A Plan for post-doc workshops for career development

Cynthia J. Jameson, University of Illinois at Chicago

Preparing for an academic career in science and engineering begins very early, some might say as early as pre-kindergarten. At the university level, graduate students and post-doctoral students do not necessarily receive from their research adviser the mentoring they need to adequately prepare them for an academic career. Buried within the 500-page document describing the *America COMPETES (Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science) Act of 2007* is a 15-line provision (section 7008) that requires National Science Foundation applicants to describe how they will mentor their postdocs. Excerpt from the America COMPETES Act:

"SEC. 7008. POSTDOCTORAL RESEARCH FELLOWS.
(a) Mentoring- The Director shall require that all grant applications that include funding to support postdoctoral researchers include a description of the mentoring activities that will be provided for such individuals, and shall ensure that this part of the application is evaluated under the Foundation's broader impacts merit review criterion. Mentoring activities may include career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics.
(b) Reports- The Director shall require that annual reports and the final report for research grants that include funding to support postdoctoral researchers include a description of the mentoring activities provided to such researchers."

Including "career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics" is suggested in the Act. Such training can also be useful for graduate students preparing for entry into postdoctoral positions and for providing support and career development for junior faculty within the institution. The following plan which I prepared for the UIC Post-Doc Institute may serve as a starting point for a customized plan for an institution.

The Post-Doc Institute Monthly Training Sessions

When	Topic	Sources	Mode
Oct. 2007 1	Setting goals and objectives: utilizing an Individual Career Development Plan (ICDP), expectations for the 2-yr period, making use of UIC resources, maximizing your WISEST fellowship, making a successful transition to the next career stage Balancing personal and professional life: time management skills, setting priorities, learning to say no, family and partner considerations during the job search/tenure process, using family-friendly policies without fear	*Individual Development Plan for Postdoctoral Fellows* [1] (i) Chap 6 in *Making the Right Moves* [2] (ii) *Balancing Parenthood and Academia*[3]	Panel discussion: Profs Mary Ashley, Olga Barannikova, Tanya Berger-Wolf, Mitra Dutta, Dr. Roser Matamala-Paradeda (Argonne) moderator: Linda Siebert
Nov. 2007	Research integrity and data management: the social foundations of science, experimental techniques and the treatment of data, values in science, conflicts of interest, publication and	(i) *On Being A Scientist: Responsible Conduct In Research* [4] (ii) *Guidelines For*	Prof. Brenda Russell

2	openness, the allocation of credit, authorship practices, error and negligence in science, misconduct in science, responding to violations of ethical standards, the scientist in society, Data management: day-to-day record-keeping, the lab notebook, tracking and storing information, finding the right data management system for you Managing your research project: getting started, developing a timeline, tracking the work and the resources, keeping your work on track	*Responsible Conduct Of Research* [5] (iii) Chap 8 in *Making the Right Moves* Chap 7 in *Making the Right Moves*	Prof. Brian Kay
Dec. 2007 3	Getting the mentoring you need and finding networking opportunities: what a mentor can do for you. Cultivating/developing your "sponsors" Setting up collaborations: the varieties of collaborations, should you collaborate? setting up a collaboration, the ingredients of a successful collaboration, special challenges for a beginning investigator, when a collaboration is not working	(i) p.106-7 in *Making the Right Moves* (ii) *Do I Need a Mentor? A Practical Guide* [6] (iii) *Giving and Getting Career Advice* [7] Chap 12 in *Making the Right Moves*	Prof. Isabel Cruz Prof. Emerita Cynthia Jameson Dean Christopher Comer
Jan. 2008 4	The job search: finding the right match (Research I, small liberal arts college, etc.), cultivating leads, preparing for the job search by knowing the hiring process from the other side. Assignment: Select a manuscript you need to write, have begun to write, or one that is languishing for some reason. Prepare a draft of a manuscript for a journal, and submit it to Post-doc Institute prior to Mar 2008 session.	(i) p. 5-8 in *Making the Right Moves* (ii) Finding Job Announcements [8] (iii) Finding a Job in Academia [9] (iv) The Job Search Process-Berkeley Career Center[10] (v) Job Search Process-UIUC Career Services [11]	Prof.Anne Houde (Lake Forest College) Dr. Monica Regalbuto (Argonne) Prof. Emerita Cynthia Jameson
Feb. 2008 5	Getting funded: finding grant/funding opportunities, understanding the funding process in various agencies (NIH, NSF, DOE, DOD, private foundations), planning a research program, preparing a strong grant application, a bit about budgets, common mistakes to avoid, submitting your application Panel discussion: An overview of the funding process at NSF, NIH and other agencies. Assignment: Identify at least 3 target RFP/ agencies. Select one; draft a proposal; submit to The Post-doc Inst. prior to Apr 2008 session	(i) Chap 9 in *Making the Right Moves* (ii)*How Not to Kill a Grant*[12] (iii)*The NIH R01 Tool Kit* [13] (iv) *Proposal preparation NSF* [14] (v) *Ten Commandments of Private Foundations Grant Proposals* [15] (vi) Roster of NIH Study Sections [16] (vii) Guide to Grants for Young Investigators[17]	Prof. John R. Regalbuto, NSF Prof. Leslie Fung, formerly NIH Study Section BBCB Prof. Michael Stroscio formerly program manager DOE, AFOSR and advisory board for DARPA, DoD
Mar. 2008	Getting published and increasing your visibility: A brief overview of scientific publishing, planning for publication, getting your paper published, increasing your visibility. Review of manuscripts: How to respond to reviewer comments. Your manuscript in preparation (started in January) should have been submitted to Linda Rapoport earlier: Feb. 11 title and abstract so that	Chap 10 in *Making the Right Moves*	Prof. Mary Lou Soffa (U Virginia) Prof. Lynn Walter (U Michigan) Referees reviews will be discussed one-on-one by Prof.

