "i" in the word "inches" on this line of type. To physicists counting on the lab's new Main Injector accelerator, a tunnel movement of not much more than that distance can mean the difference between having beam and losing it, the difference between smooth running and downtime in Collider Run II.

"When the tunnel moves, the magnets move," said Shekhar Mishra, head of the Beams Division's Main Injector Department. "When the magnets move, that introduces an additional oscillation in the beam orbit around the machine. Depending on the size of that additional oscillation, your efficiency starts going down. If it's big enough in areas where the aperture of the beam pipe is smaller, you can scrape the sides of the beampipe and lose the beam."

Then the beams people lose no time.

"We call in the alignment guys," Mishra said.

THE PROBLEM OF SEA LEVEL

The earth is moving all the time. It also changes shape over time. Every precision instrument in the Fermilab experimental complex must maintain a tightly-controlled relationship among its own component parts, and between itself and the world surrounding it—and supporting it. Asking the Alignment and Metrology Group a simple question ("What's our elevation above sea level?") can elicit a series of follow-up questions leading to a very complicated answer.

In fact, "sea level" itself is a bygone concept among those whose business is taking the measure of the world around us. They now speak of the "geoid," the actual shape of the earth, and of "geoid height," the difference between the geoid and the ellipsoid that approximates the earth's shape. The ellipsoid adopted for use in North America is derived from the result of the 1866 evaluation by the British geodesist Alexander Ross Clarke. He apparently never set foot in North America, using measurements of meridian arcs in western Europe, Russia, India, South Africa, and Peru.

Because the earth changes, the ellipsoid is updated from time to time.

"The Clarke Ellipsoid was redefined in 1988, and that's what we base our geodetic work on," said Alignment and Metrology veteran Terry Sager. "It can be a little bit confusing, because the lab is originally set to 1929 data. There's a 0.17 meter change in height between those two vertical datums, and we include that in our documentation on our web site."

Photos by Reidar Hahn

The Alignment line-up (standing, from left): May Chau, Terry Sager (holding photos of John Kyle and John Greenwood), Elizabeth Brown, Mike O'Boyle, Tony Rodriguez, Bob Bernstein, Gary Coppola, Randy Wyatt, Jack Smith, Stu Lakanen, O'Sheg Oshinowo, Craig Bradford. Kneeling (from left): Ed Dijak, Ed Wojcik, Chuck Wilson. And up front: Cy.

Around the site, giant concrete tubes with black markers are sunk 23 feet into the ground, attempting to reach the relatively immovable glacial till. Alignment and Metrology maintains a huge database of the monuments' relative positions. Thus, every point on the Fermilab site has two reference points: one to the network within the site established by the monuments, and one to the world at large. But each point also has two worldwide references, to 1929 data and 1988 data. See the emerging pattern?

Now translate those relative measurements to a precision machine inside a tunnel, such as the movable Main Injector. The beam pipe and the magnets have a specified alignment with each other, and with the tunnel walls and floor. The particle beam, which corkscrews through the evacuated beampipe at nearly the speed of light, is tuned to that specific alignment. Some very mundane influences—dirt, water, a dropped wrench—can disrupt the whole scheme, prompting that call to the alignment guys.

Seasonal changes, and Dijak bolts

Ground is hard when frozen, and soft when wet. It pushes back when hard; it gives way when wet. Those seasonal ups and downs are part of the regular cycle in an accelerator tunnel. Like the four-mile Tevatron, the two-mile Main Injector has an entire system of "corrector" magnets used to compensate for predictable (or unpredictable) shifts within a limited range.

"We have one corrector for every quadrupole [steering] magnet in the Main Injector," Mishra said. "If we find the beam orbit changing, we have to run the correctors at greater strength. If we subsequently survey the magnets and find they've moved, we have them realigned and we can back off on the corrector magnets."

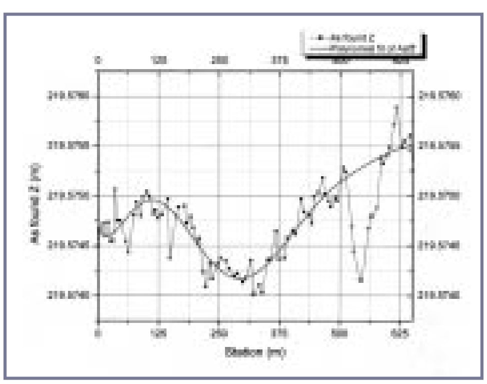
The seasonal effects of the creek running over the Main Injector tunnel are well documented. But there's another season that's nearly constant at Fermilab: the construction season. With nearby tunneling for the NuMI and MiniBooNE neutrino

Gary Coppola uses a geodimeter to check angles during construction of the Main Injector.

experiments, Alignment group leader Bob Bernstein can succinctly describe the impact on the Main Injector tunnel.

“If you take dirt off the top, the tunnel will rise,” he explained. “If you put dirt back on the top, the tunnel will sink.”

Both have occurred during the construction, as shown on the accompanying plot.



Movement in the Main Injector tunnel.

