FERMI NEWS

FERMILAB A U.S. DEPARTMENT OF ENERGY LABORATORY

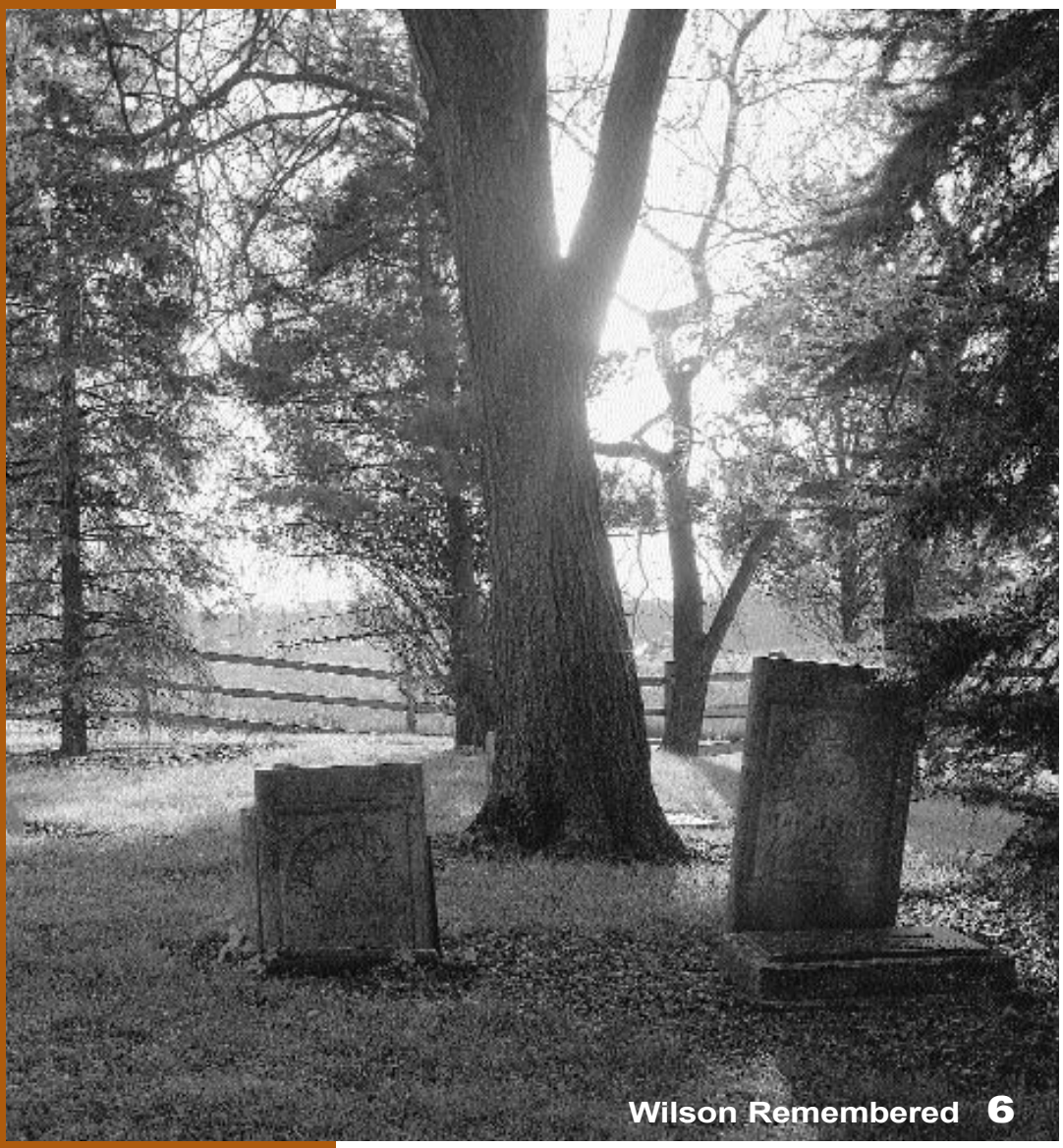


Photo by Fred Ullrich

Wilson Remembered 6

Volume 23
Friday, May 12, 2000
Number 9

INSIDE:

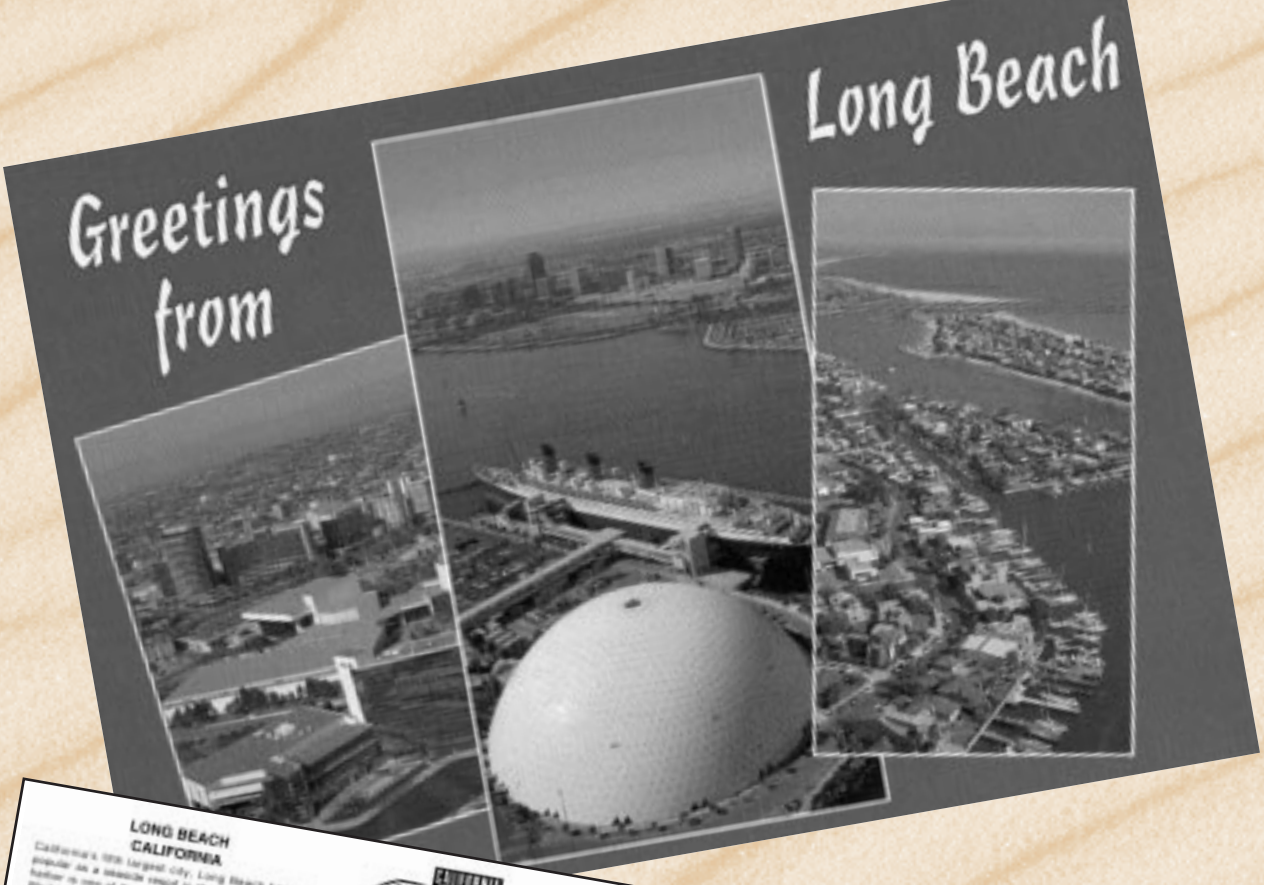
Post Cards from Long Beach

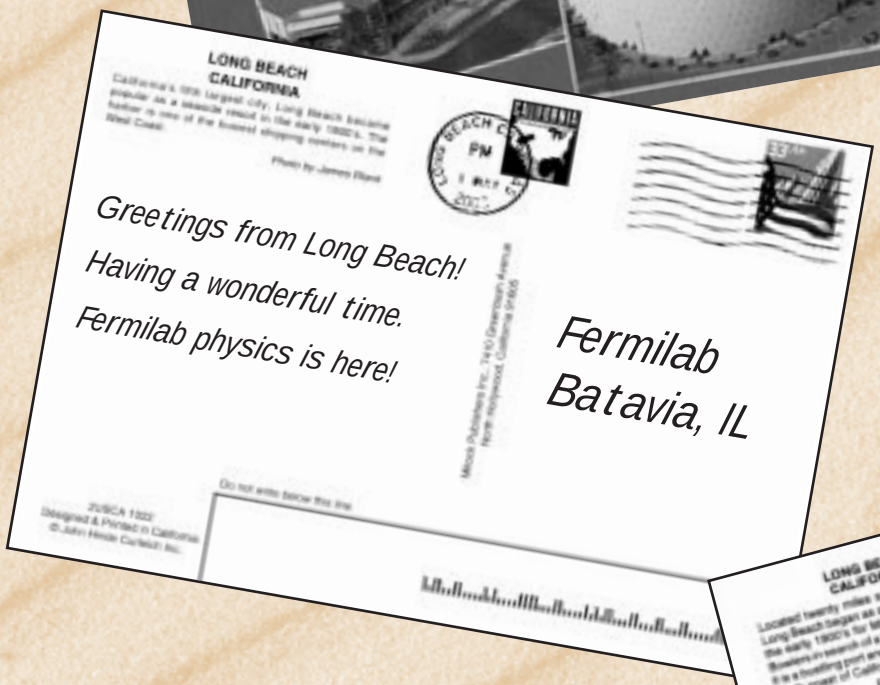
by Judy Jackson

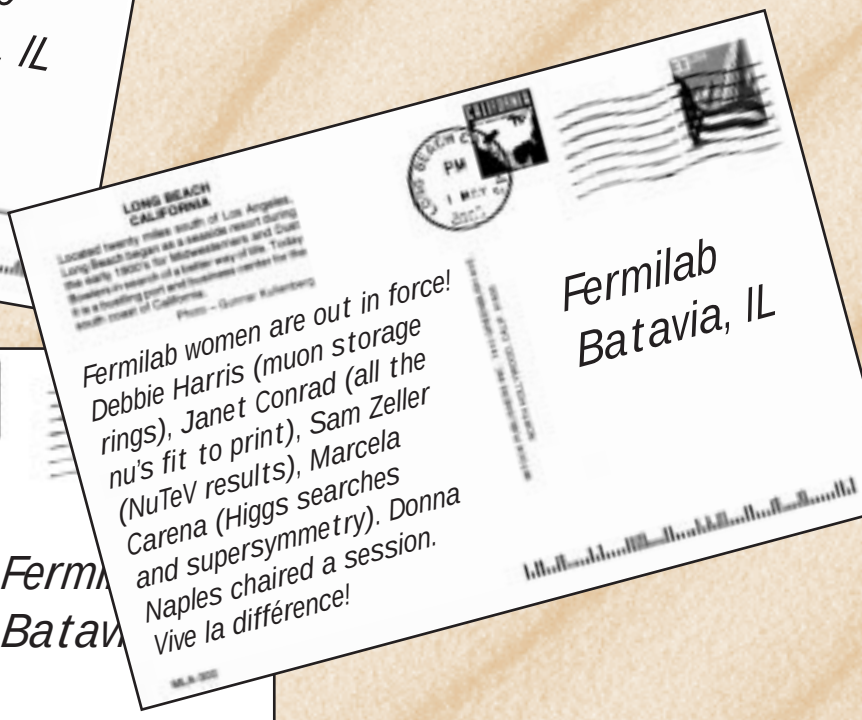
Neutrinos weigh either nothing or next to nothing. The Queen Mary checks in at some 81,237 gross tons. Last week, the lightweight particles and the portly ex-luxury liner shared a berth in the southern California city of Long Beach, site of the American Physical Society's annual spring meeting. And while no one presented results that exactly rocked the boat, there was plenty to write home about.

