



# Life in the US Academic Sciences

Mohamed Noor

Duke University

*Informal talk*

**Bright Horizons #10**  
**Monday, October 10, 2011**

# Outline of *Possible* Topics

... but it's up to you!

- Training ahead of time, and getting the job
- Three formal “parts” of the job
- Career steps and titles - tenure
  - “Assistant professor”
  - “Associate professor”
  - “Professor”
- Day-to-day



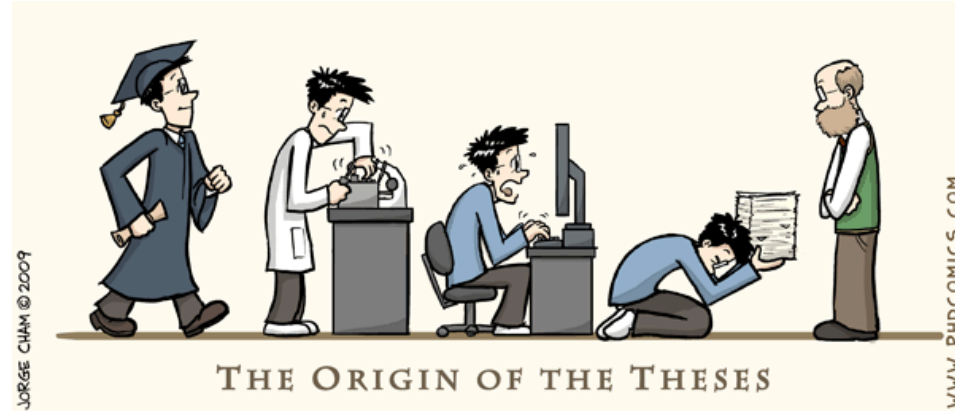
# Advance Training

- Undergraduate– 4-5 years
- Graduate school– 4-7+ years
- Postdoctoral residency(-ies)– 2-8+ years
- All “apprenticeships” in area of research
  - Learn:
    - Execution (most)
    - Writing (some)
    - Planning (variable/ a bit)



# Work during training period

- Individual efforts
  - “Dissertation”



- Collaborative efforts with other people in same research team
  - Sometimes also collaborative efforts with people in other research teams elsewhere
- Very often, individual efforts are a part of larger scale laboratory “direction”

# How people in science see each other

undergraduate

PhD student

postdoc

PI / Professor

seen by  
undergraduate



seen by  
PhD student



seen by  
postdoc

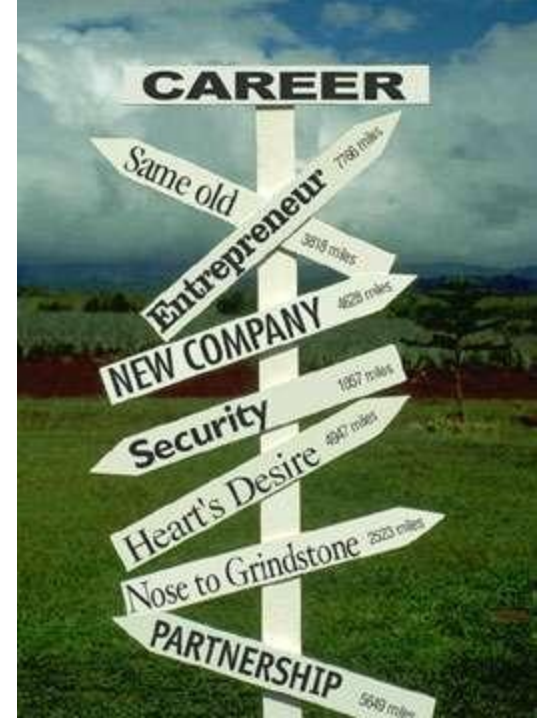


seen by  
PI / Professor



# After training...

- Some don't go on in academia
  - Industry
  - Government
  - Policy
- Some go on to purely/ mostly teaching academic posts
- Some go on to become faculty at research universities



# Tenure-track research job application

- Typically 50-500 qualified applicants apply for any job
- Chosen to interview based primarily on research record and statements
  - “CV” (publications)
- Must give engaging seminar/ lecture during interview



