

# Graduate Student Survival/Success Guide

-with contributions from  
<http://www.phdcomics.com/>

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Slides at <http://people.engr.ncsu.edu/txie/advice/gradstudentsurvival.pdf>

# Essential Skills for (PhD) Researchers

- is able to **independently**

- **Assess**

- Others' Work (e.g., conference PC members, journal reviewers)
- Own Work

- **Envision** (e.g., per n years, research agenda)

- **Design** (e.g., per paper/project)

- Problem
- Solution

- **Execute** (e.g., time/risk/team management)

- Implement
- Evaluate

- **Communicate**

- Written
- Oral



**high-quality/impact  
research**

Critical, Visionary, Creative, Strategic/Engineering, Logical... Skills

# Recommended Reading

- The Ph.D. Grind - A Ph.D. Student Memoir by Philip Guo
  - <http://www.pgbovine.net/PhD-memoir.htm>



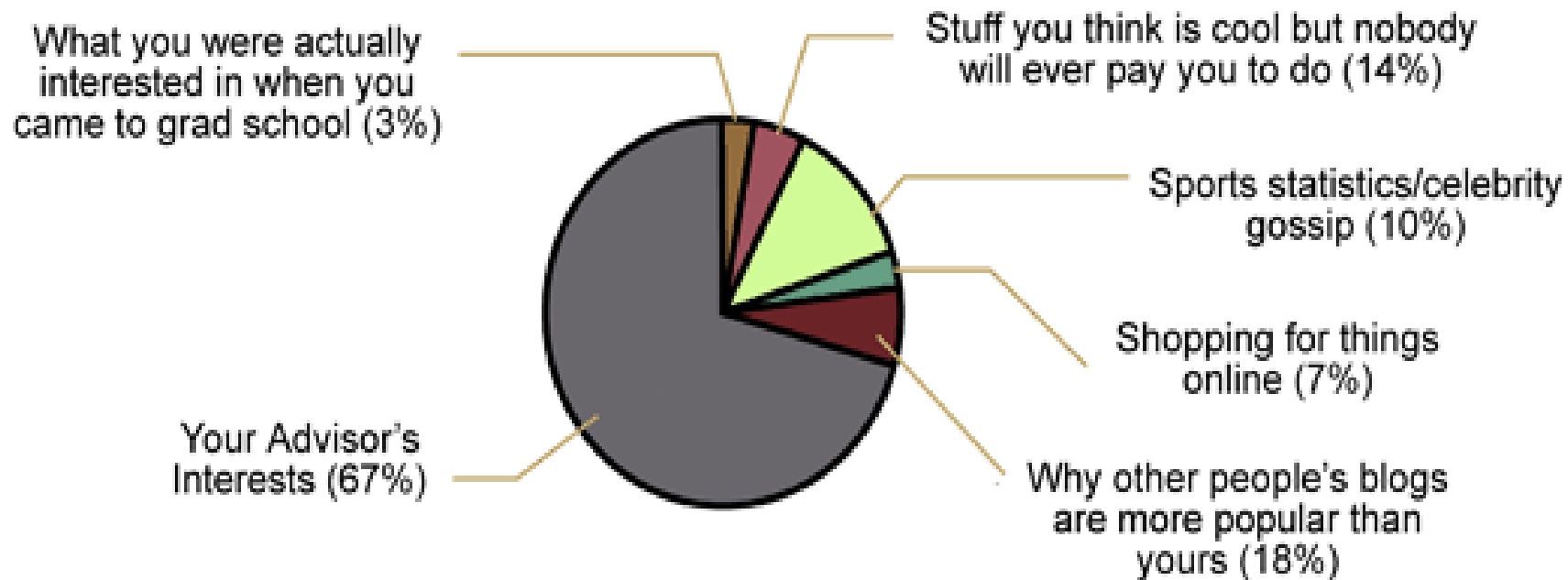
# PhD Program Checklist

- Find/convince an advisor to work with (early on)
- Work with your advisor to build impressive CV and improve your skills (along the way)
- Find/conduct summer internships (along the summer way)
- Graduate and find/get your dream job

# What Advisor to Look For

- Someone with similar/compatible interests as yours

## Your Research Interests:



# What Advisor to Look For

- Someone with similar/compatible interests as yours
- Renowned researchers
  - “They will document their work in articles, published in respected journals[/conferences]”
  - “Grant support from major research foundations”
  - Con: “limited in the amount of attention they can devote to you”
- Beginning researchers
  - “In the absence of substantial grant funding or a lengthy publication list, look for someone who has an active and growing research program.”

# What Advisor to Look For (cont.)

- Someone you can respect
  - “Choosing or keeping an advisor primarily because he or she is nice is a mistake. Sometimes nice people withhold frank evaluations of your knowledge, skills, and progress to avoid hurting your feelings. If you have an excellent advisor, your feelings toward your advisor might best be labeled as respect”
- Whom to avoid?
  - See the URL below for more

# Pitfalls(?)

- I have TA supports for 1/2/3 years now, why bother finding an advisor now?
- For now, since I have 1/2/3 year TA support, I want to work with a professor who is nice to me and doesn't push me to get research results or doesn't care much whether I get research results

## Act NOW



# Pitfall(?): Too Busy With Courses; No Time for Research Now

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## Grades Don't Matter, Sources Say

Palo Alto, CA (AP) - Documents obtained by the Associated Press indicate that grades achieved in post-graduate classes have no effect on future prospects for students enrolled in academic institutions.

According to interviews with several current and past graduate students, "grades don't count," said former grad student and now billionaire Jerry Yang, co-founder of Yahoo! Inc. "I got mostly B's in grad school, which at Stanford was really really bad."

A poll conducted by the Los Angeles Times showed that over 85% of first year grads believe getting high marks "is worth the effort" and "a valuable way to spend my time". Fewer than 10% of fifth year students felt the same way.

In reality, neither employers nor your parents appear to care if you get an A or a B in your advanced Nonlinear Optimization class. "I'm just glad I don't have to pay for tuition any more," said a mother who wished to remain anonymous.

Reaction among graduate TA's was mixed, with some expressing shock that their late hours grading amount to nothing, while others showed visible relief that losing a student's final exam will not really ruin their life.

Sources close to academic faculty reveal that this fact is well known among professors. "Of course grades don't matter," said Prof. Smith, "we only care about the lab work." Grades only serve to "feed the ego of the smart students, and break the spirit of the mediocre ones."



