

Procedures for Researchers



May 17, 2011

This document is intended to help researchers using Fermilab facilities do so easily and directly. The document contains information about procedures at the Laboratory and links to more details when appropriate.

The intent is that the information here is correct and up-to-date. If you have comments and/or corrections, we would appreciate your sending them in e-mail to PFX@fnal.gov.

<http://www.fnal.gov/directorate/PFX/PFX.pdf>

Fermi National Accelerator Laboratory
P.O. Box 500
Batavia, Illinois 60510
Phone: 630-840-3000
Fax: 630-840-4343

Operated by Fermi Research Alliance, LLC under contract with the United States Department of Energy.

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Procedures for Researchers (PFX)

Chapter 1 – Fermilab Research

Fermilab's mission is to advance the understanding of the fundamental nature of matter and energy by providing leadership and resources for qualified researchers to conduct basic research at the frontiers of high energy physics and related disciplines. Fermilab is operated for the U.S. Department of Energy (DOE) by the Fermi Research Alliance, LLC (FRA).

Collaborators working at Fermilab from more than a hundred universities and laboratories across the country and from dozens of foreign institutions carry out experiments at the forefront of elementary particle physics and particle astrophysics. A new experiment begins with a proposal from a group of researchers to the Laboratory Director. The Director considers experiment proposals with the help and advice of the Physics Advisory Committee, a panel of distinguished physicists mostly from outside institutions. For accepted proposals, the Laboratory provides some of the resources. These resources can include particle beams, advanced high-resolution detectors, computation and networking, and engineering and technical support.

An important channel for researchers' input to Fermilab is the Fermilab Users Organization. Members of the Fermilab Users Organization hold yearly elections for the Users Executive Committee (UEC), whose members meet periodically with the Director and Laboratory staff to maintain close contact with planning, programs and operations, and advise on candidates for membership on advisory committees.

A series of particle accelerators culminates in the Tevatron. The Main Injector, the replacement for the original Main Ring accelerator, injects protons and antiprotons into the Tevatron. The two accelerators, the Tevatron and the Main Injector, provide beam for experiments in two ways. In the fixed-target mode, protons from the Main Injector are accelerated to 120 GeV, then extracted and transported to the fixed-target experimental areas. In the second mode, the collider mode, the Tevatron accepts and accelerates protons and antiprotons to 1 TeV and brings the counter-rotating beams into collision. To exploit the resulting center-of-mass energy, two large collider detectors, CDF and DZero, operate at two sites around the Tevatron ring. With the Main Injector in operation, it is possible to operate simultaneously with 120 GeV fixed-target beams and collider experiments. Upstream of the Main Injector is a Booster accelerator ring, which supplies 8 GeV protons to the Main Injector and for fixed-target experiments.

Fermilab also contributes to its physics fields of interest by working with Laboratories around the world. The largest such effort is in partnership with CERN,

the European Laboratory for Particle Physics. Fermilab is the host laboratory for US CMS, a collaboration participating in the program of the Large Hadron Collider at CERN (LHC). The energy frontier will move from the Fermilab Tevatron to the CERN LHC once that machine begins producing physics results.

The People of Fermilab

Successful particle physics experiments need more than researchers and fast-moving particles. They take planning, consulting, financing, detectors, computing, engineering, construction, bookkeeping, communication, and consideration of safety and effects on the environment. The experiments use the skills and experience of physicists, engineers, technical specialists, administrators and the people who provide the services they need: purchasing, buildings, hiring, transportation, safety, information, meals, housing, child care, and recreation. The employees of Fermilab work in myriad capacities to create an outstanding laboratory for particle and astroparticle physics research. Each person who works at Fermilab brings a unique combination of skills, experience, and spirit to the job. Every researcher should recognize the human rights principles of Fermilab as the standard for the way we work together. See

<http://www.fnal.gov/pub/news03/humanrightspolicy.html>

The Laboratory and the Environment

Fermilab's 6,800 acres contain the Tevatron, Main Injector, detectors and 350 buildings. The buildings contain laboratories, shops, assembly bays, administrative offices, a medical office, a cafeteria, warehouses, recreational facilities, and housing for researchers.

Wilson Hall ("The High Rise") reaches into the sky above 6,800 acres of Illinois that hold--besides the country's busiest high-energy physics lab--lakes and ponds, upland forests, fields of corn and soybeans, oak savannas and reconstructed native tall grass prairie.

At Fermilab, we have a strong commitment to stewardship of the land. From a 10-acre beginning in 1975, in partnership with the Nature Conservancy and hundreds of volunteers, we have reconstructed more than 1000 acres of our site to native grassland that approximates the pre-settlement condition, creating one of the largest tall grass prairies in the world. Wild ducks and geese far outnumber physicists at Fermilab; and, the Laboratory maintains a large herd of American bison adjacent to the Industrial Area.

Fermilab researchers need to recognize and help implement the Environmental Policy of DOE, with its goals for the entire Fermilab community.

How We're Organized

Operating under a Directorate, Fermilab has four Divisions, three Centers, and five Sections.

The Fermilab Directorate oversees all these organizational units and directly supervises program planning, the budget, internal audit, technology transfer, the Legal Office,

<http://www.fnal.gov/directorate/Legal/index.shtml>

the Office of Quality and Best Practices ,

<http://www.fnal.gov/directorate/OQBP/index.htm>

the Office of Project Management Oversight,

<http://www.fnal.gov/directorate/OPMO/OPMOhome.htm>

and the Office of Communication

<http://www.fnal.gov/pub/about/communication/index.html>

The Accelerator Division (AD) operates and upgrades Fermilab accelerators and beamlines, providing particle beams for both fixed-target and colliding-beam experiments.

The Particle Physics Division (PPD) takes responsibility for mounting high-energy and other particle physics experiments and supports Fermilab staff scientists in their experimental and theoretical physics research.

The Computing Division (CD) operates and maintains the Laboratory's computers, computer networks, and computing services; and provides much of the hardware and software used for data acquisition, offline data analysis, management, and general computing at Fermilab.

The Technical Division (TD) conducts research and development on materials and processes and designs, builds, and tests technical components for particle accelerators and large scale particle detectors. Magnets and radiofrequency cavities, both normal- and super-conducting, are the primary focus of the Division's personnel. The TD manages the machine shops and has substantial expertise in mechanical, cryogenic, and radiofrequency engineering.

The Accelerator Physics Center (APC) provides focus for accelerator R&D efforts at Fermilab, including research on the existing accelerator systems at the Laboratory and elsewhere, and research on future accelerator systems.

The CMS Center (CMSC) provides focus on CMS efforts for Fermilab and other researchers. The CMSC includes the LHC Physics Center and an LHC/CMS Remote Operations Center, as well as the institutional home of US CMS.

The Fermilab Center for Particle Astrophysics (FCPA) provides focus for particle astrophysics efforts at Fermilab, both for experiments conducted on site, and those performed elsewhere.

The Business Services Section (BSS) manages mail, housing, food services, procurement, stockrooms, warehousing, shipping, receiving, vehicles and taxis, publications, the library, archives, official records (Records Management), telecommunications, the Travel Office, the Fire Department, and site security, including the Key & ID Office and the Communications Center ("ComCenter", that has the main telephone line into Fermilab).

The Facilities Engineering Services Section (FESS) coordinates construction and facility operations and maintenance, as well as civil engineering, architectural design and major construction inspection.

The Workforce Development and Resources Section (WDRS) administers Fermilab's Human Resources function, the Benefits Office (which includes DayCare, summer Daycamp, and the Recreation Office); the International Services Office (which comprises both the Visa Office and User Office), the Equal Opportunity Office, and the Education Office.

The Environment, Safety and Health Section (ES&H) monitors Fermilab's environment, safety and health programs, manages the Medical Office, conducts independent reviews and serves as the ES&H reporting channel to DOE.

The Finance Section (FS) manages payroll, accounting, and budget.

Since organizational changes are not unusual at Fermilab, we suggest that if you need more details about these organizations, ask at the Users' Office, the Division, Center, or Section Office, or check the Internet; for example,

http://www.fnal.gov/faw/fermilab_at_work.html

Fermilab Milestones 1965-2009

June 21, 1965:

Under contract from the U.S. Atomic Energy Commission (AEC), Universities Research Associates, Inc. (URA) incorporates to build and operate a new 200 GeV accelerator as a “truly national laboratory”.

December 16, 1966:

After considering more than 200 proposals, the U.S. Atomic Energy Commission announces the selection of Weston, Illinois, 30 miles west of Chicago, as the site for the new laboratory.

March 1, 1967:

URA appoints Robert R. Wilson as first Laboratory Director.

June 15, 1967:

Laboratory operations begin in Oak Brook Executive Plaza.

November 21, 1967:

President Lyndon Johnson signs bill to fund construction of the National Accelerator Laboratory (NAL).

September 24, 1968:

Laboratory operations relocate to Weston site.

December 1, 1968:

Groundbreaking for the Linac, the first structural component of the 200 GeV accelerator.

March 1, 1972:

First 200 GeV proton beam circulates around Main Ring.

May 11, 1974:

Dedication of 200 GeV accelerator. NAL renamed Fermi National Accelerator Laboratory (Fermilab).

September 7, 1976:

First cancer patient receives neutron therapy treatment using Fermilab's Linac.

June 30, 1977:

Fermilab E-288 announces discovery of the bottom quark.

June 1, 1979:

Leon M. Lederman becomes Fermilab's second Director.

July 3, 1983:

Tevatron accelerates protons to world record of 512 GeV.

August 16, 1983:

Groundbreaking for Antiproton Source.

October 1, 1983:

Start of the Tevatron 400 GeV fixed-target program with five fixed-target experiments.

February 16, 1984:

Acceleration of Tevatron beam to 800 GeV.

October 13, 1985:

First observation of proton-antiproton collisions by CDF collider detector at 1.6 TeV center-of-mass energy.

December 2, 1988:

Dedication of the Feynman Computing Center.

June 7, 1989:

Dedication of Fermilab as DOE National Environmental Research Park (NERP).

July 1, 1989:

John Peoples, Jr. becomes Fermilab's third Director.

October 18, 1989:

Helen Edwards, Dick Lundy, Rich Orr and Alvin Tollestrup receive the National Medal of Technology for their work in building the Tevatron.

April 14, 1992:

First colliding-beams with both CDF and DZero detectors taking data. Start of Collider Run I.

September 25, 1992:

Dedication of the Lederman Science Education Center.

March 3, 1995:

CDF and DZero collaborations announce discovery of top quark.

February 20, 1996:

End of Collider Run I. The Tevatron delivered 180 inverse picobarns to each of CDF and DZero.

March, 1998:

Discovery of the B_c Meson.

June 8, 1998:

Sloan Digital Sky Survey achieves "first light."

June 1, 1999:

Dedication of the Main Injector accelerator.

July 1, 1999:

Michael S. Witherell becomes Fermilab's fourth Director.

January, 2000:

End of the Tevatron fixed-target program (1983-2000), which provided beam to 43 experiments over 17 years.

May 31, 2000:

Groundbreaking for the NuMI neutrino beam and detectors project at Fermilab.

July 20, 2000:

The DONuT experiment reports first evidence for the direct observation of the tau neutrino.

March 1, 2001:

Start of Tevatron Collider Run II.

March 4, 2005:

Launch of Fermilab's first neutrino beam to Minnesota, using protons from the Main Injector (NuMI).

July 1, 2005:

Piermaria J. Oddone becomes Fermilab's fifth Director.

July 9, 2005:

First observation of electron cooling of antiprotons in the Recycler Ring.

September 25, 2006:

Discovery of B_s matter-antimatter oscillations: 3 trillion times per second.

January 1, 2007:

Fermi Research Alliance, LLC (URA and University of Chicago) begins management and operations of Fermilab.

November 8, 2007:

Pierre Auger Observatory discovers non-uniform distribution of ultra-high energy cosmic rays.

August, 2008:

CDF and DZero report first direct exclusion of a standard model Higgs boson (at a mass of $170 \text{ GeV}/c^2$).

April 13-20, 2009:

The Tevatron delivers 73 inverse picobarns in a single week.

May 1, 2009:

Groundbreaking for NOvA experiment in Minnesota.

Chapter 2 – How to Get Started

A Quick Start Guide for Non-Employee Users

Before You Arrive

1. If staying at Fermilab housing and arriving during non-business hours, confirm how you will obtain access to the Fermilab site – See “Site Security and Access Control”:

<http://www.fnal.gov/pub/about/communication/currentstatus.html>

Confirm how you will get from O’Hare or Midway Airport to Fermilab – See:

<http://www.fnal.gov/pub/visiting/transportation/index.html>

2. If you will be arriving during non-work hours, confirm what you will need to show the security guards at the gates to Fermilab, to be able to come on-site.
3. Confirm how you will travel from one point to another point within the Fermilab site.
4. Confirm with your Fermilab contact person or experiment spokesperson where on-site you will be working, and if there is anything else you must do before you arrive.
5. If you are sponsored by Fermilab for a J-1 visa, schedule an orientation appointment with the Visa Office (visaoffice@fnal.gov) for your first day onsite.
6. Arrange immediate (short-term) housing - See “Living onsite” and “Living OffSite” in “You and Your Family – Life at Fermilab”.
7. Arrange to ship your household goods to Fermilab. Before making a shipment to Fermilab, consult the Traffic Department (x-3470) for specific shipping information and instructions.
8. Confirm you have everything in place to enable you to obtain a Fermilab Visitor ID Badge upon arrival at Fermilab. See “Applying for a Fermilab Visitor ID Badge” or see:

http://wdrs.fnal.gov/users/fermi_badges.html

9. Download and complete the Visitor ID Badge Application form at:

<http://wdrs.fnal.gov/users/VisitorIDApp.pdf>

10. If you are a part of the CDF or DZero experiments, register with the experiments.

- a. For CDF, go to:

<http://www-cdf.fnal.gov/>

- b. For DZero, go to:

<http://www-d0.fnal.gov/>

On Your First Day

1. Go to the Users' Office, Wilson Hall First Floor, West. Badge authorization should take roughly 5 minutes - if you have already completed the online training and either obtained the signature of your experiment spokesperson or already have computing privileges, and have included your ID number on the application.
2. Go to Key & ID Office, on the Ground Floor of Wilson Hall, next to the Communications Center, to have your photograph taken and obtain your ID Badge.
3. If you are a J-1 visa holder, attend your orientation meeting with the Visa Office (next to the Users' Office).
4. Report to your place of work. See:

<http://www.fnal.gov/pub/visiting/map/site.html>

for maps of Fermilab. See the "Survival List for Researchers" chapter of this document for the number and hours of the onsite taxi.