The vertical axis rises in increments of 0.000020 meters; think of each jump representing the dot on an “i.” The horizontal axis represents stations around the Main Injector tunnel, so the end point comes back to the beginning. The sinusoidal curve shows the rise and fall of the tunnel itself, with the magnet locations represented in the points forming the jagged line.

When the points fall outside the acceptable bandwidth, it’s time for adjustments—the biggest being with a four-foot long open-end wrench.

“You need one that long to supply enough torque,” said Ed Dijak.

The magnets are adjusted with leveling screws, like the ones beneath a stove or refrigerator. Of course, you’re probably not using a laser to align your kitchen appliances. Then again, the earliest Fermilab tunnel and magnet alignments were based on lines drawn on the floor, in chalk or red paint, to set reference points.

When the KTeV (Kaons at the Tevatron) experiment was being set up around 1995, Dijak had an idea: sink bolts into the floor and attach eye-bolts to the walls to establish an alignment network. The system worked so well that “Dijak bolts” were incorporated into the design of the Main Injector tunnel.

In these newer areas, a control network is established using the laser tracker, adjusted to minimize errors, and then the final adjusted coordinates are used to align the magnets with the tracker of by optical tooling. The FMI and Recycler were aligned entirely with the laser tracker due to the tight specifications.

Using those reference points, aligning the Main Injector produces results within a few millimeters around the two-mile circle.

OPTICS, THE V-STAR AND NEUTRINOS

Tried-and-true optical instruments are the everyday tools of the craft.

“You get on two points with an optical instrument, read the scale and do the alignment,” Sager said. “It’s not sophisticated. It just works very well. It’s probably what we use the most, day to day.”

But laser trackers are critical in tight squeezes, such as in working with the collider detectors, where there is limited space and no clear line of sight. Alignment was two-dimensional until lasers gave rise to what is called the “total station device,” producing three-dimensional coordinates on any given point. Laser trackers work on the interferometer principle, analyzing the interference between the outgoing and incoming light to calculate the distance to the reflective target placed on the instrument being measured.

The sophisticated V-Star three-dimensional digital photogrammetric system was used on the two 35-ton end muon system trusses for DZero (“The

The V-Star targets lighted up the DZero end muon truss for three-dimensional coordinates.

Measure for Measure

Photos by Reidar Hahn

Mike O'Boyle (left) and Chuck Wilson attach tooling balls for use with a laser tracker, a "total station" device which gives coordinates in x, y and z planes.

Big Picture," *FERMINEWS*, Vo. 23, No.4, Feb. 25, 2000). O'Sheg Oshinowo was the task manager for the project, taking the digital photographs from a cherry-picker. V-Star uses scanning software to resolve the centers of the reflector targets within 1/100 of inch.

MINOS, the Main Injector Neutrino Oscillation Search, is the biggest picture of all. The neutrino beam emerging from the tunnel at Fermilab must be accurate within 10 feet at its destination, the Soudan, Minnesota mineshaft 732 kilometers away and 2,600 feet below the surface. The MINOS tunnel at the lab must be aligned within a few arc-seconds, or 1/1,200 of a degree. The tunnel boring machine must be pointed within a few thousandths of a degree, in an excavation replete with rock and rubble, buffeted by blasting and subject to daily shifting in orientation.

The measurements are so delicate, that sightings down the tunnel shafts are disturbed by temperature variations in the air. To handle this tricky problem, the alignment group borrowed a surveying instrument using a system of inertial gyroscopes, from Stanford Linear Accelerator Center.

"We use instruments that only other accelerator laboratories would have," Bernstein said. "I wish we had these things ourselves, but SLAC is very cooperative and generous."

To link the end points of the long-baseline experiment, the alignment group is using satellite imaging.

"It's as cutting-edge as we can be, without being in the Defense Department," Bernstein said. "We'll also take sightings above the ground at Fermilab, project those references down to the tunnel, then extend them to Soudan, and get it right within 10 feet, or three meters out of 732 kilometers. We've been up to Soudan twice, and we'll go up during the detector construction to make sure we know that all the planes of the detector are surveyed correctly and in position."

The descent to the far detector will offer Bernstein and colleagues plenty of discussion time over how far they're going below sea level. The Soudan mineshaft has a very long elevator ride.

On the Web: Fermilab Alignment and Metrology Group — http://ppd.fnal.gov/align/align_personnel.html
The Casual Cartographer — http://www.mentorsoftwareinc.com/CC/CC0499.HTM

Wilson Hall Upgrades Let the Sunshine

by Chad Boutin

What would the Wilson Hall atrium be without its greenery?

Trees and shrubs fill the entryway; ivy climbs the lower cross floors. But until recently, little sun had reached them, because the skylights were less windows than walls.

“The original designers had to add a layer of plastic under the skylights, in case they broke,” said Elaine McCluskey, project manager for the Wilson Hall Safety Improvement Program. “Unfortunately, it was an imperfect fit, and there was no way to maintain them, so water and dirt would get in between. You couldn’t see out.”

