



U.S. Army Research, Development and Engineering Command

Mark A. Tschopp, Ph.D.
*ORAU ORISE (ARL-WMRD) /
Faculty, Mississippi State
University*

The logo for the Army Research Laboratory (ARL). The letters "ARL" are rendered in a large, bold, black font. Each letter has a yellow triangular shape on top, pointing downwards, which gives the logo a dynamic, three-dimensional appearance.

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Career Mobility: Personal Experience and Lessons Learned
from Industry, Government Laboratories, and Academia

MS&T 2012, Perspectives for Emerging Materials Professionals Symposium
October 9th, 2012

11:20 AM Invited

Career Mobility: Personal Experience and Lessons Learned from Industry, Government Laboratories, and Academia: *Mark Tschopp*¹; ¹Mississippi State University

Early career materials professionals are often faced with a decision early in their undergraduate studies about their future career path. In some cases, this decision sets up their future 30+ year career in industry, government laboratories, or academia. In my case, this decision was only the beginning of a tortuous career path that eventually led to academia and a faculty position. This presentation will share my personal experience with career mobility as I moved from industry to graduate school to government laboratory to academia. I will share some of my experiences with shifting between these very different worlds as well as some of the lessons that I have learned along the way.

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Early career materials professionals are often faced with a decision early in their undergraduate studies about their future career path. In some cases, this decision sets up their future 30+ year career in industry, government laboratories, or academia. In my case, this decision was only the beginning of a tortuous career path that eventually led to academia and a faculty position, and then to a government laboratory. This presentation will share my personal experience with career mobility as I moved from industry to graduate school to government laboratory to academia (and then back to a government laboratory). I will share some of my experiences with shifting between these very different worlds as well as some of the lessons that I have learned along the way.

The Search for the Perfect Job:

- Share my experiences as I have transitioned from one position to another
 - what I've learned
 - what has been important for me
- Important to take into consideration many different opinions and make a conscious decision of what is the right fit for you...

Disclaimer: These are candid remarks/lessons learned from my own experiences. These may not be everyone's experiences. Perhaps, these views will spark discussion or encourage thought, though.

w/o visits to parents in IA

Online Offers
Aberdeen Hotels
Aberdeen Restaurants

Print Send Link/Embed



2001 Ford Escape



Est. Fuel Cost
\$1207.00

136 hrs 13 mins / 8259.81 miles

w/ visits to parents in IA

[Pin it](#) Online Offers
[Aberdeen Hotels](#)
[Aberdeen Restaurants](#)

Print Send Link/Embed



228 hrs 2 mins / 13939.71 miles

Takeaway Points:

1. This is why we don't like to travel back home over Christmas break... (for my parents!)
2. Sometimes careers take tortuous paths. Be opportunistic and take advantages of opportunities to move your career forward...
3. Experiencing different work environments and cultures is value-added for your career.



13939.71 miles!



Keep your options open!

How do you market yourself?

What you don't want to have happen...

How to turn your CV into a "Resume":

A useful skill in these economic times

STEP 1: MOVE THE "REAL-WORLD WORK EXPERIENCE" SECTION FROM THE BOTTOM TO THE VERY TOP.



STEP 2: TRIM THE DOCUMENT TO ONE PAGE. GOOD LUCK!

www.phdcomics.com/
Piled Higher & Deeper
a grad student comic strip



Have a plan of where you want to go!

How do you market yourself?

