

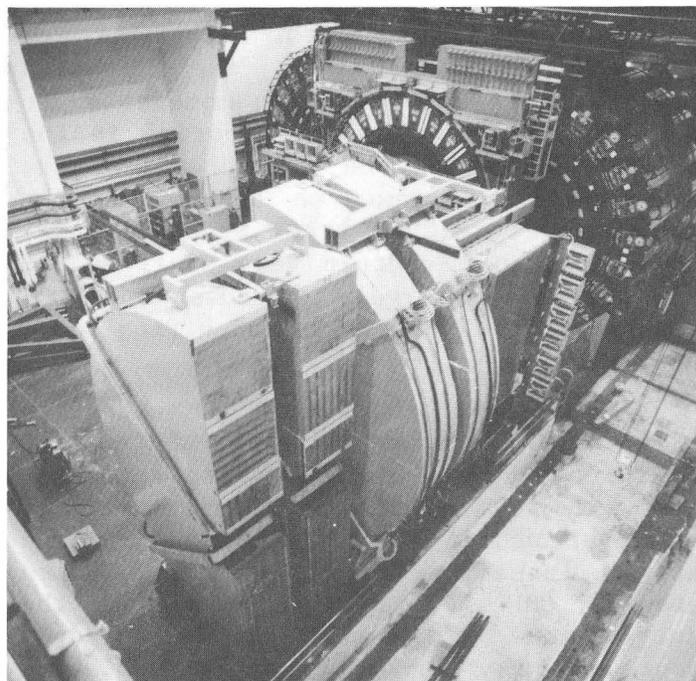
CDF Passes DOE Review, Physics Coming Up

by Mark Bodnarczuk

On March 25, 1986, the Collider Detector at Fermilab (CDF) completed its fifth and final review by the Department of Energy (DOE). The DOE review process is analogous to the process many people go through when planning a large party: how many people are coming? How much will they eat? How much will they drink? How much time will it take to prepare the food, clean the house, and make sure it all gets done on time? Most importantly what will it cost? Generating a list and reviewing it often to see if anything has been left undone prevents the embarrassment of running out of something at the party, or grieving over "all that wasted food" after the guests have gone home.

Planning a large detector like CDF is much more difficult than planning a party (with the possible exception of Hollywood parties), but the concept is similar. In order to insure that nothing gets left out, and that the detector is ready on time for the arrival of the proton/antiproton beams, that the project has no large cost overruns, DOE has guidelines that projects like CDF must comply with. The first stages of CDF R&D began in FY77 and a design handbook was generated in FY81 detailing the design of all components of the project. A project management plan was established which outlined the proposed way the project would be carried out. This included a work breakdown structure (WBS) which listed the total estimated cost of the project (\$44.2 million) into distinct work packages. Additional funds provided by Japan, Italy, and the National Science Foundation were also described and outlined within the scope of the project.

Once a year, the DOE reviewed the progress of the project to insure that it was being completed according to plan. Although the review process was long and arduous at times, Roy Schwitters (Co-Manager of CDF) claims it was an overall help to all concerned, forcing DOE, Fermilab, and the 17-institution collaboration to look at the total project in a systematic way. By solidifying all needs and



Backward muon toroids, backward calorimeters and electromagnetic shower counters are ready to be moved into the CDF collision hall.

requests on paper, DOE and CDF were able to execute the project with optimum efficiency. The CDF review process worked so well that it has become a model for other large detector projects in the United States (SLD at SLAC, DØ at Fermilab) and also in Europe (L3 at CERN). The final review is a signal that the real work, doing high-energy physics, is not too far away.

Some last minute preparations include the completion of the forward and backward detectors which are scheduled to be done by mid-August. Final components of the central detector must also be completed, namely the full central tracking system and installation of the end-plugs. Also, the solenoid magnet must be cryogenically cooled down and turned on with circulating beam in the Accelerator. This goal is being orchestrated with the Tevatron start-up and is scheduled for the first week in October. After a two-month de-bugging period the completed detector (and the CDF physicists) will wait patiently for the

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arrival of their guests, the proton and antiproton beams. Then the real fun will begin.