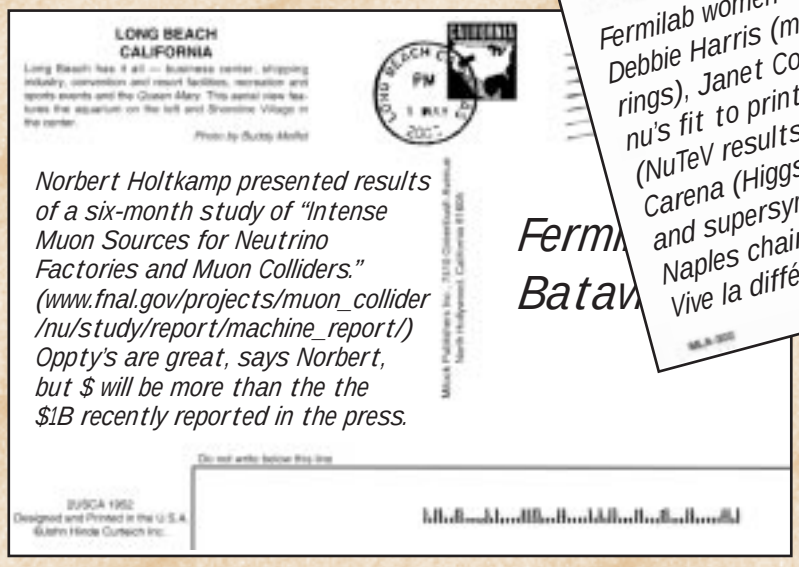
In 1967, the city of Long Beach bought the former Cunard liner and parked it in Long Beach Harbor to give this sun-drenched but slightly gritty port town a bit of added panache as a tourist destination. The neutrinos, current darlings of particle fashion, served somewhat the same function at the APS meeting, helping to bring some thousand physicists (as always, instantly recognizable by a certain sartorial *je ne sais quoi*) to this annual spring physics fest. And, like the neutrinos that fill every cubic meter of the universe, Fermilab physics was everywhere.

Although they spent a few exciting days together in Long Beach, there is an important difference between neutrinos and the Queen Mary. Whether or not neutrinos turn out to have mass, we know that they have no charge. For the Queen Mary, however, it's $15.00 for adults, $9.00 for children under twelve.


Greetings from
Long Beach


LONG BEACH
CALIFORNIA
Greetings from Long Beach!
Having a wonderful time.
Fermilab physics is here!
Fermilab
Batavia, IL


LONG BEACH
CALIFORNIA
Fermilab women are out in force!
Debbie Harris (muon storage rings), Janet Conrad (all the nu's fit to print), Sam Zeller (NuTeV results), Marcela Carena (Higgs searches and supersymmetry). Donna Naples chaired a session.
Vive la différence!
Fermilab
Batavia, IL


LONG BEACH
CALIFORNIA
Norbert Holtkamp presented results of a six-month study of "Intense Muon Sources for Neutrino Factories and Muon Colliders." (www.fnal.gov/projects/muon_collider/nu/study/report/machine_report/) Oppty's are great, says Norbert, but $ will be more than the the $1B recently reported in the press.


LONG BEACH CALIFORNIA
Cornell's Maury Tigner won the Wilson Prize. He said the future of particle accelerators is too important to be left to the accelerator experts. "All physicists are on an equal footing" in creating new machines, because all have a stake in the results.
Fermilab
Batavia, IL
LONG BEACH
LONG BEACH CALIFORNIA
SLAC's Jonathan Dorfan said the B Factory and the BaBar detector are performing beautifully, with the accelerator routinely delivering luminosity ahead of expectations. And "we think there's a lot more luminosity in it" for the future, he said.
Fermilab
Batavia, IL
LONG BEACH CALIFORNIA
Teaching vs. research?
Lo-o-o-ng author lists vs.
credit where it's due? Science goals vs. funding crunch?
Wouldn't be a physics meeting w/o lotsa talk on all those topics!
Fermilab
Batavia, IL
Mike Witherell showed "the plot" ("the most famous graph of my entire physics career") of falling funding for our field, but described a coming "golden age of physics" if the plot has a happy ending.
Fermilab
Batavia, IL

Fabiola Gianotti from CERN gave mouthwatering descriptions of the amazing results that will eventually come from the Large Hadron Collider. "Physics at LHC will significantly improve and maybe modify our understanding of particles and their interactions." No kidding.

Fermilab
Batavia, IL

LONG BEACH
CALIFORNIA

Greg Landsberg held a press conference on the search for extra dimensions at DZero: Only four so far (three regular ones, plus time), but still looking.

Fermilab
Batavia

New accelerators in Fermilab's future? (Soonish?) Muon storage rings, muon collider, a Very Large Hadron Collider, and "we're working on investigating a suitable local site" for a Next Linear Collider. All these possibilities had lots of time in the sunshine at LB.

Fermilab
Batavia, IL

An aerial view of Robert Rathbun Wilson Hall at Fermilab. The 16 story building houses research laboratories and the administrative headquarters of the laboratory.

Back at Fermilab. Palm trees: 0. Baby buffalo born while we were gone: 10. Ocean liners: 0. Collider detectors the size of ocean liners: 2. Beaches: 0. Neutrino experiments under construction: 2. Conference: Over. New physics back home: Going strong.

APS Sho
Long Bea

WILSON

The Wilson family gathers on the front steps of Wilson Hall.

Cover photo: Pioneer Cemetery, where the ashes of Fermilab Founding Director Robert Rathbun Wilson were buried on April 28.

Remembered as Truly Larger Than Life

by Mike Perricone

The description "larger than life" sometimes fits only the public part of a life.

But Robert Rathbun Wilson—physicist, environmentalist, sculptor, human rights activist, pioneering accelerator builder— was also larger than life as a private person, in the testimony of an unimpeachable source: his youngest son, Rand, whose hero was always a cowboy.

"My dad could ride and rope, and he had the unshakable moral code of a cowboy," Rand Wilson said at the memorial service for Fermilab's founding director, whose ashes were interred April 28 in a private ceremony at the Pioneer Cemetery on the lab site.

"My dad was a man of the true west. It was high noon, and he was in Dodge City to make things right," Rand continued. "The last few years, I've found myself very affected by the passing of some of the great movie cowboys—Gene Autry, Roy Rogers, and my personal favorite, the Lone Ranger. I realized why they were so special—because I knew I had grown up with a real cowboy hero. When the Lone Ranger rode off at the end of an episode, someone always asked, 'Who was that masked man?' But I always knew. He was my dad."

Robert Rathbun Wilson, who died January 16 at 85 following a long illness, had requested burial at the Pioneer Cemetery, where the last documented burial took place in 1851. The U.S. Department of Energy granted Wilson's request, and the Wilson family arranged for a small, private ceremony. Wilson's sons Daniel and Jonathan also attended with their families, including Wilson's four grandchildren.

Pioneer Cemetery includes the grave of General Thompson Mead, a veteran of the War of 1812, who established a homestead in Batavia, Illinois. The cemetery became part of the Fermilab site when the federal government acquired the land for the National Accelerator Laboratory (as it was then called) from the state of Illinois in 1967.