# “You’re hired!”

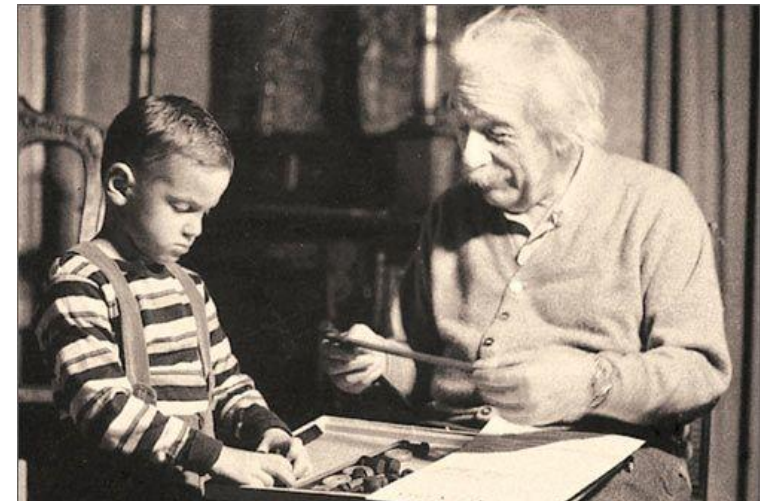
- Starting salary in Arts & Sciences departments of research universities is about **\$60,000-\$75,000** for 9 months
  - Often higher in medical schools, engineering, etc.
- Get “startup funds” of ~\$400,000 to \$800,000 to get research going
- Space:





# Advance Training

- Salary \$60K-\$75K for 9 months... but...
- Undergraduate– 4-5 years
- Graduate school– 4-7+ years
- Postdoctoral residency(-ies)– 2-8+ years
  
- Total time: **10-20** years after high school
  - Age 28-40, sometimes more if did something else or had career change



# Outline of *Possible* Topics

... but it's up to you!

- Training ahead of time, and getting the job
- **Three formal “parts” of the job**
- Career steps and titles - tenure
  - “Assistant professor”
  - “Associate professor”
  - “Professor”
- Day-to-day



# Job has three formal roles

- **Teaching**
  - Classroom
  - Mentoring of graduate students
- **Research**
  - Publishing influential papers
  - Getting research funding (grants)
- **Service**
  - Helping within the university
  - Service to profession



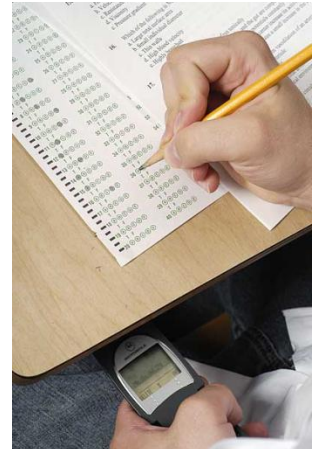
# Classroom teaching

- Past experience
  - MAYBE was “teaching assistant” (TA) for lab sections
  - Handed exactly what to say
- Expectation now
  - Create and teach a new class, with new lectures every other day for 3 months



# ... with new opportunities & new challenges...

- Can teach “what you want to teach”
  - Usually little institutionalization of content
- Volume of material to teach is huge relative to experience
- Feedback/ advice/ instruction minimal
  - How to do better?
  - How to deal with specific situations...





# Mentoring students:

Undergrad, grad, postdoctoral

- Can not only decide what you want to do, but can also tell others what you want done!
- Typically
  - Little or no supervisory training or experience
  - Little or no idea even how to recruit
- Many mistakes...

# A few common mistakes

- Getting too “buddy-like” with students
  - “Invisible hammer”
- Expecting too much of your team
- Assuming people will come to you with questions or concerns





# Teaching expectations

- Must deliver engaging, enlightening courses
  - Must cover material needed for students to succeed
- Must meet minimal teaching “load”
  - Can’t only teach specialty classes of 5 people
- Must mentor students to succeed in profession
  - Graduate students should be “placed” well



# Research expectations

- Paramount importance at research universities
- Must execute *innovative, informative* research and publish it in *premier journals*
- Any topic, though related to why you were hired



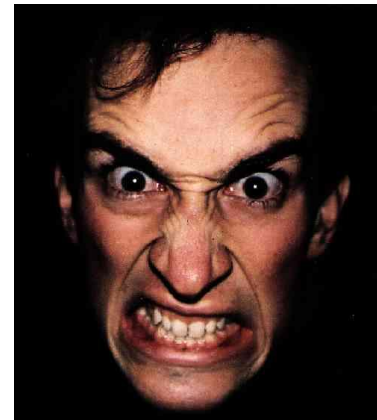
# Research funding



- Start with “startup”
- Transition to national funding sources
  - In USA- NSF, NIH, sometimes USDA
  - In GB- BBSRC, NERC
  - Others- Agence Nationale de la Recherche (France); Austrian Science Fund (FWF); Norwegian Research Council (Norway); NWO (Netherlands)
- Costs **high**:
  - \$1 million will barely support a molecular biology lab with multiple employees over 3-4 years

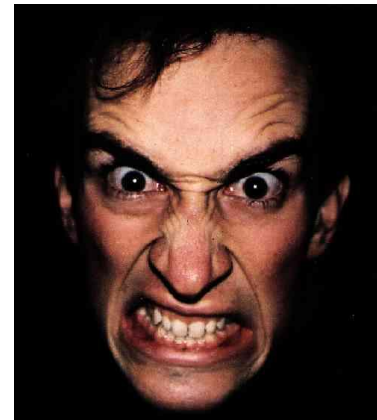
# Research success is partially determined externally