6	appropriate reviewers can be found and the complete manuscript by Mar. 3 so that reviewers can have time to review. Referees reviews will be discussed one-on-one with each author with suggestions on how to respond (how to revise accordingly and cover letter to editor to accompany revisions).		Mary Ashley and others
Apr. 2008 7	Getting funded, continued: the review process, making use of peer-review comments. Your proposal (started in Feb) should have been submitted before this session so that written ad hoc reviews can be obtained prior to panel review. Format: we solicit expert written reviews and panel reviews prior to this session. The panelists discuss each proposal in turn with the post-docs.	(i) *An Insider's View of the NIH Review Process* [18] (ii) *Grant reviews at the NSF* [19] (iii) Review process other agencies[20] (iv) *Learning from Reviewers Comments*	Dean Christopher M. Comer Prof. Robert Paul Malchow Prof. Sohail Murad
May 2008 8	Preparing an application package: the CV, the cover letter, the research statement/proposal. We will provide successful examples of a cover letter, CV, research statement, as well as examples of unsuccessful application packages. We will also provide application package requirements for small colleges. Developing a teaching philosophy, writing a teaching statement, <u>Assignment:</u> Identify several recent job postings that suit you. Select one, prepare a first draft application package, submit to Post-doc Institute before June 2008 session.	(i) p. 8-11 in *Making the Right Moves* (ii) The Cover Letter, The CV -Berkeley Career Center [21] (iii) Writing a Research Plan [22] (iv) Teaching Philosophy ACS and other sources [23]	Prof. Emerita Cynthia J. Jameson
Jun. 2008 9	Preparing an application package, continued: Post-doc's first draft application package in hand. One-on-one session Post-doc with advisor for 30 min. on this stage of independent career development plan. Based on strengths and previous experience, finding a suitable niche, positioning oneself in the faculty job market. Based on this discussion, critique of first draft application package: cover letter, CV, research plan, teaching statement. If not applying this year, discuss milestones for an enhanced CV in another 12 months. <u>Assignment:</u> Submit improved application package for review prior to July 2008 session		Research advisors: working session + discussion Advisors progress report to WISEST PI and Director
Jul. 2008	Preparing an application package, continued: Fine-tuning the application package. Mock search committee members review the application packages and provide suggestions toward a competitive application package, addressing (a) substantive content changes and (b) improved packaging. General discussion on common mistakes and the elements of a compelling application package.		Mock search committee members: Prof. Carol A. Stein, Prof. Mary Ashley, Prof. Isabel F. Cruz, Prof. Mitra Dutta

10	Discuss in general what is a search committee looking for in an application package to assign it to the "yes or maybe" pile. What attributes of an application package leads to it being assigned to the "no" pile. Assignment: Making use of feedback, put finishing touches on application package, ready to mail out by Aug. 2008. Or else, insert "to do" additions to the CV (particularly manuscripts to be prepared, abstracts to be submitted to conferences), and revise to strengthen the research statement.		
Aug. 2008 11	Obtaining and negotiating a faculty position: the job interview, negotiating your first faculty position, issues to address, common mistakes to avoid. From a search committee member's perspective, Prof. Martin Newcomb will discuss how to prepare for the campus interview. Prof. Nelson, who has hired 10 CS faculty members, will identify critical issues and parameters, as well as strategies for a smooth and thorough set of negotiations. Assignment: Prepare a 20 min job interview style proposal talk for the Sept. 2008 session	(i) Chap 1 in *Making the Right Moves* (ii) The Job Talk [24]	Martin Newcomb, LAS Distinguished Professor Peter C. Nelson, Interim Dean College of Engineering
Sept. 2008 12	Proposal presentations Year I: "the chalk talk" 20-min proposal talks by participants on their research plan (job interview style) addressed to mock interviewers who will act as members of the search committee and other faculty in the hiring department. Feedback and general discussion on how to improve. Assignment: Prepare a 15 min departmental seminar style PowerPoint presentation for the Nov. 2008 session	The Job Talk	panel of interviewers: Prof. David Featherstone, Prof. John Leonard, Prof. Dennis Nyberg, Prof. Roy Plotnick, Prof. Jennifer Schmidt Moderator: Prof. Emerita C. J. Jameson
Oct. 2008 13	The workshop consists of a 30-min mock job interview one-on-one with a senior professor of the hiring department. The professor is interested in finding out if the candidate's future research plan is innovative, well articulated, sound, and fundable. Bring your written research statement and be prepared to explain your research plan. By the way, the professor is a former NSF program officer. **Assignment:** Write a full research proposal targeted to an RFP/agency with a deadline of 12 weeks ahead or longer. Prepare first draft, except for the budget, to bring to Dec. session. This is not a drill; this is expected to be later finalized into a real submitted proposal.	How to describe a research program [25] Writing a Research Plan	interviewer Prof. R. Paul Malchow
Nov. 2008	Research presentation skills: strategies for engaging your audience, pitfalls to avoid, communicating complex ideas to an audience with	(i) books by E. R. Tufte [26]	audience: faculty and graduate students of