A Quick-Start Guide for Employees

Before you Arrive

1. Confirm how you will get from O'Hare or Midway Airport to Fermilab. See:

<http://www.fnal.gov/pub/visiting/transportation/index.html>

2. Check Fermilab maps to see where you are going on site. See:

<http://www.fnal.gov/pub/visiting/map/site.html>

3. Confirm how you will travel from one point to another point within the Fermilab site. See the "Survival List for Researchers" for the number and hours of the onsite taxi.
4. Confirm with your recruiter when you will attend New Employee Orientation.
5. If being sponsored by Fermilab for a work-authorizing visa with which to begin your employment,
 - a. Confirm the date on which you will take New Employee Orientation with the Visa Office (visaoffice@fnal.gov).
 - b. If you are being sponsored by Fermilab for a J-1 visa, schedule an orientation appointment with the Visa Office (visaoffice@fnal.gov) for your first day onsite.
6. If you are a part of the CDF or DZero experiments, register with the experiments.
 - a. For CDF, go to <http://www-cdf.fnal.gov>
 - b. For DZero, go to <http://www-d0.fnal.gov>

On Your First Day

1. Go to the New Employee Orientation, arriving no later than 8:30 am, with all required documentation (as listed in your offer letter).
2. If you are a J-1 visa holder, attend your orientation meeting with the Visa Office (next to the Users' Office).
3. Go to Key & ID Office, on the Ground Floor of Wilson Hall, next to the Communications Center, to have your photograph taken and obtain your ID Badge

Getting on Site - In Detail

Getting on Site a First Time and Thereafter

As a researcher at Fermilab, you must know how to get on the site, how to obtain a Visitor ID Number and Visitor ID Badge, obtain computing privileges, and work with your host Division. If you are a spokesperson or the physicist in charge for an experiment, you have additional responsibilities of which you must be aware.

Site Security and Access Control

General Access - Fermilab permits access to the site through controlled access points. Access and entry to Fermilab property is contingent upon producing identification. Everyone on the Fermilab site must produce one of the following documents if requested by a security official: a government-issued photo identification card, a Fermilab ID Badge, or a Fermilab-issued visitor pass with a photo identification card.

The First Time You Arrive at Fermilab:

During Regular Business Hours - The first time you arrive at Fermilab, you may enter the Fermilab site (if coming by car) through the East or West gate. You must stop at the Guard Shack on the road at the entrance to tell the guard where on site you plan to go and why, and to present a form of identification, as listed above. If walking or on a bicycle, you may enter the Site through any of the controlled entrances without presenting identification.

During Non-Business Hours - If the first time you arrive is during non-business hours, such as late at night or on a weekend, then the procedure is slightly different. Once you present your identification documents (as outlined above) to the guard, you will be asked for the reason you need to enter the Site.

- (1) If you must enter to begin a shift at DZero or CDF, the guard calls the ComCenter, and an operator from the ComCenter calls the appropriate Control Room to have the Crew Chief verify that you are expected. Once your shift is confirmed, then you are admitted to Fermilab.
- (2) If you must enter because you are staying at the Fermilab Village, the guard calls the ComCenter, and an operator from the ComCenter confirms that you are staying in the Village.
- (3) If you need to enter a Property Protection Area (PPA), you must go to the Communications Center in Wilson Hall for a visitor pass and if necessary, an access card. Make sure that you ask your limo to wait for you while you get the Visitor Pass, to ensure you have

transportation to your next destination (the Village or your experiment).

Site Security - Fermilab employees and users must have a valid Fermilab ID Badge. During your first visit, and preferably before your first shift, you must apply for a Fermilab ID Badge at the Users' Office.

The ID Badge also is used to gain access to the Fermilab site during non-business hours. As well, certain workspaces are designated "Property Protection Areas." Fermilab ID badges are required for entry into these areas, and people working or visiting in these areas must wear a properly displayed Fermilab ID badge or visitors' pass at all times. Persons on guided tours of these spaces receive instructions from their guide(s).

These access controls will remain in effect at the current security level of "SECON 3 Modified." If the U.S. Department of Energy (DOE) directs Fermilab to raise the security level due to an imminent threat, access procedures might change to requiring site-wide wearing of identification badges and other security measures. If the security level is lowered, Fermilab may also change its procedures.

Users with security or access control questions can call the Security Dispatcher at x-3414, 24 hours a day, 7 days a week. In any emergency, call x-3131 from an 840 exchange or by cell phone call 630-840-3131.

Applying for a Fermilab Visitor ID Badge

Scientists and other researchers who will be visiting for business purposes, working, engaging in research, or accessing Property Protection Areas (PPAs) must obtain Fermilab ID Badges from the Users' Office. The Users' Office website, at <http://wdrs.fnal.gov/users/>, lists hours of operation, a detailed description of how to apply for a Fermilab ID Badge, forms which can be filled on-line, and other helpful information.

To obtain a Fermilab ID Badge:

1. You need a Fermilab ID Number.
 - If you do *not* have computing privileges at Fermilab, and you will need them for your work, go to the Computing Division's online application portal at

http://computing.fnal.gov/xms/Services/Getting_Started/Introduction_to_Computing_at_Fermilab

Follow the instructions to obtain computing privileges. The process of obtaining computing privileges also issues to you a Fermilab Visitor ID number, which you will need for almost everything else you do at Fermilab.

- If you already have computing privileges at Fermilab, then you already have your Visitor ID number.

2. You need medical insurance.

Go to http://wdrs.fnal.gov/users/med_insurance.html for an explanation of the type of insurance that is required and the documents you need to prove you have satisfied this.

3. You need to pass certain Safety and Training requirements.

Go to http://wdrs.fnal.gov/users/user_safety.html to complete your mandatory New Employee/User Orientation Training.

4. You need to apply for an ID badge.

Go to http://wdrs.fnal.gov/users/fermi_badges.html and click on the link for the Application for Fermilab ID Badge. Complete the application. Your experiment spokesperson does not need to sign IF you have computing privileges at this point.

5. Go to the Users' Office, on the first floor of Wilson Hall, West side, North, (WH- 1 NW), during business hours (posted on their website). Hand in your completed ID Badge application form and proof of medical insurance. (Non-U.S. citizens also must show their passports and other relevant immigration paperwork.) They will confirm you have passed your training, review your medical insurance and other supporting documents, and process your Badge.
6. All foreign nationals who will have a Fermilab ID must have a designated, certified host. Hosts help the Users' Office in complying with DOE requirements for documenting foreign visits and assignments. Hosts must be certified, and receive annual training to maintain their certification. The hosting program has been established to satisfy DOE contract requirements. The program is under the supervision of the Chief Operating Officer of the Laboratory.
7. Ask the Users' Office if you have ANY questions about Fermilab or where you need to go next. We are *your* resource at Fermilab.

If you are visiting only for a few days and will not visit any PPA, but rather will remain in public areas such as Wilson Hall, you need not apply for a Fermilab ID Badge.

Once the Users' Office processes your paperwork, it issues a form to you that you must take to the Key & ID office on the Ground Floor of Wilson Hall. The Key & ID Office will take your photograph and issue your plastic ID Badge. The validity of the ID Badge depends on your medical insurance for the duration of your need to be at Fermilab, and, if you are a non-U.S. citizen, the duration of your visa status in the U.S., as listed at

http://wdrs.fnal.gov/users/fermi_badges.html#badges

Some large experiments, such as CDF (<http://www-cdf.fnal.gov/>) and DZero (<http://www-d0.fnal.gov/>), also require experimenters to register with the experiment.

Tours, Visitors and Minors in Experimental and Operating Areas

The parts of the Laboratory generally open to the public include the Lederman Science Center, the auditorium, and parts of Wilson Hall (Ground Floor, Atrium). Elsewhere, these potential health and safety hazards may exist: high voltages, oxygen deficient atmospheres, explosive gases, toxic chemicals, heavy rigging, complex machinery, lasers, and radiation. Also, delicate and/or carefully aligned apparatus necessary for the operation of the experimental program is vulnerable to damage. For these reasons, researchers must follow the following rules governing the admission of visitors or untrained personnel (i.e., a tour) to experimental areas:

1. Tours must be escorted by a registered researcher or Fermilab employee, however all escorts into any PPA must be a Fermilab employee.
2. Tours to some areas and/or by larger groups may need special approval by the appropriate Division/Section Head or Senior Safety Officer (SSO). Check in advance for local provisions of sites to be visited.
3. Tours into any area posted for radiological purposes (e.g., Radioactive Materials Area, Radiation Area) must be approved by the appropriate Division/Section Head or Radiation Safety Officer (RSO).
4. Tours including visitors less than 18 years old into any Radiation Area or High Radiation Area are strongly discouraged and must also be approved by the Laboratory Senior Radiation Safety Officer (SRSO). Additional requirements for tours in these areas are given in Fermilab Radiological Control Manual.

5. Tours of experimental halls and pits for experiments that are in operation or standby mode must have the approval of the spokesperson, physicist in charge, or liaison physicist in addition to the above requirements.
6. Tours of non-experimental areas or experiment halls which are idle or decommissioned may be arranged through the Building Manager.
7. Everyone under 18 years old, including children of employees, visiting scientists and DOE employees must be continuously supervised by an adult while visiting. Children may be permitted in office areas if the offices and the path from public areas to the offices are not restricted.

Every user or Fermilab employee who invites a visitor onsite is responsible for knowing and following Fermilab ES&H practices and procedures for the visit. For more information see:

http://www-esh.fnal.gov/pls/default/esh_home_page.page?this_page=800

Chapter 3 – Working Off-Site on Fermilab-Supported Research

Many researchers, who are receiving direct or indirect support from Fermilab, perform a fraction of their research off the Fermilab site. Such researchers have responsibility beyond that of researchers physically at Fermilab. In particular, they are responsible to follow the procedures of both the off-site institution and of Fermilab. For example, they must understand and obtain the relevant training, where required, of both Fermilab and the off-site host institution. At the same time, Fermilab endeavors to assist approved off-site research efforts in a number of ways. This Chapter describes the special features and procedures for off-site research. Among the possible special issues for off-site research are:

- Travel and relocation supports
- Foreign travel considerations
- Site access and site security
- Safety procedures
- Medical assistance
- Living expense differential allowance
- Off-site administrative support

Many of the procedures for researchers working off-site are site-specific. Obviously, the working environment, safety considerations, and other factors are different for working, for example, at the CERN laboratory and inside the Soudan mine. The list of sites where Fermilab-supported workers do research evolves with time, so we cannot hope to provide a detailed list of procedures for each site. We can, however, describe some general considerations common to all sites, and in greater detail, describe procedures for certain sites as examples.

Sites may be classified by the expected differences in their procedures for Fermilab-supported researchers. One may consider DOE vs non-DOE facilities, or US vs international facilities. Based on experience accumulated over many years we chose to consider classifying sites into accelerator and non-accelerator facilities. These two classes are:

- Accelerator facilities – like CERN, KEK, and DESY. These are established laboratories with facilities similar to Fermilab.
- Non-accelerator sites – like Pierre Auger, CDMS, DES, NOvA, etc. These sites, which typically accommodate one experiment, do not have a lab-like support system.

As of this writing (October, 2009), sites currently with significant presence by Fermilab-supported researchers, either currently or anticipated, include:

- CERN / LHC
 - CMS
 - US-LHC Accelerator Research Program (LARP)
- Rutherford-Appleton Laboratory
 - MICE
- Long Baseline Neutrino Experiments / DUSEL
- Soudan Underground Laboratory
 - MINOS
 - CDMS II
- NOvA
- Pierre Auger Observatory
- Apache Point Observatory
 - Sloan Digital Sky Survey (SDSS)
- Cerro-Tololo Inter-American Observatory (CTIO)
 - DECam / Dark Energy Survey

This list is not meant to be complete, but it does give a range of examples of the different types of sites discussed in this chapter. The Fermilab web site maintains a page of current experiments and projects here:

<http://www.fnal.gov/faw/experimentsprojects/index.html>

Note that this list is broken out into type of project (i.e., accelerator, collider, fixed-target) rather than on-site vs. off-site projects. In general, the links on this page will connect you to project-specific information, including details if appropriate of useful off-site information. Also note that many projects maintain such information in non-public (password-protected) areas of their web site. Questions regarding access to protected pages should be directed to project/experiment contacts. The list of contacts is maintained here:

http://www.fnal.gov/directorate/program_planning/Current_Experiment_Spokes_people.pdf

In the following sections we will discuss three examples. For the accelerator-based facility we chose the CMS experiment which is part of the CERN laboratory in Geneva, Switzerland, whereas for the non-accelerator site we picked the Pierre Auger Observatory which resides in Mendoza Province, Argentina, and the Cryogenic Dark Matter Search at Soudan, Minnesota (and later to be at SNOLAB, Canada).

The CMS Experiment at CERN

Compact Muon Solenoid (CMS) is a high-energy physics experiment, which is located in Cessy, France, as part of the Large Hadron Collider (LHC) experimental program at the CERN laboratory in Geneva, Switzerland.

Fermilab hosts the Project Office for US-CMS. There is a lot of very useful information on the web at:

<http://uscms.org/>

In particular, there is information in the following link

http://uscms.org/uscms_at_work/

which is relevant for people travelling to CERN or staying there for longer periods. Among the topics covered in these pages there are:

- Safety at CERN and CMS:
<http://indico.cern.ch/getFile.py/access?contribId=45&sessionId=11&resId=0&materialId=slides&confId=28775>
and
http://uscms.org/pdfs/Safety_at_CERN.pdf
- Registering at CERN:
http://uscms.org/uscms_at_work/working_cern/registration.shtml
- Relocating to CERN:
http://uscms.org/uscms_at_work/working_cern/relocation/index.shtml
- CERN IT Services and Projects:
<http://it-div.web.cern.ch/it-div/>
- Life in Geneva:
http://uscms.org/uscms_at_work/working_cern/life_in_geneva.shtml
- Information relevant to Short-Term (<3 months) stay, e.g. Visa, Health Insurance, USCMS apartments, CERN rental cars, French lessons, etc.:
http://uscms.org/uscms_at_work/working_cern/relocation/visa_short_term.shtml
- Information relevant to Long-Term stay, especially concerning French and Swiss working Visa:
http://uscms.org/uscms_at_work/working_cern/relocation/visa_long_term.shtml

CERN hosts a branch of the Project Office for US-CMS. This branch prepared a very useful TWiki page dedicated to people coming to and living at CERN. It is available at:

<https://twiki.cern.ch/twiki/bin/view/Main/USCMSProjectOfficeCERN>

Pierre Auger Observatory

Auger is an international collaboration dedicated to the study of ultra-high-energy cosmic rays. Currently, Auger occupies a southern site in Mendoza Province, Argentina, with a main campus in the city of Malargüe. At the time of this writing, a northern site in southeastern Colorado is in the planning stages.

Fermilab hosts the Project Office for Auger. Fermilab personnel who wish to visit the Argentine site should coordinate their plans through the Project Office, located at 37 Shabbona in the Fermilab village. The Project Secretary should be contacted for specific guidance. Also helpful is the Auger administrative website:

<http://www.auger.org/admin>

For US citizens, travel to Argentina for durations up to 90 days does not require a visa, only a valid passport. Foreign nationals should check with the Fermilab travel office and/or their consulate for travel requirements. Foreign nationals should also check on requirements for re-entry into the US.