**NOW you tell me??** A grad student expresses frustration over the revelation

*Continued on page A23*

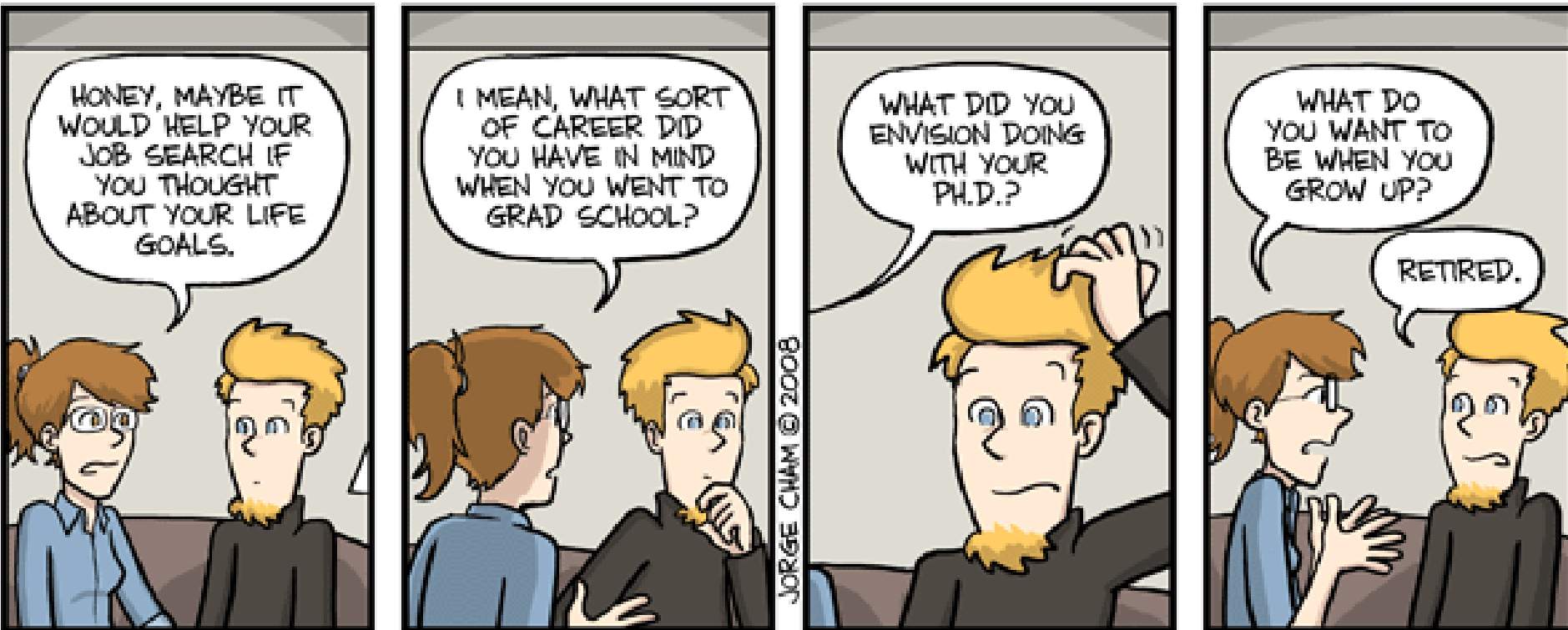
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*'Grades don't matter'*

# What Advisor Looks For

w.r.t. agree to advise or RA support

- Right/good motivation
  - Not just “I need to graduate within 3 years from now”



*'What do you want to be?'*

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# What Advisor Looks For

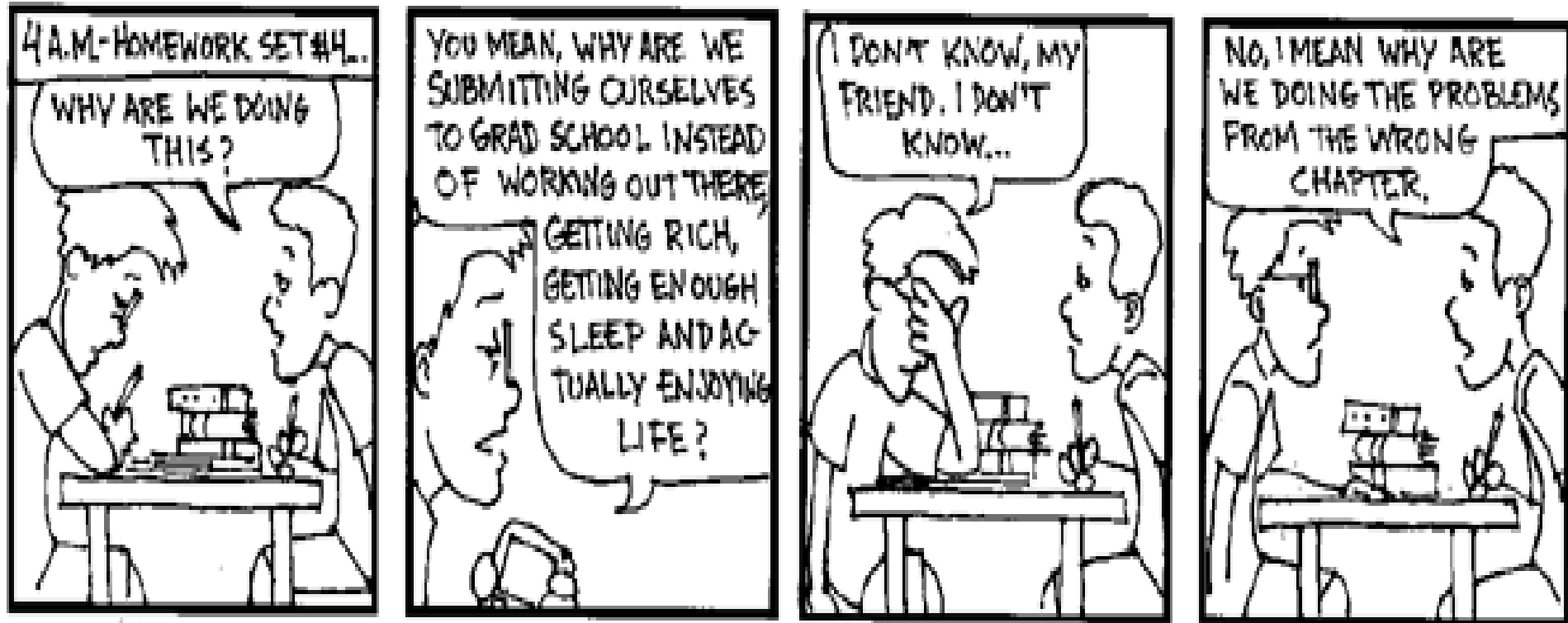
w.r.t. agree to advise or RA support

- Right/good motivation
  - Not just “I need to graduate within 3 years from now”
- Good specific important skills (for the research)
  - Problem-solving/research-development skills
  - Programming skills (for tool-building/system research)
  - Mathematical/theoretical skills (for theory research)
  - ...

# What Advisor Looks For (cont.)

w.r.t. agree to advise or RA support

- Willing to work hard



*'Why are we doing this?'*

# What Advisor Looks For (cont.)

w.r.t. agree to advise or RA support

- Follow research guidance (not in a blindly sense)