Mark A. Tschopp																					
CONTACT INFORMATION	200 Research Blvd Starkville, MS 39759 <i>Email:</i> mark.tschopp@msstate.edu <i>Cell Phone:</i> (770) 316-1411 Center for Advanced Vehicular Systems, PO Box 5405 Mississippi State University, MS 39762 <i>Email:</i> mtschopp@cavs.msstate.edu <i>Work Phone:</i> (662) 325-5580 <i>h-index:</i> 11 (Google Scholar, Scopus & ResearcherID)																				
EDUCATION	Georgia Institute of Technology , Atlanta, Georgia USA Ph.D., Materials Science and Engineering, Summer 2007, GPA 3.9/4.0 <ul style="list-style-type: none"> Ph.D. Dissertation: M.A. Tschopp, "Atomistic simulations of dislocation nucleation in single crystals and grain boundaries," pp. 1-375 (2007), 2008 Sigma XI Best PhD Thesis Award. Advisor: David L. McDowell, Regents' Professor and Carter N. Padon, Jr. Distinguished Chair in Metals Processing for MSE/ME University of Missouri-Rolla , Rolla, Missouri USA (now) Missouri University of Science & Technology M.S., Metallurgical Engineering, December 1999, GPA 4.0/4.0 <ul style="list-style-type: none"> M.S. Thesis: M.A. Tschopp, "Mechanisms of the formation of pyrolysis defects in aluminum lost foam castings," pp. 1-235 (1999). Advisor: Donald Askeland, Distinguished Teaching Professor for Metallurgical Engineering B.S., Metallurgical Engineering, May 1998, GPA 3.9/4.0																				
EMPLOYMENT	<table border="0"> <tr> <td><i>Research Scientist</i> (on leave of absence from MSU)</td> <td style="text-align: right;">2012-Present</td> </tr> <tr> <td>Oak Ridge Institute for Science and Education, Aberdeen, MD Weapons and Materials Research Directorate, Lightweight and Specialty Alloys Army Research Laboratory</td> <td></td> </tr> <tr> <td><i>Adjunct Assistant Professor, Mechanical Engineering</i> <i>Adjunct Professor, Computational Engineering</i> Mississippi State University</td> <td style="text-align: right;">2009-Present</td> </tr> <tr> <td><i>Assistant Research Professor</i> Center for Advanced Vehicular Systems, Mississippi State University</td> <td style="text-align: right;">2009-Present</td> </tr> <tr> <td><i>Visiting Research Scientist</i></td> <td style="text-align: right;">2007-2009</td> </tr> <tr> <td>Universal Technology Corporation, Dayton, Ohio (on site at) Wright Patterson AFB, Air Force Research Laboratory Life Prediction and Behavior Group (RLXLMN)</td> <td></td> </tr> <tr> <td><i>Graduate Research Assistant, Georgia Institute of Technology</i></td> <td style="text-align: right;">2003-2007</td> </tr> <tr> <td><i>Process/Manufacturing Engineer</i> GM Powertrain-Casting Development and Validation Center</td> <td style="text-align: right;">2000-2003</td> </tr> <tr> <td><i>Graduate Research Assistant, University of Missouri-Rolla</i></td> <td style="text-align: right;">1998-1999</td> </tr> <tr> <td><i>Manufacturing Engineer, GM Powertrain-Massena</i></td> <td style="text-align: right;">1998</td> </tr> </table>	<i>Research Scientist</i> (on leave of absence from MSU)	2012-Present	Oak Ridge Institute for Science and Education , Aberdeen, MD Weapons and Materials Research Directorate, Lightweight and Specialty Alloys Army Research Laboratory		<i>Adjunct Assistant Professor, Mechanical Engineering</i> <i>Adjunct Professor, Computational Engineering</i> Mississippi State University	2009-Present	<i>Assistant Research Professor</i> Center for Advanced Vehicular Systems , Mississippi State University	2009-Present	<i>Visiting Research Scientist</i>	2007-2009	Universal Technology Corporation , Dayton, Ohio (on site at) Wright Patterson AFB, Air Force Research Laboratory Life Prediction and Behavior Group (RLXLMN)		<i>Graduate Research Assistant, Georgia Institute of Technology</i>	2003-2007	<i>Process/Manufacturing Engineer</i> GM Powertrain-Casting Development and Validation Center	2000-2003	<i>Graduate Research Assistant, University of Missouri-Rolla</i>	1998-1999	<i>Manufacturing Engineer, GM Powertrain-Massena</i>	1998
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HONORS AND AWARDS	<ul style="list-style-type: none"> 2011 MSU StatePride Faculty Award Award based on excellence in teaching, research, and service to Mississippi State University. 																				

BS/MS

- Fit everything into 1-2 pages
- Focus on grades, work experience, skills

PhD/PD/+

- Develop your CV => Roadmap
- How does what you are working on translate to your CV?

How do I improve my Resume/CV?

- Find online examples – What do you like? What don't you like?
- Find successful people in your discipline – What roadmap did they follow? What can you learn from their career path?