During this first three-month run, CDF hopes to record 1-200 events containing W and Z vector bosons and carefully search for quark and gluon jets. The 1.6 TeV center-of-mass energy of the Tevatron promises to reveal jets with momenta up to 250 GeV, the highest ever recorded in the world. Along with the high energies, the measurements performed on aspects of the electroweak force and other Standard Model predictions will contain very small systematic errors, largely because the CDF detector is calibrated with such fine resolution.

The goals of the second run scheduled in late 1987 are also exciting. Initially, and throughout the run, Accelerator Operations will try to increase the intensity of the Tevatron to its optimum limit. With maximum intensity and a well calibrated detector, CDF will begin the search for the last of the six quarks in the present model, the top quark. Also, extrapolating upon cumulative W and Z evidence found initially at CERN and hopefully verified in their first run, CDF will attempt to push beyond this plateau, searching for the next (and equally important) aspect needed to confirm the electroweak theory, the Higgs boson. The predicted mass of the Higgs is unconstrained by present theory, but if its mass is between 50 and 200 GeV, the 1.6-TeV center-of-mass beams of the Tevatron may be able to produce it, and the well calibrated CDF detector will probably be able to detect its presence.

CDF will also search for particles that are beyond the present model of six quarks and six leptons. These particles, predicted by the theory of supersymmetry, are supposedly identical partners in every way except the direction of their spin. If the supersymmetry theory is correct, our vocabulary will once again be expanded to include such things as selectrons and squarks (partners to electrons and quarks).

With the review process behind them and the detector almost complete, the CDF era at Fermilab promises to be an exciting time of discovery for Fermilab and the high-energy physics community world-wide. Congratulations, CDF.



McTague to Address Users



Dr. John P. McTague

John P. McTague, Acting Science Advisor to the President, and Acting Director, Office of Science and Technology Policy, will be a featured speaker at the Friday, May 2, session of the 1986 Annual Users Meeting. (For a complete Users Meeting schedule see page 3 of this issue of FermiNews.)

In the March 31 issue of *Inside Energy/with Federal Lands*, Dr. McTague was quoted on the subject of the SSC in an article entitled "McTague Publicly Endorses SSC as Science Project Nation Must Undertake":

"You can predict that something very interesting is going to happen [at SSC]." Asked if he was saying SSC is a "must do" project, Dr. McTague replied, "That's for sure," and added, "In the sense that we have to do something. We absolutely must maintain our leadership in this field. ...in some sense, it's the most fundamental of all sciences. In addition, it attracts some of the most remarkable humans on the face of this planet. It's a symbol of pure excellence that we must maintain."

Previous to his recent appointment, Dr. McTague was Deputy Director, Office of Science and Technology Policy. He brought to government service an extensive background in the sciences, including technical staff work at the North American Rockwell Science Center; professor of chemistry at the University of California, Los Angeles; membership in the Institute of Geophysics

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FERMILAB ANNUAL USERS MEETING
RAMSEY AUDITORIUM

May 2-3, 1986

Agenda

Friday, May 2

9:00 AM	Users Executive Committee Report	N.W. Reay, OSU
9:15 AM	The State of the Laboratory	L. Lederman, Fermilab
9:45 AM	Coffeebreak	
10:00 AM	URA Report	E. Knapp, President of URA
10:30 AM	Accelerator Improvements	R. Orr, Fermilab
11:00 AM	The Fixed Target Program	R. Stefanski, Fermilab
11:30 AM	TeV I Report	J. Peoples, Fermilab
12:00 PM	Progress of the Collider Experiments	G. Bellettini, INFN, Pisa
12:30 PM	Lunch	
2:00 PM	Experimental Schedule	R. Dixon, Fermilab
2:20 PM	Address by John McTague, Acting Presidential Science Advisor	
3:20 PM	Coffeebreak	
3:35 PM	Special Video Presentation	
	"Research and Development in the Era of Gramm Rudman" by Senator Pete V. Domenici	
3:45 PM	"How Do We Sustain Good Science?"	Panel Discussion
	Panel Moderator: Prof. Ed Knapp	

