

RESEARCH AS A CAREER

Getting Started in the Lab

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Session Overview

- Introduction – who are you, who are we
- Driving your Career
 - Understand your lab
 - Selecting a Research Focus
 - Other skills needed
 - Who can help
 - How to keep your job
 - How to stand out
 - How to get ahead
 - Adapting to Change
- How to measure success
- Some of our experiences



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Kerstin Kleese van Dam



Director Computational Science Initiative

- Since September 2015 at Brookhaven National Laboratory, Long Island, NY
- Build Computational Science Initiative as new science directorate, integrating computer science, applied mathematics and computational science research and services under one umbrella.
- Currently 70 staff
- New building, new data center approved, 2 new top 500 systems purchased, \$25M of new contracts

Past Appointments

- 1989-1993 INPRO German Automotive Industry Joint Research Institute
- 1994 - 1997 DKRZ - German Climate Computing Center
- 1997-2008 Science and Technology Research Council, UK
- 2009 University College London, UK
- 2009-2015 Pacific Northwest National Laboratory, US



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Isabelle Moulinier



Current Position

- Since February 2015, Director, Product Innovation
- No longer in Research per se
- Product manager for Applied Research

Past Appointments

- 1996-1997: IBM France. Center for Applied Mathematics. France. Research engineer.
- 1997-2015: Thomson Reuters, Research and Development. US. Various roles from research scientist to Director of Research



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Driving your Career

Understand your Laboratory

Purpose

- Different Laboratories have different focus areas, it is important to understand what they are:
 - Single versus Multi-Purpose Laboratory
 - Government versus Private Industry
 - Major programs and facilities
 - Basic or Applied Research
 - Value System
 - Reward Structure
 - Promotion Route
- Ask Questions!

The role of Computer Science in your Laboratory

- Where does computer science sit in the organizational structure
- What does the computer science organization do - infrastructure provision, services, support, research, all of these
- How large is the research staff
- What are the outstanding areas of expertise for which they are recognized
- Which scientific leaders in the community do they employ



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Selecting your Research Focus

Do

- Find a topic that you are personally passionate about
- Develop a clear set of questions you want to answer in this area, and make sure they have not been answered
- Develop your own ideas on how to address these questions
- Answer **Heilmeier Questions** - be critical, learn from the answers
- Find partners that can help you achieve your research goals
- Be willing to adapt what you do over time as the conditions change
- Adapt your focus to company needs

Don't

- Change your research focus every time a new topic becomes fashionable
- Don't switch topics completely - network technology to machine learning
- Don't pursue topics that do not align with your laboratories mission (or if this is what you want to do change employer)
- Don't pursue topics that your major funding agencies are not supporting (or change to the employer that does)



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Heilmeier Questions

- What are you trying to do?
- Articulate your objectives using absolutely no jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you succeed, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- What are the mid-term and final “exams” to check for success?



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Other Skills Needed

The Myths

- If I am really good at my science I will be successful

Reality

- Many more skills are needed to be successful:
 - **Project Management** - deliver good quality on time and in budget
 - **PR** - people need to know you are doing great things
 - **Sales** - you need funding to do your research, people need to 'buy' into your ideas
 - **People Management** - you will often need help to accomplish your research goals, you need to inspire, mentor and attract good staff
 - **Networking** - build, grow and maintain a network of researcher with aligned interests
 - **Collaboration** - A network of good collaborators is essential to success
 - **Good Communication - is everything!**



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Who can help

Where to find help

- Colleagues, mentors and trusted collaborators
- People with critical thinking, who will give you honest feedback, pointing out potential hurdles and flaws
- Experienced staff that can help you identify new approaches to solutions - not solve the problem for you
- People who are willing to give you opportunities
- Discussions with end users of your research can help shape and focus ideas

Avoid

- Wet blanket personalities who always want to keep status quo
- People who are just interested in your ideas and will sell them as their own at the next opportunity



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How to keep your Job

Ensuring your success

- **Commit** only to things you have a reasonable chance to deliver successfully - say no, say you need more time, more resources if needed
- **Deliver!** - do what you promised to do, in the time frame you promised, at the quality that is expected
- **Communicate** - tell all relevant people about your progress, your success and possible problems
- **Handle problems well** - As soon as you know there is a problem communicate it to the relevant colleagues and managers, if at all possible provide options on how to address the problem, become part of the solution
- **Give credit** - If someone helped you, make sure they get credit for their help, that reflects well on you and will make it likely others will help you in the future
- ***Follow the laboratory rules and policies (time cards, health and safety)***
- ***Don't plagiarize or steal others work or ideas, don't falsify results ever***