## THE EVOLUTION OF THE "YES"



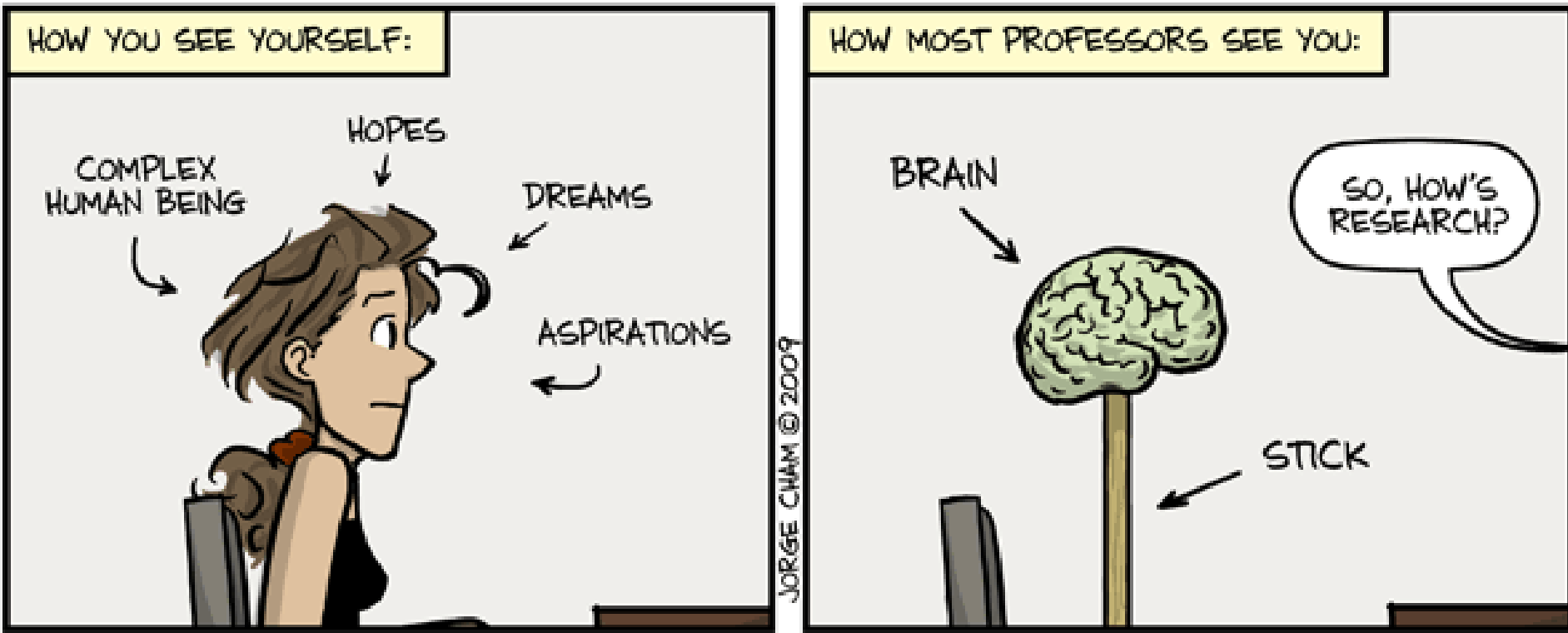
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*'The evolution of Yes'*

# What Advisor Looks For (cont.)

w.r.t. agree to advise or RA support

- Normally a trial period (1 semester~n years) before committing to advise or RA support



*'Brain on a stick'*

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- If a professor agrees to
  - try you out
  - advise you or
  - advise you + support you as RA

## What Next?

# Do and Publish High-Impact/Quality Research!

## Your (real) Impact Factor

$$\text{Impact Factor (corrected)} = \frac{
 \begin{array}{l}
 \# \text{ times your work is cited} \\
 - \# \text{ citations that actually trash your work} \\
 - \# \text{ times you cited yourself (nice try)} \\
 - \# \text{ times you were cited just to pad the introduction section} \\
 - \# \text{ citations the editor pressured the author to include to increase the journal's impact factor}
 \end{array}
 }{
 \begin{array}{l}
 \# \text{ original articles you've written} \\
 + \# \text{ articles you were included in out of pity or politics} \\
 + \# \text{ not-so-original articles you've } \text{~~written~~ \text{ copied and pasted}
 \end{array}
 }$$

<http://www.phdcomics.com/comics/archive/phd120808s.gif>

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*'Your Impact Factor'*

Top conference/journal papers weigh much more



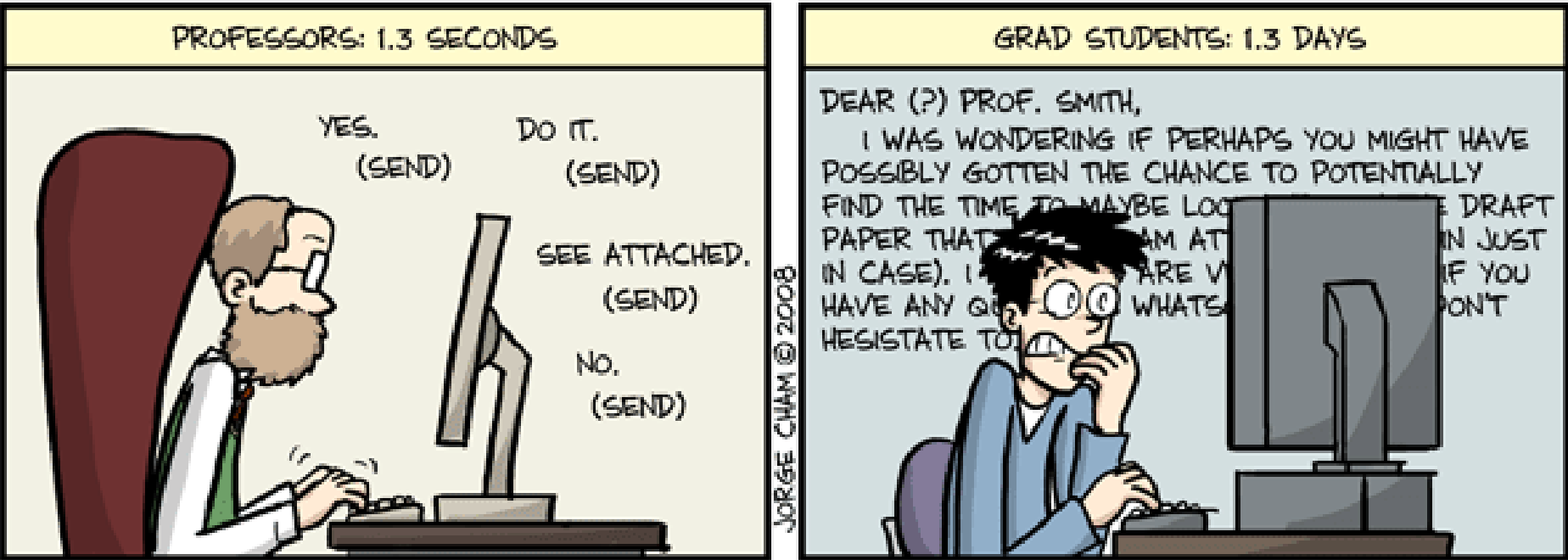
# But How?