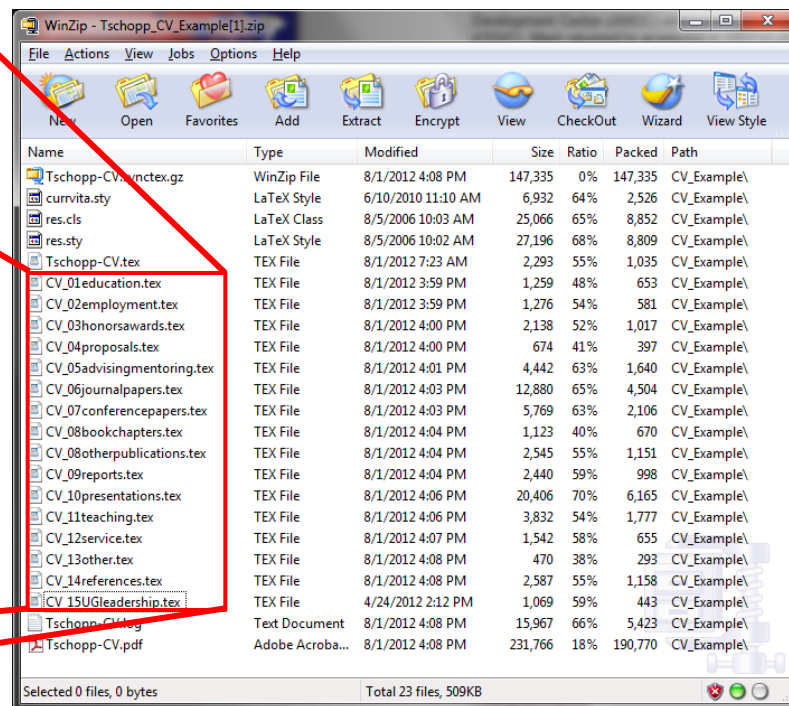
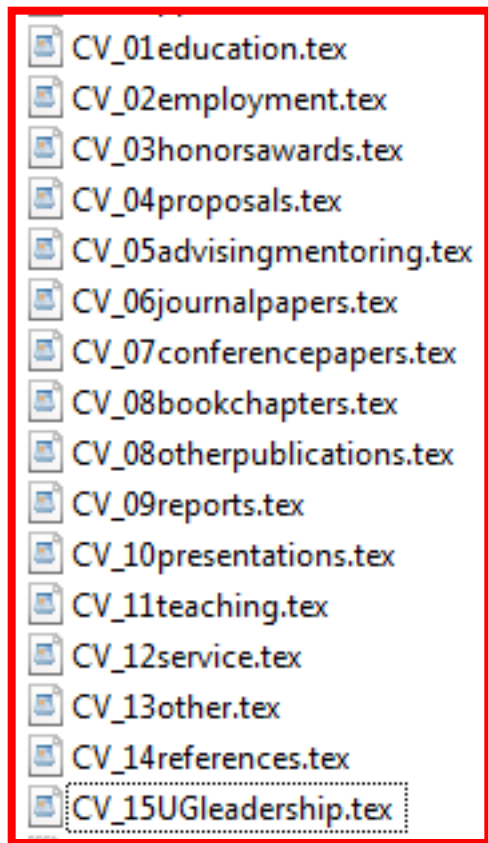
Like my CV template? Here's the LaTeX:

<http://www.cavs.msstate.edu/mtschoopp>

How do you market yourself?

Why I like LaTeX...

- I can keep track of everything, but I can comment out items (or keep track of things that don't need to be in my CV)



Like my CV template? Here's the LaTeX:
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Journal Articles

```
\item
\underline{Barrett, C.D.}, Tschopp, M.A., El Kadiri, H.,
``\href{http://dx.doi.org/10.1016/j.jmps.2012.06.015}{Breakdown of the Schmid Law in
Homogeneous and Heterogeneous Nucleation Events of Slip and Twinning in Magnesium}," Journal
of the Mechanics and Physics of Solids, doi:10.1016/j.jmps.2012.06.015.
% From Kip 6/1/11
% Reviewed and back to Kip 7/1/11
% Haitham's comments. 7/21/11
% My comments, 8/7/11
% To Heather, 8/8/11
% Reviews back, 12/13/11
% in press, 8/2/12
```

LaTeX

Make notes about when I sent to collaborator/journal, when they accepted it, when in print, etc.



Compiles into this...

pdf

Barrett, C.D., Tschopp, M.A., El Kadiri, H., “Breakdown of the Schmid Law in Homogeneous and Heterogeneous Nucleation Events of Slip and Twinning in Magnesium,” Journal of the Mechanics and Physics of Solids, doi:10.1016/j.jmps.2012.06.015.

Like my CV template? Here's the LaTeX:

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How do you market yourself?

Your Profile Picture Perhaps the most important decision of your day.

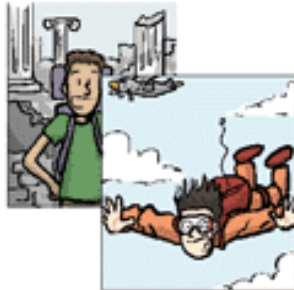
The Goofy Close-up



Personal Info:

"OMG, like, haha ROTFL!!!!!"