- Internally, must come up with creative ideas for important science and execute rigorously
- Externally:
  - Peer review of submitted manuscripts
  - Peer review of submitted grant proposals



# Research success is partially determined externally

- Internally, must come up with creative ideas for important science and execute rigorously
- Externally:
  - Peer review of submitted manuscripts
  - Peer review of submitted grant proposals
  - Success of grant proposals now in USA– probably close to 8%



# Service expectations

- Light for assistant professors (pre-tenure)
- Expected to be on committees
  - Student
  - University
- Expected to assist with peer review
- Later: editorial posts, society posts, grant panels, etc.



# Outline of *Possible* Topics

... but it's up to you!

- Training ahead of time, and getting the job
- Three formal “parts” of the job
- **Career steps and titles - tenure**
  - “Assistant professor”
  - “Associate professor”
  - “Professor”
- Day-to-day





**What is *tenure*?**

# What is *tenure* NOT?

- Before “tenure”, faculty are on term contracts
  - Assistant professors typically on 3-year contract, renewed once
  - Expectation of continued renewal but CAN be declined
    - Change in department or university priorities
    - Failure to execute duties
    - Financial constraints
  - Renewal typically involves departmental vote and upper administrative approval



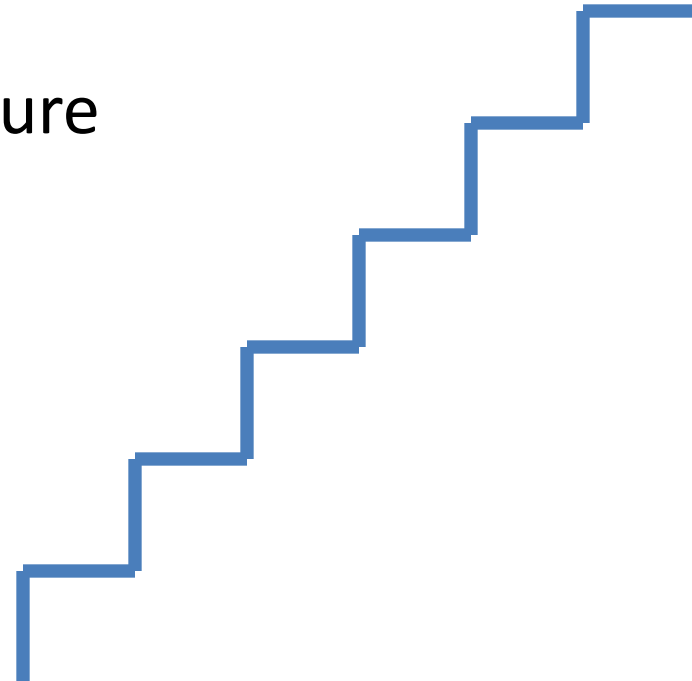


# What is *tenure*?

- No longer on contract
  - Continued employment without “votes” or “approvals”
- But NOT a 100% guarantee
  - Can be removed for non-performance of duties  
(Harder)
  - Can be removed in fiscal emergencies sometimes

# Titles / steps

- Assistant professor
  - NOT “assistant to a professor”
- Associate professor
  - In most places, comes with tenure
- “Full” professor



# Process for promotion & tenure

- Candidate submits “dossier”
- Department solicits “external evaluators”
- Department votes
- Chair makes recommendation
- Dean makes recommendation
- Advising committee makes recommendation
- Provost makes decision



# Typical reasons for lack of promotion

- Not enough high-impact, esp. publications
  - External review letters suggest impact limited
- Failure to secure research funding
  - Research deemed “insustainable”
- Poor teaching evaluations or insufficient teaching load



# Outline of *Possible* Topics

... but it's up to you!

- Training ahead of time, and getting the job
- Three formal “parts” of the job
- Career steps and titles - tenure
  - “Assistant professor”
  - “Associate professor”
  - “Professor”
- **Day-to-day**



# Duties change over time...

- Early— lots of “direct research”
  - Professor is their own best postdoc
- As career progresses
  - More supervision of others
  - More teaching
  - More service of all types
  - ... *typically*, less “direct research”



# What do we do **well**?

- Coming up with innovative research
- Executing rigorous science
- “Selling” research to colleagues in the same field
  
- Teaching typically improves with experience
- Mentoring typically improves with experience

# What do we do **poorly**?

- Discussing our research with the broader scientific community and the public / media
  - Maintaining perspective outside our bubble
- Not improving experiences or training opportunities for the next generation of students/ mentees
  - “We did it that way, and we turned out OK...”





**THANK YOU!!!**

... my last talk for the cruise...  
it's been great!

Thank you all for wonderful thoughts,  
useful information, feedback,  
stimulating conversations, etc.!