The Auger Observatory maintains a project office in Malargüe which can provide assistance with travel, lodging, and administrative issues. The administrative website is a valuable resource for information concerning visits to the site:

<http://www.auger.org.ar/index2.php>

This web page also provides a link for registering your visit to the Argentine site. All visitors are urged to do so.

All researchers traveling to the Argentine site must have both workers compensation (work-related) insurance, and adequate private (non work-related) health insurance. Details on this topic and on the availability of nearby medical facilities can be found here:

<http://www.auger.org.ar/medicalrequirements.shtml>

The Auger Central Campus includes an office building, which includes a visitor's center, computing facilities, limited office space, and meeting areas; and an assembly building. Researchers are expected to comply with the regulations contained in the Site Safety Plan. Electronic access to this plan and related documents are found here:

http://www.auger.org.ar/safety/safety_index.shtml

The Surface Detectors and Fluorescence Detector sites are spread over an area of 3,000 square kilometers. Much of this area is rural, remote, and privately owned. Access to the detectors in the field must be in accordance with special safety rules contained in the Field Access Policy:

<http://www.auger.org.ar/fapolicy.shtml>

Internet access is available at the Auger Central Campus site. For instructions on configuring your laptop for access and guidance regarding computer security, email, and printing, please consult this web page:

<http://www.auger.org.ar/computing.shtml#AccessingInternet>

Once at the site, most questions regarding your visit can be answered by first contacting the Central Campus office. Contact information is found here:

<http://www.auger.org.ar/sitephones.shtml>

Cryogenic Dark Matter Search (CDMS)

CDMS is an international collaboration dedicated to the direct detection of dark matter in the form of Weakly Interacting Massive Particles (WIMPs). Currently, CDMS is housed in the Soudan Underground Laboratory, located in northern Minnesota in an old iron mine ½ mile underground. The next phase of CDMS is planned for SNOLAB, located in a deeper (1.5 mile), and active, mine near Sudbury, Ontario, Canada. A description of the CDMS experiment can be found at:

<http://ppd.fnal.gov/experiments/cdms/>

Fermilab provides project management for CDMS and all of the operating funding for the Soudan Laboratory. A leased house is available, as space allows, for physicists taking shifts, and other visitors from Fermilab. Travel to Soudan can be either by car (about a 9-hour drive from Fermilab) or via plane to Minneapolis and rental car from there (about 3.5-hour drive). Access to the underground laboratory is only possible with permission from the Minnesota Department of Natural Resources and laboratory staff. Normal working hours are 7:30am-5:30pm M-F, and cage trips underground are only regularly available at those times.

Safety in the underground laboratories is strictly supervised by the laboratory staffs and monitored by Fermilab inspections as well. Visitors will be required to undergo a safety briefing at their first visit, and people working on the experiments must take a more extensive safety training.

You can learn more about the Soudan Underground Laboratory and the Soudan Mine State Park by visiting the following links:

<http://www.soudan.umn.edu/>
http://www.dnr.state.mn.us/state_parks/soudan_underground_mine/index.html

Information about SNOLAB is available at:

<http://www.snolab.ca/>

The best way to travel to SNOLAB is to fly from Chicago to Toronto and then take a commuter plane (2-3 flights/day) to Sudbury. A rental car is needed in the Sudbury area, since SNOLAB is about 20 minutes drive from town. Visitors are welcome, but arrangements must be made with laboratory staff ahead of time. The mine is controlled by a commercial mining company (Inco-Vale) and access is available only by permission.

Chapter 4 – Researchers Survival List

Airline Tickets - Travel Office, Wilson Hall 4-SE, x-3398, e-mail: travel@FNAL.gov

Arts & Lecture Series Tickets - x2787:

<http://www.fnal.gov/culture/NewArts/index.shtml>

Cafeteria - Wilson Hall - 1 South. The cafeteria on the first floor of Wilson Hall serves breakfast, lunch and snacks, Monday through Friday, and breakfast and lunch on Saturday. There is usually no service on Sundays and holidays. Menus and hours:

<http://bss.fnal.gov/cafe/index.html>

Car Rental - Users' Office, Wilson Hall - 1W, x3111.

Cashier - Wilson Hall - 4E (just outside East elevator), x-5808, Tues.-Fri., 12:30-4:15 p.m. Personal checks to \$200 may be cashed with a Fermilab ID.

CERN Courier - Sign up for mailing list in Users' Office or Office of Communication.

Chez Leon Dining - Users Center, Wednesday lunch 11:30 - 1:00, every other Thursday dinner 7:00 p.m. By reservation only (x3524). Menus listed:

<http://fnalpubs.fnal.gov/chezleon/>

Computer Accounts - Details and procedures for requesting computer accounts may be obtained by going to

http://computing.fnal.gov/xms/Services/Getting_Started/Introduction_to_Computing_at_Fermilab

Copying Duplicating - Wilson Hall Ground Floor, or Library, Wilson Hall - 3 South.

Cultural Activities - Program announcements. Atrium Reception Desk, Wilson Hall - 1 North, x-3353:

<http://www.fnal.gov/pub/events/index.html>

Day Care - 28 Shabbona, for information x3762.

Discount Tickets (Recreation) x5427:

<http://wdrs.fnal.gov/recreation/convenience.html>

E-Mail Addresses - To find telephone numbers or email addresses:

<http://www-tele.fnal.gov/cgi-bin/telephone.script>

EMERGENCY - Call 3131. Fire, Ambulance, Security. Stay on line to answer any questions.

Environment, Safety and Health Manual - ES&H Section, Wilson Hall - 7 East:

<http://www-esh.fnal.gov>

Fax Communications Center - Wilson Hall - Ground Floor, 1-630-840-4343. Check Fermilab Phone Book for other Fax numbers.

Fermilab Today - Electronic newsletter published Monday through Friday. Office of Communication, Wilson Hall - 1 East, x-3351:

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

FIRE - call x-3131. Stay on line to answer questions.

Gym Membership - Includes pool and gym memberships, leagues, clubs, etc. Recreation Office, Wilson Hall - 15 West, x2548 or x5427:

<http://wdrs.fnal.gov/recreation/facility.html>

History and Archives:

<http://history.fnal.gov/>

Housing Information - Aspen East in Village, x-3777, e-mail: housing@fnal.gov :

<http://bss.fnal.gov/accommodations/index.html>

Key Requests - Key requests must go through the appropriate Division or Section Office. Key and ID Office, Wilson Hall Ground Floor, x-4506.

Library - Wilson Hall - 3 South, x-3401, e-mail: library@fnal.gov:

<http://bss.fnal.gov/library/index.html>

Lost and Found - Communications Center, Wilson Hall - Ground Floor, x-3000.

Mailing Lists - Users' Office, Wilson Hall - 1 West, x-3111.

Maps - Users' Office, Wilson Hall - 1 West, x-3111.

Medical Clinic - Wilson Hall - Ground Floor West, x-3232.

Medical Emergency - Call x-3131. Stay on line to answer questions.

Notary Public - Argonne Credit Union, Wilson Hall - Ground Floor North, x-3293.

Pager (On Site) - Dial 72, wait for tone, dial pager number, wait for 3 beeps, give message.

Post Cards - Fermilab post cards, books, and posters are available at the Office of Communication, Wilson Hall - 1 North East, x-3351.

Personnel Policy Guide:

<http://wdrs.fnal.gov/policies/index.html>

PREP Equipment Loans - prep@fnal.gov

<http://cdorg.fnal.gov/ese/ESEPREP.html>

Radiological Control Manual - ES&H Section, Wilson Hall -7 East:

http://www-esh.fnal.gov/pls/default/esh_home_page.page?this_page=900

Recreation Membership - Recreation includes pool and gym memberships, leagues, clubs, etc. Recreation Office, Wilson Hall - 15 West, x-2548 or x-5427:

<http://wdrs.fnal.gov/recreation/facility.html>

Remote Computing Access:

<http://computing.fnal.gov/vpn/>

Residence ID - For identification of users' family members. Housing Office, Aspen East, x-3777.

Service Desk - (Fermilab IT Service Desk), x-2345:

<http://servicedesk.fnal.gov>

Social Security Applications:

<http://www.ssa.gov/>

Stockrooms - Site 38, Warehouse #1, x-3825, Mon.-Fri., 8:00 a.m.-11:45 a.m., and 12:30-4:30 p.m.

Taxi - Call HACK (x-4225), 7:30 a.m.-4:30 p.m. weekdays, on-site transportation only.

Technical Publications - Wilson Hall - 3 South West, x-5693, email: techpubs@fnal.gov

Telephone Numbers - Telephone numbers or email addresses,

<http://www-tele.fnal.gov/cgi-bin/telephone.script>

Tours - The Education Office, x-5588, makes reservations for and conducts guided tours.

Travel Office - Wilson Hall - 4 South East, x-3398, e-mail: travel@fnal.gov

Users Center - 10 Che Pinqua, Village; Mon. - Fri. 5:00 p.m. - midnight. Bar, snacks, recreation are available.

Users' Office - The Users' Office is the best resource for researchers for Fermilab information (Wilson Hall - 1 North West, x-3111 and x-3811, e-mail: usersoffice@fnal.gov):

<http://wdrs.fnal.gov/users/users.html>

Vehicle Stickers - Keys and ID Office, Wilson Hall ground floor next to the Communications Center, x-4506.

Visa Office - The Visa Office provides U.S. immigration-related guidance to users and assistance to employees, as well as information about changes to U.S. immigration laws or policies, and about consulate processing of visas. The website at visas.fnal.gov has a lot of useful information, or email visaoffice@fnal.gov.

Visitors ID Badges - Required for all researchers, obtained through Users' Office, Wilson Hall - 1 North West.

Weekend Services - Communications Center, Wilson Hall - Ground Floor North, x-3000. Dispenses pre-arranged housing contracts, airline tickets; dispatches Security to handle emergency stockroom withdrawals, PREP exchange/withdrawal, housing lockouts, and emergency on-site transportation.

Yellow Pages - Fermilab Telephone Directory, or

<http://www-tele.fnal.gov/telephone/yellow/yellow.html>

Chapter 5 – ES&H – Environment, Safety and Health

To pursue their research interests, people come to Fermilab from various institutions all over the world. Each institution has its own procedures, its own way of doing things. Here at Fermilab, we too have found our own ways to work together safely and effectively with respect for others, for resources, and for the environment.

Over the years, Fermilab has developed an integrated set of policies and procedures, compatible with federal and state regulations and laws that guide the way we do business. While you are a researcher at Fermilab, you must learn and follow the policies and procedures we have established. We have collected in this chapter the key ES&H policies and procedures that every user must know. When you register for an ID badge, you will be asked to sign a statement that you have read this chapter and agree to comply with its provisions.

ES&H Policies

Appropriate ES&H policies have always been fundamental to Fermilab. The [Fermilab ES&H Manual](#) (FESHM) describes Fermilab's ES&H program. The [Fermilab Radiological Control Manual](#) (FRCM), part of the FESHM, describes Fermilab's radiation safety program. These can be found at:

FESHM

http://www-esh.fnal.gov/pls/default/esh_home_page.page?this_page=800

FRCM

http://www-esh.fnal.gov/pls/default/esh_home_page.page?this_page=900

Furthermore, to implement Laboratory policies and to further strengthen safety in their areas, Fermilab Divisions, Sections, and Centers have their own policies and procedures in addition to the FESHM and FRCM.

Working Safely at Fermilab

All Fermilab employees and users are responsible for protecting themselves, their colleagues, and the environment. This fundamental principle is essential for our work today, for our future and for the future of Fermilab. Each user is accountable to the Head of the experiment's host Division/Section/Center. The Accelerator, the Particle Physics, Computing, and the Technical Divisions are responsible for the safe design and operation of experimental apparatus. The Division/Section/Center Heads are responsible for the safety of all activities in their areas. The Laboratory Director is ultimately responsible for safety at Fermilab. If you do not follow Fermilab ES&H policies you may be denied use of Fermilab facilities.

Fermilab Divisions, Sections, and Centers have their own ES&H staff (or access to other staff) to provide technical support. The Division staff may include a Senior Safety Officer (SSO), a Radiation Safety Officer (RSO), and an Environmental Officer (EO). Each Division and Section also has a liaison within the Fermilab ES&H Section. This liaison provides support to the Division or Section if it is needed. You should find out who are your host Division or Section ES&H staff and make sure to ask them about your ES&H concerns.

The Laboratory ES&H Director has the authority, delegated by the Laboratory Director, to stop any unsafe or hazardous activity, including experimental activities. Senior Safety Officers in the Divisions and Sections have authority to stop unsafe activities, and the Accelerator Division Operations crew chiefs have authority to stop unsafe beam-related or enclosure-access activities.

If you know of conditions that may cause ES&H concerns, you have the responsibility to report the conditions to your spokesperson or to ES&H staff. If you believe an assigned task is a hazard to personnel or the environment, you should not perform the task, but instead notify your supervisor and ES&H staff. You should file complaints about ES&H violations to the host Division. If not fully satisfied, you may take a safety concern either with the ES&H Section, the Fermilab Directorate, or, with the DOE (x-3281 or FermilabEmployeeConcerns@ch.doe.gov).

Environment Safety & Health Requirements for Experiments

As a user you will work with the ES&H staff of your Division, and if further assistance is necessary, with the ES&H Section. The ES&H staff will help you review your procedures and equipment for potential hazards. Furthermore, you will be expected to perform, at a minimum, a verbal Job Hazard Analysis (JHA) or a written JHA depending on the complexity of the task.

The spokesperson for every Fermilab experiment must obtain all the necessary review approvals before operation of the experiment begins. The host Division calls this an “Operational Readiness Clearance.”

These experimental aspects require review and approval before an experiment can operate:

- Mechanical and conventional safety
- Flammable gas safety
- Pressure and vacuum vessel safety
- Cryogenic safety
- Hydrogen target safety
- Electrical safety
- Radiation safety
- Controlled access

Toxic chemicals
Environmental protection
Compliance with regulatory requirements

Environment, Safety and Health Resources for Researchers

In addition to the resources of the Division ES&H staff, the Fermilab ES&H Section staff has areas of particular expertise that you may want to use. Examples are: instruments and techniques for monitoring radiation; distribution and management of radioactive sources; and transporting and disposing of both radioactive and non-radioactive hazardous waste. Also, the ES&H Section's Radionuclide Analysis Facility (RAF) and Radiation Physics Calibration Facility (RPCF) provide special services in radionuclide analysis and instrument calibrations.

Basic Safety

There are some basic rules that you should know for working safely at Fermilab. Keep in mind that this is not a comprehensive list of ES&H requirements. You can obtain more detailed ES&H information from [Fermilab ES&H staff](#) and the [Fermilab ES&H Manual](#).