An important factor is know how to **work**  
with your advisor

And first you need to know your advisor

# Advisor has MUCH more Tasks to do (and is Efficient in Tasks)

## AVERAGE TIME SPENT COMPOSING ONE E-MAIL



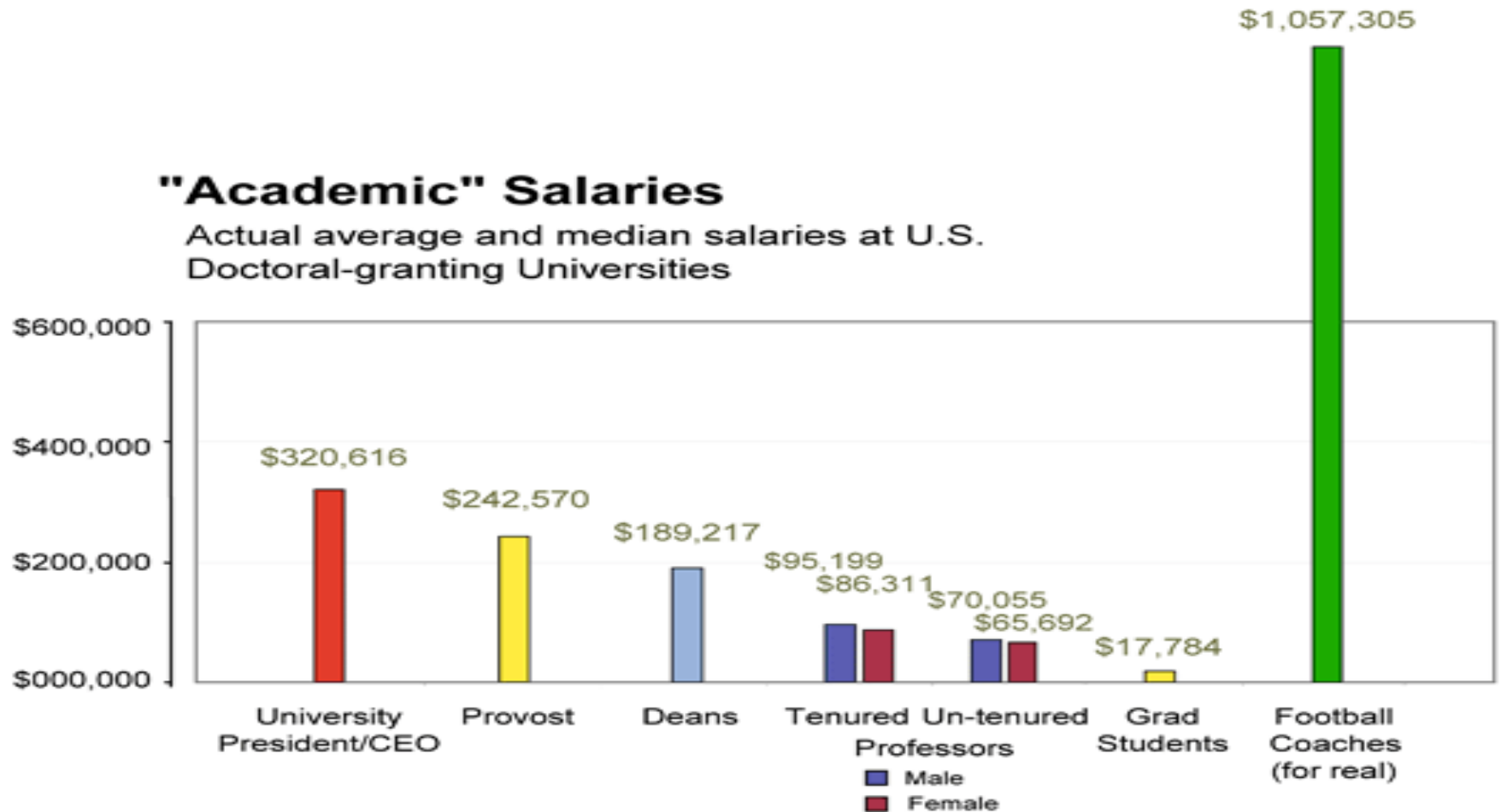
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*'Average time spent writing one e-mail'*

# Advisor's Time is MUCH more Expensive

## "Academic" Salaries

Actual average and median salaries at U.S. Doctoral-granting Universities



Notes: Administrator figures are medians salaries, the rest are averages. All figures in 2008 dollars. Sources: College and University Professional Association for Human Resources 2005 Survey; American Association of University Professors 2007 Survey; The Chronicle of Higher Education 2001 Survey of Graduate Assistants; USA Today Survey of Div. I-A College Football Coaches Compensation 2007.

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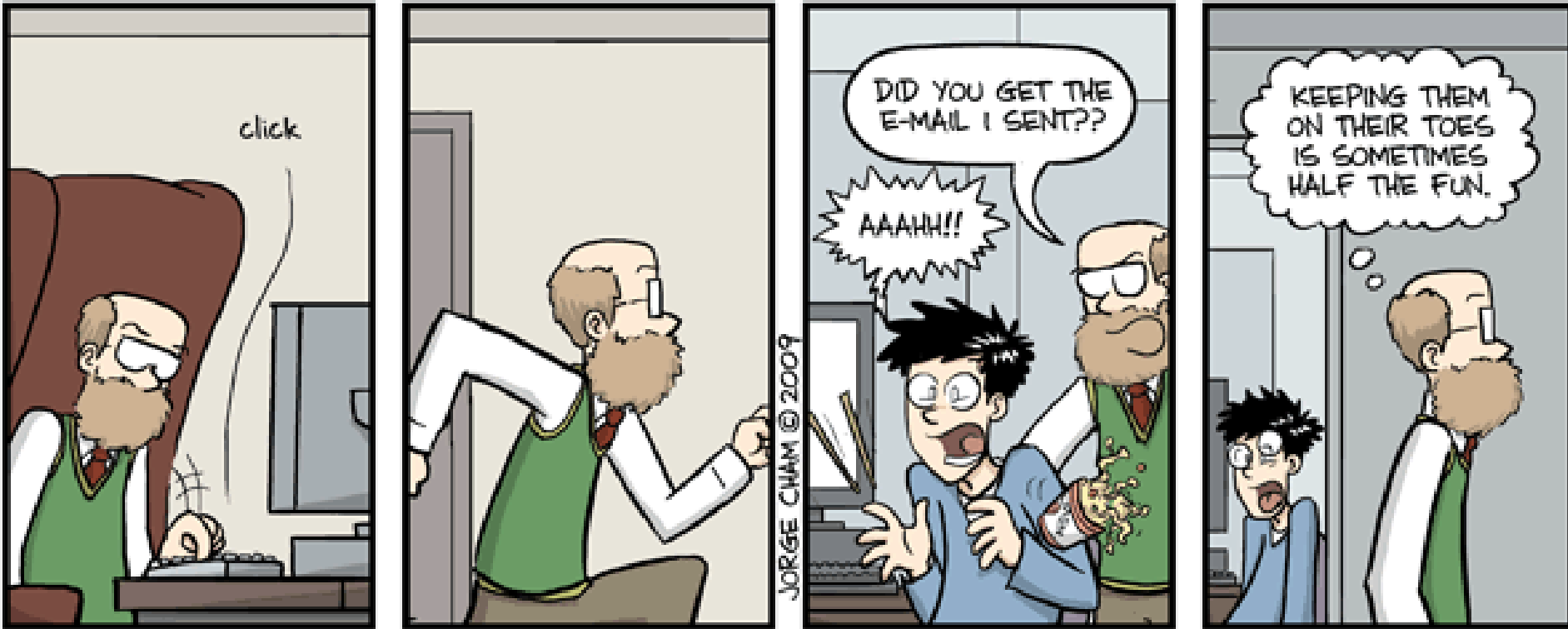
'Academic Salaries'

# **Appreciate the time that advisor allocates for you**

Be prepared before meeting advisor

But be proactive in requesting advisor's time  
allocated for you

# AND be Responsive to Advisor's Email



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*'Did you get it?'*

# Advisor Can be Hands-Off



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*'An impending sense of doom'*

# Find the RIGHT level of abstractions to convey your work details to advisor

- If advisor doesn't know what is going on, YOU suffer in the end
- Not necessarily the lower level of details, the better
  - Remember advisor is busy; likely no time to understand the messy details
- Solution 1: acceptance tests in contrast to walking advisor through your tool code base

# Solution 2: Send Formal Writing (in Paper Draft) to Your Advisor

WHAT YOU WROTE IN YOUR E-MAIL:

Prof. Smith,  
I finished the preliminary  
analysis, but I'm having  
problems with the statistics  
software. The license has  
expired and your approval is  
needed to renew it. Can you  
please call the support depart  
ment at 423 and authorize th  
purch... wise I can't co

WHAT YOUR PROFESSOR READ:

Prof. Smith,  
I finished

It's about time.  
Send me a draft  
tomorrow.