PANEL

Prof. R. Stephen Berry, U. of Chicago	(Chemistry)
Prof. James L. Cronin, U. of Chicago	(High Energy Physics)
Prof. Daniel Kleppner, MIT	(Atomic Physics)
Prof. Riccardo Giacconi, Space Telescope Sci. Institute	(Astrophysics)
Prof. Bertrand I. Halperin, Harvard U.	(Condensed Matter Physics)

5:30 PM Users Annual Social, hosted by the Universities Research Association

Saturday, May 3

9:30 AM	Advanced Computer Project	I. Gaines, Fermilab
10:00 AM	Computer Acquisition	J. Appel, Fermilab
10:30 AM	Coffeebreak	
10:45 AM	Report on Astrophysics: Still Inflating Away	M. Turner, Fermilab/ Univ. of Chicago
11:15 AM	Status of the SSC Project	S. Wojcicki, Stanford
11:45 AM	Jet Spectroscopy	R. Field, U. of Florida, Gainesville
12:15 PM	Adjournment	

FFLA Broadens Their Scope to Reach Young Students

Until now all programs developed by the Friends of Fermilab Association (FFLA) have emphasized pre-college education in the physical and natural sciences. A new venture, "Problem Solving in Mathematics," extends FFLA's range of projects designed to improve and enhance the classroom experience for elementary and middle school teachers and students in Kane and DuPage counties. The seminar program was held at Fermilab on April 17 and 18, and will continue for a second two-day session in early May.

The rationale for the programs stems from the limitations of the traditional emphasis on computational skills in the K-8 math classroom. This shortcoming has recently received considerable attention from educators and federal agencies. There is a widening realization that the increase in the rate of acquisition of scientific and technical knowledge over the past four decades is still growing, and that today's students must be prepared to solve problems which we cannot yet conceive. Teaching skill in problem solving from a student's earliest days in the classroom has become the natural extension of teaching basic computational skills.

Directing the program is Cathy Cook, Mathematics/Science/Computer Coordinator at Aptakisic-Tripp District #102. Ms. Cook, who received the 1984 Presidential Award for Excellence in Science and Mathematics Teaching for the state of Illinois, has had several years of experience teaching mathematics and computer classes, and in conducting workshops and seminars in problem solving. The program is currently in a pilot stage, with 47 K-8 teachers from the Batavia and Naperville schools attending the seminars and learning the skills and strategies involved in teaching Problem Solving. One important aspect of the program is that the teachers are trained to provide this instruction for their colleagues in their schools and thus disseminate widely the techniques for teaching problem solving.

The seminar involves lectures for the entire group as well as "break-out" sessions for K-2, 3-5, and 6-8 teachers. The participants receive problem solving materials designed by Ms. Cook to use in their classrooms and instruction on how to analyze and classify different types of



Cathy Cook (left), project director, working with "manipulatives" with 6th to 8th grade teachers.

math problems. The curriculum also covers methods of nurturing creativity and encouraging brainstorming and cooperative learning among students. The learning strategies, including logic puzzles, chart and model making, manipulatives, acting out, and finding patterns, help students find new and interesting ways of solving problems.

The teachers and participating school administrators were visibly enthusiastic about trying out the materials in their classrooms. They also clearly enjoyed the opportunity to discuss the program with Fermilab physicists Leo Michelotti and Drasko Jovanovic, who have served as program advisors. "Problem Solving in Mathematics" has been funded by the U.S. Department of Energy and by an individual contribution from a Fermilab physicist, and supported by the Addison-Wesley Publishing Company.

