



USC Viterbi
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PhD Programs

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- 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

Pros vs. Cons

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

Why?

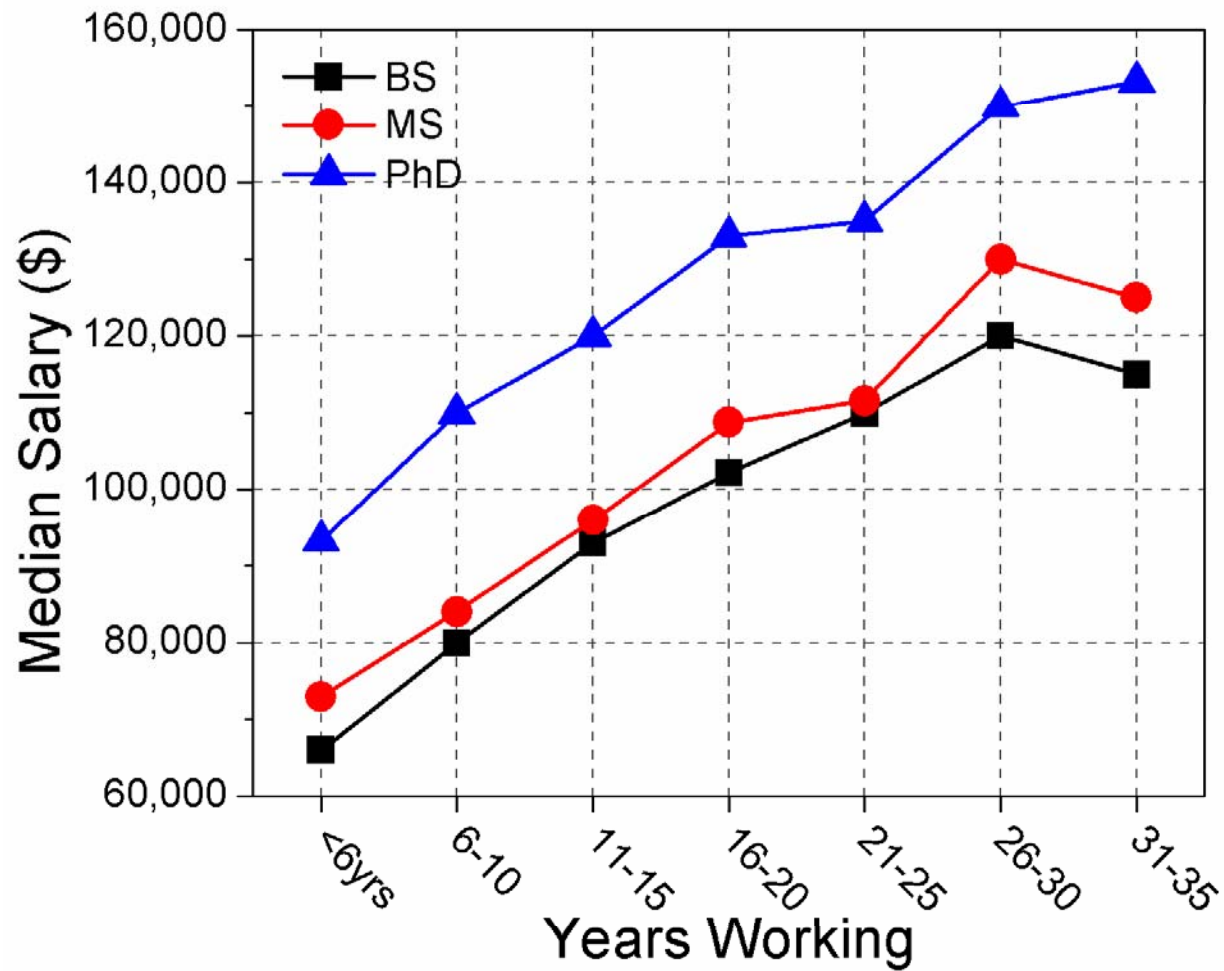
**“With a MS or PhD, you'll be running your own research projects.
With a BS, you'll be doing someone else's research.”**

“A B.S. is yesterday's high school diploma.”

**But ask yourself – Do you want that extra responsibility.
Not everyone does.**

Why?