Now new skylight panes have let the sunshine in for an even greener future. The atrium plants are seeing more light from above, and Sue Grumboski, who cares for the foliage, has already seen the difference.

“On the south facing plants I have noticed more bright green color, more vibrant growth,” she said. “Now that I have light, I am getting growth on the back sides of trees. I only used to get growth on the north side. And the spathiphyllum, the ‘Q-tip tree’ on the south end, is blooming for the first time. We have flowers blooming that never did before we cleaned the skylights.”

Wilson Hall is entering the home stretch of its lengthy rehabilitation, a project that has altered the building in ways both subtle and profound. None of the changes will be dramatic enough to raise eyebrows at first glance. But the quality of life in the atrium will improve for everyone and everything inside, as the plants have already found.

Perhaps the most noticeable outward change has been in the building glass between the highrise towers. Gone are the plate-glass panes that once covered the north facade above the main entrance; in their place are sheets of safety glass with plastic cores, much like the glass in a car windshield.

“The old glass would shatter into sharp pieces,” McCluskey said. “But if it breaks now, the plastic will hold it together, or it will break into round pieces that will be less likely to hurt you. The safety glass is also made in smaller pieces than the old panes, and that’s why the windows are divided into three sections now.”

The atrium space has always created a congenial atmosphere among Fermilab scientists. Lunchroom napkins are the scratch pads of physics history; researchers routinely scrawl ideas for new experiments on them for their hamburger-munching colleagues. But Illinois weather has taken its toll on the highrise, and in 1993, a fist-sized chunk of concrete fell through a sloped window pane, shattering the glass and the sense of calm within. The fertile buzz of conversation stopped.

In

Congress eventually allocated over $15 million to strengthen the concrete and make other improvements to the building.

If you look up from the atrium nowadays, you still see some scaffolding, but most of the work on the internal concrete is finished. Once the work is completed, McCluskey's crew will begin replacing the windows on the southern facade, aiming to finish by late summer.

The last improvement to the atrium atmosphere will be to the air itself. The main entrance is closed for now, but when it reopens in July, revolving doors will keep more of the air conditioning inside, and keep Illinois weather out.

It will take a few more months before the highrise emerges from the last of its construction, but when it does, it will be ready again for more good buzz. And more sunshine.

Previews:

- The 15th floor is scheduled to reopen for visitors in June. A temporary visitor's display is open on the first floor.
- The main entrance should reopen in early August. Ground floor entrances are open.
- On the horseshoe around the main entrance, a few parking spaces will be lost, but lighting and the sidewalk will be improved to accommodate bus traffic. Noisy work will occur 5 to 8 AM through July.
- Exterior concrete repairs will continue around the outside of the building through the fall.
- When south facade glass is being replaced this summer, access to auditorium lobby will be restricted.

On the web: http://www-fess.fnal.gov/engineering/wh/whsipconstr.htm

Photos by Reidar Hahn

The trees are pleased as Sue Grumboski tends the rejuvenated spathiphyllum.

Why is a Sammy Sosa Home Run Like a

by Judy Jackson

Reprinted from The American Physical Society Forum on Education Newsletter.

Everyone agrees that scientists need to do a better job of communicating what they do and why it matters. It is the rare science policy speech that fails to exhort scientists to communicate more and better. A recent quote from Congressman Vern Ehlers, member of the House Science Committee and one of two physicists in Congress, captures the prevailing tone.