14	a range of expertise, creating visual communications with graphical impact, the importance of practice and critical feedback (self-study) Research presentations Year I: 50-min talks by participants on their completed work to a "departmental" audience (not only experts), each followed by critical feedback from audience ca. 15 min.	(ii) *Making Presentations* [27]	Department of Biological Sciences, WISEST facilitators, other STEM post-docs
Dec. 2008 15	The Anatomy of a standard single investigator NSF proposal. Writing an NSF CAREER proposal. How is it different from a standard NSF proposal? Budgets, timelines, etc. for an agency-targeted proposal Bring the draft of your full proposal for review at this session. You will be helped to prepare a budget for it.	(i) The Art of Grantsmanship, Jacob Kraicer [28] (ii) NSF GPG [29] (iii) previous NSF workshops on proposal preparation [30] (iv) NSF Outreach [31]	Cynthia J. Jameson, Professor Emerita Amneh Kiswani Asst. Director Pre-Award, Office of Research Services
Mar. 2009 16	Managing a single investigator science lab Getting started, developing a lab budget. Staffing your laboratory. Planning for tenure: Career planning timeline.	*At the Bench. A Laboratory Navigator* [32] Chap 4 in *Making the Right Moves* other sources for managing your lab I [33] other sources for getting started, managing your lab I	Cynthia J. Jameson, Professor Emerita
Mar 2009 17	Leadership: your role as a laboratory leader, creating your vision as a leader, developing your leadership style, building and sustaining an effective team, conflict resolution, providing critical feedback, improving your interpersonal communication skills Avoid these management mistakes (Barker): 1. Some PIs ignore tenure requirements for several years in order to get research under their belt--and then they have to scramble. 2. Some PIs let the lab assume its own shape and style. 3. Some PIs assume all people they hire will be motivated and competent. 4. Some PIs refuse to intervene in lab conflicts. 5. Some PIs don't adapt to their ever-evolving lab	Chap 3 in *Making the Right Moves* *At the Helm. A Laboratory Navigator* [34] other sources for managing your lab II [35]	Cynthia J. Jameson, Professor Emerita
TBA 2009 18	The Educational Plan portion of an NSF CAREER proposal. Assessment Plan What constitutes an assessment plan Bring the draft of your Project Summary for an NSF CAREER proposal. Make sure it conforms to the NSF guidelines. We will critique each one in turn. Assignment: Prepare a complete version of your NSF CAREER proposal. Use the checklist from Dec 2008 to satisfy the NSF guidelines. Keep working on it until the final refinement before Aug.	Educational component [36] Assessment in educational programs [37]	Prof. Emerita C. J. Jameson Prof. Donald Wink Reviewers of Project Summary for NSF CAREER proposals

	2009 session		
TBA 2009 19	Teaching: becoming an effective teacher, planning to teach a course, assessing student learning. Gender bias in student evaluations "Student Evaluations and Gendered Expectations: What We Can"t Count Can Hurt Us"	(i) Chap 13 in *Making the Right Moves* (ii) R. Boice *The new faculty member* [38] (iii) NAGT Workshops[39] (iv) other sources[40] (v) *Bias, The Brain, And Student Evaluations Of Teaching* [41] (vi) *Student Evaluations and Gendered Expectations*[42]	Cynthia J. Jameson, Professor Emerita Prof. Joey Sprague Univ. of Kansas
TBA 2009 20	Becoming a mentor: what is mentoring? a mentor's responsibilities, strategies for effective mentoring in your lab, different mentoring needs, mentoring individuals outside your lab	(i) Chap 5 in *Making the Right Moves* (ii) *Entering Mentoring* [43] (iii) Workshop on Mentoring[44] (iv) *Mentoring support: National and local resources for mentoring* [45](v) How to Mentor Graduate Students[46](vi) Compact between Grad student and Faculty advisor[47]	Cynthia J. Jameson, Professor Emerita
TBA 2009 21	Finding your research community, cultivating a national/international reputation within it, responsibilities beyond the laboratory, the scientific investigator and the outside world, people you should get to know (cultivating allies/support) Awards and honors	Tips on increasing your visibility raiseproject.org website[48] Always be ready to be nominated for an award	Cynthia J. Jameson, Professor Emerita
TBA 2009 22	Gender and culture issues and dynamics in academe: bias in the workplace, responding to subtle and overt forms of discrimination, building a network of support, lessons learned in WISEST seminars Building institutional support people you should get to know within the university (cultivating allies/support), faculty governing bodies and committees, support facilities and services	(i) sources for gender and culture issues in academe[49] (ii) sources for building institutional support[50]	viewing of Virginia Valian lecture DVD "Why So Slow?" Cynthia J. Jameson, Professor Emerita
TBA 2009 23	Time management Dual career issues	(i) Chap 6 in *Making the Right Moves* (ii) other sources on time management [51] (ii) Time management tips (iii) sources on dual career issues[52] (iv) When to reveal two-body problem?	Cynthia J. Jameson, Professor Emerita
TBA 2009	Final Progress report. Fill out final progress report_form.doc and submit prior to this meeting.		Cynthia J. Jameson, Professor Emerita Linda Siebert