FFLA is a not-for-profit corporation. It is a membership organization with members drawn from within the Fermilab community and the general public.

- Barbara Grannis

SPECIAL NOTICE

On Friday, May 2, at 3:35 p.m. in the Ramsey Auditorium, Senator Pete V. Domenici (R.-N. Mex.) will address the Users Meeting via a 10-minute video tape on the subject of "Research and Development in the Era of Gramm-Rudman."

Earth's History is Next Lecture Topic

The concept of moving continents has drifted almost unnoticed into our thought and lexicon, even though the consequences of this movement can be downright earth-shaking. There is evidence relating to continental motion from paleontology, geology, seismology, and other disciplines. This evidence will be explained, and the pieces related, by Dr. Kevin Burke in his Fermilab lecture, "Ocean Opening - Ocean Closing: The Last Four Billion Years of Earth History," another in the Fermilab Lecture Series. Dr. Burke will also describe how our planet has evolved.

The lecture will be given in the Ramsey Auditorium on Friday, May 16, 1986, at 8:00 p.m. Admission is \$2.00, \$1.00 for senior citizens. Tickets are available at the Reception Desk in the Wilson Hall Atrium weekdays from 10:00 a.m. to noon, and 1:00 p.m. to 4:00 p.m. Phone reservations can be made at ext. 3353, and are held for a maximum of five days awaiting payment.

- Frank Cole

Advance-Ticket Program Started

Responding to assertions by Fermilab employees and users that Auditorium Committee-sponsored events are sold out before word has barely gotten around, the Auditorium Committee has established a special advance-ticket program designed to give Fermilab people an opportunity to obtain tickets before the "SOLD OUT" signs go up.

This program is especially timely in that the summer showcases "are among the most popular programs presented in the arts series." This summer's program includes outstanding folk, jazz, and ethnic music from artists such as Art Thieme, Franz Jackson's Jazz Entertainers, Jay Burkhart's Chicago Jazz Cradle, jazz flautist Stephen Kujala, classical flautist Carol Wincenc, and North American Indian flautist Carlos Nakai, as well as dramatic storytelling by Glenn Ohrlin and Jim May, and some of Chicago's finest dancers in the ever-popular Choreographer's Showcase.

Tickets for the events listed on the schedule below are now available at the Atrium Reception Desk between 10:00 a.m. and noon, and 1:00 p.m. and 4:00 p.m.

SUMMER SHOWCASE SCHEDULE 1986

An Evening of Storytelling

Saturday, June 21, 8:00 p.m.

Admission: \$6.00

Jazz Showcase

Saturday, August 21, 8:00 p.m.

Admission: \$6.00

Flute Showcase

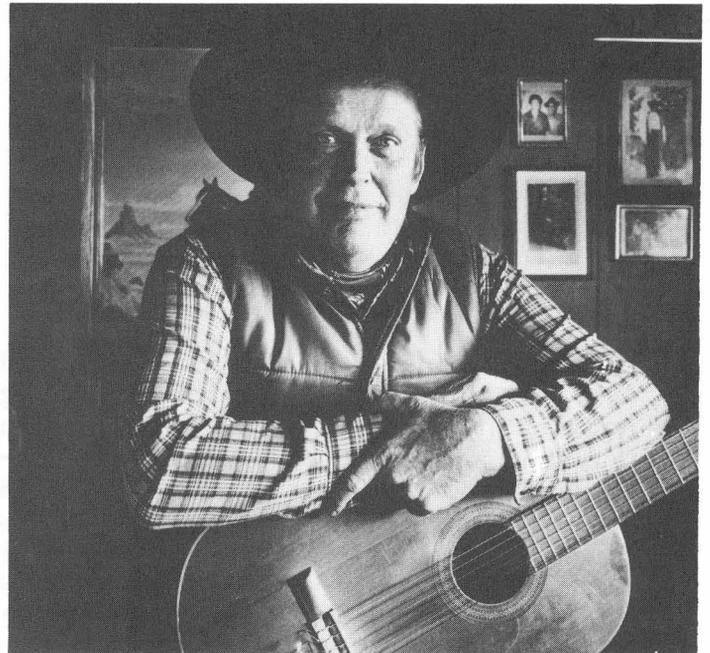
Saturday, August 9, 8:00 p.m.