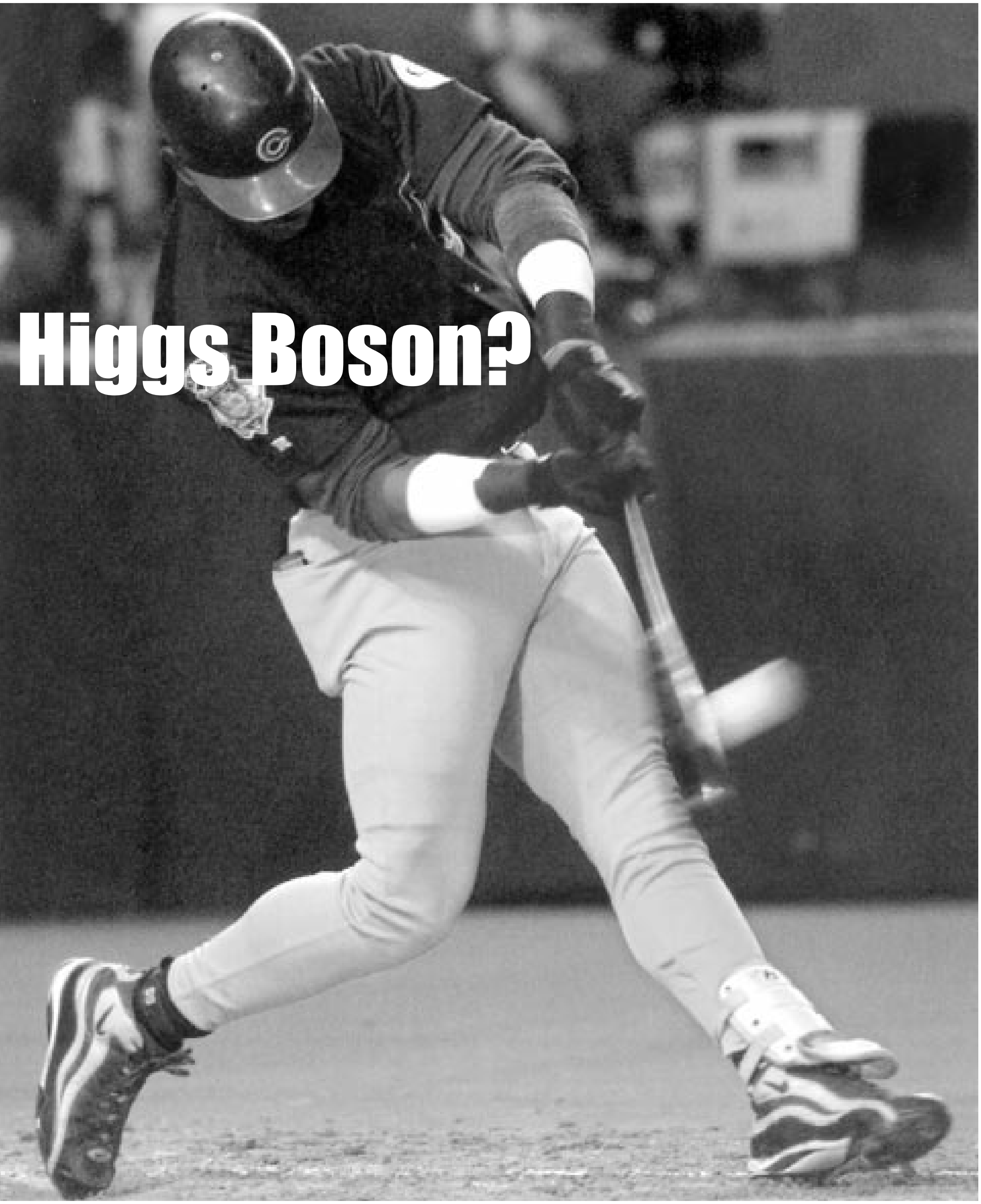
“The scientists have done very badly,” Ehlers said, “in terms of communicating with Congress and keeping Congress and the public informed—in an explainable way—what they’re doing and why it is important.”

While all scientists are tarred with the bad-communication brush, it often appears that physicists are tarred the blackest. Physicists above all others, say those both outside and within the field, are failing to get their message across. The clear implication is that the physical sciences would not be experiencing their current funding troubles if they would simply improve at explaining what they’re up to. As a case in point, many cite the Superconducting Super Collider. Never mind the gazillion-dollar cost overruns, this line of thinking goes, if physicists had only done a better job of talking up the SSC, we would be smashing protons under Waxahachie today.

It is true that it is critical to communicate from the science community to the rest of the world, not only for reasons of funding. It’s also true that if it were easy, we would have done it already. And is it just me, or is it especially hard for physicists?

Think about it. Biology is easy to sell. Putting aside the benefits of medical research, it seems obvious that it’s a good idea to study living things: *we’re* alive, aren’t we? Cosmology and astrophysics have a similar advantage: perhaps it’s in human genes, a relic of our nomadic days of gazing heavenward for guidance while we wandered in the wilds, but for some reason, everybody loves to look at the stars. The geologists have dinosaurs, one of the branding success stories of all time. True, chemistry’s image has a certain down side (Does the term “Bhopal” mean anything to you?), but the chemists surely have one of the classic tag lines of the ages. “Better living through quantum mechanics” just doesn’t have the same ring.

Physics, by contrast, is a hard sell. Why? Because, from the point of view of general comprehension, when physics left the realm of the visible at the end

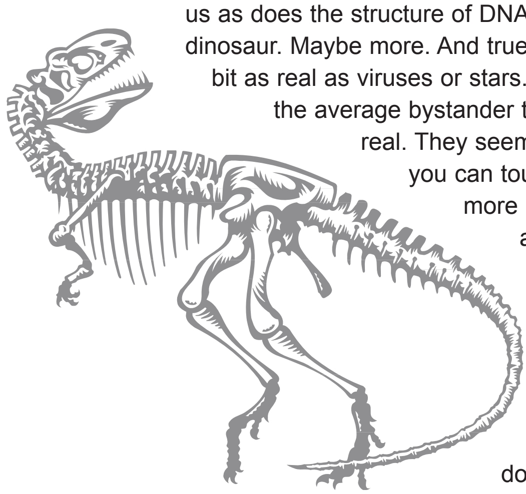


Associated Press

OR What's a Meta For?

What's a Meta For?

of the 19th century, it entered the world of the abstract. For all practical purposes, to those outside its own rarefied precincts, physics left reality behind and became an abstraction.



Of course, quantum mechanics and relativity have as much to do with the solid reality around us as does the structure of DNA or the fossil of a dinosaur. Maybe more. And true, quarks are every bit as real as viruses or stars. Nevertheless, to the average bystander they don't *seem* as real. They seem less like things you can touch and see and more like…..math. And, as anyone who has tried will tell you, if science is a tough sell, math is impossible.