-Smith

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*'What your Prof. read'*

Don't rely (only) on informal writing or oral conversion! Often the time, students are not good oral communicators



Keep in mind that **Miscommunication**  
between advisor and student may be the  
most common factor for causing damage  
to research development

**Of course you need to know  
what your advisor may likely do to  
you ... 😊**

# Advisor can be Pushy on Working Time



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*'Regular Working Hours'*

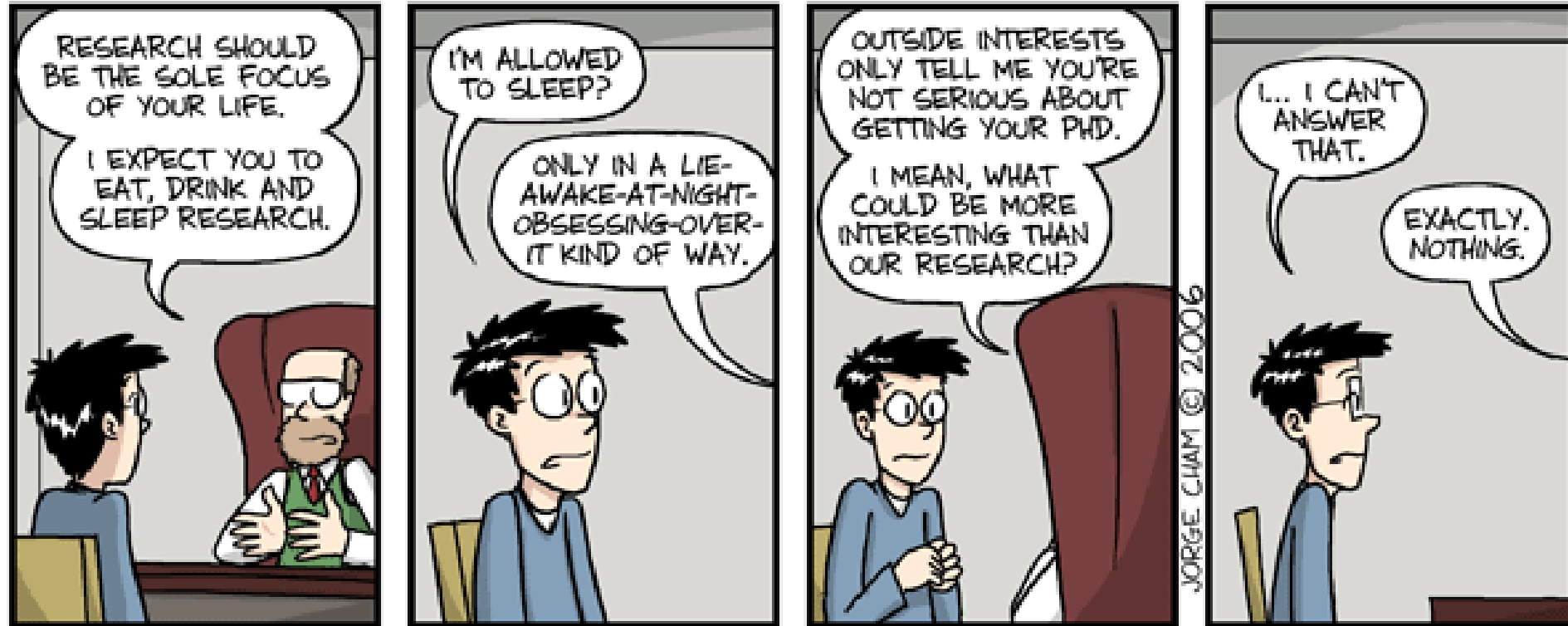
# Advisor can be Pushy on Working Time –cont.



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*'Nights and weekends'*

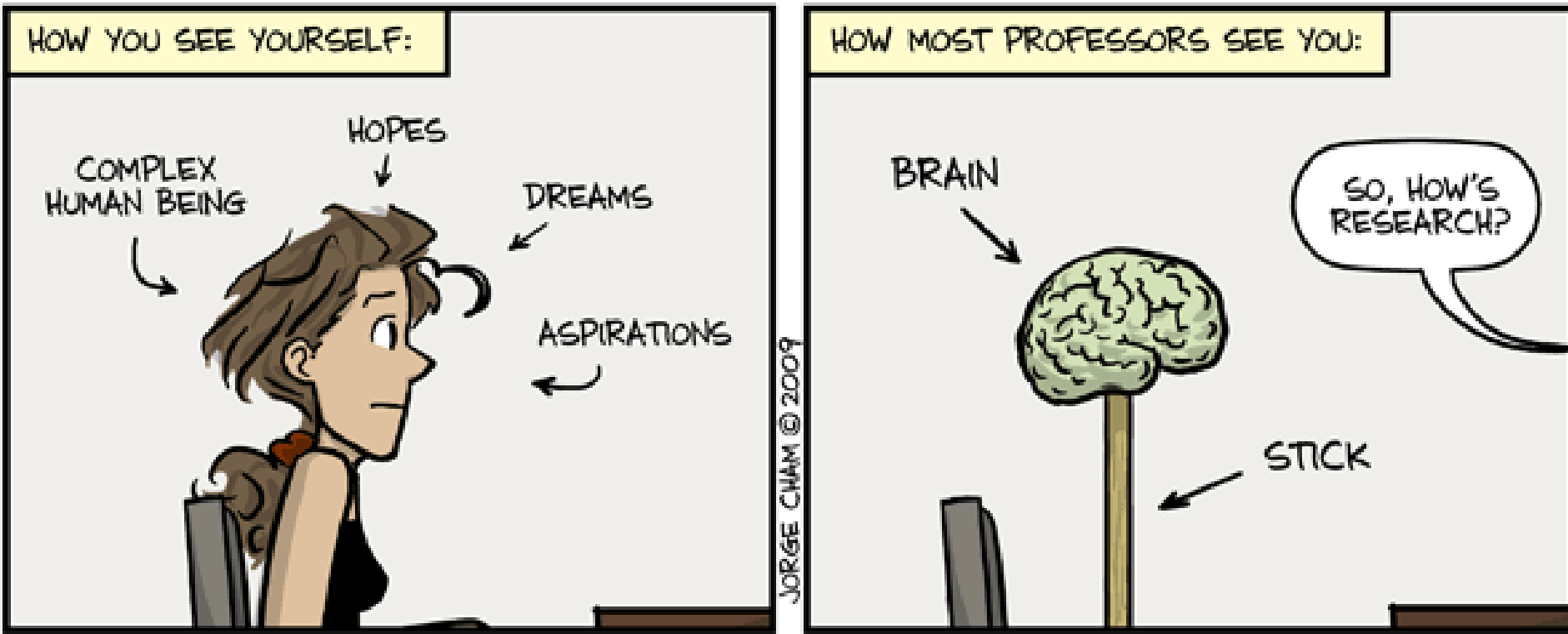
# Advisor can be Pushy on Your Passion to Research



*'Outside interests'*

# But More Often Advisor Looks For Concrete Deliverables (Results/Artifacts)

- papers
- tools
- experimental results
- new ideas
- ...



