

PhD Programs

Prof. Andrea M. Armani

The Mork Family

Department of Chemical Engineering and Materials Science

Ming Hsieh

Department of Electrical Engineering



- Why?
- Difference between a MS and a PhD
 - Why a MS degree
 - Why a PhD
- What happens
 - What is a qualifying exam/candidacy/screening exam
 - What is a dissertation/thesis
- Application Process
 - What is necessary to get in
 - How can you get it

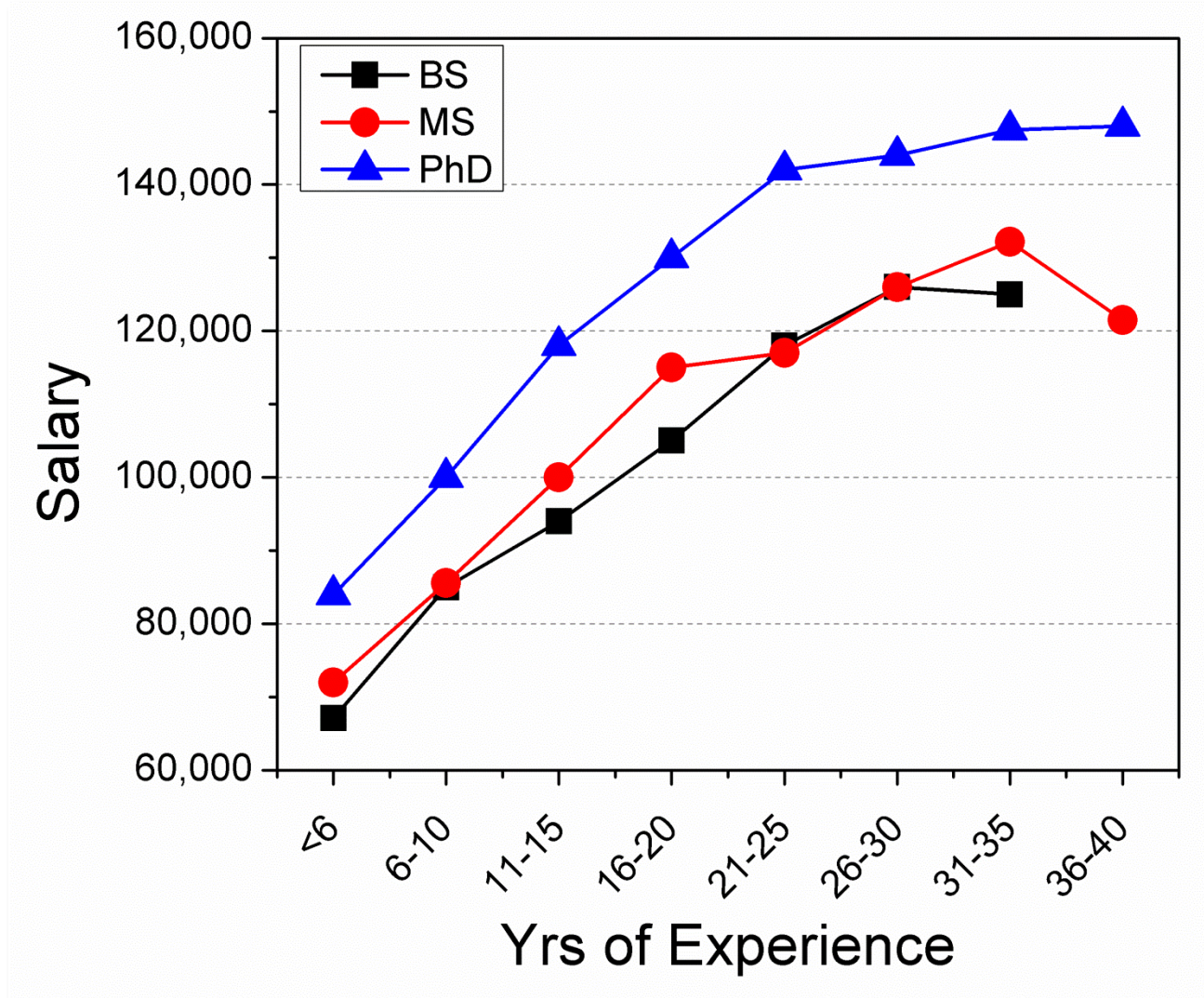
MS:

- Must pay for it
- Improves career options

PhD:

- Free!!! (at most top 20 schools)
 - Your advisor pays for it
 - your tuition
 - a “living wage”, ~\$28k
- Fun (if you like research)
- Further improves career options

Salary for Chem E's



MS:

- Extension of undergraduate coursework
- Some masters degrees include a thesis project
- Typically 1 yr

PhD:

- Includes a masters degree
- Majority of time is spent doing research
- Typically 5yrs (in engineering)
- Ends with the thesis (written)

Yr 1

Yr 2 through...