24			post-doc advisers: Prof. Ludwig C. Nitsche, Prof. Lewis E. Wedgewood, Prof. David H. Wise, Prof. Miquel Gonzalez-Meler, Prof. Joel S. Brown, Prof. Mary Ashley, Prof. Neil C. Sturchio

Reviewers and panel members:
UIC profs in the general research areas of the post-docs who are not members of their mentoring team
UIC profs who have extensive funding agency experience, e.g., former and present NIH study section members; NSF prog. officers, grant panelists

Guide to setting up the training/panel sessions:
Training Scientists to Make the Right Moves, Burroughs Wellcome Fund and Howard Hughes Medical Institute, available on-line as a pdf to download at
http://www.hhmi.org/resources/labmanagement/training.html

Sources:

---

[1] Sources for developing an ICDP:
Federation of American Societies for Experimental Biology (FASEB)'s Science Policy Committee: *Individual Development Plan for Postdoctoral Fellows*:
http://opa.faseb.org/pdf/idp.pdf

Scripps Research Institute *IDP for Postdoctoral research associates*:
http://www.scripps.edu/services/postdocs/newpostdocs/IDP.pdf

[2] *Making the Right Moves. A Practical Guide to Scientific Management for Postdocs and New Faculty*, Second Edition, Burroughs Wellcome Fund, Howard Hughes Medical Institute, available on line at
http://www.hhmi.org/labmanagement /moves.html

[3] *Balancing Parenthood and Academia: Work/Family Stress as Influenced by Gender and Tenure Status,* Elizabeth M. O'Laughlin and Lisa G. Bischoff, Journal of Family Issues, 2005, 26, 79-106. On-line at http://jfi.sagepub.com/cgi/content/abstract/26/1/79

[4] *On Being A Scientist: Responsible Conduct In Research*, National Academy Press, 1995, available on line at http://www.nap.edu/readingroom/books/obas/

[5] *Guidelines For Responsible Conduct Of Research,* Office of Research Integrity, University of Pittsburgh, January 2007, available on line at http://www.pitt.edu/~provost/ethresearch.html

[6] Do I need a mentor? Virginia Commonwealth University Medical College:
http://www.medschool.vcu.edu/ofid/facdev/facultymentoringguide/suggmentee.html
A Practical guide to Getting Mentored
www.asktheheadhunter.com/hamentor.htm

[7] Giving and Getting Career Advice, U Michigan ADVANCE:
http://www.umich.edu/~advproj/career%20advising.pdf

[8] Academic Job Search
Finding Job Announcements - Berkeley Career Center
http://career.berkeley.edu/PhDs/PhDJobs.stm

[9]UBC: Finding a job in academia:
www.med.ubc.ca/__shared/assets/Finding_a_Job__academia_1676.ppt
http://www.grad.ubc.ca/gradpd/guides/academic.html

[10] The Job Search Process - Berkeley Career Center
http://career.berkeley.edu/PhDs/PhDAcademic.stm
complete: The Job Search Process
- The Hiring Process from the Other Side
- Nuts and Bolts:
  - Finding Job Announcements
  - The CV
  - The Cover Letter
  - Letters of Recommendation
  - Teaching Portfolio
  - Interviewing
  - Negotiating the Offer
- Your Career Trajectory: The Transition from Grad Student to Assistant Professor

In order to be adequately prepared, you should know what the hiring process is:
The Hiring Process from the Other Side
http://career.berkeley.edu/PhDs/PhDhiring.stm

[11] U of Illinois Urbana-Champaign Career Services Office
http://www.grad.uiuc.edu/careerservices/academic/
also has a complete set:
- Job Search Process
- Writing CVs
- Cover Letters
- Research and Teaching Statements
- Interviews
- Offers

[12] *How Not to Kill a Grant Application*
A series of articles from the archives of ScienceCareers, AAAS
Part 1: Murder Most Foul: How Not to Kill a Grant Application
http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2000_01_07/noDOI.10400866310227203536

Part 2: Abstract Killers: How Not to Kill a Grant Application, Part Two
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0280/abstract_killers_how_not_to_kill_a_grant_application_part_two/

Part 3: So What?: How Not to Kill a Grant Application, Part Three
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0350/so_what_how_not_to_kill_a_grant_application_part_three/

Part 4: Lost at Sea: How Not to Kill a Grant Application, Part Four
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0350/lost_at_sea_how_not_to_kill_a_grant_application_part_four/

Part 5: How Not to Kill a Grant Application, Part Five: The Facts of the Case Thus Far
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0490/how_not_to_kill_a_grant_application_part_five_the_facts_of_the_case_thus_far/

Part 6: How Not to Kill a Grant Application, Part 6: Developing Your Research Plan
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0560/how_not_to_kill_a_grant_application_part_6_developing_your_research_plan/

[13] *The NIH R01 Tool Kit*
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2007_07_27/caredit_a0700106

[14] *Proposal preparation NSF*
Proposal and Award Policies and Procedures (PAPP) Guide
Includes proposal preparation instructions for National Science Foundation:
http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/nsf081.pdf

NSF home:
http://www.nsf.gov/index.jsp

[15] *Ten Commandments of Private Foundations Grant Proposals*
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0350/ten_commandments_of_private_foundation_grant_proposals

[16] Roster of NIH Study Sections
http://www.csr.nih.gov/Roster_proto/sectionI.asp

[17] In addition there is a searchable funding directory in ScienceCareers (GrantsNet)
http://sciencecareers.sciencemag.org/funding