Radiation Safety

Training and badges - Consult your Division ES&H staff to find out what radiation safety training you need. You must wear your [dosimetry badge](#) when you enter a radiation area. You must have current radiological safety training to wear a dosimetry badge. You can get a temporary badge at the Communications Center (Wilson Hall - Ground Floor North). Contact the Dosimetry Program Manager (x-8386, dosimetry@fnal.gov) and apply for a permanent badge if you plan to stay at Fermilab for six months or more.

Radioactive sources - Fermilab has an inventory of radioactive sources for loan to researchers. Strict controls are in place for radioactive source usage. No one is allowed to use a radioactive source without at least Radiological Worker Training and Radioactive Source Training (contact the ES&H Section source physicist, Wilson Hall - 7 East). No one may bring radioactive sources onto the Fermilab site or remove them from the site without receiving prior authorization from the Fermilab Senior Radiation Safety Officer, Head of the ES&H Section.

Interlocks - While an accelerator is operating, the beam enclosure interlock system keeps people out of the area where radiation rates rise to harmful levels. Tampering with any part of the enclosure interlock system is forbidden and may lead to dismissal from the Laboratory or denial of access to the site.

Controlled access - Controlled access entry without breaking the interlocks is possible in most of the beam enclosures. Only authorized people who have had appropriate training may enter areas under controlled access conditions, and they may enter only under specifically prescribed conditions. Users may become qualified to make a controlled access only after authorization by the Division ES&H staff.

Generating, Managing and Disposing of Radioactive Waste - Users must manage and dispose of all radioactive waste according to Division, Fermilab and DOE regulations. The researcher who generates the waste has the responsibility to take steps to minimize the radioactive waste produced. Remove any equipment not needed in beam areas before startup. Any material to be removed from a beamline enclosure (including an enclosure in an experimental hall) must be measured for radioactivity and appropriately labeled. Contact the Division ES&H staff if you need help from a radiation technician or need information about proper disposal procedures.

Electrical Safety

Except in special debugging situations with minimal exposure to electrical shock or other dangers, do not work on electrical equipment unless it is disconnected or until it has been de-energized and verified to have no stored electrical energy by use of lock out and tag out (LOTO) procedures discussed in the FESHM 5000 series:

<http://www-esh.fnal.gov/FESHM/5000/5120.pdf>

The Laboratory discourages the use of extension cords, cube taps and other forms of temporary wiring. All portable electrical equipment and power tools must be adequately grounded or double-insulated when connected to a power source.

Environmental Protection

At Fermilab, [our policy](#) is to conduct research with respect for the environment. We do this by working within the framework of our Environmental Management System and NEPA review process; by practicing pollution prevention during all phases of research; by addressing emissions & effluents, secondary containment, environmentally preferable procurement, notification of releases, and by use of ES&H staff to find alternatives and implementing energy conservation.

High environmental standards are fully compatible with accomplishing critical research. Here, we give a few basic environmental rules. You will find more information about environmental standards in the FESHM 8000 series:

http://www-esh.fnal.gov/pls/default/esh_home_page.page?this_page=8000

If you have questions, contact your Division ES&H staff, or the ES&H Section Environmental Protection Group (Wilson Hall – 7 East).

Division ES&H staffs must review all purchases of chemicals or transport of chemicals to the Laboratory. To reduce environmental impact and minimize waste, buy only as much material as you actually need, choose less toxic or less hazardous alternatives whenever you can, and use or recycle so that it does not become a waste.

If you have waste chemicals that must be disposed of, arrange disposal through your Division waste coordinator.

Be aware that the construction, installation, operation or modification of any air pollution source may require a permit. This includes any source of airborne radionuclides. Therefore, you should communicate with the Division or Section Environmental Officer at the very beginning of the planning process in order to identify potential issues and/or permitting requirements.

Good Practices at the End of Experiments and Other Research - Experimental apparatus and equipment should be dismantled in an environmentally responsible manner. Many of the components of an experiment are reusable, either by Fermilab or other institutions. For assets owned by Fermilab the Property Office can assist with the disposition of salvageable materials and equipment. Items that cannot be reused should either be recycled or properly disposed.

Hazardous Materials Safety

Read hazard warning labels on containers to find out how to handle a chemical or other material safely. If the container has no label, do not use the material until you know what it is and how to safely use the product. Remember that you must first have D/S/C ES&H Staff approval before bringing any hazardous material onto Fermilab property.

You can find detailed information on the hazards of a product on Material Safety Data Sheets (MSDS). MSDSs are available from the following ES&H Section webpage:

http://www-esh.fnal.gov/owa_user/msds_search.html

You must store flammable solvents such as methanol and acetone in safety cans and flammable-storage cabinets. Since specific regulations govern the use of hazardous chemicals in radiation areas talk to the Division ES&H staff prior to use.

Personnel Protective Equipment

You must wear safety shoes when there is a risk of foot injury. You may charge safety shoes to your experiment budget. Safety shoe forms are available at the following website:

http://www-esh.fnal.gov/FESHM/5000/5101_02.pdf

Contact your Division ES&H staff to obtain and properly use a respirator to control the inhalation of toxic materials such as dusts, fumes and solvent vapors.

You may obtain prescription safety eyeglasses through the ES&H Section, Wilson Hall - 7 North East; you may charge them to your experiment's task number (budget code). You and your supervisor can complete the Prescription Safety Eyewear Request Form and sign up for a safety eyeglass appointment at the following website:

<http://www-esh.fnal.gov/eyewear/index.htm>

Both the stockroom and Division ES&H staff supply non-prescription safety eyewear.

You must wear hearing protection whenever the noise may rise above the standard of 85 dBA. Such areas are posted. You can get various types of hearing protection devices from the Fermilab stockroom, Division ES&H staff and the ES&H Section.

Laboratory ES&H

ES&H Training - The spokesperson or other supervisor (e.g., Point of Contact, POC) is responsible for ensuring that researchers and others receive all the required training that applies to their jobs. Work assignments and other conditions dictate course requirements. You must ensure that your own training is both complete and current. You may determine your current training status by running an

Individual Training Plan - (ITP) accessible on the Internet through the ES&H Section Home Page at this URL:

<http://www-esh.fnal.gov/pls/default/itp.html>

Also, the Division ES&H staff can help you determine the courses you need to take. Some common courses that researchers may need are:

- Radiological Worker
- Controlled Access
- Oxygen Deficiency Hazard
- Laser Safety
- Crane Operation
- Forklift Operation
- Confined Space
- Lock Out - Tag Out (LOTO)
- Radioactive Sources
- Chemical Safety/Hazard Communication

Lasers - You must register all Class 3(b) and Class 4 lasers brought to the Laboratory with the ES&H Section before use. Other laser requirements may include training and eye examinations.

Ladders and Scaffolding - All ladders and scaffolding used at the Laboratory must meet the prescribed ANSI and OSHA standards in their construction and use. Never use metal ladders for electrical work or in areas where there is any possible contact with live electrical parts.

Crane or Forklift Operation - Any user who intends to operate a crane or forklift must have the required training and authorization. You can arrange crane or forklift training through your Division ES&H staff.

Confined Spaces - You must have training and a written permit from the Division safety officer before you enter a confined space. Typical examples of confined spaces include manholes, tanks, pipes, sump pits, and Cerenkov counters.

Oxygen Deficiency Hazards - You must have current medical approval and authorized oxygen deficiency hazard training before you may enter areas posted as oxygen deficient hazard (ODH) areas. Contact your Division ES&H staff for more information.

Traffic - Fermilab traffic regulations conform to those of the State of Illinois as prescribed in Rules of the Road. Violation of traffic regulations may result in disciplinary action. Vehicle accidents are among the leading causes of injury at the Laboratory.

Firearms and Hunting - Fermilab has a general prohibition against bringing firearms or any other weapons on site without the explicit written approval of the Director. Hunting and trapping are strictly prohibited on the Fermilab site.

Chapter 6 – Life at Fermilab

The Users' Office - A Resource for Researchers and their Families

The Users' Office (<http://wdrs.fnal.gov/users/>) coordinates the issuance of ID badges for site access and computing accounts for computer system access to scientists and professionals, introduces the user to the Laboratory, and gives users information about Laboratory policies, procedures and facilities. We host monthly Newcomers' Brown Bag Lunch and Welcome presentations to help new arrivals to transition smoothly to life here. We provide information and respond to questions and concerns about nearly any issue relating to the users involvement with Fermilab. The Users' Office also supports the Users Executive Committee and Graduate Students' Association.

Mail

Mailroom staff picks up and delivers mail daily. Village resident mailboxes are located at 18 Sauk in the Village.

Please contact the mailroom at Site 38 Warehouse2, x-3210 if you have questions concerning overnight, business, or certified mail. The mailroom is open weekdays from 7:00 a.m. - 3:50 p.m.

Phone

Fermilab's Telecommunications Department's website is at

<http://bss.fnal.gov/telecomm/index.html>

Fermilab also maintains a telephone directory at

<http://www-tele.fnal.gov/cgi-bin/telephone.script>

The Laboratory's main telephone number is 1-630-840-3000. Callers can reach users and employees directly by dialing 1-630-840- and the 4-digit extension number. Within the Laboratory, the 4-digit extension number suffices to place calls.

When unable to dial an outgoing telephone call directly, place such outgoing business calls through the Fermilab operator. The operator will require a Project and Task code for chargeback on some calls.

To request telephone installations, including voice mail, submit a Telephone Service Request Form

<http://bss.fnal.gov/telecomm/index.html>

to Telecommunications, MS 228. These forms require signature approval from the appropriate Department Head.

Medical Care

Emergencies: In an emergency, dial 3131. Fermilab has staff and equipment to provide emergency medical service 24 hours a day, 365 days a year. Anyone seriously injured is taken immediately to a community hospital for emergency care.

Urgent Care: The Medical Office, Wilson Hall – Ground Floor East (x-3232) is staffed by registered nurses and a physician on weekdays from 7:00 a.m. to 3:30 p.m. Should you need immediate medical care when the Medical Office is closed, go directly to the Emergency Room (phone 1-630-859-2222) at Mercy Center Hospital, 1325 Highland, Aurora, just south of the E-W Tollway on Route 31.

Routine Care: Users should consult health care providers in the community for non-emergency medical care. Users must show they have medical insurance coverage while they are at Fermilab. Users will be billed by the provider for any medical services not covered under their regular health insurance plan.

Pharmacies in the United States require prescriptions for the purchase of most drugs. Eyeglasses require prescriptions as well.

Food Service

The current menu and general information for the Fermilab cafeteria is available at:

<http://bss.fnal.gov/cafe/index.html>

The cafeteria on the first floor of Wilson Hall serves breakfast, lunch, and afternoon snacks Monday through Friday, and breakfast and lunch on Saturday. There is no service Sundays and holidays. Hours are posted near the cashier.

Vending machines are in the southwest corner of the first floor in Wilson Hall, in the Cross Gallery of the Accelerator, the Meson Laboratory, and at 18 Sauk Blvd. in the Village. There may be vending machines at some of the larger experiments as well. Check locally. Report problems with vending machines to x-3971.

Conference Rooms

Fermilab has available conference rooms of varying sizes and technological abilities, throughout the Fermilab site. Reservations must be made with the designated person responsible for the conference room in question. To see a listing of the

conference rooms and their responsible agents, see the Fermilab Yellow Pages, under “C” for Conference Rooms, at

<http://www-tele.fnal.gov/yellow/yellow.html#LetterC>

You and Your Family - Life at Fermilab

The Users’ Office Wilson Hall – 1 North West

<http://wdrs.fnal.gov/users/users.html>

provides general information, maps and other materials about Fermilab and the surrounding area, and can assist you and your family members to settling into the Fermilab area.

Once a month, International Services hosts a Welcome Presentation for non-U.S. citizens that provides an overview of the issues that commonly arise when adjusting to life in the U.S.: U.S. immigration, Social Security numbers, U.S. taxes, the U.S. healthcare system, local banking, local housing, driving in Illinois, and Life at the Lab, including Fermilab’s many cultural events. The Welcome Presentation is offered both to employees and to users. See also

<http://wdrs.fnal.gov/users/users.html>

International Services also hosts a monthly Newcomers Brown Bag Lunch for employees and users who have been at Fermilab for fewer than 2 years. The lunches begin at 12 noon, followed by a 10-minute presentation on a “Getting to Know Fermilab” topic given by a different Fermilab organization. The remainder of time is spent in Q&A and general discussion on any topics until 1 pm (or later, if you can stay). The goal is to provide a forum for newcomers to meet others from across the Lab, get answers, and share experiences. Contact visaoffice@fnal.gov if you have questions.

The “Graduate Student Association’s Guide to Life at Fermilab” at

<http://gsawiki.fnal.gov/>

is a useful resource for visitors. The Guide provides more information about health insurance, social security cards, drivers' licenses and other things you may need to know before you arrive.

Living On Site - The Fermilab Housing Office, located in “Aspen East” at the corner of Batavia Road and Sauk Boulevard, is open Monday through Friday, from 8:00 AM to 4:00 PM. Fermilab rents furnished houses, apartments, and dormitory rooms.

You may request housing by emailing the Housing Office at housing@fnal.gov, calling 1-630-840-3777, or using our on-line housing request form at

http://bss.fnal.gov/accommodations/housing_request.html

Information is available at the Accommodations website:

<http://bss.fnal.gov/accommodations/index.html>

Living Off Site - There are a number of short- and long-term stay hotels in the area around Fermilab. Users should book directly with the hotel of their choice. There are many apartment and other longer-term housing options for users visiting Fermilab for longer durations. The GSA Guide to Life has information about these options at:

<http://gsawiki.fnal.gov/>

In addition, limited information for living off the Fermilab site is available at the Housing Office at Aspen East, the corner of Sauk Blvd and Batavia Road in the Village.

Getting Settled - The Guide to Life provides extensive information about resources and tips to setting up a new household in the Fermilab area. See:

<http://gsawiki.fnal.gov/>

- Thrift Stores
- Banking
- Food Options within Five Minutes of Fermilab
- Shopping
- Grocery Stores
- Entertainment

Access to the Fermilab Site by Family Members - Fermilab permits access to the site through controlled access points. Access and entry to Fermilab property is contingent upon producing identification. Everyone visiting the Fermilab site must produce one of the following documents if requested by a security official: a government-issued photo identification card, a Fermilab Visitor ID Badge, or a Fermilab-issued visitor pass with a photo identification card.

Family members who require access to the Fermilab site during non-business hours (such as when living in Fermilab housing, or needing to drive a Fermilab employee or user to or from work) must contact the Key & ID Office on the Ground Floor of Wilson Hall to obtain a Spousal Pass.

A central corridor of public areas allows the public to visit much of the Fermilab site without the need for visitors' passes. The public areas include most of the

recreational features of the site, as well as Ramsey Auditorium and the ground floor and atrium level of Wilson Hall. Members of the public may access these areas between 8 a.m. and 6 p.m. from late-October to early-March and from 8 a.m. to 8 p.m. during the balance of the year. Roadways that are off limits to visiting members of the public are posted with signs.