It was at that time, before a single building had been put up on the land that had formerly been cornfield, that Wilson made his most critical contributions to what would become the world's forefront facility in high-energy physics research, according to Ned Goldwasser.

"Bob Wilson's greatest impact came in the formative years, when the laboratory was only a dream and then a twinkle in a few eyes," said Goldwasser, the lab's first deputy director, in his tribute during the Ramsey Auditorium memorial service.

Photos by Reidar Hahn

Paying tribute to Robert Rathbun Wilson (from left): Norman Ramsey, Rand Wilson, Bob Mau, Ned Goldwasser, and Ken Stanfield.

"Bob was a statesman of immense courage," Goldwasser continued. "He persuaded others that this laboratory was possible, and then he made it possible."

Goldwasser described Wilson as a man of many and varied talents, and the speakers at the memorial service paid tribute to that breadth of character from the Ramsey Auditorium stage, framed by prairie flowers drawn wholly from the lab's site.

Deputy director Ken Stanfield noted that more than most institutions, "Fermilab remains the creation of just one man." He saw Wilson's presence in the way things are done every day at the place that is "still Robert Wilson's laboratory."

Norman Ramsey, founding president of Universities Research Association, Inc., recalled that Wilson was designated Employee No. 1 and then determined that Ramsey should be Employee No. 0, "which led to a little confusion at the gate." He lauded Wilson's attention to detail in all aspects of the lab, including the budget, and admitted that Wilson's manner could be "sometimes a little tough."

But Ramsey concluded: "He was a very close personal friend and I miss him greatly."

While normally a taciturn man, Wilson became quite voluble during one of his favorite activities: riding a horse. The director who had grown up a Wyoming cowboy often started his day viewing the lab from horseback, accompanied by assistant director J. Ritchie Orr, who had not grown up on horseback.

"Bob would be galloping along, talking, looking here and pointing there," Orr recalled. "He was one of the great horseman of all time. Meanwhile, I was trying to keep up, and hanging on with both hands."

Former Fermilab director Leon Lederman, in videotaped remarks, said Wilson had modeled the lab after the great laboratories of Europe, including the fabled island laboratory of Tyco Brahe. Lederman referred to the current-day budget difficulties in the field when he asked, "Where is Bob Wilson now when high-energy physics really needs him?"

Bob Mau had the answer: Wilson exists in every fiber of the lab.

Mau, chief of accelerator operations with 30 years of service, spoke of himself as representing "the common employee, the average worker bee" at the memorial. But Mau spoke with uncommon elegance as he led an imaginary tour through the site, past the Wilson sculpture Broken Symmetry at the west entrance, along the road that winds through the woods because Wilson didn't want some special old trees cut down, past the restored prairie lands, the ponds, the pi-shaped power poles, the array of birdlife from blue herons to geese, arriving at the twin-towered vision of Wilson Hall.

"He somehow convinced the best minds to move to the cornfields of Illinois," Mau said. "Bob taught us all to work together to achieve more than any of us could by ourselves. No one in the hierarchy was beyond the reach of the average employee. There are 300 PhD's at the lab but nobody is called 'Doctor.' He gave us jobs that fed our families and fed our creativity. You can wander the site picking raspberries and mulberries for lunch."

Mau said he represented the people who were touched by Robert Wilson and continue to be touched by him through the lab, and he concluded by addressing the Wilson sons directly.

"With all due respect to our current managers," Mau said, "we still think of your dad as The Boss." □

DASTOW 2000
Seeds of the FUTURE

Photo by Jenny Mullins

by Mike Perricone

With ID 00070, Ernie Malamud's contributions to particle physics are firmly established in Fermilab's history. With a magnet show on Daughters and Sons to Work Day (DASTOW 2000), Malamud's reach extended to at least one new possibility for the future.

"After the show was over," Malamud said, "a little girl about eight or 10 years old came up to me. She said she learned more about science today than she has learned in school."

Wilson Hall's One West conference room was filled to capacity for the morning's magnet show, opening possibilities for many young minds who might have felt a similar spark.

Thursday, April 27, was a day dedicated to the future. The planting of seeds and trees for Earth Day offered a symbol for the possibilities, hopes and aspirations that the day's activities aimed to nurture in some 200 young visitors (and some older ones, too).

Many corners of the lab were open for discovery, including the people themselves. Head of Lab Services Kay Van Vreede keynoted the day with a presentation of "before and after" pictures—drawn by a class of seventh-graders to show their expectations of how scientists looked, compared to their experience of scientists after visiting the lab. The "before" pictures featured bald guys with glasses and lab coats; the "after" pictures were a celebration of diversity.

Dr. Bob Betz, a key influence in Fermilab's earliest efforts at prairie restoration, led a woodlands and wildflowers tour on the Margaret Pearson Nature Trail. Fermilab's Fire Department had special kid-sized equipment on hand, along with the full-sized fire trucks that are exciting to kids of any age. Mentors and parents gave personal insights into the many jobs and skills that go into the operation of the lab. Three physicists—Bill Foster, Norman Gelfand and Peter Mazur—held a question-and-answer session ranging from how a TV works to how to get an A on an upcoming science project. Jerry Zimmerman showed the kids how to chill out with his renowned Cryo Show.

Photo by Reidar Hahn

And visitors to the buffalo barn had a special privilege: witnessing a calf being born on the afternoon of a day dedicated to the future. □

Photo by Jenny Mullins

Photo by Reidar Hahn

Photo by Reidar Hahn

Photo by Jenny Mullins

Photo by Jenny Mullins

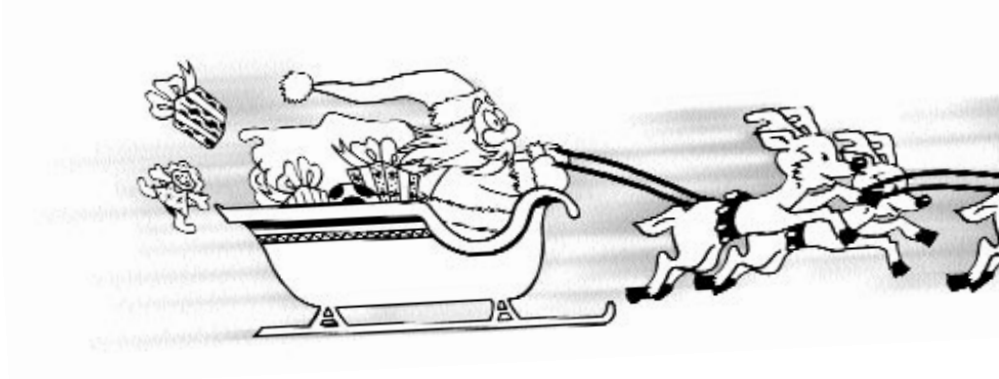
Photo by Reidar Hahn

Santa's WORLD

Photo by Jenny Mullins

Arnold Pompos

...REVISITED



Dear Editors:

It was a cute and humorous article in FERMINEWS *written by Sharon Butler and Arnold Pompos, about Santa at nearly the speed of light (Volume 21, No. 23, Dec. 11, 98, available on the Fermilab web site at www.fnal.gov/directorate/public_affairs/ferminews/santa/). I believe, however, that the physics is all wrong.*

The article claims that light travels slower in transparent media than it does i n free space. In my view, light doesn't slow down at all: Light actually zigzags from atom to atom as it traverses a transparent medium. Hence it travels a longer distance compared to going straight, leading to an apparent decrease in speed.

The story also states that astronomers take advantage of the Doppler effect to figure out the speeds with which stars and galaxies in our expanding universe are moving with respect to us. Yet the expansion of the universe causes a redshift, not a Doppler effect.

Last but not least, the article talks about the length (Lorentz) contraction, the apparent foreshortening of a body traveling at high speed. I think that the Lorentz contraction is misnamed and is rather a rotation than a contraction: If a cube passes you at nearly the speed of light you would see some amount of the leading face (depending on exactly how fast it's moving) and the square side would appear foreshortened.

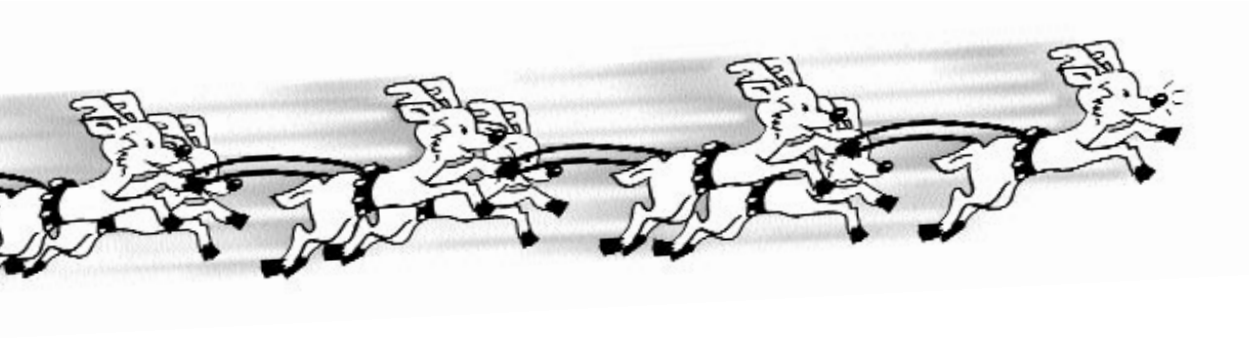
Sincerely,
Douglas George

Dear Douglas:

Thank you for bringing up the topic. Events at or near the speed of light are really some of the most fun and surprising of all physics phenomena. They are quite different from our day-to-day experience, and our intuition often fails us. So we'll try to give some additional insight into Santa's relativistic world.

Zigzagging light?

It is tempting to think of light traveling through a medium as light particles (photons), bouncing back and forth between atoms. This way of thinking, however, does not always lead to an easy understanding of all experimentally



observed phenomena related to light. For example, a material with high density (heavy and/or closely packed atoms) does not necessarily slow down light more than a less dense medium, despite the fact that one would expect more scattering to take place inside the denser medium.

To easily understand the reduction of the speed of light inside matter, physicists take advantage of light's "split personality." Light can behave like a particle *and* like a wave.

Traveling through matter, light waves interact with the electrons of the material. The theoretical description is based on the famous Maxwell's equations. (See Fermilab's popular science descriptions at www.fnal.gov/pub/light/ for more details on topics related to light.) Knowing the electromagnetic properties of a material, such as the dielectric constant, scientists can compute the reduced speed of light, the speed at which light waves travel through matter.

Doppler effect vs. redshift

The Doppler effect, originally a theoretical prediction, was first observed for sound waves, in 1845, long before the sirens on police cars made this a publicly known phenomenon. It took another 60 years until the Doppler effect was also observed for light, in experiments with beams of light-emitting ions. The spectral lines measured in such experiments are shifted towards the blue end of the spectrum if the ions are moving toward the receiver, and to the red end if the ions are moving away from the receiver. The results are in agreement with the special theory of relativity.

When looking at light emitted by a star, for example, things are more complicated. In addition to a Doppler shift, which is present if a star moves through space, astrophysicists also observe gravitational and cosmological redshifts in the star's spectral lines. These can only be explained in the framework of the general theory of relativity.

The gravitational redshift refers to the shift in color that occurs when light is emitted by a massive object, say a star. It is due to the energy loss that light suffers when it travels against the star's strong gravitational field.

The cosmological redshift, which you mention, is due to the expansion of space itself. It plays a major role in the search for galaxies and quasars deeply hidden in our universe.
(See related story on page 12.)

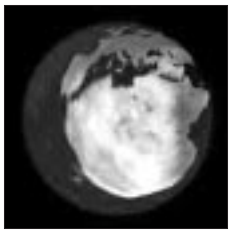
The world at near the speed of light

The Lorentz contraction cannot be explained by a simple rotation in three-dimensional space. Calculations must be based on the theory of relativity, and must be carried out in four-dimensional space-time.

Nevertheless, you brought up a very interesting question: How does Santa *see* the world when he travels near the speed of light?

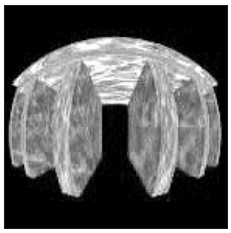
Research groups at the universities of Stuttgart and Tübingen, Germany, work on the visualization of effects, taking into account the finite speed of light. They created animations showing various objects when observers pass by at near the speed of light. Check out the movie gallery at www.tat.physik.uni-tuebingen.de/~weiskopf/sr/; we also offer some examples at right. □

Sincerely,
Arnold Pompos and Kurt Riesselmann

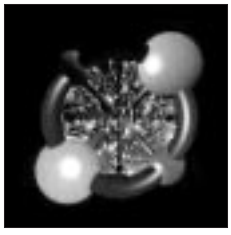


When traveling at 99 percent of the speed of light, Santa gets a distorted view of the earth…

…the Eiffel Tower…



…the Brandenburg Gate…



…and the interior of an atomic lattice.