(Typical process and what each step is)

- First year: coursework – “Token Masters”
- *End of first year – screening exam/qualifying exam*
- Second/third year – research
- *End of second/third year – candidacy exam*
- Fourth/fifth year – research
- End of fifth year – thesis defense

Screening/qualifying exam:

- Written or Oral
- Committee-based

Candidacy exam can be:

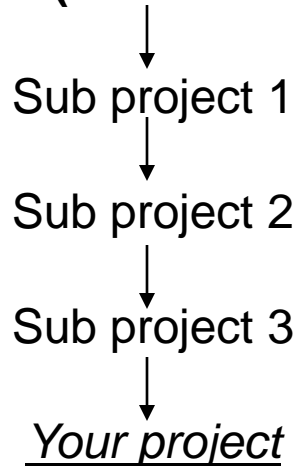
- Presentation over planned thesis topic
- Presentation of proposals (non-research related)

Large group effort to a single goal

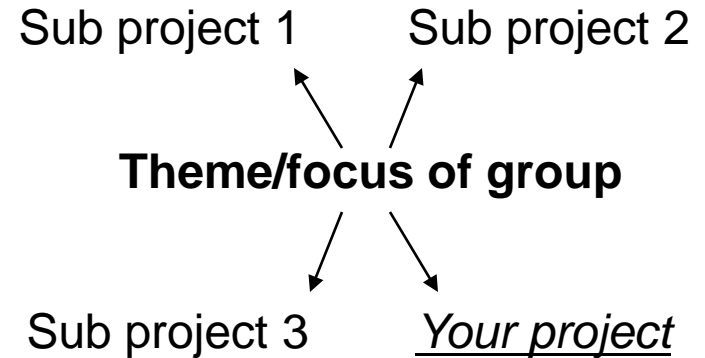
Examples:

- Genome
- HIV Vaccine

Main Goal (started 10 yrs ago)

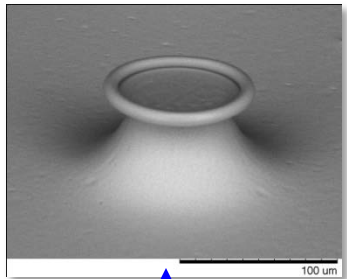


Single efforts around a “theme”

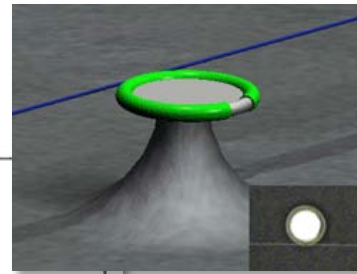
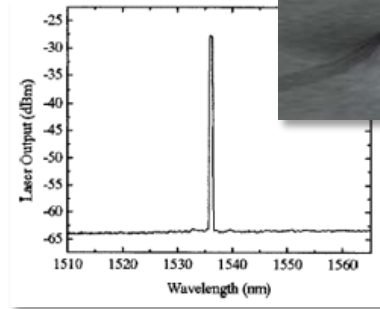




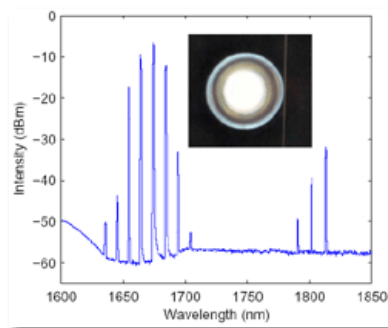
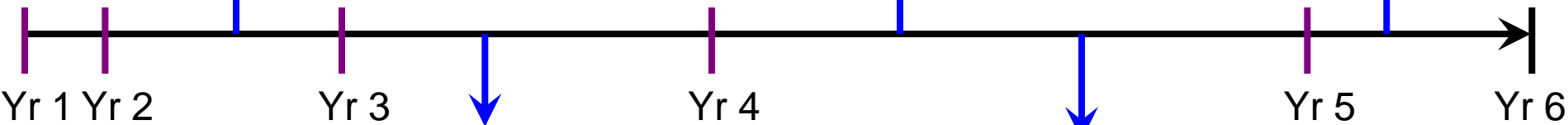
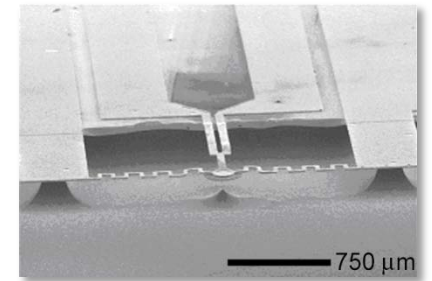
Device invented