NALWO

NALWO - NALWO, National Accelerator Laboratory Women's Organization, is an organization open to all women and their families affiliated with Fermilab:

<http://www.fnal.gov/orgs/nalwo/>

NALWO sponsors English classes. The classes are free of charge and may be joined at any time. Volunteer teachers work with students at all skill levels. Information about the time and place is available at 630-840-3994.

Children at Fermilab - Everyone under 18 years old, including children of employees, visiting scientists and DOE employees, must be continuously supervised by an adult while visiting Fermilab. Children may be permitted in certain office areas designated by the responsible Division or Section Head, subject to approval by the Division or Section Head.

Children can visit public and office areas. In general, they cannot visit laboratory areas, *e.g.* beamline enclosures, experimental halls, counting rooms, portakamps (except those used exclusively for offices) and non-office areas of assembly buildings. On a case-by-case basis, the Division Head may give permission for properly escorted children to visit specific laboratory areas for a specified length of time. You must get permission before allowing children to visit a laboratory area.

Day Care - Fermilab operates a day care facility for employees, visiting scientists and contractors. The Children's Center is in the Village, at 34 Shabbona. There are eight classrooms accommodating children age 6 weeks through 6 years of age. Hours are 6:45 a.m. to 5:30 p.m. with full-day and half-day programs. Enrollment is based on availability and a waiting list is maintained. For information regarding costs, etc., call the Children's Center (x-3762).

Day Camp - During the summer, Fermilab operates a summer day camp for children of employees, visiting scientists and contractors. One-week sessions (full days) are held during the summer months of June, July and August. Dates are subject to change each year. Enrollment is open to children age seven to 12 years old. If there are more applicants than available space, selection is made by lottery in February. For information regarding costs, the application process, etc. please call The Children's Center (x-3762) or Recreation Office Administrative Assistant (x-5427.)

Travel and Transportation

Fermilab's Travel Office - The Fermilab Travel Office, Wilson Hall – 4 South East (x-3398), makes reservations for air travel, car rental, hotels and limousine service. Tickets must be charged on the Lab's airline central billing account. (Travelers may not charge tickets to individual credit cards). You cannot pay for travel by personal check or cash.

It is your responsibility to arrange for limousine service. If you are unable to honor your reservations and if you fail to cancel, you will be held financially responsible. Fermilab has a contract with West Suburban Travelers Limousine, Inc. For Reservations call 1-630-668-9600. When other transport service is used reimbursement is limited to West Suburban Contract rates. See

http://bss.fnal.gov/travel/limo_reservations.html

Fermilab's On-Site Transportation - The Fermilab taxi provides transportation on site from 7:30 a.m. to 4:30 p.m. on weekdays. To call the taxi, dial x-4225 (HACK).

Off-Site Transportation - No public transportation serves the Laboratory site, but the Travel Office has information about the quickest and least expensive transportation in the area. The Travel Office will help you arrange for transportation to O'Hare International Airport. Please visit our Travel Website at

http://bss.fnal.gov/travel/airport_system.html

The GSA's Guide to Life also has detailed information about options for getting around Fermilab and the surrounding area at

<http://gsawiki.fnal.gov/>

- Commuter Trains
- Getting to Chicago by Car or by Train
- Buying a Car
- Other Transportation Options (Bicycles, etc.)

Rental & Lease Cars - Pilot's Leasing is onsite (in the Users' Office) and provides rental cars to Fermilab users for short or long term rental. To reserve a car, please visit the Pilot's Leasing desk in the Users' Office during regular business hours or call (x-3111 or x-3811), fax (1-630-840-2688) or email (usersoffice@fnal.gov) the Users' Office and we will forward your request to Pilot's Leasing. For a link to Pilot's Leasing's current rates, see:

<http://wdrs.fnal.gov/users/links.html>

Government Vehicles - Government vehicles are available from the General Services Administration, Chicago Fleet Management Center, 7345 W. 100th Place, Suite 108 , Bridgeview, Illinois 60455. Users supported under a federal contract may be authorized to use them. Cars must be picked up and returned to the Bridgeview street address. Requests for those vehicles must be made prior to pickup, via the user's home institution.

Driving in Illinois

To drive legally in Illinois, you must have a valid driver's license and insurance. Even if you do not drive, a license may be useful as a form of official identification. You may drive in the U.S. using a valid license from a foreign country for up to six months while temporarily living in Illinois. After that, you should have an Illinois Driver's License. Technically, if you live in Illinois for over 90 days, you must get an Illinois driver's license. A license from another state is valid in Illinois for up to 90 days. If you are stopped by police for a traffic violation and they determine that you lack an Illinois Driver's License (and are supposed to have one), they can require you to pay a fine.

Non-U.S. citizen employees of Fermilab may apply for a "regular" Illinois Driver's License. The application process requires a Social Security number.

http://www.cyberdriveillinois.com/departments/drivers/drivers_license/tempvisitors.html

Do not assume that driving rules and conventions from your home country are acceptable in the U.S. - check the "Illinois Rules of the Road".

http://www.cyberdriveillinois.com/publications/rules_of_the_road/rrtoc.html

If you use your home country license be sure to check the driving laws of other States before driving across state lines. Depending on what State you are driving in, the rules might be different.

Are We Having Fun Yet?

Fermilab Recreational Facilities - The Users Center, at 10 Che Che Pinqua in the Fermilab Village, is open Monday through Friday from 5:00 p.m. until midnight. The Center has a bar, ping-pong, pool tables, and other games. There's also TV, a grand piano, and various meeting rooms. Children must have responsible adult supervision.

Chez Leon, a gourmet restaurant in the Users Center, serves lunch on Wednesdays and dinners every other Thursday night. Special catered meals are also available. Reservations are required. The menu and additional information is available at

<http://bss.fnal.gov/chezleon/index.html>

The Recreation Facility, at 16 Potowatomi, includes a multipurpose gymnasium, an exercise room, a fully-equipped weight room and locker rooms, with 24-hour access for members. Memberships can be purchased in the Recreation Office, Wilson Hall – 15 West (x-5427).

The outdoor swimming pool, open during the summer, is available through the purchase of a season pass or by paying a daily fee. Children's swim lessons are also available. Membership to the pool and registration for swim lessons can be arranged through the Recreation Office, Wilson Hall – 15 West.

Three tennis courts, a basketball court, soccer field, softball diamond and two sand volleyball courts are available adjacent to the Village Barn.

You can also rent a canoe for a nominal cost for use on or off-site.

The Recreation Office has information about all these recreation facilities and programs, as well as the many on-site clubs, organizations and leagues. For more information, contact the Recreation Office, Wilson Hall – 15 West or go to:

<http://wdrs.fnal.gov/recreation/index.html>

On-Site Cultural Activities - Fermilab sponsors many cultural activities in the 847-seat Norman F. Ramsey Auditorium at the south end of Wilson Hall. For further information, see:

<http://www.fnal.gov/culture/NewArts/index.shtml>

The Fermilab Arts Series features monthly Saturday evening performances of internationally acclaimed dance, theater, comedy, chamber music, jazz and folk music ensembles. In the Lecture Series, Fermilab hosts distinguished guests from many disciplines. Visit the web page at:

<http://www.fnal.gov/culture/NewArts/index.shtml>

The Fermilab Gallery Chamber Series offers three classical performances per year. Gallery Chamber Series performances are held in the Wilson Hall Art Gallery, second floor crossover. Visit the web page at

<http://www.fnal.gov/culture/NewArts/index.shtml>

You can obtain information and tickets for the Arts Series, Gallery Chamber Series, and Lectures at the Box Office, Wilson Hall – 1 North West, in International Services. The Art Gallery on the second floor of Wilson Hall offers changing exhibits by local and regional artists. The exhibitions are engaging and varied, including watercolors, oils, contemporary sculpture, fiber arts and photography. Fermilab invites the employees, users and the public to visit and relax in the Art Gallery during work hours.

http://www.fnal.gov/pub/Art_Gallery/

Fun in the ‘Burbs’ - Detailed information about living in the communities surrounding Fermilab is available in the Graduate Students’ Association’s “Guide to Life,” available at

<http://gsawiki.fnal.gov/>

- Parks
- Libraries
- Museums
- Entertainment
- What To Do in Chicago

Substance Abuse

Fermilab fully supports state and federal laws concerning the drug-free workplace. Fermilab users are expected to comply with Fermilab drug and alcohol use policies and are subject to Laboratory disciplinary actions for drug or alcohol abuse. Article 26 of the Director’s Policies states that “Substance abuse in the workplace poses undue health and safety risks for the user and all others in our environment.” Fermilab’s Personnel Policy on Drug and Alcohol Abuse states that disciplinary action will be taken for unauthorized consumption by employees of alcohol or being under the influence of alcohol at the work site. Any use, sale, purchase, transfer, or possession of illegal drugs is prohibited. The Fermilab Personnel Policy Guide is available at:

<http://wdrs.fnal.gov/policies/policies.html>

Fermilab offers a voluntary counseling and referral program to all employees who may be experiencing stress in their lives, including substance abuse. The Employee Assistance Program provides a confidential and professional service without cost to employees and is available on site. For more information about employee assistance, see the Equal Opportunity/Counseling web page at:

<http://wdrs.fnal.gov/eo/index.html>

Chapter 7 – Publications and Communications Information

Publishing at Fermilab - Technical Publications Policy

Anything intended for outside distribution written by a Fermilab employee (or includes Fermilab employees on the authors list) or describes work done using Fermilab facilities must receive a Fermilab publication number. This includes papers submitted to journals for publication, those contributed to conferences workshops, symposia and publications, and theses.

These papers come under the DOE and FRA classification of "work for hire" and all copyright forms must be signed by the Technical Publications Office.

The Fermilab Technical Publications Website

<http://bss.fnal.gov/techpubs/index.html>

contains links to the Technical Publications Request and Submission system for requesting publication numbers, submitting papers, thesis and proposals. Also located there are links to DOE Disclaimers/Acknowledgement, Fermilab Publications, and the Publications Announcement Mail list.

Research Records

Fermilab experiments have established a policy on managing research records that ensures a consistent approach. This policy is supported by detailed procedures to guide staff in fulfilling their responsibilities for managing the records arising from their research activities.

The creation and maintenance of records is important to the research process.

Complete, authentic, and reliable records are required to:

- Demonstrate good research practice and strengthen the reliability of research evidence
- Safeguard researchers and experiments from allegations of research misconduct
- Protect individual and institutional intellectual property rights

Further information on records management and requirements is available in the Fermilab Employees Records Management Handbook.

Fermilab Library

The library is located in Wilson Hall on the third floor crossover, and has about 15,000 books, from college-level texts to more advanced research. There are also current issues of 7 daily newspapers, current magazines and journals, and back issues of journals not available online. A photocopier, printer, scanner, and 5 PCs are available for your use.

Anyone with any category of Fermilab ID card is welcome to request books and journal articles. The Library searches for books and articles from local, national and international sources. Most articles are e-mailed as PDFs within a few days and PDFs of articles from the library print journals collection are e-mailed in one day.

<http://library.fnal.gov>

The Library in coordination with the ES&H Section maintains the "Work Smart" standards set. This is the set of federal, state and local laws, regulations and standards to which the Laboratory must adhere

<http://bss.fnal.gov/worksmart/worksmart.html>

Laboratory Communications

Fermilab Today - The Fermilab Office of Communication produces a daily electronic newsletter to keep employees, users, funding agencies, reporters and members of the local community informed about what is happening at Fermilab. To subscribe, please visit: <http://www.fnal.gov/pub/today/subscription.html>

Experimental collaborations are welcome to use *Fermilab Today* to share important milestones and scientific results with the rest of the Laboratory. If you have noteworthy news you'd like to share, please send an email to today@fnal.gov or call the Office of Communication at 1-630-840-3351.

NALCAL - Each Friday, Fermilab posts on the Web a weekly calendar, NALCAL, with the times, topics and locations of meetings of general interest, seminars, and colloquia held on the site, with general announcements at the bottom of the page. Please submit material for the following week's calendar to the Director's Office, x-8447, by noon on Wednesday. NALCAL is at

<http://www.fnal.gov/directorate/nalcal/nalcal.html>

symmetry - A joint publication of Fermilab and SLAC, *symmetry* is a magazine about particle physics and its connections to other aspects of life and science, from interdisciplinary collaborations to policy to culture. Copies of *symmetry* are mailed to funding agencies, congressional offices, government representatives, the national and international press, the local media, universities, members of the Fox Valley

community and anybody interested in learning more about the particle physics community. To subscribe or to read *symmetry* online, please visit

<http://www.symmetrymagazine.org/>

Also published by *symmetry* are a blog, *symmetry breaking*, with frequent articles related to particle physics. If you have suggestions or questions with regard to *symmetry*, please call the Fermilab Office of Communication at 1-630-840-3351.

Media Relations - All users are encouraged to work with the Fermilab Office of Communication, 1-630-840-3351, Wilson Hall - 1 North East, regarding press releases, press materials and information issued to the media about research results and other activities related to Fermilab. The Office of Communication also coordinates its media communications with the public information officers at funding agencies and users' home institutions. Ideally, please contact the Office of Communication about four weeks before you plan to announce new scientific results or other news that might create media interest. Staff members of the Office of Communication also act as spokespersons for Laboratory activities and news, and delegate inquiries from reporters to the appropriate experts among Fermilab staff and users. For more information, see:

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

Outreach - The Office of Communication and the Education Office encourage outreach by employees and users to help communicate information about Fermilab, high-energy physics and basic research. The Office of Communication and the Education Office have materials and programs that users and employees may find useful for presentations at Fermilab, at schools, at their home institutions or at community events. The Office of Communication has a large selection of photographs and even some videos that can be incorporated into presentations. The Office of Communication also manages a Speakers' Bureau. If you would like to volunteer to be a speaker to a community group, please contact the office at 1-630-840-3351. The Education Office offers various hand-on demonstrations that scientists can take to schools. To volunteer for school visits or other education programs, please contact the Education Office at 1-630-840-5588. More information is available on the following Web sites:

Office of Communication:

<http://www.fnal.gov/pub/about/communication/>

Education Office:

<http://ed.fnal.gov/>

Visual Media Services

The Fermilab Visual Media Services (VMS) office is located on the ground floor of Wilson Hall near the west parking lot entrance. VMS offers a variety of services that include photography, video production, video streaming, A/V support, copying and duplicating, graphic design, and large format inkjet printing. Contact VMS at 1-630-840-3349 or vismedsr@fnal.gov, or see:

<http://www-visualmedia.fnal.gov>

Photography - Visual Media Services offers a full range of digital photographic services and maintains an extensive online database of photos:

<http://www-visualmedia.fnal.gov>

Please make sure that your milestones, experiments and projects get included in the archive by contacting VMS at 1-630-840-3349 to schedule a photo shoot. Need a passport or visa photo? VMS can provide instant photos. Photographic quality digital printers can output images for presentations and displays.