Admission: \$7.00

Choreographer's Showcase

Saturday, September 27, 8:00 p.m.

Admission: \$6.00



Cheers! Glenn Ohrlin

Glenn Ohrlin, guitarist, storyteller, and 1985 National Heritage Award-winner, will be one of several storytellers appearing in Ramsey Auditorium on June 21 as part of "An Evening of Storytelling."

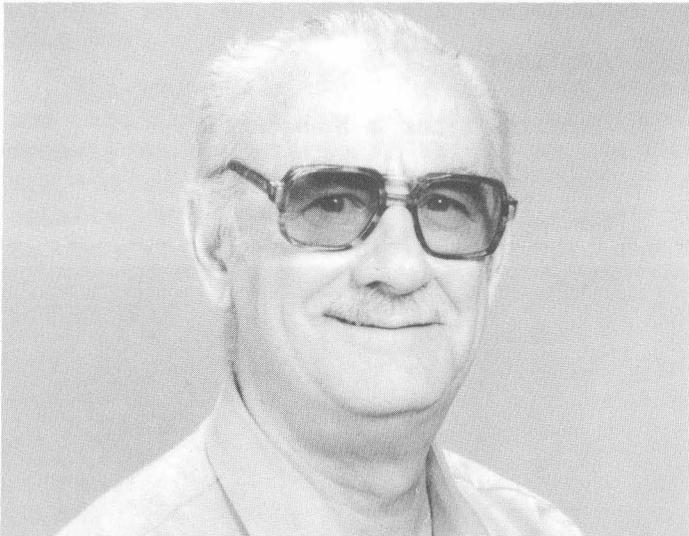


The Users Center will be closed to the public on Friday, May 2, 1986, to accommodate the Users Annual Social, which is hosted by the Universities Research Association.

Michelassi Retires From Lab

Gianmaria "Jim" Michelassi retired from Fermilab on April 30, 1986, after serving the Laboratory as a mechanical engineer for 18 years.

After military service during World War II, Jim received his Ph.D. in mechanical engineering from the University of Pisa in 1947. He then worked for the Piaggio Corporation designing helicopters and small vehicles until he emigrated to the U.S. in 1956.



Gianmaria "Jim" Michelassi

At Fermilab since 1968, Jim has worked in many areas in the Laboratory. During the original construction, he helped design and build magnets for the Booster and 200-MeV beam lines. As the experimental beam lines came into operation he worked in collimator and cooling system design for the Meson Laboratory. Working in the Cryogenics Group and then Technical Services, he took part in the superconducting retrofit of the Chicago Cyclotron Magnet in the Muon Laboratory.

In 1980 Jim joined the TeV I effort to construct the Tevatron Collider. There he played a major role in the cost optimization and design of the magnets for the Antiproton Source, and helped design the magnet measurement systems used in that effort. Following completion of that project, Jim has worked in the Safety Group since 1985.

"His colleagues at Fermilab wish to take this opportunity to thank him for his efforts and devotion, and to wish him and his family a busy and happy retirement," said Fred Mills, Jim's former supervisor. 



Mary Walker, (second from right) Assistant Secretary for Environmental Safety and Health for DOE, views the experimental areas from the 15th floor of Wilson Hall during a recent visit to Fermilab. Providing explanations are (l. to r.) Chris Quigg, Dick Lundy, and Phil Livdahl.

