Duffy Group: New staff/student Introduction
July 2009

1. Registration for synchrotron access

   This may take a long time for non-citizens.

   National synchrotron Light Source

   See:

   http://www.nsls.bnl.gov/users/access/

   Once you are registered, you can start to complete the necessary training courses:

   http://www.nsls.bnl.gov/users/access/training.asp

   Advanced Photon Source

   http://www.aps.anl.gov/Users/New/

   https://beam.aps.anl.gov/pls/apsweb/ufr_main_pkg.usr_start_page

2. Safety Classes at Princeton

A. General laboratory safety training. Everyone is required to take this course before working in a lab.

http://web.princeton.edu/sites/ehs/LabPage/training.htm

http://web.princeton.edu/sites/ehs/Training/index.htm#rs4

The calendar for lab safety training is here. Please register and attend one of these sessions ASAP.

http://web.princeton.edu/sites/ehs/Training/calendar.htm

B. Laser safety training course (for high powered lasers). This is required before you use any lasers in the lab.

http://web.princeton.edu/sites/ehs/Training/index.htm#cals9

C. Training for Researchers Using X-Ray Equipment. This is required before you use any xray equipment at Princeton

http://web.princeton.edu/sites/ehs/Training/index.htm#cals5

3. Support Personnel

Susan Taxson (111) -- Duffy group assistant
Sheryl Rickwell (110) -- Graduate secretary
Bob Koenigsmark (1st floor) -- Facilities and safety manager
George Rose (B-81) -- Departmental machinist
Brian Mohr (317) -- Computer system administrator
Laurie Wanat (1st floor) – Computer support
Contact Laurie and Brian at: it-support@princeton.edu

4. Seminars. The following seminars are of interest:

http://geoweb.princeton.edu/events.html
Geoscience Dept. seminar: Monday at 4 PM.
Solid Earth Brown Bag seminar: Friday at 12 PM
EGG Seminar, Thursday at 12:30 PM

PRISM (Materials science): Wed at 12 PM (lunch at 11:30!)

You are expected to attend the Monday 4 PM and Friday 12 PM seminars!

5. Stock rooms

Princeton University has several stockrooms where you can purchase basic lab supplies. These are located in Physics, Chemistry, and Molecular Biology. An account number is needed.

http://web.princeton.edu/sites/TreasurersOffice/Purchasing/deptstockroomsproject.html

6. Library resources:

Web of Science -- for searching the scientific literature:

http://apps.isiknowledge.com/WOS_GeneralSearch_input.do?product=WOS&search_mode=GeneralSearch&SID=3C4GE98koP1dDJdGCKe&preferencesSaved=

On-line journals at Princeton University:
http://lib-terminal.princeton.edu/ejournals/by_title_zd.asp

7. Travel

--Only Avis or Hertz can be used for car rental. Use Princeton corporate code and decline any additional insurance.

-- If you are <25 years old, it is still possible to get approval to rent cars. Not sure who

-Travel reimbursement form:
http://geoweb.princeton.edu/policies/EmployeeTravelVoucher.pdf

-Send me a copy of any Travel reimbursement submitted.

- Duffy group policy is to limit meal reimbursement to $25 or less per day.

8. Keys

See Bob Koenigsmark for keys. You will need three keys: 1) office (ZBA) , 2) lab (Guyot B-61) 3) building

9. Computer/email access

http://web.princeton.edu/sites/oit/staffservices.htm

10. For other forms and info on geosciences policies, see the Dept. web page:

http://geoweb.princeton.edu/policies/procedures/index.html

http://geoweb.princeton.edu/

11. Computer programs to get or become familiar with

IGOR Pro
Data thief
Origin

Brief outline of 1st 2 years for graduate students

1st year

1. Complete ~5-6 classes in 1st year
2. Complete DAC benchmarks
3. First year report (written – 10-15 pages) and presentation in ~ April.
4 If foreign, must take English proficiency test in May. If fail, intensive summer program required.

2nd year

1. Fall: decide on generals topic and committee.
2. Complete remaining coursework
3. Serve as AI
4. in Mid-October, give final presentation on 1st year report
5. May: Generals

Recommended papers providing general background on *technical details* of research instruments used in the Duffy group. (For the latest scientific results -- see my webpage for papers from the group).

1. General diamond cell techniques

A.P. Jephcoat, H.-K. Mao & P.M. Bell, Operation of the Megabar Diamond-Anvil Cell, *Hydrothermal Experimental Techniques*, Wiley-Interscience, 1987. (This is in the geosciences library).

Miletich R., Allan D.R., Kuhs W.F.
High-pressure single-crystal techniques.
In Hazen RM (ed) "High-Temperature and High-Pressure Crystal Chemistry",
Reviews in Mineralogy and Geochemistry, 41 (2001) 445-520

M. Eremets, High Pressure Experimental Techniques (a copy of this book is in the lab).

2. Raman system

A. F. Goncharov, V. V. Struzhkin, R. J. Hemley, H. K. Mao, and Z. Liu, "New techniques for optical spectroscopy at ultrahigh pressures", *Proceedings of the AIRAPT-17, International Conference on High Pressure Science and Technology* Honolulu Hawaii, July 25-30, 1999.

F. Laplant and D. Ben-Amotz, Design and construction of a microscope-based Raman system, Rev. Sci. Instrum., 66, p. 3537, 1995.

3. Synchrotron XRD and laser heating

Guoyin Shen, Mark L. Rivers, Yanbin Wang, and Stephen R. Sutton
Laser heated diamond cell system at the Advanced Photon Source for *in situ* x-ray measurements at high pressure and temperature
Review of Scientific Instruments Vol 72(2) pp. 1273-1282. February 2001

B Buras and L Gerward, Application of x-ray energy dispersive diffraction for characterization of materials under high pressure, Prog. Cryst. Growth and Character., 18, 93-138, 1989.

4. Brillouin scattering

SM Lindsay, MW Anderson, JR Sandercock, Construction and alignment of a high-performance multipass vernier tandem Fabry Perot interferometer, Rev. Sci. Instru. 52 (10): 1478-1486 1981