Great Discovery, Great Question:

HOW CAN AN OBJECT WE SEE TODAY BE IF THE UNIVERSE IS ONLY

by Judy Jackson

On April 13, 2000, collaborators of the Sloan Digital Sky Survey, *of which Fermilab is a member, announced that the Survey had identified the farthest known object in the universe, as measured by spectroscopic redshift. Sky Survey commissioning data from March 2000 yielded an unassuming red speck of light, tagged by SDSS astronomers as a high-redshift quasar candidate. Follow-up spectroscopy from the Keck Telescope in Hawaii confirmed that the object was in fact a quasar, and established its record-breaking redshift of 5.8.*

The arrow points to an image of the most distant quasar ever observed in the universe.

In the six days following the press release, there were 957,000 hits (requests for web pages or graphics) on the Sky Survey web site, at www.sdss.org. The normal average is three to four thousand per day. Over those six days, the SDSS Web site served up 15.4 gigabytes, an average of 31 KB every second. The one-day average peak rate was more than double that. Among the people who visited the SDSS web site to learn about the quasar were several dozen curious readers who wrote to Sky Survey webmaster Craig Wiegert with a variation of the following question:

"How can the recently SDSS-discovered quasar with a redshift of 5.8 be separated from the earth by 27 billion light-years in a universe that's only 14 (+6/- 2) billion years old?"

So many people, in fact, e-mailed in with that excellent question that Wiegert and University of Chicago/Fermilab astrophysicist Michael Turner posted a response on the Web, and we reprint it, with their kind permission, in FermiNews.

Photo by Jenny Mullins

Fermilab and University of Chicago astrophysicist Michael Turner, scientific spokesman of the Sloan Digital Sky Survey

27 Billion Light Years Away 14 Billion Years Old?

by Michael S. Turner & Craig Wiegert

Because the universe is expanding, light from distant galaxies is shifted to the red (longer wavelengths). The factor by which the wavelengths of spectral features are increased is denoted as one plus the redshift, *z*:

(received wavelength of light) = *(emitted wavelength)* x (1 + z).

The phenomenon of redshift can be thought of as the stretching of the wavelength of light by the expansion of the universe. This is *not* the same thing as the Doppler shift caused by a moving object, although cosmological redshift is often inaccurately described in this way. (The Doppler shift formula $z = v/c$, or its relativistic counterpart, still applies in astrophysical situations where the expansion of the universe is not important.)

The redshift of a distant object tells us directly the size of the universe when the light was emitted, relative to the size of the universe today. So when the light was emitted from our redshift 5.82 quasar, the universe was a factor of 6.82 (remember, 1+z) smaller in linear size. Quasar redshifts are very easy to determine. You can check our calculations yourself! All quasars have a very prominent feature in their spectrum, the famous Lyman alpha line of hydrogen; the wavelength of Lyman alpha is 1216 Angstroms, in the ultraviolet. For our redshift 5.82 quasar this feature has been redshifted to around 8300 A, in the near infrared!

Computing the age of the universe when the light was emitted from our redshift 5.82 quasar is more challenging. It requires knowledge of the expansion rate of the universe (Hubble constant) and composition of the universe (which determines the slowing or speeding up of the expansion). Further, since the universe is expanding, the quasar is farther away now than when it emitted the light we see today, and so we must be careful to qualify statements made about its distance.

Using our best values for the cosmological parameters (for the experts $H_0 = 65 \pm 6$ km/s/Mpc, $\text{Omega}_{\text{matter}} = 0.35 \pm 0.07$ and $\text{Omega}_{\text{total}} = 1.00 \pm 0.05$), we can infer that the light we see today was emitted when the universe was about 0.95 billion years old; for these parameters the universe is about 13.9 billion years old today. (The error margin on this is -1.4 to +1.7 billion years.) We are thus seeing the galaxy that hosts this quasar as it was almost 13 billion years ago.

Estimating the distance to the quasar requires a little more work yet. According to Einstein's general theory of relativity, the expansion of the universe is actually an expansion of space itself, and galaxies are moving away from each other because they are "being carried along by space." The theory does NOT limit the speed at which space expands, only the motion through space. Thus, the distance to this quasar can be greater than 13 billion light years. In fact, if we ask the question, "How fast is the distance between us and this quasar increasing?" we get the seemingly amazing answer of 540,000 km/sec or about 1.8 times the velocity of light. This number is ultimately not very interesting, both because this is not the best way to think about distant objects, and because there are objects farther away whose distance is growing even faster. To quote Fermilab's Judy Jackson, "There is no speed limit on the universe."

When we run the numbers, we find that this quasar is about 27 billion light years away today. This is the value we would obtain if we could magically freeze the universe in time and then measure the distance with a meterstick. From the redshift, we

GALAXIES
ARE MOVING AWAY FROM EACH OTHER
BECAUSE THEY ARE BEING
"CARRIED ALONG BY SPACE."

can then compute the distance to this quasar when the light we see today was emitted: it is 27 billion light years divided by 6.82, or about 4.0 billion light years. These numbers may seem paradoxical (and to be sure they depend somewhat upon our knowledge of the cosmological parameters; the uncertainties are -2.8 to +3.6 billion light years), but they do make perfectly good sense within Einstein's theory. The theory is well tested and its predictions make sense when carefully examined.

For example, although light from this distant quasar has only been traveling for 13 billion years, the distance measured today between where it began its journey to us and the position of the Milky Way is (and must be) greater than 13 billion light years because of the general expansion of the universe. In effect, the light has to fight its way "upstream" against expanding space.

In the end, the key to understanding all of this is to view the expansion of the universe as Einstein's amazing theory tells us to, as an expansion of space that scales up all distances in the universe. One way to visualize this is to imagine a universe with just two space dimensions, inhabited by two-dimensional creatures. Their expanding universe can be described as a rubber sheet that is being stretched uniformly in both directions, thus increasing the amount of space. Galaxies in this universe can be represented by dots painted on the rubber sheet. The dots move away from one another not because they are moving on the rubber sheet, but because of the expansion of the sheet. (In fact, it is simple to show that the change in separation of any two dots with time is proportional to their separation; this is known as Hubble's law.) Beyond the motion due to the expansion of the sheet, galaxies and photons can move along the sheet. The speed limit for this motion is the speed of light. However, there is no speed limit for recessional motions associated with the stretching of the sheet.