Video Production - The video production staff at Fermilab can help you produce videos about research or for training purposes. VMS can provide video file conversions for incorporating files into presentations, posting on the web or can provide a fully mastered DVD if desired.

Streaming Video - Visual Media Services can record lectures, workshops or other presentations at Fermilab for both on demand and live streaming. Through an online searchable database they maintain an archive of past presentations.

Audiovisual Support - Need to make a presentation to a room full of people? VMS supports a number of the main meeting rooms in Wilson Hall. VMS also loans out projectors and screens for use in rooms where there is no permanent equipment installed. Portable public address systems can also be set-up as needed.

Duplicating Services - On the ground floor of Wilson Hall, near the east side entrance, the Laboratory provides services to duplicate and copy materials related to the scientific mission and business of Fermilab. High-volume, high-quality duplicators, bindery equipment, a variety of paper stocks and color copies are available.

Graphic Design - VMS offers help with all kinds of graphic design projects, including conference announcements posters and other printed materials.

Large Format Inkjet Printing - VMS offers high-quality large-format printing up to 42 inches wide and any reasonable length, they can also laminate and mount your project to foam board. Prints can be imaged from a number of software programs.

Closed Circuit Television

The Fermilab closed circuit television system transmits information about the status of Laboratory operations throughout Fermilab. Besides displays of information specific to experiments, there is a display on Channel 13 that provides general information about the accelerator including ramp and intensity, and messages of general interest to the user community.

Chapter 8 – Computing for Researchers

Scientific computing at Fermilab has developed in a unique environment, physically and intellectually close to the needs of experiments and projects. As a result, the Computing Division can offer researchers outstanding computing resources for acquiring and analyzing data:

- On-line computing via hardware and software support.
- Storage and processing power to support experiments during data taking.
- Services, processing power, and storage in support of experiments' offline computing needs, including access to the national cyber infrastructure.
- Computing for software development and analysis, project management and tracking, and document preparation.
- Extensive local and wide-area networks to facilitate communication.
- Support of many local workgroup computing activities.

The Memorandum of Understanding

After a proposed experiment or project receives Fermilab approval, the experiment or project and the Computing Division reach an understanding about how much and what kind of computing resources the experiment will use. The memorandum of understanding (MOU) spells out this understanding, and the Computing Division allocates resources according to their availability and in line with Laboratory priorities. Formal meetings or consultations are used to schedule major production activities; frequent consultation between the experiment or project and the Division helps plan major development projects. The Division also provides general computing.

The Division and the experiment periodically review the MOU. The spokesperson should schedule a review of the experiment or project's computing status and needs at least every year, but more often for an experiment or project with a shorter lifespan.

The Computing Division aims to provide the level of reliable computing the project or experiment needs. If problems or shortfalls arise, the Division will help to resolve them within the capabilities of its human and financial resources.

Liaisons

The online and offline areas of the Computing Division and the project or experiment all provide liaisons which facilitate communication between the Division and the

experiment, identifying needs and allocating resources. Liaisons make clear and consistent communication possible.

Online Liaison - During development of the MOU, the Computing Division assigns one or more online liaisons to the project or experiment. This liaison provides the primary day-to-day contact between the experiment and the online support arm of the Computing Division. Online liaisons actively connect an experiment to the large body of expertise in online and data acquisition hardware and software in the Computing Division.

Offline Liaison - Many projects or experiments, including all running experiments, have an offline liaison assigned from the pool of physicists and computer scientists in the Division. The liaison facilitates the experiment and the Division working together to accomplish the experiment's offline computing tasks. They keep the experiment informed about Computing Division activities, policies, resources, limitations, and plans and communicate to the Computing Division the experiment's needs, plans, problems, and concerns. The liaison reviews and advises on all major requests for resources, passes them for implementation to the relevant Departments, and follows up to ensure that they have been satisfied promptly and to good effect.

Experiment Liaison - The project or experiment designates one or two contact people to serve as coordinators for the experiment in matters related to online and offline computing and data acquisition. If desired, specific contacts may be provided for online and for offline. This person(s) is preferably available at Fermilab and generally familiar with the computing needs of the experiment. This person(s) helps the experiment speak to the Division with a unified voice, providing information about computing to the experiment and channeling feedback from the experimenters to the Division. The experiment's major requests for resources must come through the experiment liaison.

While experimenters can certainly address their requests to people other than the Computing Division offline liaison through the Fermilab Service Desk (servicedesk.fnal.gov, (1-630-840-2345), we ask that experiments first review any major commitment of resources with the Computing Division offline liaison.

Allocating Resources

The offline liaisons for the project or experiment and the Computing Division negotiate major requests for offline resources, which will be included in the MOU. Requests must be made in a time within the budget cycle for funds to be requested, as necessary. If the request does not conform to the general terms in the experiment's MOU, it may be necessary to write an addendum to the MOU or otherwise come to a written agreement. Requests should be made through the Computing Division Service Desk

<http://servicedesk.fnal.gov>

or call 1-630-840-2345. The Computing Division will address any questions about requests to your experiment's offline liaison.

The Computing Division maintains the PREP equipment pool, a large number of some of the more common reusable electronic modules and other equipment from tests and experiments. This equipment may be loaned for use or reuse as part of the implementation of a signed MOU for an experiments or beam test, or of an MOU dedicated simply to PREP equipment loans. See the PREP web page:

<http://cdorg.fnal.gov/ese/ESEPREP.html>

or email prep@fnal.gov for more information, an on-line catalog, and request forms.

Where to Find the Services You Need

A list of services supported by the Computing Division is available from the Computing Division web site. See the Computing Division web site:

<http://computing.fnal.gov/xms/Services>

then click on the "Getting Started" link to view the Service Catalog. Listed below are some of these services.

Computer Accounts - The process for obtaining your accounts is different depending on whether you are an on-site employee, an on-site visitor, an off-site visitor, or a contractor. Whatever the case, a valid Fermilab ID must be obtained before you may request your computer accounts. Details and procedures for requesting computer accounts may be obtained by going to:

http://computing.fnal.gov/xms/Services/Getting_Started

Service Desk - Requests for information technology services or reports for incidents should be submitted to the Fermilab Service Desk:

<http://servicedesk.fnal.gov>

or call extension 2345. Open 8:00 a.m.- 4:30 p.m., Monday - Friday, the Service Desk is the primary point of contact for general and offline computing incidents. After hours, emergency incidents may be reported by calling x-2345 (please listen to the entire message); however, potential computer security incidents should be immediately reported to 1-630-840-2345 AND to computer-security@fnal.gov.

When you have questions and concerns about online and data acquisition systems, call your experiment's online liaison within the Computing Division to provide help on detailed technical questions as the need arises.

Software and Documentation - A large selection of general-purpose and physics-related software is supported on all of the major platforms. FermiTools (fermitools.fnal.gov) offers some of Fermilab-developed software packages, along with documentation. Other software is available by going to:

http://computing.fnal.gov/xms/Science_%26_Computing

Network Connections - The Computing Division provides and operates an extensive Fermilab local and wide-area network, and regulates its access and use. Anyone connecting to the Laboratory network for more than a few days must register his or her system before use.

Documentation about how to connect to the network, including getting remote access to Fermilab, wireless access, and visitor information is available by going to:

http://computing.fnal.gov/xms/Services/Getting_Started/Getting_connected_to_Fermilab%27s_Network

Magnetic Tape Management - Fermilab provides nearline and archival storage for an experiment's data in automated tape libraries. Fermilab will retain this data and will periodically migrate the data from legacy to newer media.

Acquiring PCs and Workstations - Requests for acquiring personal computers or workstations should be made through the Fermilab Service Desk at:

<http://servicedesk.fnal.gov>

or calling 1-630-840-2345.

Workgroup Computing

Members of a project or an experiment, through their liaisons, negotiate with the Computing Division for support for the workgroup cluster. Support varies from occasional consultation, to system support for upgrades, to very intensive involvement. In all cases, however, the project or experiment must provide a local System Manager to carry out routine functions such as backups and account management. To take full advantage of the capabilities of the Computing Division, members of projects or experiments should work closely with Computing Division personnel on hardware, networking and software issues as they develop their systems.

General Consulting - The Computing Division provides general consulting to all Fermilab researchers. However, if you need help with system or hardware issues on a supported workgroup cluster, please submit a Service Desk request at

<http://servicedesk.fnal.gov>

or call 1-630-840-2345.

System Support - Workgroup clusters have local System Managers as well as backup System Managers assigned from the Computing Division. If you have a problem that appears to be system- or hardware-related, call your local System Manager first, then please submit a Service Desk request at servicedesk.fnal.gov or call 1-630-840-2345..

Software Support - The Computing Division provides support for certain software packages. Some come from vendors, others come from other laboratories, and still others are in-house developed. Some are general-purpose; many are specific to the high-energy physics community. You can find out which software is supported by the Computing Division and learn about other products that are available for your use by viewing the Service Catalog at:

http://computing.fnal.gov/xms/Services/Getting_Services

The "Software" category contains the necessary links. If the Division supports the product you need, and if licensing allows for distribution to your computer, you can arrange to have it installed by opening a Service Desk Request at:

<http://servicedesk.fnal.gov>

or calling 1-630-840-2345.

Computing Hardware Support - The Computing Division provides hardware support for distributed workgroup computing. Please fill out a hardware service request, which is linked from the Service Desk page at:

<http://servicedesk.fnal.gov>

Online and Data-Acquisition Support - Online and data acquisition support for experiments covers maintenance and repair of electronics, computer hardware and software installation and support, and development and support of specific hardware and software components, as set forth in the MOU.

The Division also serves as a resource of knowledge and expertise for researchers as they commission their data acquisition and online systems. Many groups in the Computing Division offer outstanding services; you can reach all of them through your experiment's online liaison.

Equipment Maintenance - If the MOU provides for it, Fermilab maintains PREP HEP modules, supports test instruments, and data acquisition systems. Users usually transport malfunctioning instruments to the PREP issue window for exchange and repair. Read more on the PREP web page:

<http://cdorg.fnal.gov/ese/ESEPREP.html>

The easiest contact method is to e-mail prep@fnal.gov or to open a Service Desk request, <http://servicedesk.fnal.gov>. Computer maintenance usually comes from the Computing Division. You can get after-hours support by following procedures on the PREP web page. During accelerator running times, you can also get after-hours support at the PREP web page:

<http://cdorg.fnal.gov/ese/ESEPREP.html>

While the Computing Division does not provide experiment-specific DAQ software, you can get software consultation services in support of PREP CAMAC devices via the e-mail list, camac-support@fnal.gov. Some software and driver information is available at the Fermitools CAMAC web page:

<http://fermitools.fnal.gov/abstracts/camac/abstract.html>

Software Installation - Project members and researchers should be sure to request appropriate software tools and licenses in the MOU. The experiment has the responsibility to ensure that all necessary software licenses are registered with the Computing Division's license coordinator to meet legal obligations. To register software licenses, contact the Fermilab Service Desk,

<http://servicedesk.fnal.gov>

or call (630) 840-2345.

Offline and Grid Support - The Computing Division has adopted the strategy of placing all of its production resources in a Grid meta-facility called FermiGrid. This facility establishes a common set of services which enables researcher access to Fermilab based computer farms and storage, and an interface to the broader national infrastructure, Open Science Grid. More information, including how to obtain access to FermiGrid, may be found at:

<http://fermigrd.fnal.gov/>

Support for this facility includes:

- as agreed to in the project or experiment's MOU, maintenance and repair of the associated hardware including computer-farm nodes purchased by experiments for inclusion in the facility (see Allocating Resources section)
- help with installation of appropriate grid client software and interfaces
- diagnostic help associated with use of the facility

Assistance can be obtained by opening a Service Desk request at servicedesk.fnal.gov or calling 1-630-840-2345.

Additionally, the Division serves as a resource of knowledge and expertise for researchers in the area of offline resource planning, grid job submission guidelines, and general grid use. These resources can be reached through your experiments' offline liaison.

Responsibilities of Those Using Fermilab Computers

You are responsible for reading, understanding, and following the Fermilab Policy on Computing, which is available at:

<http://security.fnal.gov/policies/cpolicy.html>

Changes to This Chapter on Computing at Fermilab

Please email cdweb@fnal.gov if you notice information that is incorrect or out of date.

Chapter 9 – Working with Support Sections and the Technical Division:

Visa Office, Security, Business Services, Finances, Procurement, Shipping, Stockroom, etc.

Visa Office

Fermilab's Visa Office assists employees with their immigration sponsorship and advises users and visitors on *general* U.S. immigration-related matters; users and visitors sponsored by U.S. institutions first should seek *specific* immigration advice from their sponsors. Examples of the issues with which the Visa Office can assist users and visitors include understanding U.S. immigration, preparing for visa applications at U.S. Consulates or admission to the U.S.

Visa applications at U.S. Consulates can be lengthy for professionals working in high energy physics (and others), due to security clearances. These conditions change throughout the year and from year to year. Please review our Travel Advisory webpage to learn about the steps that you can take to help prepare yourself for a visa application and admission to the U.S. at:

<http://wdrs.fnal.gov/users/travel.html>

If you qualify to enter the U.S. without a visa for your short business trips, please review the information on the Visa Waiver Program at

<http://wdrs.fnal.gov/users/business.html>

The Visa Office recognizes that users and visitors often have questions on complicated immigration-related matters, such as the residency process ("Green Card" process). Please see

<http://visas.fnal.gov>

for information about these processes. We also have hard copy memos on such topics as employment-based immigration, Adjustment of Status, extending B-1 status, correcting your admission status, and recording your departure from the U.S. You may browse and pick up these and other memos in the Visa Office (Wilson Hall 1st Floor -North West), next to the Users' Office in International Services.

As immigration issues arise, we post them in our Alerts section of our website. The Alerts are located in the right-hand column of each page on our website:

<http://wdrs.fnal.gov/visas/visas.html>

For more information on the general advice we can give users and visitors please visit

<http://wdrs.fnal.gov/users/index.html>

Security Department

The Security Department of the Business Services Section has specific responsibility to provide the Laboratory community with physical security. This includes personnel security, security patrols, traffic control, investigation of property loss, and assistance in dealing with threats of violence. They conduct traffic safety enforcement in accordance with FESHM 9010 and they operate a long term parking program for personnel on business travel. Each user is directly responsible for following security requirements and contributing to secure missions and workplaces in accordance with the principles of Integrated Safeguards and Security Management (ISSM):

<http://esh-docdb.fnal.gov/cgi-bin/RetrieveFile?docid=432>

Finances

To help users carry out research, Fermilab provides a variety of materials and services to researchers and bills the cost to the user's home university or laboratory.