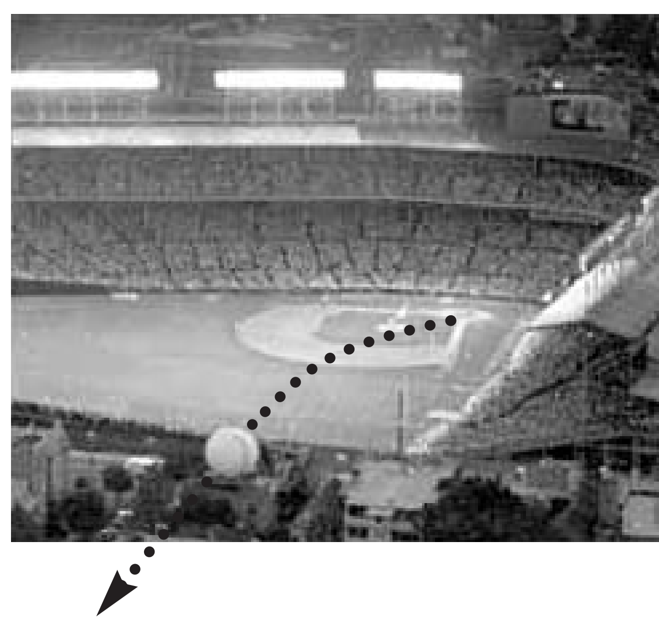
So physicists did what they had to do when faced with the problem of communicating the abstract to a math-challenged world: they turned to metaphor. From the football-field-with-the-nuclear-pea-at-the-50-yard-line-and-the-electrons-in-the-stands atom to the bowling-ball top quark and Campbell's Cream of Primordial Soup, the search was on for the metaphors that would bring physics back from incomprehensible equations to understandable—and fundable—life.

It's a never-ending search, the metaphor hunt. A recent spate of news stories prompted by the CERN-Fermilab rivalry for discovery of the Higgs boson turned up many old metaphorical friends, as well as some interesting new entries. Predictably, a particle accelerator, or "atom smasher," is compared to "a giant racetrack," or "the world's largest microscope" or a "time machine" reproducing the Big Bang (which itself began life as a metaphor but has by now crossed over into existence as a more or less scientific term for a real phenomenon). The Higgs, again predictably, is "molasses-like goo" or "cold molasses" or "subatomic molasses." Peter Higgs, the physicist who started all this, is "Atlas, a mythical figure with the weight of the world on his shoulders," which weight will only be removed with the discovery of the Higgs, to help shoulder the load.

Particle detectors look like "space ships" or "rockets on their sides" or "cathedrals" or, in one case, "a shopping mall." (There's more to *that* concept than meets the eye.) Particle collisions produce a "spray like shrapnel" yielding a "zoo of particles," or a "smashed watch" that physicists must reassemble from the scrambled springs and gears.

So far, so familiar. However, a recent Chicago Tribune story by Ron Kotulak yielded this home-grown image of how physicists detect what comes out of a high-energy particle collision: "It's like standing on the corner of Waveland Avenue and watching a Sammy Sosa home-run ball come sailing out of Wrigley Field." The particles then "fall back into their low-energy state and become invisible again, just as Sosa's ball is quickly whisked away by a souvenir hunter."

Like Sosa, that description of particle detection is hard to beat for local color.



HOME RUN BALL / HIGGS BOSON

Physics is all about the hard hunt for truth.

One story compared physicists to wild geese, migrating to the high-energy physics lab with the highest energy. Another evoked CERN scientists as hungry souls with their noses pressed to the restaurant window while Fermilab experimenters sit down to dinner inside, presumably to a feast of roast boson under glass.

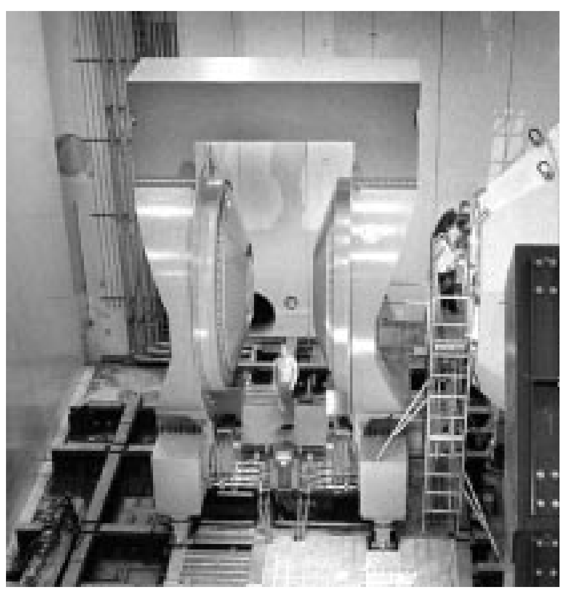
"A basic prejudice of the universe" for matter over antimatter perhaps does as good a job as any of explaining that peskily difficult concept, CP violation. And I know that I for one have a much clearer idea of how to produce quark-gluon plasma now that I understand that the interaction regions of Brookhaven's RHIC accelerator are "75-ton rings of steel, looming like giant handcuffs."