Finally, we should clarify that an expanding universe does not mean that everything in the universe is growing in size. Objects held together by forces strong enough to resist this expansion won't expand. For example, atoms are held together by the electric force, neutrons and protons are bound by the strong force, and astronomical objects like the Earth, our solar system, and our galaxy are held together by the force of gravity associated with these high concentrations of matter. □

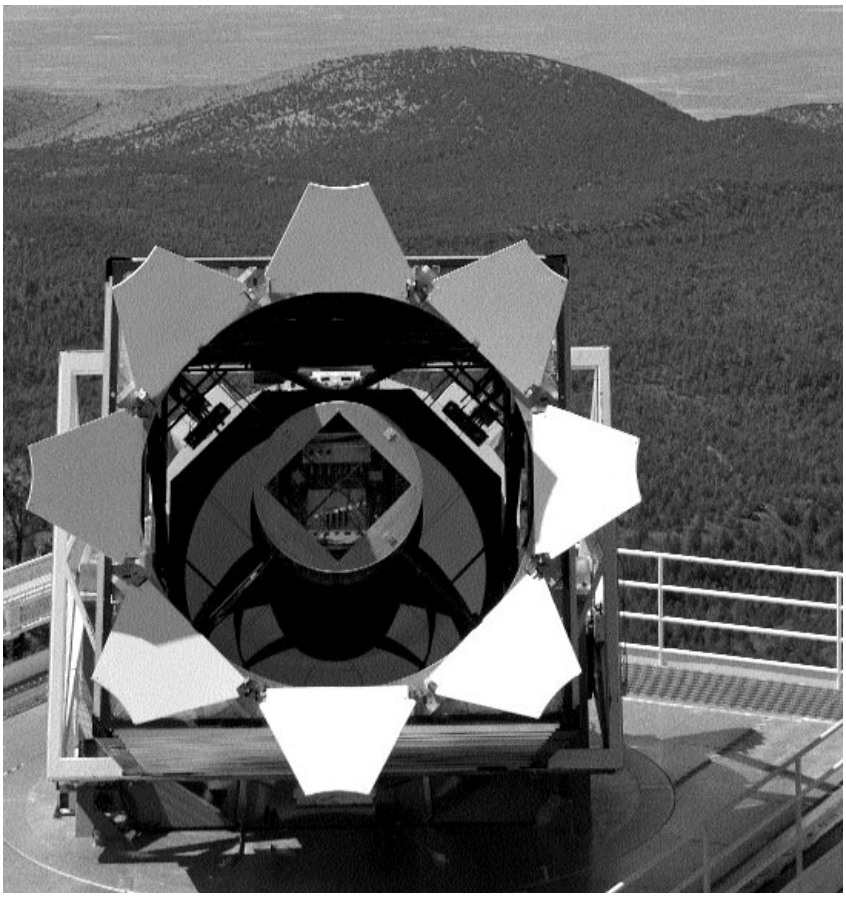


Photo by Reidar Hahn

The telescope of the Sloan Digital Sky Survey at Apache Point, New Mexico.

CALENDAR

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

INTERNATIONAL FILM SOCIETY Presents

Friday June 16, 8 p.m. Ramsey Auditorium Wilson Hall, *Smiles of a Summer Night (Sommarnattens Leende),* Dir: Ingmar Bergman, Sweden (1955), 108 min. A brilliant romantic comedy, starring Ulla Jacobsson, revolves around the sexual liaisons and moral dilemmas of eight sophisticated people vacationing at a country estate in the late 1800s.

ART SERIES Presents:

Saturday June 3, 2000 $19 Ramsey Auditorium, Wilson Hall, *The Four Bitchin' Babes*, Sally Fingerett, Megon McDonough, Debbi Smith and Camille West. Together they tell humorously observant tales of modern urban life, and harmonize like a heavenly chorus.

FERMILAB LECTURE SERIES Presents:

May 19, Dr. Chris Chyba of the SETI Institute on the Study of Life in the Universe.

June 9, Dr. Judah Folkman, Harvard University will discuss angiogenesis and cancer research. Tickets are $5. Ramsey Auditorium at 8 p.m.

ONGOING

■ NALWO (National Accelerator Laboratory Women's Organization) is pleased to announce the free morning English classes in the Users' Center for FNAL guests, visitors, and their spouses have been expanded; The new schedule is: Monday and Thursday, 9:30am - 11am beginners (Music Room) and intermediates (Library) Monday and Thursday, 11am - 12:30pm advanced, emphasizing pronunciation and American idioms (Music Room)

■ NALWO coffee for newcomers & visitors every Thursday at the Users' Center, 10:30-12, children welcome. In the auditorium, International folk dancing, Thursday, 7:30-10 p.m., call Mady, (630) 584-0825;

■ NALWO cordially invites all women associated with the lab (users, guests, employees, spouses) to the Annual Spring Tea, Friday morning May 12, 2000 from ten o'clock until noon at the lovely Warrenville home of Janine Tollestrup. If you can, please bring a favorite dessert or appetizer to share. For additional information and directions, please contact Rose Moore, 208-9309 or Sue Mendelsohn, 840-5059 or mendel@fnal.gov or Selitha Raja, 305-7769

■ $E=MC^2$—E=eclectic; M=music; C=come one, come all! Come join us for a weekly gathering of Fermi folks and friends on Thursday nights at The Users Center in The Piano Room!!! We have begun an acoustic "open style" sing around. Anyone who plays an instrument, enjoys singing and/or listening to music is welcome. We are trying to keep the group as "unplugged" as possible in order to accommodate everyone.Our goal is to make everyone feel welcome from beginners to the more accomplished players, but most of all..to have a good time. We have a lot of talent walking the hallways of Fermilab and now we've got a place to get together and jam!! This is a new endeavor so interest and support are important. We meet at 5:30pm to maybe 9:00 pm on Thursdays. For further information, please contact Dennis Ostrowski x4389 LDP 630-314-4024 or ostrowski@fnal.gov.

BARN DANCES

There is only one barn dance in May: Sunday, May 14 Barn dance in the Kuhn Village Barn from 7 to 10 p.m. Music provided by Chrips Smith & Friends with calling by Dot Kent.