To use home institution funds for carrying out research at Fermilab, the user establishes an account: the home institution writes a purchase order to Fermilab, directed to the Chief Accounting Officer, Wilson Hall - 4 East, indicating the user's level of signature authority; the research work to be conducted; the dollar limitation; the type or classification of services or materials covered; and the time period for which the order is valid. The dollar amount and the time period should both be adequate to complete the research. (When the user exceeds either, the home institution has to issue a change order.) Then the user receives a project and task code to use at Fermilab, much like a department-store charge account.

The project or experiment spokesperson establishes authorizations for example, stockroom withdrawal authorization with the concurrence of the fiscal officers of the users' home institutions so that users' ID cards have appropriate coding.

In some cases, the Program Office of the DOE High Energy Physics program puts university funds directly into Fermilab's "Financial Plan" to be used by and for the institution's research at the Laboratory. Although the funds are for the use of the university personnel, because they are in the Fermilab Financial Plan they are subject to the same terms and conditions as Fermilab funds. These terms and conditions are in FRA's prime contract with the Department of Energy for operation of Fermilab.

Billing

Fermilab submits monthly bills against the institution's purchase order for costs incurred on the researcher's project and task code. Costs include such items as purchases, special services rendered, stockroom withdrawals, telephone expenses and burden charges.

Burden charges include labor burdens (fringe, vacation and other paid time off) charged based on time worked against the project and indirect burdens to reimburse the Laboratory for its indirect expenses covering Divisional Program Support, Materials/Service Acquisition, Common Site Support and G&A. More information, including current rates, can be found on the Finance and Accounting websites.

<http://finance.fnal.gov>

Invoices must be paid promptly; payment terms per DOE Directive are "net 30 days." It is the institution's responsibility to have a payment system in place to assure prompt payment of Fermilab invoices.

Institutions with accounts more than 90 days past due may be suspended from doing research at Fermilab or using any of Fermilab's facilities, including computing. The suspension lasts until the accounts are brought current. Habitually delinquent accounts may mean permanent denial of access to the Fermilab site or the use of its facilities.

Invoices with disputed charges should be processed less the disputed charges, with the deductions and the reasons noted. If the Fermilab Accounts Receivable Group cannot resolve the question, then the Chief Accounting Officer resolves the dispute. Fermilab will not consider disputed charges delinquent.

Institutions must pay charges by their users which are not incurred in accordance with their institution's policies--personal phone calls, travel not preapproved, for example--because Fermilab considers the user an agent of the institution. The institution must recover the unauthorized cost from the individual user.

Although most of the policies and procedures are the same as those under a "cash reimbursement policy," as outlined above, there are some differences.

When the Department of Energy puts funds into Fermilab's contract for a particular institution, Fermilab's Chief Financial Officer sends the institution a detailed policy and procedure letter concerning the use of these funds. A copy of this letter is maintained in the Accounting Department.

Procurement

Fermilab's Procurement Department (x-3521) acquires goods and services. Procurement specialists will help you plan your procurement requirements for computer equipment, construction services, fabrication, electronics, repair and operation. Fermilab has a ProCard charge card system that Procurement can explain.

We encourage users to ask Procurement for information about the availability of products, and to arrange for sales representatives to come in and discuss technical matters. Users may purchase items for cash (up to \$50) from vendors. For reimbursement, a petty cash form, with receipts, a project and task code and necessary approval are required.

Fermilab has a standard purchase requisition form that should be completed and sent to the host Division office after the appropriate signatures for the account have been obtained. The staff processes the order and maintains accounting records. (Note that you must get ES&H Section approval for the purchase of radioactive sources; see the ES&H Chapter.) Items purchased are normally delivered to Receiving and then delivered to the user by Fermilab personnel. However, if circumstances warrant, you may pick up materials directly from Receiving; to do so, make arrangements in advance with the Receiving Department (x-3575).

Fermilab's contract with the U.S. Department of Energy obliges the Laboratory to conform to DOE and federal procurement regulations. For procurements of more than \$5,000, the Laboratory must obtain competition. However, procurement regulations recognize that situations sometimes make competition impractical or impossible. In these circumstances, Fermilab may exercise judgment waiving the competition requirement, documenting why proposals were not solicited and how the Laboratory determined that the price was fair and reasonable. If you feel you need to make a sole-source procurement for more than \$5,000, consult the Procurement Department (x-4168) for assistance.

Fermilab Stores

The Fermilab Stores Catalogue lists all supplies available in the Fermilab storerooms. Users may borrow copies from Division or Section offices or storerooms. The stores catalogue is available on the Internet at

<http://www-stock.fnal.gov/stock/>

The Fermilab Stockroom (x-3825) at Site 38 is open on workdays from 7:00 a.m. - 3:30 p.m. (You can get emergency access to stockrooms at other hours by calling Security at the Communications Center, Wilson Hall - Ground Floor, (x-3000).

How to Withdraw Stock

Only authorized personnel with valid Fermilab identification cards may withdraw stock. Authorization levels are entered electronically into the name and address system of the Laboratory and coded on your ID card. These codes indicate the total permitted dollar value per withdrawal:

- X" Not authorized to withdraw stock
- "1" Not to exceed \$500.00
- "2" Not to exceed \$2500.00
- "3" Unlimited

Make withdrawals in person or by submitting a list of your requirements including stock numbers, quantities, descriptions, your ID number and a valid project and task code. Possession of a Fermilab ID with an authorization code of 1, 2 or 3 does not mean automatic stockroom authority; certain stock items--alcohol, for example--require special authorization. The stockroom handles requests for these items on an individual basis.

To order stock compressed gas, call x-3808 and tell the type of gas, how much you need, your budget code, group, delivery instructions, name, badge number and telephone extension. Orders placed by 2:00 p.m. will normally be filled the next day.

Property Management

To distinguish Fermilab-owned equipment from user-owned equipment, users should clearly identify all equipment they bring to the Laboratory.

The Property Management staff helps users arrange for long- or short-term loans of Fermilab equipment for use off site. After approval of the request by the Fermilab Division directly responsible for the equipment, the Property Management Group handles the administration of the loan.

Fermilab has very limited warehouse storage space. However, because we recognize that sometimes researchers need to store equipment, rather than returning it to the home institution, researchers can arrange for short term storage by calling the Warehouse Group (x-3577). Note: Fermilab does not permit storage of hazardous materials such as flammable liquids, corrosives or radioactive materials. The Laboratory provides storage on a space-available basis. There is no charge for material stored in the warehouses or the outdoor storage facility.

Fermilab is prohibited by DOE Order 580.1-1 and the Property Management Regulations from assigning sensitive items or Accountable Property, i.e. Capital/Controlled equipment, to non-employees. All such property must be assigned to a Fermilab employee.

Shipping Materials or Equipment to Fermilab

Before making a shipment to Fermilab, consult the Traffic Department (x-3470) for specific shipping information and instructions. The shipping address is:

Fermi National Accelerator Laboratory

Wilson Road & Kirk Road

Batavia, Illinois 60510

Attention: Shipping and Receiving Department c/o User's Name

For all shipments, provide the Traffic Department with the agency or shipper, the name of a user at Fermilab familiar with the shipment, delivery destination at Fermilab, the size, weight, and number of pieces, an itemized list of equipment, and storage requirements, if necessary. After the material arrives at Fermilab, make all subsequent arrangements through your institution's management.

Technical Division Support

Machine Shops - Researchers who need the services of a machine shop can call on two large shops, the Village Machine Shop and the Wilson Hall Shop, and 10 smaller satellite shops located throughout the site, all operated by the Technical Division. The satellite shops, each staffed by a machinist, contain some equipment that qualified nonmachinists can use. (The machinist in charge at the site decides if you're qualified.) Any work that must be done by the TD Machine Shop personnel should be coordinated through your experiment management; you will need a purchase requisition and suitable drawings. You can also obtain ready access to any of about 60 commercial Chicago-area machine shops through the Task Order operation at TD.

Product Testing and Measurement - Do you need to evaluate conformity of manufactured products to dimensional and material specifications? The Quality Control Group of the Technical Division has an array of test and measurement systems for this purpose, including computer-controlled 3-D coordinate measurement machines, capable of making almost any conceivable mechanical or optical measurement. The group has hardness testers and inspection systems using ultrasonic, eddy current and magnetic induction techniques. The Quality Control Group also has a blanket order with an outside firm to do quick-turnaround chemical analysis and physical testing of samples.

Materials Testing - When it comes to special materials--polymer composites and adhesives, for example--and their properties, you may want to consult with the Materials Development Laboratory (MDL) in the Technical Division. This group has expertise in formulating special epoxy resins for everything from optical adhesives to cryogenic materials and the insulation of high power and superconducting coils. They can advise you in almost any area of plastic materials. They have a testing lab for tensile, compressive, impact, creep, cryogenic, optical and some electrical properties with environmental chambers and high- and low-temperature facilities. They have several TV-equipped microscopes, and metallographic sample preparation equipment.

Magnet Testing - The Magnet Test Facility at the Technical Division offers a unique facility for precision measurement of magnetic fields. This facility can test beam-line type magnets that can be transported to the testing area located in the IB1 building at the Industrial Area.

Facilities Engineering Support Section

Engineering - The Engineering Group (x-8640) of the Facilities Engineering Services Section (FESS) offers the services traditionally found in an architectural/engineering firm: architecture, civil and environmental engineering, structural engineering, mechanical and controls engineering, fire protection, electrical engineering, estimating and construction management. The Group sometimes uses task order contracts with commercial architectural/engineering firms to augment its own manpower. Project management for an experiment should arrange for services, such as preliminary engineering studies and reviews, from the Engineering Group. The Associate Director for Operations Support sets the priorities for conceptual and final design work, building modifications and new facilities.

Time and Material (T&M) Coordination - Installing experiments may require the services of construction tradesmen--riggers, iron workers, millwrights, carpenters, electricians, pipe fitters, HVAC workers, sheet metal workers, insulation and general construction laborers and heavy equipment operators. Project management for each experiment oversees T&M in the installation of experiments. FESS's Services Group coordinates the activity lab-wide.

Operations Requests - Operations, maintenance and repair of all electrical, mechanical and refrigeration equipment that supports experimental equipment, as well as all general site utilities, fall within the responsibilities of the FESS Operations Group. This does not include equipment used directly in experiments. The Operations Group is responsible for the 345 KV through 480 volt distribution system, industrial cooling water, deionized/low conductivity water, domestic water, natural gas, sanitary water, fire protection systems, master substation and the Central Utility Building operation and maintenance. FESS Operations also coordinates crane

inspections. Requests for services normally go through the Building Manager to Work Central (x-3434) where the craft shops coordinate the people, parts and custody requirements for work completion.

Exterior Building Maintenance - Exterior maintenance and repair of all Fermilab buildings, including carpentry, siding and windows fall within the responsibilities of the FESS Operations Group (x-3789). Leaking roofs and overhead door service are the responsibility of the Services Group within FESS (x-3824). Project management requests these services through the Building Manager.

Inside Building Maintenance - Cleaning and custodial services of all Fermilab buildings and some limited painting of Fermilab buildings come from the Services Group (x-3824) of FESS. The group also handles operations and interior modification and repair of Wilson Hall.

Care of Roads and Grounds - Roads, parking lots and hardstand maintenance and repair fall within the responsibilities of the Services Group (x-3303) whose staff also manage snow removal, traffic barricades, road signs, landscape care, wildlife care and nuisance animal control. This group also handles trash removal and propane gas distribution. Make requests for service through your Building Manager.

Staffing Your Experiment

On-Call Personnel - Researchers may requisition on-call personnel through the Fermilab Employment Office (x-5810). On-call employees fill short-term, temporary openings either full- or part-time and receive the following benefits: shift premium, overtime, social security and workers compensation. To obtain on-call assistance, complete a purchase requisition with experiment number, university, name of the Fermilab group to which assigned or where located, budget code, description of duties, skill requirements and expected length of assignment. Please see:

<http://wdrs.fnal.gov/employ/employinternal/index.html>

for the on-call requisition and a sample completed form. The requisition requires approval by the Division Head responsible for the experiment and the Laboratory Director. A personnel administrator from the Employment Office coordinates the employment process with the researcher. Once an individual is selected to fill the on-call position, the individual must attend a New Hire Orientation, which is held on most Monday mornings (Employment will schedule this during the hiring process). The on-call employee is responsible for turning in his or her time sheets to Payroll. On-call employees, like most other employees, receive direct deposit of their wages; paychecks are only very rarely issued.

Temporary Help and Contract Labor - A researcher may requisition temporary help or contract labor through the Business Services Contracts Department (x-3387). The

purchase requisition must include a description of the work to be done, skill requirements or special qualifications, dollar limits, period of employment and budget code and university information. The Contracts Department provides the researcher with resumes and arranges for interviews and background checks. After evaluation of resumes and interviews, the researcher notifies the Contracts Department of the selected candidate, along with a written summary of the evaluation criteria and rationale used in the selection or rejection of the individuals interviewed, and the date and time the individual will start work, the duty location, the name of the immediate supervisor, and any special reporting instructions.

A contract employee must complete an Agency Employee Registration form within three working days of assignment at Fermilab. The form should be sent to Fermilab Communication Center at Mail Station 101. For more information about temporary help or contract labor, call the Procurement Department (x-3521).

University Student Help. If university students are brought to Fermilab to help with or participate in an experiment, please remember the restrictions on people under 18 years of age. Please also see "Applying for a Fermilab Visitor ID Badge".

Shipments from Foreign Countries

Through the services of the U.S. Department of Energy and the U.S. Department of State, Fermilab will arrange for a U.S. Customs waiver, post a Temporary Importation Bond (T.I.B.), or pay import duties on materials shipped to the Laboratory from foreign countries. Getting a waiver takes a minimum of three weeks.

Besides following the general instructions, users shipping materials from foreign countries need to provide additional information, in advance, to the Traffic Department (x3470), either by telephone or letter: foreign consignor; foreign freight forwarder; waybill/airbill number and package identification number; date of shipment, port of entry, vessel name or aircraft flight number; arrival date; value of shipment for customs purposes; and a brief description of the equipment. Receipt of this information will enable the Laboratory to effect delivery of the equipment with least delay. The user must pay any storage charges incurred while the shipment is being cleared through Customs. In order to avoid Laboratory overhead costs, route inbound shipments on a freight prepaid basis and outbound shipments on a freight collect basis.

Chapter 10 – Planning for an Experiment or Test at Fermilab

The Fermilab Director, with the advice of the Physics Advisory Committee (PAC) and the Accelerator Advisory Committee (AAC), determines the experimental program and the facilities to be built within the available funding. The PAC normally consists of 14 members appointed by the Director for overlapping four-year terms. The AAC normally consists of 12 members with staggered two-year terms. The Director customarily seeks advice from the Users Executive Committee in selecting new PAC members.

The Program Planning Office, in consultation with the Director, coordinates the experimental physics program at the Laboratory, developing experimental schedules and establishing priorities among experiments.