Hey, some metaphors work better than others.

In fact, feelings run high on the subject of just which metaphors work best for conveying the essence of frontier (now *there's* a metaphor that should be receiving overtime pay) physics. Among particle physicists, sharply different views, verging on dogma, have emerged about how best to describe high-energy physics. The partisans of the accelerator-as-giant-microscope school froth at the mere mention of accelerator-as-recreator-of-Big-Bang; while Big Bang adherents glare at the microscopists. At times, it can feel like metaphor warfare. Maybe it's a physicist's need to reduce the complex world to a set of simple laws that makes it hard to accept that both of these metaphors work sometimes, neither works every time, and occasionally they even work together.

When Mrs. Bartlett taught my ninth-grade English class about figures of speech, she used an example of metaphor that has stuck with me for 40 years, although its source eludes me: "The truth is a hard deer to hunt."

The truth *is* a hard deer to hunt. Physics is all about the hard hunt for truth. The search for words and images to communicate the excitement of the chase and why it matters to us and to society is almost as hard. We're never going to find the single perfect image to explain it. But with a grab-bag mix of metaphors—stars, home runs, microscopes, shopping malls, handcuffs, whatever—we'll all die trying. Metaphorically.



Brookhaven's PHENIX detector has "75-ton rings of steel, looming like giant handcuffs."

Dispatch from Malargüe

A **NEW** LABORATORY

by Paul Mantsch, project manager
Pierre Auger Observatory

Paul Mantsch

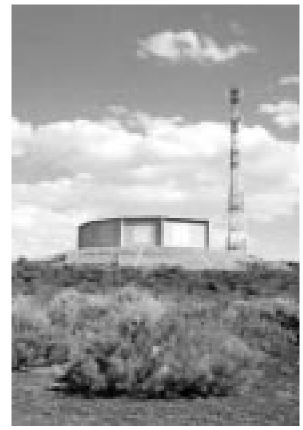
"Projecto Auger en Marcha" headed a recent article in *Los Andes*, the leading newspaper of Mendoza Province. Progress on the Pierre Auger Cosmic Ray Observatory in Mendoza, Argentina is now, indeed, clearly visible. It is thrilling to watch as the first of 1600 particle detectors begin to spring up on a thousand-square-mile expanse of desert known locally as the Pampa Amarilla or yellow pampa.

The first of 1600 particle detectors making up the cosmic ray air shower array. Building the new laboratory on the Pampa are (from left) Peter Mazur, Rishi Meyhandan, Ingo Alekotte, Jose Ten, Eduardo Moreno, Germano Guedes, Humberto Salazar, Iuri Pepe, Pedro Barraza, Laudo Barbosa.

On top of a rounded volcanic cone on the southern edge of the observatory site stands a light-blue semicircular building with six large windows with a sweeping view of the sky over the pampa. This newly completed building will enclose the first six of 30 telescopes to be placed around the site. On dark nights these telescopes will record the faint streaks of fluorescent light made by giant cosmic ray air showers as they cascade through the atmosphere toward the particle detector array spread out below. By day windows reveal a strikingly beautiful panorama of the many and varied pastel desert hues stretching to the horizon of this ancient lakebed. To the west stand rugged, snow-capped mountains, some of the highest in the Andes. The particle detector stations out on the pampa, built around 3,000-gallon water tanks, are not easy to see. Each tank is colored light beige to match the dominant color of the surrounding desert and is often only revealed by an occasional glint of the sun from one of the solar panels.

RISES FROM THE

Pampa



The first fluorescence telescope building with communications tower.

At night the clear Southern Hemisphere sky presents a dazzling display of stars. We are, after all, looking at the very center of the Milky Way. This is an important reason for building the first site of the Auger Observatory in Argentina. Theorists are becoming more intrigued by the possibility that the mysterious, extremely-high-energy cosmic rays may come from the equally mysterious dark matter halo surrounding our galaxy. This is but one of the many ideas that attempt to explain the source of the extremely rare but enormously energetic messengers from space. We will later build a second identical observatory site in the Northern Hemisphere so that, as the earth turns, we will be able to search for sources of high-energy cosmic rays from the entire sky.

On the outskirts of the town of Malargüe the tree-lined Auger Campus is taking shape. In the middle of what was until recently a tree nursery the first campus building, the Detector Assembly Building, and an adjacent communications tower have just been completed. This smallish industrial building with electronics and mechanical shops will be a center of detector building and maintenance activity for the observatory. The 150-foot tower soaring above the trees behind the Assembly Building will be topped with antennas that will gather in the signals sent by all of the observatory’s detectors. The Assembly Building will soon be joined by the Auger Center Building. The Auger Center building, funded by a gift of $1M from the University of Chicago, will be home to the data acquisition system, a visitor’s center and a place for scientists to hang out. All of the buildings were designed by a

Photos by Paul Mantsch

Surveying the pampa from one of the windows of the new fluorescence telescope building.