Sunday, June 11 Barn dance in the Kuhn Village Barn from 7 to 10 p.m. Music by the Cook County Revelers with calling by Paul Watkins.

All dances are taught and people of all ages and experience levels are welcome. Admission is $5, children under 12 are free (12-18 $2). The barn dance is sponsored by the Fermilab Folk Club. For more info, contact Lynn Garren, x2061, garren@fnal.gov or Dave Harding, x2971, harding@fnal.gov.

LUNCH SERVED FROM 11:30 A.M. TO 1 P.M.
$8/PERSON

DINNER SERVED AT 7 P.M.
$20/PERSON

Chez Léon MENU

FOR RESERVATIONS, CALL X4512
CAKES FOR SPECIAL OCCASIONS
DIETARY RESTRICTIONS
CONTACT TITA, X3524
HTTP://WWW.FNAL.GOV/FAW/EVENTS/MENUS.HTML

LUNCH WEDNESDAY, MAY 17	DINNER THURSDAY, MAY 18	LUNCH WEDNESDAY, MAY 24	DINNER THURSDAY, MAY 25
Closed	*Closed*	*Three Cheese, Bacon and Cabbage Calzone* *Salad of Tomatoes, Black Olives, Cucumber and Red Onions* *Tarta Sicilana*	*Booked*

FERMINEWS

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The deadline for the Friday, May 26, 2000, issue is Tuesday, May 16, 2000. Please send classified advertisements 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

■ '99 Harley Davidson Sportster Custom XL883C (Black) 3,000 miles has a windshield, forward controls, saddle bag brackets and a touring seat. Asking $7,500 contact Terry X4572 skweres@fnal.gov or Janine at none2compare@yahoo.com.

■ '99 Goldwing SE (Silver) with extras. Price lowered to $1,500 less than Kelley Blue Book (3/27/00 $16,500) Priced at $15,000 11K Miles - excellent condition and runs great. Still has 2 yrs on original as of Nov. 5 (unlimited miles) warranty. Can get another 3 yrs extended (unlimited miles). Call Terry X4572 or e-mail skweres@fnal.gov

■ '97 Honda Civic DX 4dr., 36K miles, air, automatic and CD player. Call 630-466-1959 for more info.

■ '96 Ford Taurus GL. All STD equip. (including A/C, dual air bag, Heated mirrors, power windows, rear defroster, tilt, and tinted glass). Plus: cassette, cruise, power locks, 4 wheel disc anti-lock brakes,and power drivers seat. 48k asking $9,500 obo. Rob x4190 or 690-3314

■ '90 Ford Ranger, Ext Cab 4x4, V6, a/c, bed cover, 5 spd, low miles, black, $3300, call Wes x 4698 or 892-2558

■ '90 Subaru Legacy Sedan LS, 136K, 4WD, power sunroof, cruise control, AM/FM cassette, trunk through feature, AC, rear defrost, power doors and windows, in good condition, one owner, all service done by dealer. $3000, x6396 or mccusker@fnal.gov

■ '88 Plymouth Sundance 4-door hatchback excellent condition 105,000 miles new brakes, battery and radiator. $2,500 obo x8295, x3604, 428-0024 (evenings).

■ Mobile home for sale. Located in Calumet City. 2 bedroom, 1.5 bath, all paneled. New furnace, A/C. Moving out of state. $6,000 OBO. Call: 708-862-5711.

■ Home for Sale: Riverside property with 2 story, 5 room house, large bathroom, 2 enclosed porches, central air conditioning, and detached 2.5 car garage. Located in the historic section of Geneva across from Wheeler Park, within walking distance from train station and downtown shopping. Year-round views of the Fox River in a beautiful garden setting with patio and goldfish pond. Asking $178,500. Contact erik@fnal.gov, or call 630-840-6416.

■ Golf clubs "King - Cobra" driver, regular flex graphite shaft, $95. "Taylor - Made" fairway driver, graphite shaft, $90. Jerry x8779.

■ Moving/Consolidation Sale Saturday May 13th 8 a.m. to 3 p.m. 42W848 Robin Lane Hampshire IL 60140 Directions can be found by using www.mapquest.com for more info contact Terry X4572 or e-mail skweres@fnal.gov

■ Machinist tools, Cannondale bike, gas barbecue grill and many other items call (630) 897-6642 Adult air rifle, model TF/QB-25, barrel cocking, magnum power, $75 model XS-B3, sidelever cocking, folding steel stock, $45;both in good condition. Interested call x-4490, or send an e-mail to mahengjie@fnal.gov.

■ Briggs & Stratton engine, 20" blade. Runs fine, Mulches only. $20 o.b.o. e-mail bellanto@fnal.gov. 6" lawn roller $50 6" bench grinder with two wheels 1/3 HP $25 Heavy duty dog run 10' X 11' X 6'H $100 Double divided dog run with two doors 1 2' X 8' X 5'H $200(630)753-0278

FOR RENT

■ Apartment, 2BR, DR, Kit, Bath, LR, basement washer/dryer, garage, central air, non smoking. Batavia. $750/month. Available immediately. markl@fnal.gov, 847.202.9209.

WANTED

■ We are looking for a 3 bedrooms house to rent from mid August 2000 for one year, in the surroundings of FNAL. Please contact montanet@in2p3.fr

■ Bicycle wanted. Call 840-4794 or 8196.

■ Moderate size refrigerator and lawn mower for young couple starting in apartment. Call Larry at 4386 or e-mail allen@fnal.gov.

■ Old but still working manual lawnmower (pushmower). Phone 305-4558, e-mail lehnerf@fnal.gov.

SPORT FISHING

■ Great Lake Michigan Sport Fishing... via King Olaf Charters. We specialize in multi-boat charters. All equipment provided. Call Captain Bill Penn 630-554-3155 (day) or 630-554-3828 (evenings) or Carol Magnuson (x3451) for more information.

BIBLE STUDY

■ The 12 o'clock (noon) Bible Study has begun a one year survey of the Bible course. Wednesdays in the Huddle located in the cross gallery. Contact Jeff Ruffin x4432, or ruffin@fnal.gov .

MILESTONES

RETIRING

■ Alma Karas, ID 4434, BS-MA Purchasing, June 2, last day of work May 26.

■ Rose Warner, ID 6110, BS-Accounting, June 26, last day of work May 12.

■ James Pachnick, ID 1766, June 12, last day of work May 3.

■ James Fourmont, ID 2918, FES-OP-Electrical, June 12, 2000.

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