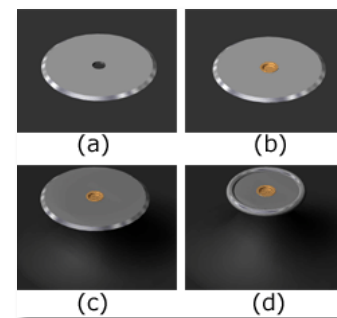
Application:
Makes laser



Makes new device



Application: Raman



Application: Modulator

Fellowship:Grad School as Scholarship:Undergrad

Pro: get higher stipend when you have a fellowship.

Con: you have to apply for it. Many require permanent resident or citizenship status

- NSF (<http://www.nsfgrfp.org/>)
- NDSEG (<http://ndseg.asee.org/>)
- Hertz (<http://www.hertzfoundation.org/>)

Factors determining acceptance:

Undergrad

1. GPA
 1. SAT
 3. Extracurriculars
 4. Awards/honors/etc
 -
 -
 -
 -
- Rec letters

Grad

1. Research
 1. Rec Letters (3-5)
 1. GPA
 4. GRE
 5. Awards/honors/etc
 -
 -
 -
- Extracurriculars

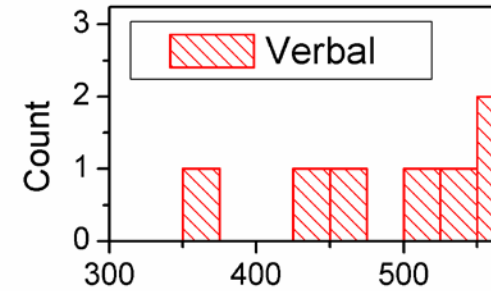
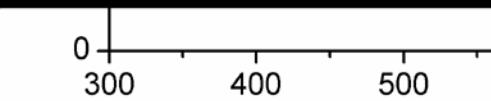
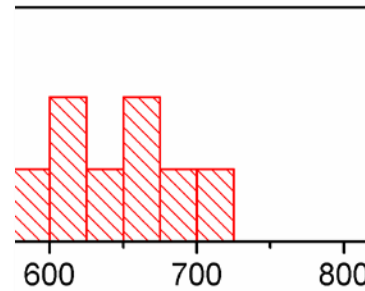
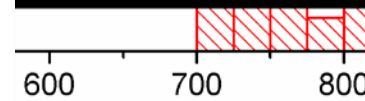
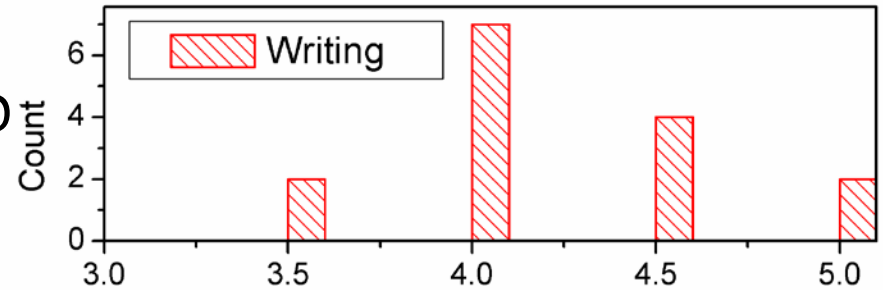
Scores for the domestic students who were admitted to the 2010 Chem E PhD Class:

Based on these numbers you want:

- GPA: ~3.4
- GRE Quant: 97%
- GRE Verbal: 70%
- GRE Writing ~4.0

But, there is quite a distribution. At the PhD level, this is not a strict numbers game.

~ very dept specific ~



It is important to figure out what you do and don't like.

There are several sources of research support for undergraduates on campus:

- Overview of options:

<http://www.usc.edu/programs/ugprograms/ugresearch/>

Funding:

- Merit Research: <http://viterbi.usc.edu/students/undergrad/research/>
- URAP: (faculty must submit)

http://www.usc.edu/programs/ugprograms/ugresearch/faculty_urp.shtml

- WiSE: <http://www.usc.edu/programs/wise/>