You are Special

• Once you get your PhD, you will be in elite company

• Now stop gloating over it and show me what you can do

• With a PhD tassel, you will not automatically:
  – Get respect from your peers
  – Be considered the unquestioned expert in your organization
  – Know the most about the project you have been asked to tackle

• But you have the necessary skills and smarts to earn each of the above, with effort
Observations on Research Success - I

1. Challenge your abilities as you seek to raise your own bar
   - Work on challenging problems that give you butterflies in the stomach – be daring
   - Leave room for mid-course correction and occasional failures
   - Strive to improve yourself even though it may not seem related to your current tasks
   - Be courageous in the face of hard technical problems

2. Refuse to let the urgent crowd out the important
   - Urgent emails to respond to have their place, but not to the exclusion of thinking deep on your hard problem
   - Urgent problem brought on by environmental or political climate does not necessarily need your attention
**Observations on Research Success - II**

3. Be agile in adjusting the magnification level of your microscope
   - As you look at a solution, you sometime need to delve into the details – the exact algorithm, the system under study, the code
   - Many times you will need to abstract out details and consider black boxes and see how they fit in an overall solution

5. Work on important problems divided into manageable portions
   - Ask yourself in quiet solitude if the problem is scientifically challenging and important
   - We do not get big-bang results for the important problem in the first year
   - Have things to show for at time granularities of at most one year

**Observations on Research Success - III**

5. Be committed to the problem you are trying to solve; don’t dabble in it
   - This is not a day job
   - Quantity A: Achievements of person with limited ability, completely committed to his problem
   - Quantity B: Achievement of person with great skill dabbling in his problem
   - A > B, in almost all cases

7. Do your job such that others can build on top of it
   - The essence of science is cumulative
   - Release details of your experimental procedure so that others can replicate it – Tech Reports are great for this
   - Release input and result data set
   - Release source code with detailed instructions for reuse
Observations on Teaching Success: Personal Account

• Walking in to teach my first class of 125 juniors for a course called “Data Structures and Algorithms”
• As a teacher, I want to enable the students to be
  – Innovative in designing algorithms
  – Interpret imprecise requirements
  – Responsible in collaborating with other team mates
• So I set challenging open-ended programming projects.
• Result: Student evaluations that make me cringe today

Observations on Teaching Success: Personal Account

• Today: Happy story – multiple teaching awards from department, college, and university
• What lessons I learned (and wish somebody had told me)
  – Teach so that most of the class gets it, but leave something in to challenge the top students
  – Hand-holding with many students is necessary
  – Be responsive to student needs – respond to questions on mailing list quickly, return graded homeworks and exams quickly, hold extra office hours before exam
  – Treat the students as responsible individuals – know their names, expect professionalism and exhibit professionalism
  – Use electronic means to keep the students in the loop – RSS feeds, video recorded lectures
Summary

• Multiple career options available after a PhD
• A PhD is neither a necessary nor a sufficient condition for future career success
  – You have to earn the success through continual efforts
  – The PhD does provide you with a rich array of tools to help you achieve such success
• Success in research: Challenge yourself; Pick important problems and manageable portions; Magnify details at the appropriate level; Be engrossed in the problem you are solving; Work in a way others can build on it
• Success in teaching: Be responsive to the student needs; Pay close attention to what the students are not getting