Salary for Chem E's



MS vs. PhD

MS:

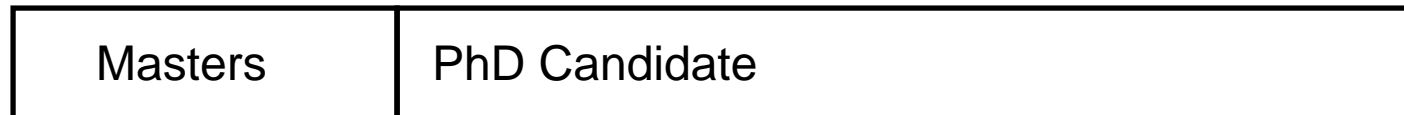
- Extension of undergraduate coursework
- Some masters degrees include a thesis project
- Typically 1 yr

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...



Funding at USC for 2008

Supports:

- Graduate Researchers in Sciences/Engineering
- Faculty
- Summer programs (Undergraduate/Graduate)
- K-12 Outreach Efforts

Funding Source	Amount
Federal & Non-Federal	\$484.6 M
Direct Federal Sponsored Support	\$321.8 M
Non-Federal Sponsored Support	\$ 162.8 M

Funding Source	Amount
Sponsored Projects by Funding Source	\$484.6
Health & Human Services	\$189.3
Department of Defense	\$67.4
National Science Foundation	\$35.1
All Other Federal	\$30.0
Foundations and Associations	\$43.9
Universities	\$31.2
Corporations	\$40.6
All Others(State and Local Governments, Hospitals, etc)	\$47.1

Logistics (PhD)

(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:

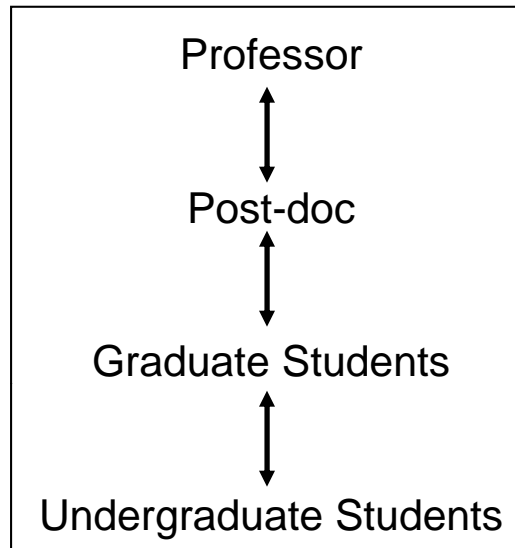
- Written or Oral
- Committee-based

Candidacy exam can be:

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

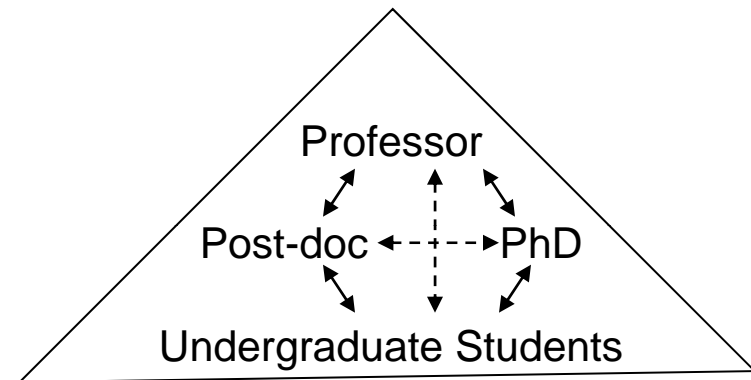
Research Group=Company

European model



- Very linear, top-down hierarchy
- Based on having all levels

US Model



- Very inter-connected
- Many variations
- Very robust

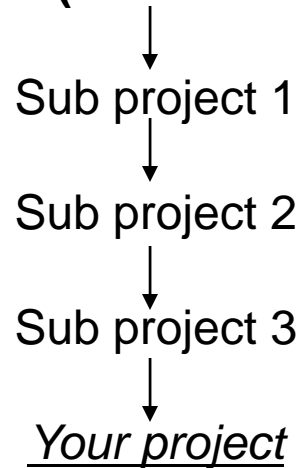
Choosing a project

Large group effort to a single goal

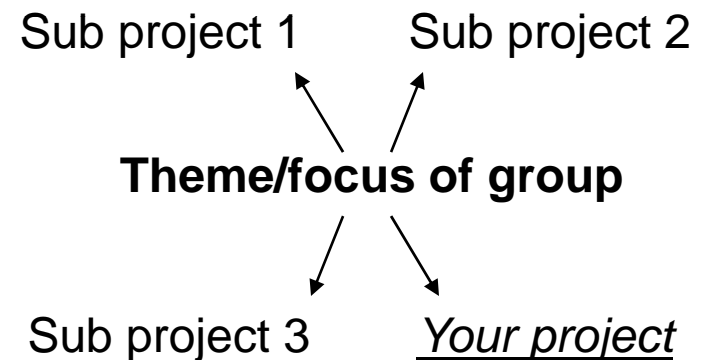
Examples:

- Genome
- HIV Vaccine

Main Goal (started 10 yrs ago)

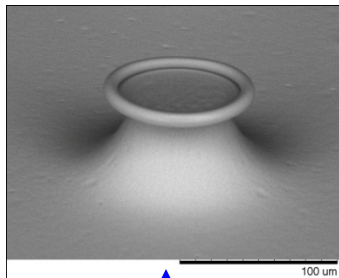


Single efforts around a “theme”

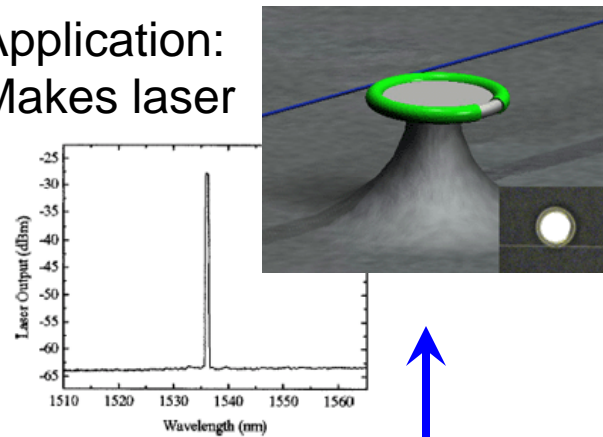


Example PhD

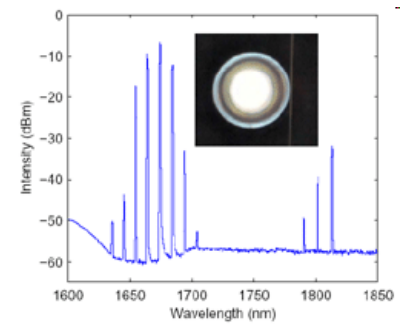
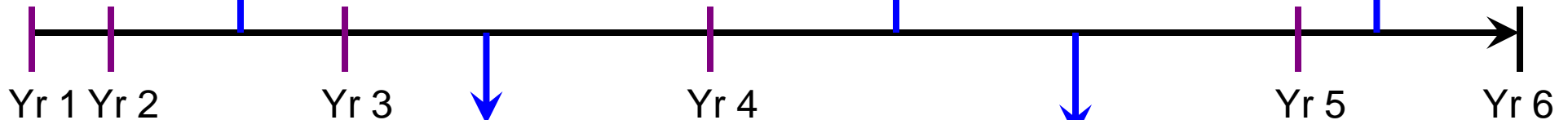
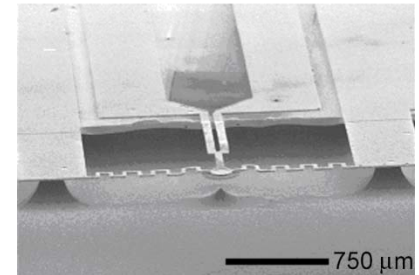
Device invented



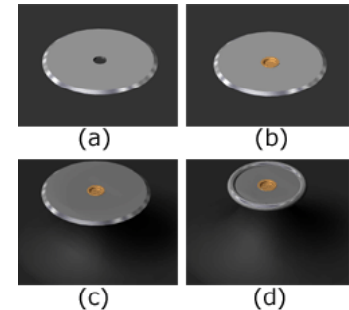
Application:
Makes laser



Makes new device



Application: Raman



Application: Modulator

Fellowships



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/>)

Getting into Graduate School

Factors determining acceptance:

Undergrad

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

Grad

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

Getting involved in research

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/>