Dispatch from Malargüe

The Detector Assembly Building on the Auger Observatory Campus.

Preparing detector tanks for deployment.

talented team of local architects and bear the unmistakable touch of artists.

Malargüe is a friendly town. The people have accepted with good grace the onslaught of hundreds of scientists and engineers speaking of capturing strange objects from space, often in languages that they don't understand. This friendship crystallized recently when we were asked to participate in a parade to help celebrate the anniversary of the town. With the Auger banner in the fore, nearly a hundred of us walked, somewhat befuddled, to the applause and cheers of the town's people. It was a moment of glory not unlike, we later imagined, what might be accorded to rock stars. We have grown very fond of this remote, dusty town and its people. We value the friendship of the people of Malargüe, as we have become a part of their lives and they of ours.

It is a rare and exciting opportunity to be building a new laboratory. Driven by the vision of uncovering the secrets that lie at the heart of mysteries of the high-energy particles from space, we savor years of the long hours, the mud, the scorching desert sun and the wind-blown sand. Nature does not reveal her secrets easily. But that's what doing science is all about, and it's great fun. I wish our friend Bob Wilson were there to help us. I bet he would have loved it.

Photos by Paul Mantsch

Auger collaborators preparing for the parade in Malargüe.

CALENDAR

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

FERMILAB ARTS SERIES

Choreographer's Showcase

Featuring Hubbard Street 2

April 21, 2001, 8 p.m. $17/$9 for ages 18 and under.

This traditional Fermilab Arts Series event features a variety of some of the brightest young dancers and dance companies in Chicago.

For more information call (630)-840-ARTS.

NALWO Women's Day

An appreciative and enthusiastic crowd of about 250 Fermilab families enjoyed NALWO's International Women's Day performance by young talented dancers and musicians in Ramsey Auditorium on March 10. Highlights of the program included a recitation of a Pushkin poem, several beautifully costumed dances by the Fermilab Children's Ballet, and wonderful piano, violin, flute, recorder, and accordion musical selections. After the show, the participants continued the celebration with a potluck party at the Users' Center.

ONGOING

NALWO

■ Free English classes in the Users' Center for FNAL guests, visitors and their spouses. The schedule is: Monday and Friday, 9:30 a.m. - 11:00 a.m. Separate classes for both beginners and advanced students.

■ The Fermilab Barn Dance series presents a dance on Sunday, March 18 from 2 to 5 p.m in the Fermilab Village barn. Music by the Bean Walkers with Dan Saathoff. $5 for adults, $2 for age 12-18, under 12 free. Singles and families welcome. For more information contact Dave Harding (x2971, harding@fnal.gov) or Lynn Garren (x2061, garren@fnal.gov) or see http://www.fnal.gov/orgs/folkclub/

■ The "Silk and Thistle" Scottish country dancers will celebrate Tartan Day with a free public dance at 7:30 p.m. Tuesday, April 3 in the Village Barn. Don your tartan and try out traditional Scottish dancing, sample Scottish foods, and learn about Scottish history and culture. Doug Jensen will provide instruction; easy dances in the early evening. Buttons to commemorate Tartan Day will be available for $1. Call 630-584-0825 or 630-840-8194, email folkdance@fnal.gov, or see www.midwestnet.com/clients/piper/

BOOK FAIR

Wilson Hall Atrium
April 17 - 7:00am-3:30pm
April 18 - 9:00am-5:30pm

Recreation Bookorp Inc. will offer quality books, stationary, photo albums, toys and much more at discount prices.

SUMMER CAMP

Registration for the Children's Summer Day Camp begins March 1 with a deadline of March 30. The session dates for the Children's Summer Day Camp are: Session I - June 18 - July 6; Session II - July 9 - July 27; Session III - July 30 - August 17. Day Camp information, booklet and registration form can be found in the Recreation Office or on our web page, http://fnalpubs.fnal.gov/benedept/recreation/campbrochure.html.

DANCING

At the Village Barn, newcomers always welcome: International folk dancing, Thursdays, 7:30-10 p.m. Scottish country dancing, Tuesdays, 7:30 - 10 p.m. For information on either group, call Mady, (630) 584-0825 or Doug, x8194, or email folkdance@fnal.gov.

MILESTONES

ESTABLISHED

■ A chair: the Boyce D. McDaniel Professorship in Physics; at Cornell University; in a Jan. 18 ceremony at Cornell's Johnson Museum of Art. The chair is endowed by two of McDaniel's former students, Helen and Don Edwards of Fermilab, who asked that the new professorship be awarded to a faculty member in the College of Arts and Sciences whose discipline is particle beam physics, and who would teach both graduate and undergraduate students in addition to performing research. David L. Rubin, professor of physics and director of accelerator physics at the Floyd R. Newman Laboratory of Nuclear Studies, received the first appointment to the chair.