[18] *An Insider's View of the NIH Review Process* Tough Choice #1: Which Study Section?
Tough Choice #2: Which Institute?
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0210/grant_reviews_part_three_an_insider_s_view_of_the_nih_review_process

[19] *Grant reviews at the NSF*
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0210/grant_reviews_part_four_federal_review_the_nsf
NSF Grant Proposal Guide section on NSF Proposal Processing and Review:
http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_3.jsp
Merit Review at NSF:
http://www.nsf.gov/bfa/dias/policy/meritreview/

[20] The Texas A&M University Office of Proposal Development has a comprehensive summary list of the review process by agency. The links are at:
http://opd.tamu.edu/proposal-resources/understanding-the-proposal-review-process-by-agency

[21] Berkeley Career Center - The cover letter
http://career.berkeley.edu/PhDs/PhDcover.stm

UIUC Career Services Office - Cover letters
http://www.grad.uiuc.edu/careerservices/academic/coverletters/

Berkeley Career Center - The CV
http://career.berkeley.edu/PhDs/PhDCV.stm

UIUC Career Services Office - Writing CVs
http://www.grad.uiuc.edu/careerservices/academic/cvs/

[22] *Writing a Research Plan* for the application package, ScienceCareers.org:
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/1820/writing_a_research_plan

[23] Sources for developing a teaching philosophy and writing a teaching philosophy statement for an academic job application:
ACS: *How to write a Teaching Philosophy for Academic Employment*
http://www.chemistry.org/portal/resources/ACS/ACSContent/careers/empres/careers_academicnews.pdf
OSU: *Developing a teaching portfolio and writing a teaching philosophy statement*:
http://ftad.osu.edu/portfolio/philosophy/Philosophy.html
http://ftad.osu.edu/portfolio/philosophy/Phil_guidance.html
CMU: Quick Tips: Developing Your Teaching Philosophy:
http://www.cmu.edu/teaching/resources/developphilosophy.html
Iowa State U: *Questions to address in writing a teaching philosophy statement*:
http://www.celt.iastate.edu/teaching/philosophy.html

WU: *Writing a teaching philosophy statement for the academic job market*:
http://artsci.wustl.edu/~teachcen/Teaching-assistants/Writing%20a%20Teaching%20Philosophy%20Statement1.pdf

[24] *The Job Talk* for the interview, ScienceCareers.org
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/3360/academic_scientists_at_work_the_job_talk

[25] How to describe a research program, Cynthia J. Jameson

[26] Books by Edward R. Tufte (Professor Emeritus at Yale University, where he taught courses in statistical evidence, information design, and interface design), Graphics Press:
The Visual Display of Quantitative Information, about how to display data for precise, effective, quick analysis,
Envisioning Information, provides practical advice about how to explain complex material by visual means,
Visual Explanations: Images and Quantities, Evidence and Narrative, about the representation of mechanism and motion, process and dynamics, causes and effects, explanation and narrative.
About the books, see http://www.edwardtufte.com/tufte/books_vdqi

[27] Sources for making presentations:
Making Presentations: a Checklist (from U. Colorado Health Sciences Center)
http://www.uchsc.edu/CIS/MkgPresntsChkList.html
Making effective Oral Presentations (from Northeastern University College of Business Administration Prof. Edward G. Wertheim)
http://web.cba.neu.edu/~ewertheim/skills/oral.htm
Designing Presentation Visuals (from Pacific Lutheran University Media Services)
http://www.plu.edu/libr/media/designing_visuals.html
Oral Presentations Self Checklist.pdf, Cynthia J. Jameson

[28] The Art of Grantsmanship, Jacob Kraicer http://www.hfsp.org/how/ArtOfGrants.htm

[29] NSF Grant Proposal Guide: http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_index.jsp
pdf version: http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg081print.pdf

[30] NSF workshops on proposal preparation given by current or former NSF Program Officers
NSF Workshop proposal review and preparation:
http://www.ipsr.ku.edu/grantsup/NSFWorkshop/NagelPPT.pdf
NSF Proposal preparation highlights:
http://researchdev.wustl.edu/Proposalprepst.louis07.ppt
How to get NSF funding: a view from the inside: Parker: http://www.wwu.edu/depts/rsp/insideview.pdf

NSF Merit Review Process and Research Proposal Preparation by Khosla:
http://www.research.msstate.edu/information/nsf/proposal.ppt
NSF-HSI Workshop on Proposal preparation
http://www.yorkmedia.com/nsf/The%20NSF%20Proposal%20Preperation%20Process.ppt
Proposal prep merit rev process:
http://www.first2.org/national_meeting/presentations/Poston1.ppt
http://www.utdallas.edu/research/sp/documents/nsf/NSF_Proposal_and_Merit_Review.pdf
http://www.maineidea.net/Resources/NSF_Proposal_Submission_and_Review.pdf

[31] NSF maintains an outreach activities website http://www.nsf.gov/bfa/dias/policy/outreach.jsp that makes available the materials (presentations) used by NSF program officers in recent regional grants conferences or workshops. This is an excellent source of advice on NSF grants and proposal writing. The list below gives an indication of what is available as of Dec. 11, 2008. You will find the comprehensive NSF presentations useful for future reference, although most of them are not immediately useful at this time.

