

Mapping a Research Career

CRA Career Mentoring Workshop February 27, 2020

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Who is Barbara Ryder?

Professional

- A.B. in Applied Math (Brown, 1969), ABD in CS (Stanford, 1971); 6 years at Bell Labs, Murray Hill, NJ; Ph.D. in CS (Rutgers, 1982)
- CS professor at Rutgers (1982-2008); Moved to become CS Department Head at Virginia Tech; retired in 2016
- ACM Fellow (1998); IEEE-CS TCSE Distinguished Women in Science and Engineering Award; ACM SIGSOFT Influential Educator Award (2015);
- Led CS@VT team placing 2nd place nationally in 2016 NCWIT NEXT Awards

Personal

- Married to Jonathan Ryder for 50 years with 2 children and 4 grandchildren

Who is Rachel Pottinger?

- Associate Prof and Associate Department Head of the Undergraduate Program at the University of British Columbia (in Canada, eh)
- PhD from the University of Washington
- Research area: data management, particularly helping users understand and explore their data
 - I do interdisciplinary work (Civil Engineering, Biomedical, Financial, etc.)
- Married to Steve, a tenured teaching faculty member in my department
- Mother to two girls: Naomi (12) and Eleanor (4)

Who are you?



Life as a junior faculty member

- Year 1: Learning the ropes
 - Invest in activities with career payoff
 - Find mentors
- Years 2-3: Establish your identity
 - Publish, acquire funding, establish collaborations
- Years 3-5: Solidify your research profile in a research area
 - Use your graduate students to leverage your research efforts
- Year 6: prepare dossier and go up for tenure
 - Seek advice and recent examples

Be honest in assessing your own strengths and weaknesses

Biggest Challenges

- How to develop a coherent research agenda with limited time to do so, while juggling all your responsibilities?
- How to discover the joys of an academic career (working with the students) while “staying afloat”?
- Preserve time for family and friends
 - They keep you sane and cannot be replaced
 - People work more effectively when they are happier





Rule #1: Make everything possible help your research

- Service at your university:
 - Ask for things like graduate recruiting or arranging distinguished lectures
- Service to your research community:
 - Serve on the “best” program committees that you can
- Teaching:
 - Talk about your research in your undergraduate classes → recruit students
 - Teach courses that will help you find and evaluate students → projects
 - Get students to do research presentations when possible
 - Don't neglect research groups reading papers!

Rule #2: Build your mentors and network

- Graduate school is not designed to teach you everything that you need to know to be a successful faculty member
- You need mentors now more than ever
 - Consider separate mentors for research, teaching, and service.
 - If your department/university has mentoring available, use it!
 - Ideally have someone outside your department (or at least research group) to talk to.
 - Consider external resources like the Center for Faculty Development and Diversity
- Be strategic at conferences: seek out people who can help you (or write tenure letters), follow up, and keep track.



Rule #3: Choose research collaborations carefully



- Collaborations can leverage your time to address broader research issues
- You have to be able to point to *your* track record
 - Do not publish everything with the same people (e.g., your former advisor)
 - Make sure you define your own contributions in each project
- Most research collaborations will not work out in the long run
- Never agree to work on research that you cannot motivate
- Make sure all sides agree on expectations.
- Make sure that you have an exit strategy.
- Interdisciplinary work is great, but make sure that all sides can get research out of it → do not be a code monkey.

Your rules for success

- Choose really good students who you can work well with
- Define what success is for you
- You can't fall into housekeeper/secretarial roles

Planning your research agenda



- Try to find a **juicy** research problem
- Set aside **uninterruptable blocks of research thinking time** in your weekly schedule
 - Don't cheat yourself
- Keep a research notebook for ideas to think about later
- Honestly question the generality, practicality of previous work in literature
- Consider impacts of proposed work

Building up your research agenda & breaking it down

- Frame long-term research questions to answer
- Develop your personal style
 - Pick one problem at a time versus juggling several projects at once
- Use short-term objectives to subdivide research into *chunks* per student
- Make sure you and your students know what it means to solve a problem or validate a technique
- Re-examine your research achievements/plans at regular intervals
 - Are you making progress towards your long-term goals?



Importance of Communication



- Attend workshops, especially work-in-progress sessions
- Participate in grant evaluation panels and program committees
- Be ready to talk to funders at conferences
- Write papers & give talks about your work
- Spend time on making talks and papers organized, logical, easy to understand, coherent, high-quality
 - Work with grad students on editing their writing, but make them edit
 - Make it clear why the work is important and useful
- Have an elevator pitch on your research

Swap elevator pitches with the person next to you

Remember. This should take the amount of time that you have in an elevator. So aim for a minute and a half

Overall advice for junior faculty members (1/2)

- Understand what it takes to get tenure at your institution, but don't stop at minimum.
- Make sure that you are established in a “home” research community
- Spend money to save yourself time: it's an investment in you.
- Toot your own horn as loudly and as often as possible.
- Keep your CV up to date on your website.
- Do not mistake teaching as your only job.
- Spend the time to reflect on your overall trajectory.



Overall advice for junior faculty members (2/2)

- Set writing/paper submission goals for yourself. Then prioritize it.
- Plan so that you can recover from curve balls
 - Never put someone untried on your critical research path.
- Spend the time to establish your students' community: help them help themselves.
- Always think about “impact”.
- Play the game, but do the job you want to have: don't be a raisin in the sun.
- Make sure that you get down time.



Other resources

- Dave Patterson's non-technical talks
 - <http://www.cs.berkeley.edu/~pattersn/talks/nontech.html>
- Jeannette Wing's tips on the interview process
 - <http://www.cs.cmu.edu/~emigration/interview.pdf>
- Jeannette Wing's 12 tips for department heads from an NSF perspective
 - <http://cacm.acm.org/blogs/blog-cacm/54177-twelve-tips-for-department-heads-from-an-nsf-perspective/fulltext>
- Advice from Tao Xie about everything
 - <http://web.engr.illinois.edu/~taoxie/advice.htm>