Chez Léon MENU

Lunch served from 11:30 a.m. to 1 p.m.
$8/person

Dinner served at 7 p.m.
$20/person

For reservations, call x4512
Cakes for Special Occasions
Dietary Restrictions
Contact Tita, x3524
http://www.fnal.gov/faw/events/menus.html

LUNCH
Wednesday, April 4
Chicken Mole
Mexican Rice
Refried Beans
Avocado Slices with Red Onions
Papaya with Lime

DINNER
Thursday, April 5
Grilled Squid
Kebabs of Beef, Onion and Peppers
Rice Pilaf
Lemon Napoleon

LUNCH
Wednesday, April 11
Cheese Fondue
Tomato, Cucumber and Red Onion Salad
Mixed Berry Coupe

DINNER
Thursday, April 12
Tortilla Soup
Red Snapper Vera Cruz
Vegetable of the Season
Pineapple Cake

FERMI NEWS

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The deadline for the Friday, April 13, 2001, issue is Tuesday, April 3, 2001. Please send classified ads and story ideas by mail to the Public Affairs Office, MS 206, Fermilab, P.O. Box 500, Batavia, IL 60510, or by e-mail to ferminews@fnal.gov. Letters from readers are welcome. Please include your name and daytime phone number.

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CLASSIFIEDS

FOR SALE

■ '00 Pontiac Sunfire SE, silver, 4 door, auto, dual airbag, power windows, power locks, keyless remote, cruise control, A/C, CD player, tilt, ABS, 11,000 miles, 2 year/25,000miles left on warrantee. $2,000 under Kelley Blue Book (kbb.com), $12,100. Call ext. 4740 or 630-897-7110 after 6:00PM.

■ '97 Chevy Malibu LS, 3.1L V6, 46,500 miles, dark green w/beige interior, fully loaded-power everything, AM/FM/CD, $11,999. Call ext. 3325 or 630-527-6218 after 6 p.m.

■ '95 Ford Taurus GL, white, automatic, A/C, AM/FM stereo, PB, PS, cruise control, air bags, power locks/windows/mirrors, keyless entry, new tires, 76K miles, $6,500 o.b.o. Call Boris at 630-840-8704.

■ '95 Dodge Neon, brilliant Blue, 81K, 5 speed manual, 4 cyl., power steering, power brakes, power locks, cruise control, AM/FM/cassette stereo, roof rack, air conditioning (needs work), tilt wheel, dual air bags, ABS, alloy wheels. No rust, great gas mileage. $5,300 Call 761-8207 or 761-9661.

■ Homak heavy-duty steel security 16-gun cabinet (21″W x 22″D x 55″H) with reliable Sargent & Greenleaf combo lock with reinforced tubular, key-code cam locks with anti-drill security pin. $350. Contact crogers@fnal.gov x3824

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■ Slide projectors, computer games and programs. Most are new, $5.00 or less. 630-896-3211.

LAWN MAINTENANCE

■ Attention homeowners in West Aurora, North Aurora, and Batavia, excellent lawn maintenance available, call Roger 630-859-3789.

FURNITURE REFINISHING

■ Repairs and restorations, pick-up and delivery available. 815-695-5460.

ATTENTION FERMILAB ARTISTS AND ARTISANS:

■ Now is the time to show us your artistic side! The Employees' Arts & Crafts Show will take place May 14-June 15 in the 2nd Floor Gallery of Wilson Hall. All Fermilab employees, visiting scientists, retired employees, contractors and their immediate families are encouraged to enter the exhibit. The last exhibit featured an eclectic combination of photographs, prints, paintings, sculptures, weavings, quilts and jewelry. Please pick up an application form from the Wilson Hall Atrium desk. Application deadline is April 26 and work must me dropped off on Wednesday May 4, 2001.

TUESDAY GOLF LEAGUE

■ Pebble Beach is too far away. Bliss Creek is just minutes from here. The Tuesday Bliss Creek golf league will be starting in April. We have openings for individuals or foursomes (but they're going fast). Golfers of all abilities are welcome. If interested, please contact Dean Sorensen (deans@fnal.gov, x8230), Pat Sorensen (psorensen@fnal.gov, x3811) or Don Arnold (arnold@fnal.gov, x2871).

NOON BIBLE CLASSES

■ Need wisdom, want understanding? Take a 1 year study of the scriptures. Wednesdays at 12 noon in the Huddle.Call x4432, Jeff Ruffin.

LETTER TO THE EDITOR

To FERMINEWS:

In the March 16, 2001 issue of FERMINEWS, an article entitled "Making the Cut" highlighted the fascinating ecosystem work being done by Liz Aicher and others on the Fermilab site. Unfortunately, a few key facts about Liz were omitted. During normal business hours, Liz is a valuable employee of the Laboratory, working in the Property Office. One of her main duties is to administer the loans of physics equipment to facilities in foreign countries. It should also be noted that her efforts expended helping the ecosystem return to equilibrium are all done on her own time. We in Business Services are proud of all of Liz's accomplishments and commend her on taking such an active interest in this important endeavor.

Jeff Irvin
Assistant Head, Business Services Section.

Photo by Reidar Hahn

Liz Aicher, ecology volunteer, at her day job in Business Services.

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