*'Brain on a stick'*

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But Concrete Deliverables don't come often enough, then advisor also looks for process evidence or anything else to assess a student to decide

- Whether to advise a student after trial period
- Whether to continue to advise a student
- Whether to continue RA support

**Simply put, how your advisor feels about you if you don't deliver (enough)**

In advisor's mind:

- Has the student worked hard enough?
- Are the student's skills good enough to deserve investment?
- **Any other factors causing the issue?**

# Which Factor Advisor Bets on?



*'The grandeur of his vision'*

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- Has the student worked hard enough?
- Are the student's skills good enough to deserve investment?
- **Any other factors causing the issue? (too ambitious goal or the problem/task is uncertain to succeed, health, family, ...)**

But Concrete Deliverables don't come often enough,  
then advisor also looks for process evidence or  
anything else to assess a student to decide

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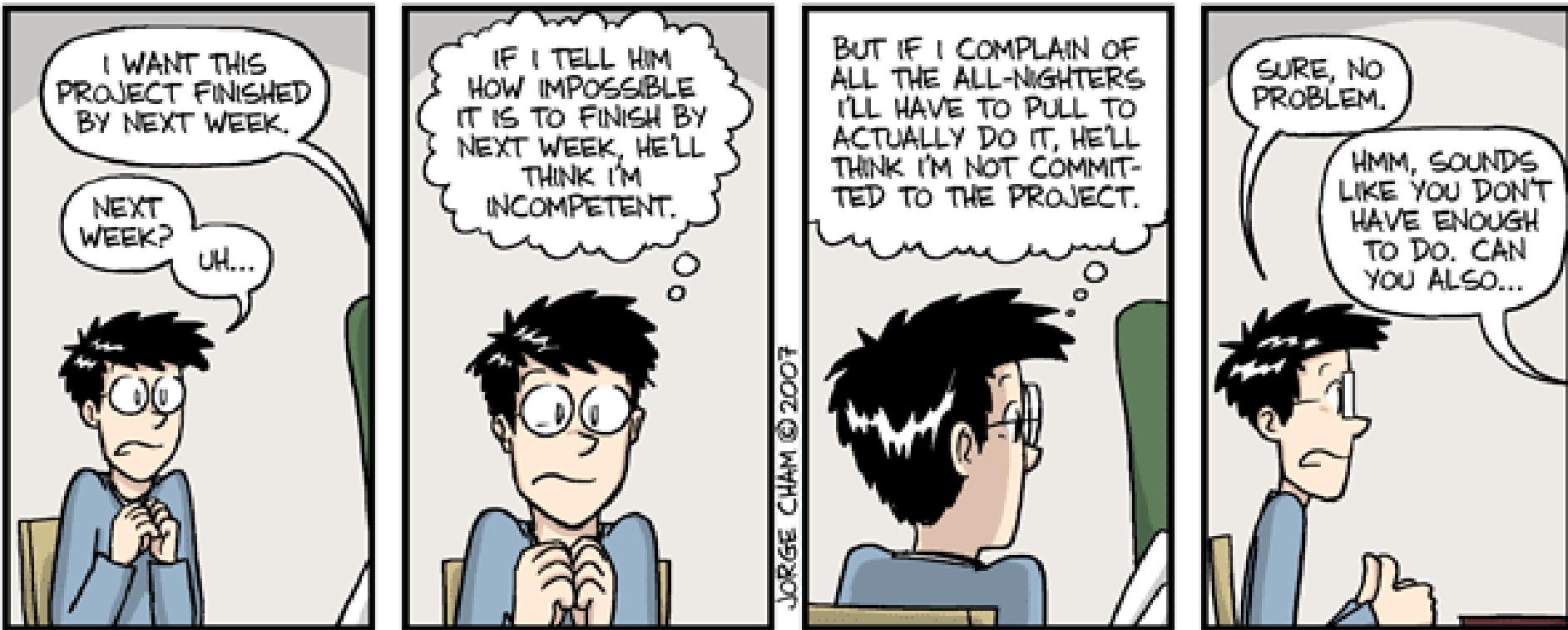
## **Solution:**

**deliver incrementally  
partial deliverables;  
make your work details  
transparent to advisor  
(avoid miscommunication)**



# Be Realistic, Candid, and Transparent

## Don't Over-promise



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*'Doing the impossible'*

But don't intentionally pad your schedule to budget more than enough time for given tasks (not bargaining here)

But if indeed your skills are not to expectation, you need to work harder than others to make your deliverables up to expectation

# Advisor doesn't Like (Just) Hearing Problems after Problems



*'Problems'*

<http://www.phdcomics.com/comics/archive/phd041107s.dif>

- Be proactive to propose possible solutions rather than just say passively "I faced this problem and I cannot move on; what next?"
- Be proactive to provide insights rather than staying on the problem surface (provide right levels of details for advisor to understand and give advice)

# Anti-Patterns on “Problem-Facing” Students

- Short-sightedly follow what advisor asks to do (e.g., implementing a particular feature) without knowing the goal/point of doing so
  - E.g., not knowing what “good” or “bad” results of the approach/tool would look like
- Doesn't understand research contributions or questions investigated by tool or experiment; therefore, doesn't dare/know to do workaround to address the problem
  - E.g., not knowing what is (not) important
- Lack good debugging or problem-solving skills

**Need communicate well to advisor for getting guidance**

# Hard!: Is Advisor Too Ambitious or Student not Good Enough?

How long your Prof. thinks it should take to do something



"Trivial"

=

There goes your week.

"Easy enough"

=

Pull your hair out for a month.

"About a week"

=

Actually, this is pretty easy. He/she doesn't know there's technology that will do this for you now. Take the week off!

"Should keep you occupied for the rest of the term"

=

He/she will forget they asked you to do this by the end of the term. Don't even bother.

"This might make a good thesis topic"

=

Say hello to your thesis topic.

"Hmmm..."

=

Uh oh.

*How long your Prof. thinks it should take to do something'*

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# After All, Need to Show Concrete (even Partial) Deliverables

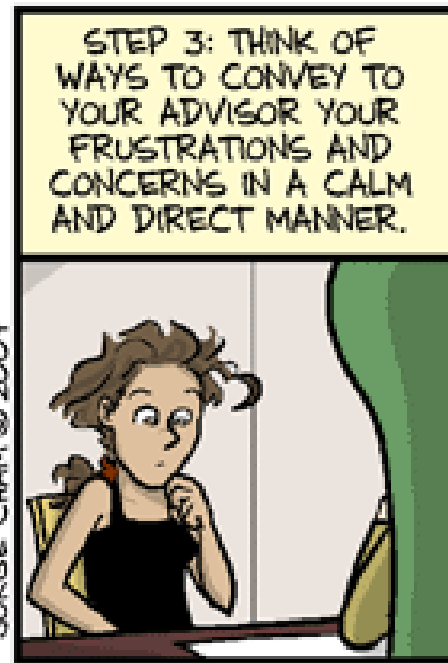


*'Meeting of the minds'*

Work hard and smart (strategically)

# Bottom Line is not Cause Advisor “Don’t Care”

HOW TO DEAL WITH FRUSTRATING FACULTY EXASPERATED BY A PERCEIVED LACK OF INTEREST AND SUPPORT? A STEP-BY-STEP GUIDE:



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*'Some helpful advice'*

Bad sign: advisor doesn't push you or care even when you don't deliver → likely soon advisor won't work with you

# Driving Force should Come from You, Not (Just) Advisor

## SUMMER DAYS...

THE LAB: 1 DAY AFTER ADVISOR LEAVES FOR VACATION.



THE LAB: 2 DAYS AFTER ADVISOR LEAVES FOR VACATION.



THE LAB: 1 DAY BEFORE ADVISOR COMES BACK FROM VACATION.