Swimming Season is Here

The Fermilab swimming pool will open for the 1986 season on Saturday, May 31, 1986. Lifeguards will be on duty on the weekends May 31 and June 1, and June 7 and 8. The pool will be open on a daily basis beginning June 9, and will continue through Labor Day, September 1, 1986. Lifeguards will be on duty 12:00 noon to 9:00 p.m. Monday thru Friday; 9:00 a.m. to 9:00 p.m. weekends and holidays. The pool is closed from 9:00 p.m. to 6:00 a.m. Adult swimming only 6:00 a.m. to 8:00 a.m.

Pool membership is open to Fermilab employees, visiting researchers, employees of DOE at Fermilab, Great Lakes Security personnel at Fermilab, families and accompanied paid guests. Memberships may be purchased from the Receptionist in the Atrium of Wilson Hall beginning May 5, 1986. They may also be purchased at the pool the weekend of May 31 and June 1 ONLY! Season rates are \$22 for a single person, \$38 for a couple, and \$55 for a family. Daily charge for swimming is \$2. This is the first rate increase since 1980.

Swimming instructions will be available for children and will be taught by a certified water-safety instructor. Registrations for lessons can be made with Helen McCulloch, ext. 3126, or with the lifeguards at the pool.

- Helen McCulloch

Benefits Q&A . . .

Benefit Questions & Answers:

Q: If I terminate my employment at the Laboratory and my wife is pregnant, will the pregnancy expenses be paid by the insurance plan?

A: If you are enrolled for family coverage in the Connecticut General Plan, the pregnancy expenses will be covered. If you are enrolled for family coverage in an HMO plan, the pregnancy expenses will not be covered. In order to cover the pregnancy expenses you can continue under the group HMO plan for six months provided that you pay the employer and employee portion of the family rate, or you can convert to an individual HMO family plan.

Q: I support my parents. Can I enroll them on Fermilab's medical plan?

A: You cannot enroll parents in Fermilab's medical plan. Your parents are not considered eligible dependents under the Connecticut General and Health Maintenance Organization plans. Eligible dependents under the plans are your lawful spouse, unmarried children less than 19 years old, unmarried children 19 years old but less than 23 years old enrolled in school as full-time students, and unmarried children 19 or more years old and incapable of self-sustaining employment by reason of mental or physical handicap. (You must provide proof that a dependent child is incapable, and Connecticut General or the HMO must give prior approval.)

Q: At the last open enrollment I joined an HMO. Is my family still covered under the Connecticut General Dental Plan?

A: You can join an HMO, and continue to have coverage under the Connecticut General Dental Plan. However, you must continue to pay the required contribution for family dental coverage. ❀

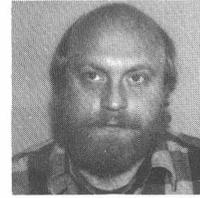
Stockroom Reminder . . .

The Fermilab stockrooms, located in the Wilson Hall Catacombs and the Site 38 Warehouse, will be closed for annual audited inventory during the week of May 19-23.

The Wilson Hall stockroom will be closed **May 19th and 20th.**

The Site 38 stockroom will be closed **May 21st through May 23rd.** ❀

*In Memoriam
Roger A. Books
1950-1986*



Roger Books came to Fermilab in February of 1981 as a technician in the RF Group. He was also instrumental in keeping Main Ring rf acceleration systems operational and doing developmental work for the Tevatron rf systems. In December of 1984, Roger became ill, and found it necessary to go on long term disability in June of 1985.

"Roger was a very reliable individual and put a personal interest in the projects he worked on. He shared a mutual respect with his fellow workers," said Bill Miller and Jim Ziober, Roger's supervisors. "All of the RF Group personnel deeply regret his passing. They have not only lost a fellow worker, but also a friend."

Roger is survived by his wife Kay, two sons, and a daughter.

... "McTague" cont'd from pg. 2

and Planetary Physics; and chairmanship of the National Synchrotron Light Source Department at Brookhaven National Laboratory. He is the author of over 80 experimental and theoretical papers in the fields of condensed matter physics and chemistry. ❀

Director's Review of Accelerator Status and Upgrade Program to be held in Curia II.