Presentations from Recent Events:

NSF Update - Fall 2008

NSF Regional Grants Conference hosted by the University of Nebraska - Lincoln - October 20-21, 2008

- Introduction and NSF Overview
- Proposal Preparation
- NSF Merit Review Process
- Award Management
- Challenges, Opportunities and New Directions
- Crosscutting and Special Interest Programs
- Office of International Science and Engineering
- Transformative Research
- Office of the Inspector General
- Breakout Sessions:
  - Proposal and Award Policy Update
  - Social, Behavioral and Economic Sciences
  - Compliance Issues
  - Mathematical and Physical Sciences
  - Geosciences
  - Office of Integrative Activities: MRI & STC
  - Education and Human Resources
  - Engineering
  - Faculty Early Career Development (CAREER) Program
  - Federal Financial Report Process

NSF Workshops for Hispanic Serving Institutions - Spring 2007

- Introduction and NSF Overview

Proposal Preparation
NSF Merit Review Process
Award Management
Electronic Systems: FastLane & Grants.gov
Business Assistance

[32] Barker, Kathy. *At the Bench: A Laboratory Navigator*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2005.

[33] Other sources for managing your lab I:
Lab Management Articles:
Haynes, Laura et al. Lab Management: Insights for the New Investigator. *Nature Immunology*. September 2006.
Huey, Kimberley Starting a New Lab: How to Develop a Budget and Buy Equipment
Portny, Stanley E., and Jim Austin. Project Management for Scientists. ScienceCareers.org (July 12, 2002).
Lab Management Books
Feibelman, Peter J. *A Ph.D. is Not Enough: A Guide to Survival in Science*. New York, NY: Perseus Books Group, 1994.
Harmening, Denise M. *Laboratory Management: Principles and Processes.* Upper Saddle River, NJ: Prentice Hall, 2002.
Lucas, Christopher J., and Murry, John W., Jr. *New Faculty: A Practical Guide for Academic Beginners*. New York, NY: Palgrave MacMillan, 2002.
Menges, Robert J., and associates. *Faculty in New Jobs: A Guide to Settling in, Becoming Established, and Building Institutional Support*. San Francisco, CA: Jossey-Bass, 1999.

[34] *At the Helm --A Laboratory Navigator* by Kathy Barker, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York, 2002. 362 pp. ISBN 0-87969-583-8. This book aims to help young scientists raise their scientific productivity by providing them an easily absorbed short course on management in the context of the single-investigator science laboratory, including adapting work styles to changes in personal circumstances, such as getting married or having children.

[35] Other sources for managing your lab II:
Barker, Kathy. At the Helm: Avoiding Management Mistakes. ScienceCareers.org (July 25, 2003).
Cohen, Carl M., and Suzanne L. Cohen Lab Dynamics: Sciences at the Balcony. ScienceCareers.org (September 2, 2005).
Dolgin, Elie. Management for Beginners. *The Scientist.* July 2008.
Grens, Kerry. Dealing with Conflict. *The Scientist.* February 2007.
Levine, Irene S. Mind Matters: Managing Conflict in the Lab.ScienceCareers.org (September 23, 2005).
Marshall, Hilary. Lab Rage: Dealing with Personality Conflicts. ScienceCareers.org (June 30, 2000).
Cohen, Carl M., and Suzanne L. Cohen. *Lab Dynamics: Management Skills for Scientists*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2005.

[36] NSF Career Award Workshop Educational Component
http://orsp.rutgers.edu/downloads/Presentations/2007/NSF/2.%20Dr.%20Monica%20Devanas.pdf

[37] Designing and Implementing Meaningful, Outcomes Focused. Assessment in ERC Education and Outreach Programs. December 3-5 2008. NSF ERC Meeting
http://www.erc-assoc.org/annmtg/2008_meeting_files/education_raghusa.pdf

[38] R. Boice, *The new faculty member*, San Francisco: Jossey-Bass, 1992; R. Boice, Quick starters: New faculty who succeed." in M.T. & J. Franklin, eds., *Effective Practices for Improving Teaching*. New

Directions for Teaching and Learning. San Francisco: Jossey-Bass, 1991; R. Boice, *Advice for new faculty members*. Needleham Heights, MA: Allyn & Bacon, 2000.

[39] see the following in http://serc.carleton.edu/NAGTWorkshops/earlycareer/teaching/efficiency.html

advice for new faculty members:
- Advice For New Faculty Members: Nihil Nimus
- Advice for New Faculty: Everything in Moderation

on preparing a new course:
- How to Prepare New Courses While Keeping Your Sanity

on preparing for a class period:
- Class Preparation Time: How Much Is Enough?
- How to plan a class period
- What is the Most Difficult Step We Must Take to Become Great Teachers?

see also http://serc.carleton.edu/NAGTWorkshops/earlycareer/teaching/toolkit.html for keeping students engaged in large lecture classes
- Interactive Lecture
- Just-in-Time Teaching.
- Beating the Numbers Game: Effective Teaching in Large Classes
- How to Create Memorable Lectures
- Big, But Not Bad,

[40] other sources for teaching:
"*Advice for New Faculty Teaching Undergraduate Science*" Sarah L. Keller and Andri L. Smith, Journal of Chemical Education Vol. 83 No. 3 March 2006 401-406. A pdf is posted at:
http://www.engr.washington.edu/advance/mentoring/KellerAdviceArticle_052908.pdf

Karl Wirth: Thinking About Learning: Motivating Students to Become Intentional Learners