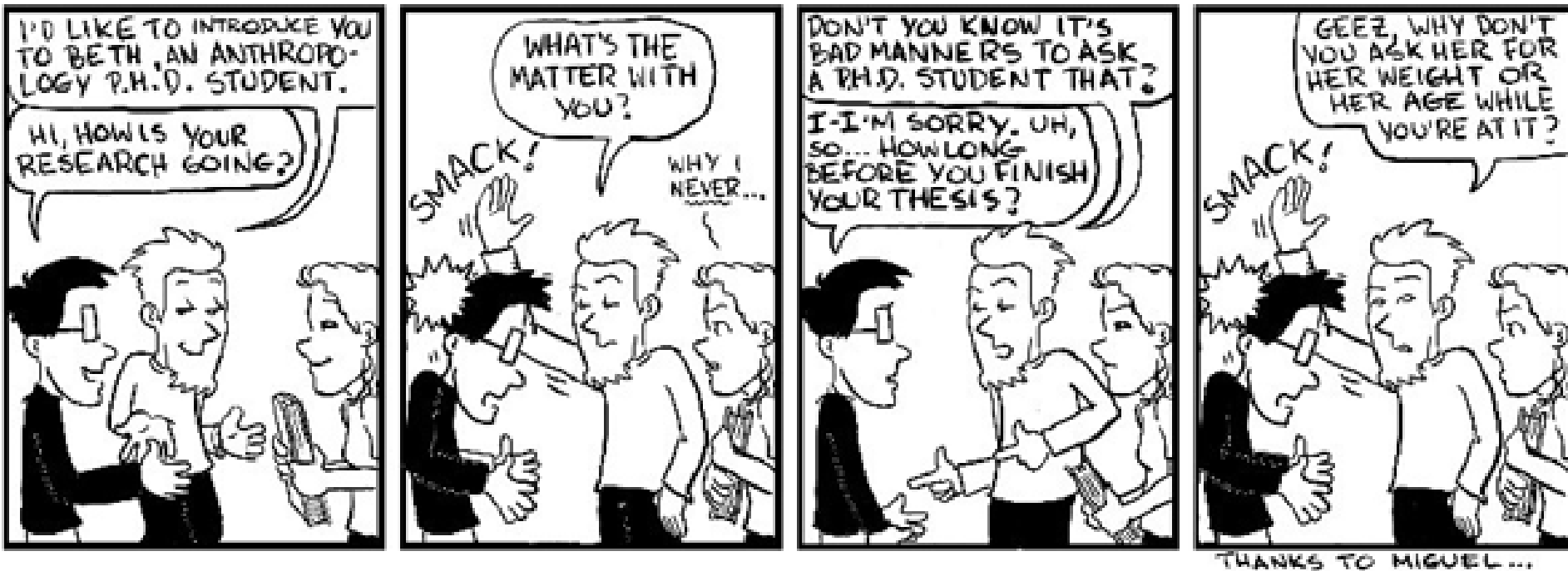


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*'Summer days...'*

# Make Sure You Make Progress



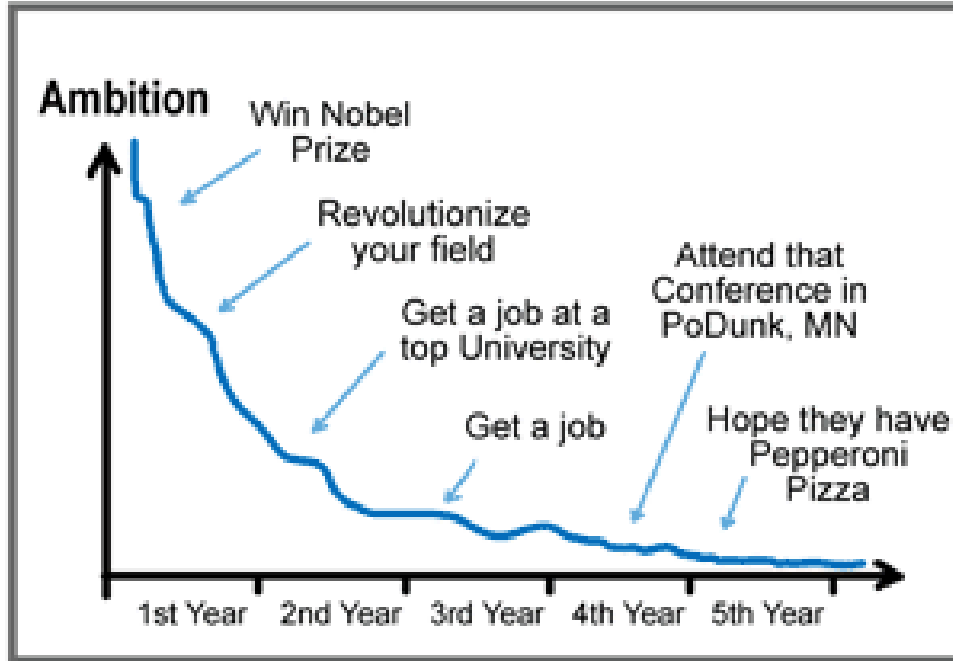
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*'Grad student etiquette'*



# (Don't) Feel Going Down Over Years

## YOUR LIFE AMBITION - What Happened??

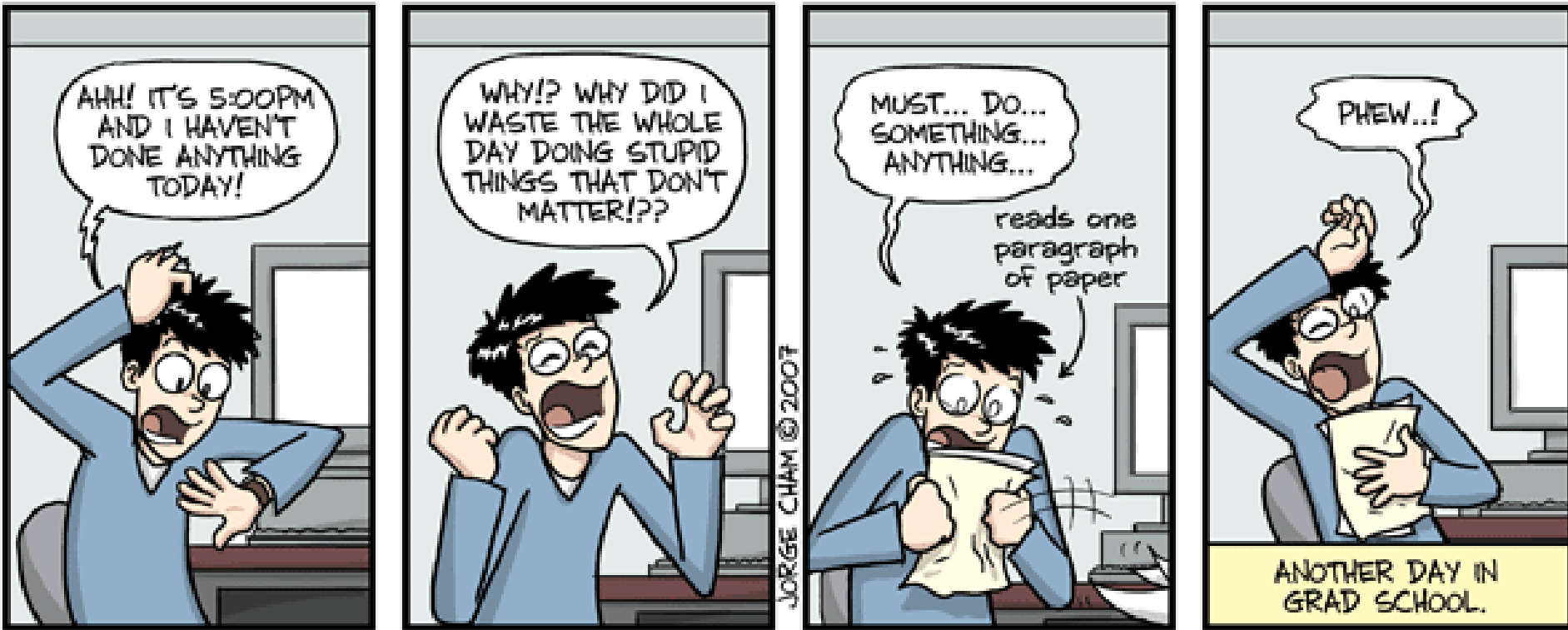


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*'Your Life Ambition'*

# Not Spend Your Day Like



'Why? Why??'

