Strategies for Successful Research
A Panel Discussion – Graduate School Seminar

Today's Panel Presentations
• Shekhar Joshi, Forestry
  • Choices!
• Nancy Auer, Biological Sciences
  • Keeping on Track!
• John Gierke, Geological & Environmental Engineering
  • Finishing the Race, What’s Next…
• Panel Discussion/Q & A

Who am I?
• Shekhar Joshi
• Professor of Plant Molecular Genetics, Forestry
• Over 30 years of research experience
• > 65 peer reviewed papers and book chapters, 100+ presentations; four patents and edited two books
• Michigan Tech Research Award winner of 2011 and NSF CAREER award winner in 2003
• Graduate Program Director (2004-2009)
• ATLANTIS (2008-2012)
• http://www.mtu.edu/forest/about/faculty/joshi/

Pearls of Wisdom about Choices
• We do not choose who our parents are?
• We do not choose where we are born?
• Genetics X Environment interaction dictates all our choices and...
• We are the products of choices that we made
• Education is the most important decision
  • University, subject, topic
• IVY League Universities? Not for everyone
• STEM, Business, Humanities...
• Choices you make hereafter will impact your future!

Choose wisely..
• What you are most passionate about?
• What are your knowledge and skill sets?
• Why should you do research?
• Where you want to do research?
• Grad school is not a job
• Write one line in the book of science!
• Advisors come in all shapes and sizes:
  • Big shot? Busy? Kind? Productive?
  • Life long relationship
Choices you make

- University
- Subject
- Topic
- Department
- Advisor
- Committee
- Colleagues

What am I looking for?

- Initiative/drive
- Literature awareness
- Works hard
- Shows excitement
- Intelligent
- Brave to ask questions
- Pleasant personality and sense of humor
- Works well with others
- Communication
- Productive

Tips - 1

- Know the departmental requirements
- Training to be a researcher not a technician – scholarship
  - critical thinking – alternative interpretation
  - looking at things in different ways – asking the tough questions
  - Become responsible for the/your project, you have joined a team
- Commitment to research and scholarship
  - great demands on time - time management is very important - be productive (morning person?)
  - Make to-do lists; guard your time
  - time wasters – telephone, coffee break, procrastination
- Shifting priorities
  - long term and short term goals
  - re-evaluate lists
  - differentiate between urgent, important and can wait

Tips - 2

- Attitudes of a good researcher
  - Patience – there will be frustrations and failure
  - Integrity! (no short cuts)
  - Anticipates the next step or outcome or need
  - Current, keep up with literature
  - Flexible and open – creativity (unique solutions)
- Writing skills – lots of writing – posters, papers, dissertation
- Routine
  - Arrange regularly scheduled meetings with advisor
  - Prepare for meetings
  - Take notes (bring a notebook) and follow through
  - Create multi-drive or share all data with professor regularly
  - Self-care – both mental and physical

Future employers are looking for...

- Academic competence
- Your ability to identify your own Skill set
- Communication – writing/oral/poster
- Enthusiasm
- Remain teachable
- Resourcefulness
- Team member, your work impacts others
- Inquisitive / Curiosity– genuine interest
- Keeps up with literature
- Creative
- Works well with others
- Help and train others in lab
You should consider the question: Where am I heading?

- **Industry**
  - Post-doctoral experience probably not needed, but may serve as a post-doctoral experience
  - Employers are probably most interested in specific skills (e.g., computational, experimental, proposal writing, etc.)
  - If you did not publish and are unable to publish, you will likely close the door on the research path

- **Research**
  - Post-doctoral experience probably not needed but will serve as a post-doctoral experience
  - Employers are looking for research skills and ability to publish and write proposals
  - If your graduate research is not yet published, will you be able to?
  - What are the expectations for proposal writing and funding?

- **Academics**
  - If research is in your future, you will almost certainly need to complete a year or few of post-doctoral experience
  - You should at least have some X number of manuscripts (depending on field) from your graduate work in review.
  - You should get some teaching experience, beyond laboratory TAing
  - You should be actively involved in proposal submissions (PIA helps to lessen the pain)

It is never too early to begin networking

- Advisor, Advisory Committee, Department and Graduate Committee Chair, ???
- Conferences and Workshops (especially the thematically focused ones)
- Professional Society New-Faculty Workshops
- Reviewing for journals and funding agencies (talk to your advisor)
- Apply for jobs: start about 1 year before completion (talk to your advisor)
- Contact the people research active in your field
- See if your advisor can invite you to give a departmental presentation at another institution where he/she has close colleagues

Publications

- **Refereed journals**
  - Unfortunately, numbers are important
  - High-impact journals count 2X-7X more than low-impact ones

- **Book Chapters**
  - Are a close second in most people's perceptions
  - Conference proceedings and project/professional reports will count, a little, more if they are refereed (make sure that you highlight if they are)

Dissertation Framework

- **Traditional**
  - In terms of finishing, probably more expedient, unless you have been publishing along the way
  - Not as easy/fast as you might think it is to cut apart into manuscripts. A common negative comment from reviewer’s: “This reads as if it is excerpted from a dissertation.”

- **Collection of manuscripts**
  - In the end, better for research and academic path
  - May actually take longer, so start now!

Dissertation from a Unified Collection of Papers & Manuscripts

- **Unifying Chapter** may include a literature review that could be published as a “review” paper, if such a paper does not already exist
- **Manuscript 1 or Conference Proceedings**: e.g., early/preliminary/laboratory work
- **Manuscript 2**: more work, modeling, field, …
- **Manuscript (maybe a professional society magazine)**: implications for the future
- **Appendices**: details usually in a traditional dissertation but not in a manuscript
Conference Presentations

- Significance is important
- Giving an oral (platform) presentation carries more weight
- The titles of your presentations (abstracts, oral, posters) should show an evolution/growth
- Do not overdue it

Proposals

- If not too late, write your proposal for doctoral studies as if it is an NSF proposal
- Do not pass up opportunities for even small grants if you will be competing with peers
- Get experience in at least 1 NSF/NIH proposal, from the start (brainstorming) to the finish (Fastlane/Grants.gov submission)
- Even if the funding would not come through until after you are graduated and gone, get the experience
- Describe your experience(s) in cover letter and include mention of it in CV

Other

- Have a functional/insightful web page with PDFs of papers, presentations, posters, etc.
- Keep your CV up to date
- Have ready a cover letter, research vision, and teaching philosophy ready at a moment's notice
- Have an interview presentation ready to give
- Have a “teaching” presentation ready to go