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How to stand out

Do

- Producing outstanding research
- Be proactive in adapting and solving challenges
- Seek and make the most of opportunities – community service, talks, funding proposals, leadership roles
- Be aware of, thoroughly prepare and seek award opportunities
- Help other colleagues , projects that are in need - if you can do so without neglecting your own work
- Be your own advocate, tactfully
- Make the most of being one of few women in the room, people will remember you more easily, make it for the right reasons

Don't

- Take on tasks you cannot complete
- Claim expertise you don't have
- Be discourteous to colleagues or visitors
- Be continually late - 'ahh x has arrived so everyone must be here now'
- Always go home when the rest of the team is working frantically to meet a deadline
- Take credit for other people's work



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How to get ahead

Planning your next career step

- **Where** - Think about where you want your career to go next - more research, leading a larger research team, a change of research focus, a different balance of tasks (more support less research), more management (people and/or projects)
- **How** - Determine steps that will get you closer to your goal - education, training, more emphasize on certain aspects of your work (prioritize!), connections you need to make, **create your own opportunities** - new research area, build your own research community (workshops, journals)
- **Implement** - Follow through on your plan, seek strategic partners, be patient, but don't delay
- **Be Flexible** - Things never quite go to plan, be flexible, don't overlook opportunities that get you where you want via a detour or even a step back
- **Know when it is time to leave** - Sometimes you have achieved all you can in one organization and another offers better opportunities



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Adapting to Change

External Change

- Assess change impact on lab mission, funding agency focus, collaborator landscape, organizational structure
- Use Heilmeier questions to review impact on your research and your career perspective
- Ask: do I need to / can I adapt what I do to remain successful?
- Are there alternatives? i.e. a new employer, new research focus, new career direction, working to change the change
- What will it take to be successful? see previous slide

New Role, New Job

- New Job - Understand your Lab
- Determine what your new job requires to be successful
- Make a plan for your first 6 months on what you want to accomplish
- Build your new support network
- Maintain existing ties
- Acquire new skills if needed



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How to Measure Success

What does Success Mean to You

- People perceive success differently, and your perception might change over time. Success can be:
 - Scientific Discovery
 - Quality of Publications and Citation Count (Nature, Top Cited Author)
 - Funding Volume
 - Impact of your Research (enabled discovery of new cancer drug)
 - Level of Influence (On Research Direction, on Laboratory Strategy, Advisor to Funding Agencies and Governments)
 - Title and Influence - Director, Chief Scientist etc.
 - Salary
 - Independence
 - Work/Live balance
- You will need to decide which of these are most important to you, it should drive your career choices, help avoid choices that serve only success metrics you are not interested in.



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Some of Our Experiences

Things I am glad I did

- Not be afraid to speak out about new research ideas I had to everyone in sight incl. laboratory leadership
- Be persistent about what I thought were good ideas
- Be flexible, find different routes and approaches to get me where I wanted to be, even if they were not direct
- Change to employers, who at the time could help me best to follow my research ideas
- Leave when I felt I had accomplished all I can in an organization
- Never burn bridges
- Prioritize what I get engaged in
- Declined jobs that did not excite me
- **Overall make sure I had fun in my research!**



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Things I wish I had done or realized earlier

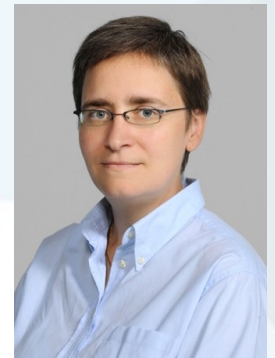
- Be more discerning about where I published
- Be more visible in the community promoting my research ideas incl. initiating workshop series, special journals
- More actively engage with program managers in funding agencies
- Be more engaged in large conference and workshop organization (e.g. SC)
- Pursue awards and affiliate appointments



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Things I am glad I did



- **Internally**
 - Worked on projects with different people and teams
 - Shifted research focus as needed (related areas)
 - Transferred research into products (internal innovation award)
 - Be the voice of the customer
 - Built a trust network – through consistent delivery
 - Be a mentor
 - Become a people manager
- **Externally**
 - Community service, i.e. program committees
 - Workshops, local events, networking
 - Co-wrote a book; some publishing



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Things I wish I had done or realized earlier

- Figure out what career meant to me earlier
- If you don't ask, nothing will happen
- Figure out how to say "yes, and" sooner, instead of "no"
- Assess risks, prioritize better, weigh opportunities
- Acknowledge my preference of applied over basic research
- Keep up with wider research more effectively
- Appreciate problems more than technology
- Deal with the impostor syndrome – it does not go away



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