[41] Bias, The Brain, And Student Evaluations Of Teaching, D. J. Merritt, *St. John's Law Review*, **82**, 235-287 (2007)
http://www.stjohns.edu/media/3/15809021162c4c7abc99c9b0134c8049.pdf

[42] Student Evaluations and Gendered Expectations: What We Can't Count Can Hurt Us, J. Sprague and K. Massoni, *Sex Roles,* **53**, (11/12) 779-793 (2005)
http://www.springerlink.com/content/y705543672670178/

[43] *Entering Mentoring* This guide developed by HHMI Professor, Jo Handelsman, and her colleagues and co-founders of the Wisconsin Program for Scientific Teaching at the University of Wisconsin, Madison, raises questions about teaching expectations, mentoring as a function of training new teachers, and dealing with diverse learning styles, personal styles, ethnicity, experience, gender and nationality. 141 pages available on-line as a pdf to download at
http://www.hhmi.org/catalog/main?action=product&itemId=272

[44] Stanford Workshop on Mentoring
Best practices in mentoring:
http://paesmem.stanford.edu/html/proceedings_6.html

[45] *Mentoring support: National and local resources for mentoring*
http://paesmem.stanford.edu/html/proceedings_9.html

[46] How to Mentor Graduate Students, University of Washington
http://www.grad.washington.edu/mentoring/gradfacultymentor.pdf

How to Mentor Graduate Students: A Guide for Faculty at a Diverse University, University of Michigan
http://www.rackham.umich.edu/downloads/publications/Fmentoring.pdf
Adviser, Teacher, Role Model, Friend: On Being A Mentor To Students In Science And Engineering, National Academy Press, 1997
http://www.nap.edu/openbook.php?record_id=5789
Advising and Mentoring Graduate Students, Ohio State University,
http://www.gradsch.ohio-state.edu/Depo/PDF/ProfessionalDevelopment/MAbestpractices.pdf

[47] Compact Between Graduate Students and Their Mentors,
This compact outlines the rights and responsibilities of students and mentors necessary for a high-quality graduate student training experience. It serves both as a pledge and a reminder to mentors and their graduate students that their conduct in fulfilling their commitments to one another should reflect the highest professional standards and mutual respect.
http://www.bcm.edu/gradschool/?pmid=9290
Compact Between Graduate Students and Their Advisors,
http://www.gs.howard.edu/announcements/Student-Mentor%20Compact%206-15-09.pdf

[48] http://www.raiseproject.org/ The Raise Project is a campaign to increase the status of professional women through enhanced recognition of the achievements of women in science, technology, engineering, medicine and mathematics. Use the searchable list in this website to identify honors and awards appropriate to your field.

[49] sources for gender and culture issues in academe
Why So Slow? The Advancement of Women. Virginia Valian, Cambridge, Mass.: MIT Press, 1998.
Gender Issues in Academics and Academia MIT Open Courseware, Spring 2004 by Profs. Laurel Ruhlen & Kayla Jacobs.
Creating Gender Equity In Academia. *Equal Rights Advocates' Higher Education Legal Advocacy Project Roundtable Report.* 2003.
"Why Don't You Get Somebody New To Do It?": Gender, Race, and Cultural Taxation in the Academy" Laura Hirshfield and Tiffany Joseph, *Paper presented at the annual meeting of the American Sociological Association Annual Meeting, Sheraton Boston and the Boston Marriott Copley Place, Boston, MA*, Jul 31, 2008
Gender Equality in Academia: Bad News from the Trenches, and Some Possible Solutions
Kristen Monroe, Saba Ozyurt, Ted Wrigley, and Amy Alexander, *Perspectives on Politics* 2008, 6 (2) 215-233
Gender schemas at work. *Why So Slow? The Advancement o*f W*omen.* Valian, V. 1998. Cambridge, Mass.: MIT Press.
Beyond gender schemes: improving the advancement of women in academia. Valian, V. 2004. NWSA Journal 16: 207-20.
The effect of multiple mentors on protégé attitudes toward the work setting. Baugh, S.G. & Scandura, T.A. 2000. Journal of Social Behavior and Personality 14, 503-521.
Leveling the Playing Field for Women in Tenure and Promotion, Sue V. Rosser, *NWSA Journal* 19.3 (2007) 190-198
Is There A Global Warming Toward Women In Academia?
By Christine Hult, Ronda Callister, and Kim Sullivan, featured in Tomorrow's Professor
Sex and Science: How Professor Gender Perpetuates the Gender Gap, Scott E. Carrell, Marianne E. Page, James E. West, AWIS Washington Wire, May 7, 2009,
Engaging Men In Gender Initiatives: What Change Agents Need To Know, Jeanine Prime and Corrine A. Moss-Racusin, Catalyst 2009 www.catalyst.org
National differences in gender-science stereotypes predict national sex differences in science and math achievement. B. A. Nosek, F. L. Smyth, N. Sriram, N. M. Lindner, T. Devos, A. Ayala, Y. Bar-Anan, R. Bergh, H. Cai, K. Gonsalkorale, *et al.* (2009) *Proc. Natl. Acad. Sci. USA* 106, 10593-10597
Gender, Culture, and Mathematics Performance**,** Janet S. Hyde and Janet E. Mertz, Proc. Natl. Acad. Sci. USA , June 2, 2009 vol. 106 no. 22 8801-8807

Gender Similarities Characterize Math Performance, Janet S. Hyde, Sara M. Lindberg, Marcia C. Linn, Amy B. Ellis, Caroline C. Williams, Science 321 494-495 (2008).