Proposing an Experiment

Scientists who would like to carry out an experiment at Fermilab first submit a formal research proposal to the Laboratory Director. Although it is not a requirement, it often helps to discuss the proposal with Fermilab staff before making the formal submission. A list of proposals and links to them are available on the web at:

<http://lss.fnal.gov/archive/test-proposal/index.shtml>

Consideration of Proposals - In deciding whether or not to approve an experiment, the Director usually relies heavily on the recommendations of the PAC, which meets several times a year to consider proposals. During an open PAC session, the proponents, or scientists proposing an experiment, make an oral presentation to the PAC. After the presentation the PAC has a preliminary discussion of the proposal and the presentation. Afterward, the PAC may have questions or comments for the proponents, which are addressed either orally at that time or in written form for the next meeting.

At subsequent meetings the PAC considers all the material available regarding the proposal, including the responses to questions and impact statements prepared by Laboratory staff, before making a recommendation to the Director.

Deciding on Proposals - The Director makes a decision about the proposal on the basis of the PAC recommendation and other factors. The decision may result in approval, deferral, or rejection of the experimental proposal.

Approval - The Director may grant Stage I approval if the proposed physics goals are worthwhile, the experiment seems technically feasible, and the costs in Laboratory resources and running time of the experiment appear appropriate for the expected physics results. Experimenters need to recognize that Stage I approval does not represent a commitment of Laboratory resources, either in support for setting up the experiment or in running time. Rather, it helps Laboratory staff and experimenters in planning long-range projects.

After Stage I approval, the experimenters and the Laboratory carry out a careful technical design and cost study for the experiment, and prepare a first draft of the Memorandum Of Understanding (MOU), as described later in this chapter. If the PAC finds the results of this procedure acceptable, and the experiment fits into the overall priorities of the experimental program, the PAC recommends Stage II approval. In some cases, the Director grants full approval without the Stage I-II process.

Deferral - The Director may defer the decision on a proposal for a number of reasons; for example, a technical question may need clarification or the appropriate Fermilab facility may not be available within a reasonable time. In the case of deferral, the Director notifies the spokesperson in writing of this decision and the reasons for it, specifying the conditions to be met before reconsideration.

Rejection - The Director may reject a proposal. The Director notifies the spokesperson in writing of this decision and the reasons for it.

Withdrawal of a Proposal - The proposal may be withdrawn from consideration at the request of the spokesperson.

Withdrawal of Approval - The Director may withdraw approval if the conditions of the experiment's approval have changed sufficiently to warrant reconsideration. The Director will not withdraw approval without first discussing the situation with the experimenters and with the PAC.

Appeals - Proponents who wish to appeal a decision should send a written appeal to the Director. The Director may form an ad hoc committee to help in reviewing the proposal. The final decision on the appeal rests with the Director.

Proposing a Test at Fermilab

Detector R&D, calibration of a detector in a beam line, and other tests requiring less funding and support than an experiment also require a less formal consideration process. However, researchers must submit a written request to the Program Planning Office. In simple cases, this can be done in the form of a draft Memorandum of Understanding (MOU). The draft MOU or other form of request

will be circulated among relevant Divisions and Sections for consideration of technical, cost, and schedule feasibility. Sample MOU's are available on the web at:

http://www-ppd.fnal.gov/mtbf-w/MOU/mtbf_mou.htm

Expressions of Interest and Letters of Intent

A scientist may submit an Expression of Interest (EOI) or a Letter of Intent (LOI) describing a particular physics goal or measurement, without the details of a full proposal. However, it may or may not receive formal consideration. An EOI will normally identify a physics measurement and basic technique for which an experiment could be proposed. Similarly, an LOI will identify the physics measurement, but would have more details, and include information about the collaboration dedicated to developing a proposal. Neither an EOI nor LOI is required before a proposal is submitted.

Memorandum of Understanding

When the Director notifies the spokesperson that a proposal has been approved, the Laboratory asks the spokesperson to review the support required for the experiment with the Accelerator Division, Computing Division, Particle Physics Division, Technical Division, and the ES&H Section. Normally, the spokesperson prepares a draft memorandum of understanding, or MOU, for implementing the experiment, which is then reviewed by the various Divisions and ES&H.

In particular, the staff will review the draft MOU for feasibility of the experiment in terms of personnel, cost, accelerator impact and time scale. If the request for support in the MOU differs significantly from the proposal, or if the proposal cannot be implemented with the available resources of the Divisions in a reasonable time, the proposal goes back to the Director for reconsideration. When an acceptable MOU has been drafted, it goes to the Director for signature.

The MOU serves two important purposes. First, it helps the Laboratory assess the demands posed by approved experiments, including the adequacy of available funds and the scope of the experimental program. Second, after the Laboratory and users have negotiated and accepted the document, it serves as an understanding between Fermilab and the users through the planning and data-taking steps of the experiment. The MOU includes computing needs for data analysis and provision for the removal of the apparatus. The more specific the MOU, the fewer will be the misunderstandings that arise during the course of the experiment.

Sample MOU's are available on the web at:

http://www-ppd.fnal.gov/mtbf-w/MOU/mtbf_mou.htm

Drafting an MOU

The MOU draft needs to provide the following information:

Goals - Summary of the physics goals and techniques: The MOU includes a copy of a current one-page summary of the experiment, as an introduction to the MOU or as an appendix.

Personnel - A list of people who work on the experiment and their home institutions. The MOU clearly designates a scientific spokesperson or co-spokespeople for the experiment. The document shows any additional research commitments for each participating physicist listed. Where specific additional liaison personnel from the experiment or from the Laboratory will be needed or useful, these shall be identified in the MOU.

Support Required - The support required to implement the experiment support should be identified by the sources of support when it is known. When the source is unknown, the needed support should be identified, with the explicit statement that the source is not yet known.

Accelerator - Details of any beam requirements, such as energies, intensities, spill lengths, luminosity. The total beam desired to achieve the physics goals of the experiment must also be included. This latter item includes how much beam time the experiment needs, taking into consideration the time needed for setting up, testing, data-taking and dismantling of the experimental equipment. If the proposal's approval calls for a specific number of particles on target, the MOU should say so. This is called the duration of the run, and it influences planning; it must agree with the conditions of approval.

Equipment and Services - All major items and services needed for the experiment, clearly identifying which items Fermilab will provide and which will be provided by users. To facilitate review of the MOU, ordinarily the Laboratory list is separated into subgroups, one for each Division and Section that will make a contribution. As a rule, the Laboratory provides general purpose, reusable equipment for approved experiments, while users provide items unique to each experiment, or items that the group will keep after the experiment ends. The cost of each item should be shown in the right margin of the page.

The MOU includes estimates of construction costs of building special facilities for the experiment. It also includes estimates of major operating costs such as rigging, gases, computing and the like. The Laboratory may distinguish between operating and equipment costs in editing the MOU.

Computing needs, including networking and data storage needs, must be identified. A plan for analysis of the data must be specified.

Funding - A summary detailing what funds are available and in what fiscal year, including required incremental funds. The document should indicate sources of funding and give a rough breakdown of budgets.

The Laboratory normally adds administrative charges to user direct charges.

Experimental Planning Milestones - Experimental milestones in sequence, including tentative dates for beginning the installation and for beginning data-taking. If the experiment requires construction of major pieces of equipment, the MOU should specify dates for one or more stages of the design, procurement and construction process.

Computing - The MOU sets forth the allocation of computing resources to the experiment according to terms negotiated between the Computing Division and the experiment.

The experiment offline liaison and the Computing Division offline liaison (see Chapter Eight) negotiate the offline portion of the Computing Section of the MOU. To determine the computing resources required for data analysis, the experimenters describe plans for analyzing their data and the number of stages anticipated, from code development through production, stripping, final data analysis and Monte Carlo.

The MOU sets forth the Computing Division's support of experiments' online requirements. The Computing Division MOU coordinator, in collaboration with the Departments involved in experiment support, meets with the experimenters during the early stages of experiment planning to define the commitment of the Division to the experiment's online and data acquisition needs, among other things. For online needs, they consider:

- Software support needed for the experiment during the online life cycle stages of planning, commissioning, and running.
- The overall architecture of the data acquisition and online system.
- The computer system types, the attached peripherals and networking considerations.
- Front end instrumentation and data acquisition buses to be employed.
- Online and data acquisition software requirements.
- Hardware and software maintenance and support requirements.

The Computing Division then budgets for the above requirements and procures the necessary resources. Experimenters should make sure to allow enough time for procuring equipment before the expected turn-on dates, because no stock facilities exist for some devices and systems.

Special Considerations - This section describes any special operating conditions that may be required; e.g., test beam needs. For experiments performed within accelerator

enclosures, a protocol between the Accelerator Division and the experiment outlines the safe design, installation and operation of the experimental apparatus. It addresses requisite safety responsibilities, reviews and concerns.

ES&H - A spreadsheet of potential hazards and other special environment, safety and health considerations shall be attached as an Appendix.

MOUs need to be amended from time to time; in some cases, the spokesperson and the Laboratory completely rewrite them.

Spokespersons

The Laboratory needs to maintain clear, direct and consistent communication with each experiment at every stage from proposal to conclusion. The scientific spokesperson serves as the primary link between the Laboratory and the experiment. Thus, every group of experimenters at Fermilab must designate a scientific spokesperson; some experiments choose to designate co-spokespersons. Large experiments may also have Fermilab Managers who serve as Head of their respective experiment's Fermilab Department in the Particle Physics Division (PPD). The responsibilities of the spokesperson and/or the PPD Department Head for the scientific, technical and ES&H aspects of the experiment must be clarified in a Memorandum of Understanding (MOU) or Project Management Plan with the Laboratory. Members of the Laboratory staff often need to discuss an urgent matter with a responsible member of an experimental group concerning safety, scheduling or operation of an experiment. Each spokesperson of an experiment should identify its management structure along with a clear chain of command regarding who is to be contacted in various situations. This includes identifying a Project Manager, an Operations Manager, a Department Head, a Building Manager, or a Physicist-in-Charge, whom the Laboratory can contact quickly.

Responsibilities of Spokespersons or Their Explicitly Delegated Colleague:

- Serve as main contact for the Laboratory in all matters related to a proposal or experiment.
- Respond to questions and concerns during evaluation of a proposal for an experiment.
- Prepare a Memorandum of Understanding (MOU) in consultation with the host Division, and supervise preparations for an accepted experiment.
- Maintain a current list of experimenters in the group present at the Laboratory.
- Agree with the appropriate Division Head(s) upon the required level of staffing of the experiment during beam operation.
- Ensure that all members of the group have medical insurance valid while at Fermilab (normally done as part of the ID issuing process).
- Arrange and be responsible for on-site housing used by the group.

- Ensure that all members of the group have registered, have valid Fermilab ID cards and appropriate stockroom withdrawal authorization.
- Make financial arrangements for the experiment.
- Ensure that all members of an experiment understand and comply with Fermilab ES&H regulations. If any violation of the rules occurs, the spokesperson has the responsibility to take corrective action and prevent recurrence.
- Inform experimenters about specific hazards of the experiment and the training they require. Make sure that every member receives timely and appropriate ES&H training.
- Arrange for work space for the group.
- Establish computer accounts for the experiment and regularly review the experiment's computing needs.
- Obtain an Operational Readiness Clearance (ORC) or Readiness Permit before operating all, or any part of, the experiment's apparatus.
- Identify the deputy spokesperson, the physicist-in-charge, or other scientific leadership for the experiment.
- Report in writing annually any change in membership of the collaboration to the Program Planning Office.
- Submit copies of publications and Ph.D. theses.

Working with Accelerator and Particle Physics Divisions

For each experiment performed at Fermilab, either the Accelerator Division or the Particle Physics Division serves as the host Division for coordinating the needs of the experiment. Experimenters will work closely with one or both Divisions during all stages of their experiment including planning, design, and set-up of experiments. There are technical experts as well as technical facilities available for help. In addition, Building Managers are assigned to every building at Fermilab. Building Managers are responsible for ensuring compliance with all the relevant ES&H rules and codes. To accomplish this, they coordinate ES&H-related work in their buildings. Experimenters should work closely with Building Managers to make sure their work complies with ES&H standards.

Accelerator Division (AD) - The Accelerator Division operates and upgrades Fermilab accelerators and beamlines, providing particle accelerators for both fixed-target and colliding-beam experiments. The Accelerator Division Headquarters are located in the Cross Gallery (x-4468). The Associate Accelerator Division Head for Systems helps make the proposal impact statements required for all experiments. This person serves as initial point of contact between the Accelerator Division and the experimenters until the Accelerator Division appoints a liaison physicist.

Each Monday, at an All Experimenters' Meeting, there are presentations on short-range and long-range schedules of accelerator operations, a weekly summary of

accelerator performance, the status of all running experiments, and special reports on topics of interest to the research community. This meeting provides an opportunity for an open discussion of operations, problems and special considerations. Experimenters may contact the Main Control Room or the relevant Accelerator Division Run Coordinator directly for questions concerning accelerator operations or beam operations. Displays of the current accelerator status and beam-intensity distribution are available on closed-circuit TV and in an abbreviated format on the web.

Particle Physics Division (PPD) - The Particle Physics Division provides management and technical resources for the construction and operation of particle physics experiments. The Division Head serves as the initial point of contact for new experiments. The Division Office is located at Wilson Hall - 8 West (x-3200). Within PPD, large experiments have their own PPD Departments, while smaller experiments, or those in the very early stages of development, reside in the Experimental Physics Projects Department.

Safety Inspections - The Division conducts regular safety inspections of buildings and experiments.

Office Space - Office space for researchers is arranged through relevant Departments and the Particle Physics Division Office.

Engineering - Engineering and other technical specialists within the Particle Physics Division are available for general technical consultation and may participate in the necessary ES&H reviews required for the Operational Readiness Clearance or Operational Permit. Division technical support must be identified and approved in advance.

Detector Construction Facilities - The Particle Physics Division operates facilities to build experimental apparatus. Experimenters must identify and get prior approval for use of the technical resources they need.

Installation - The Particle Physics Division oversees the rigging, electricians and other trades to install experiments. Outside contractors often provide these services, collectively called "T & M" (for time and materials).

Survey and Alignment - To ensure accuracy in installation, experimenters designing apparatus should consult the Alignment Group during the design phase on the method of alignment, the required accuracy and the need for fiducial marks.

Operational Readiness Clearance - Each PPD experiment, including test beam studies, must obtain an ORC from PPD before operating all, or any part of, the experiment's apparatus. ORCs are also required during the test phase for partially complete systems. ORC is a sign-off checklist showing that various aspects of the experiment have undergone and passed an ES&H review by the Division, that the

experiment has provided all specified documentation, and that the Division and the spokesperson have jointly conducted a final ES&H walkthrough.

Scheduling of Experiments and Tests

The Office of Program Planning is responsible for coordinating and scheduling beams for experiments at Fermilab. The Office attempts to satisfy the needs of each experiment, consistent with guidance from the Laboratory Director and established priorities. Schedules appear on the web, linked from the web page of the Office:

http://www.fnal.gov/directorate/program_planning/index.html