May 5, 1986, from 1:30 p.m. to 5:00 p.m.: "Coherent Instabilities and Impedance," (K. Ng, J. Reid, J. Crisp, P. Lucas, P. Martin, and D. Wildman).

May 10, 1986, from 9:00 a.m. to 12:30 p.m.: "Magnets, Field Quality, and Tracking - The Main Ring," (G. Fisk, A. Tollestrup, L. Michelotti, R. Gerig, N. Gelfand, and D. Edwards).

Film Society Presents

On Friday, May 9, 1986, at 8:00 p.m., the Fermilab International Film Society will present *Jules and Jim* (directed by Francois Truffaut) in Ramsey Auditorium.

"The Truffaut classic about a special *menage a trois*...charming, touching, and funny."

Tickets are \$2 for adults, and children 12 and under get in for 50¢. Tickets are available at the door.

A Message About Massages

What could be better after a grueling day at the office than a FREE MASSAGE?

On Thursday, May 8, 1986, in Curia II, from noon to 12:30 p.m., James Hackett, Director of the Chicago School of Massage Therapy (CSMT) will show a demonstration and presentation of some of the latest techniques in sports massages, stress reduction, acupressure, and trigger point therapy, all of which will be available to members of the Recreation Facility.

"There are many benefits to massage. Some of the most prevalent are improved circulation and enhanced body awareness," Hackett explained, "We can give full body Swedish massage, mini tune-ups, or we can work on specific body areas like head/neck/shoulders, back, legs, and feet."

The CSMT will be offering free 30-minute massages to members of the Recreation Facility during May. Beginning Monday, May 12, 1986, massages will be offered on Mondays from 6:00 p.m. to 10:00 p.m. and on Thursdays from 5:00 p.m. to 9:00 p.m. Sign-up sheets for the massage sessions will be provided at the demonstration; Recreation Facility memberships will also be available at this time. Future plans may include offering massages at a cost to members.

The CSMT graduates approximately 75 to 100 therapists per year. One of the graduation requirements is work outside of clinic hours, and the therapists working at the Recreation Facility will be students fulfilling those requirements.

Experience the exhilaration of a professional massage. For more information, contact Helen McCulloch, on ext. 3126. ❀

Rafting Vacancies Are Almost Gone

NALREC presents the First Fermilab Annual Rafting Trip from June 20 through June 22, 1986 at Popp's Resort in Caivitz, Wisconsin.

The trip includes the bus ride to and from Wisconsin, two days' lodging at the resort with two people to a room, two days of river rafting on the Peshtigo and the Wolf Rivers in four-man rubber rafts, a sunset boat cruise on Friday on the High Falls Flowage River, a two hour water show on the beach at the river's edge on Saturday afternoon, swimming, fishing, boating, hiking, and camp-fires. Enjoy breakfast, lunch, dinner, snacks, and refreshments at Rene's Supper Club, which is noted for their steak and lobster dinners.

The total cost of this fun-filled weekend is \$115, payable in full by May 28.

One day of vacation is required, and the 46 available spots are almost filled, so call your NALREC representative soon. For more information, and to reserve a seat for this wacky weekend, call Dominick on ext. 3187, Lucy on ext. 4623, Jesse on ext. 4305, or Joe on ext. 4181. ❀

NALREC Steak-Fry Sizzles

Follow the balloons to a NALREC steak fry on Friday, May 9, 1986, at the Village Barn from 5:15 p.m. until 10:00 p.m.

Along with the cookout, there will be a candystripe tent (located under the balloons) that will house strolling magicians, clowns, and a palm reader for your entertainment during dinner.

From 7:00 p.m. to 10:00 p.m. the band, "Croozin' the Loop," will provide dance music playing 50s and 60s rock & roll oldies. There will also be dance contests and prizes for the best couple in Jitterbug, Hula Hoop and Polka dancing contests.

The price for this evening of fun, including the steak dinner and all the trimmings is only \$3.50. ❀

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