50 sources for building institutional support*:*
Faculty in New Jobs: A Guide to Settling In, Becoming Established, and Building Institutional Support. Jossey-Bass Higher and Adult Education Series. Ed. Robert Menges (about navigating the interpersonal and intrapersonal dynamics of a new faculty role)
The New Faculty Member: Supporting and Fostering Professional Development, R. Boice, Jossey-Bass Inc., 1992 (part 3 discusses ways of building an institutional support system).

51 (a) *Time Management for New Faculty,* Anastassia Ailamaki, Johannes Gehrke, School of Computer Science, Carnegie Mellon University, *SIGMOD Record, 32(2): 102-106, June 2003*, available on line at: http://www.pdl.cmu.edu/PDL-FTP/stray/timemgmt.pdf
(b) *Time Management for Faculty,* Compiled by Prof. Alan Marscher, Director, Center for Excellence in Teaching, Boston University, for a faculty development workshop on February 13, 2006*:*
http://www.bu.edu/cet/develop/time.html
(c) *How to Say No (And get away with it)*:
http://chronicle.com/jobs/news/2008/09/2008092201c.htm
(d) *Conserving time while teaching and other hints for new faculty*, Sarah Keller:
http://www.advance.rice.edu/negotiatingtheidealfacultyposition/resources/Conserving%20Time%20While%20Teaeching%20Keller.ppt
(e) Richard Reis on Tomorrow's Professor web site:
Establishing Your Absence
http://sll.stanford.edu/projects/tomprof/newtomprof/postings/1.html
Faculty Time Savers
http://sll.stanford.edu/projects/tomprof/newtomprof/postings/34.html
(f) *Lessons in Time Management*
Lee Tobin McClain, *Chronicle of Higher Education* December 16, 2003
http://chronicle.com/jobs/2003/12/2003121601c.htm
(g) *Time Management 101 for Grant Applicants*
Vid Mohan-Ram, *Science's Next Wave*, October 8, 1999
http://nextwave.sciencemag.org/cgi/content/full/1999/10/06/1
(h) *Time Management for Academic Leaders, Christian Hansen*
http://www.facultyfocus.com/articles/faculty-development/time-management-strategies-for-academic-leaders/
(i) *The Time Trap: The Classic Book on Time Management*, Alec Mackenzie, Paperback 3rd edition AMACOM 1997, 282 pp.
(j) *Coping with Faculty Stress*, W.H. Gmelch, SAGE Publications, London,1993, vol. 5 of Survival Skills for Scholars - 112 pages, Coping with Faculty Stress
(k) *Making Time, Making Change: Avoiding Overload in College Teaching*, Douglas R. Robertson, New Forums, Stillwater, OK: 2003.

52 (a) Dual-Career Academic Couples: What Universities Need to Know*,* L. Schiebinger, A. Henderson, S. Gilmartin, (Stanford: Clayman Institute, 2008):
http://www.stanford.edu/group/gender/ResearchPrograms/DualCareer/DualCareerFinal.pdf This is the 108-page report on the study of dual-career academic couples done by Stanford University's Clayman Institute for Gender Research based on survey information from 9000 full-time faculty at 13 research universities and interviews with university administrators about hiring policies at these institutions.
(b) Dual-Science-Career-Couples: Survey Results, L. McNeil and M. Sher:
http://www.physics.wm.edu/~sher/survey.pdf This is the 48-page report of a survey carried out in 1998 of 620 physicists, 89% of whom had partners who were scientists.
(c) Dual-Career Couples: Keeping Them Together, L. E. Wolf-Wendel, S. Twombly and S. Rice, *The Journal of Higher Education*, Vol. 71, No. 3 (May - Jun., 2000), pp. 291-321, Ohio State Univ. Press:
http://www.jstor.org/stable/2649292

(d) The Two-Body Problem: Dual-Career-Couple Hiring Practices in-Higher Education, L. Wolf-Wendel, S. B. Twombly, and S. Rice, Johns Hopkins University Press, 2003 Baltimore.
(e) Meeting the Needs of Dual Career Couples in Academia, M. Fleig-Palmer, J. Murrin, D. K. Palmer, and C. Rathert, 2003 CUPA-HR Journal, Vol. 54, No.3, pp. 12-15:
http://www.cupahr.org/newsroom/journal/archive/2003_CUPAHR_winter_spring_journal.pdf
(f) Solving the Two-Body Problem, A. Agrawal and J, Thaler:
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2240/solving_the_two_body_problem
(g) Universities and the Two-Body Problem, Susan Landau (Computer Science):
http://research.sun.com/people/slandau/two_body_sigact.pdf
(h) Spousal hiring policies various universities, a list of URLs:
www.historians.org/grads/Spousal_Hiring_Policies.doc
(i) Partner Accommodation Policy at UIC:
http://www.uic.edu/depts/oaa/Docs/Partner_Accommodation_Policy_Final1.pdf
(j) GC-HERC: The Greater Chicago Higher Education Recruitment Consortium:
http://gcherc.org/site/1684/members.cfm
(j) The dual career section of GC-HERC has many links to articles and university dual-career pages:
http://www.gcherc.org/site/1684/res_dualcareer.cfm?site_id=1684