# Writing, Writing, Writing

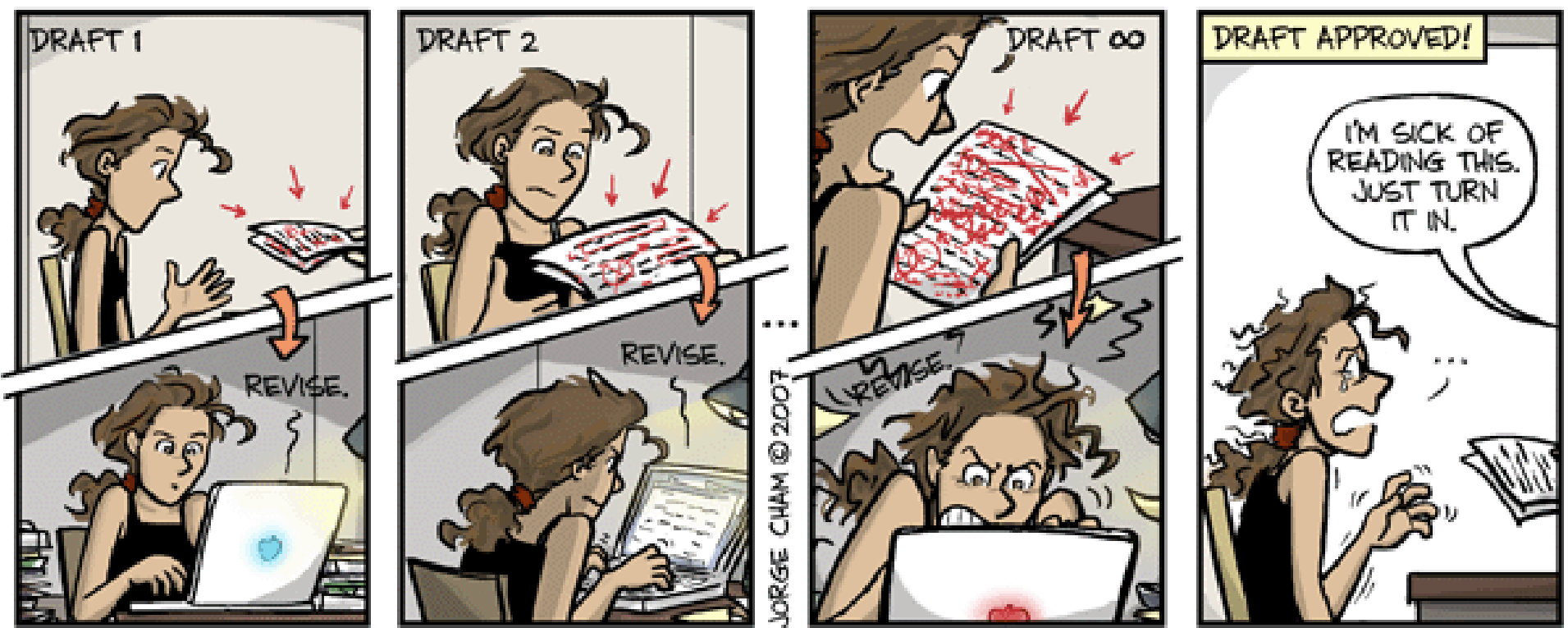
- Many students (esp. international students) have poor writing skills
  - Pitfall: rely on advisor to write or rewrite, not learning how to write better

# Writing Skills are Important to Your Career Goals



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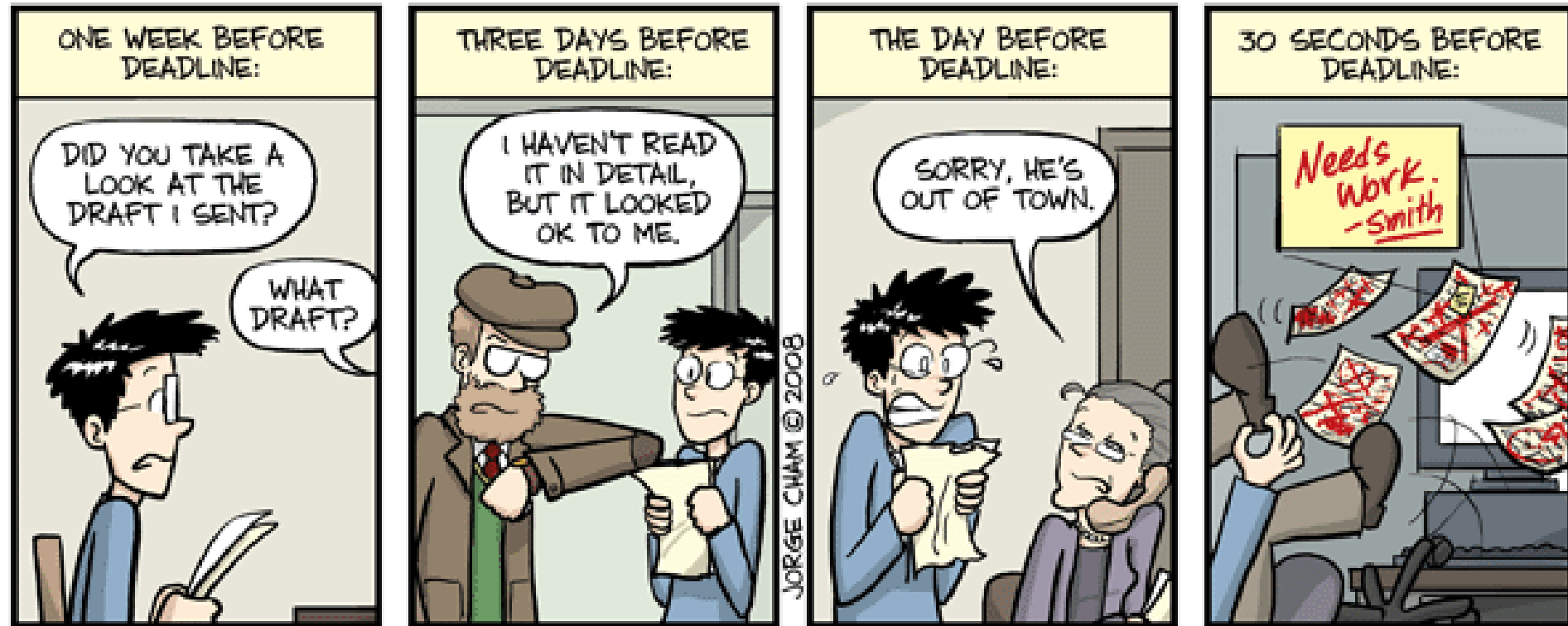
# If You are Lucky, when Preparing Your Submission (write early!) ...



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*'Draft approved!'*

# If not Lucky, (Don't Expect Your Advisor's Only Task is Just Working with You) ...



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*'Needs work'*

# Maybe the most important question: When is a student ready to get a MS/PhD?

My personal interpretation

- MS: independent research developer
- PhD: independent research developer, thinker, and architect

# After ALL, Most Importantly Keep Good Physical and Mental Health



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'Sleep'

<http://www.phdcomics.com/comics/archive/phd100308s.gif>

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# More Resources

<http://people.engr.ncsu.edu/txie/advice/>

- Research Skills

- <http://people.engr.ncsu.edu/txie/advice/researchskills.pdf>