You in exotic location/participating in extreme sport



Activities:

"Been there, done that."

Your baby picture (aww!)



About me:

"I used to be cute... WHAT HAPPENED??"

You with significant other



Relationship:

"See? I'm not the only person who likes me."

The casual snapshot

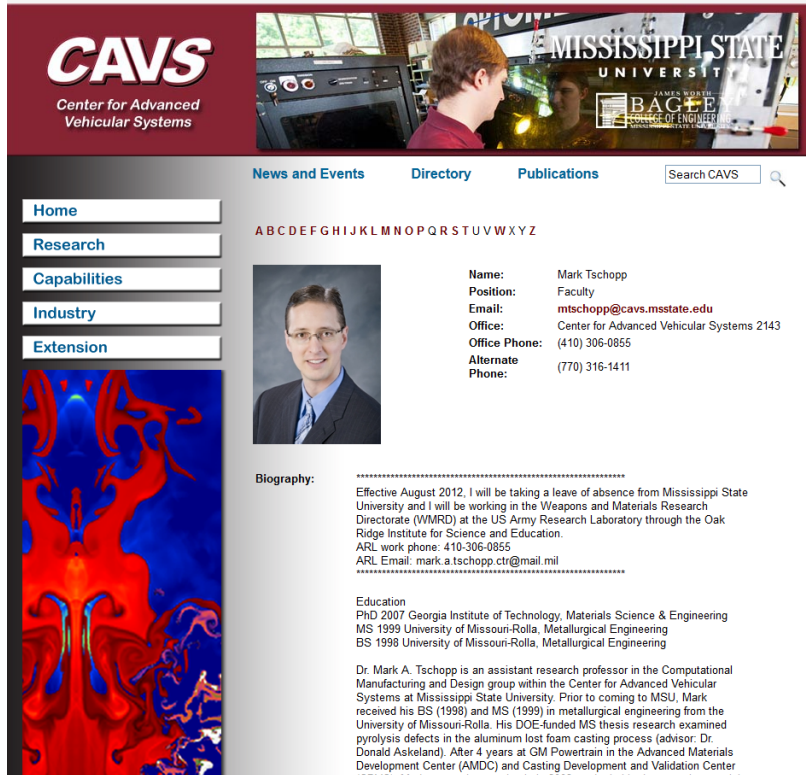


Status:

"Like, whatever, i didn't just spend 3 hours trying to pick my profile picture."

JORGE CHAM © 2008 WWW.PHDCOMICS.COM

How do you market yourself?



CAVS
Center for Advanced Vehicular Systems

MISSISSIPPI STATE UNIVERSITY
BAGGEE
SCHOOL OF ENGINEERING

News and Events Directory Publications Search CAVS

Home
Research
Capabilities
Industry
Extension

ABCDEFGHIJKLMNOPQRSTUVWXYZ

Name: Mark Tschopp
Position: Faculty
Email: mtschopp@cavs.msstate.edu
Office: Center for Advanced Vehicular Systems 2143
Office Phone: (410) 306-0855
Alternate Phone: (770) 316-1411

Biography:
Effective August 2012, I will be taking a leave of absence from Mississippi State University and I will be working in the Weapons and Materials Research Directorate (WMRD) at the US Army Research Laboratory through the Oak Ridge Institute for Science and Education.
ARL work phone: 410-306-0855
ARL Email: mark.a.tschopp.ctr@mail.mil

Education
PhD 2007 Georgia Institute of Technology, Materials Science & Engineering
MS 1999 University of Missouri-Rolla, Metallurgical Engineering
BS 1998 University of Missouri-Rolla, Metallurgical Engineering

Dr. Mark A. Tschopp is an assistant research professor in the Computational Manufacturing and Design group within the Center for Advanced Vehicular Systems at Mississippi State University. Prior to coming to MSU, Mark received his BS (1998) and MS (1999) in metallurgical engineering from the University of Missouri-Rolla. His DOE-funded MS thesis research examined pyrolysis defects in the aluminum lost foam casting process (advisor: Dr. Donald Askeland). After 4 years at GM Powertrain in the Advanced Materials Development Center (AMDC) and Casting Development and Validation Center (CDVC), Mark returned to academia in 2002 to obtain his doctorate in materials

What is the first thing that comes up when you type your name into GOOGLE?

- If you enter your name, what comes up first?
- Is it what you want people to see?
- Are you taking advantage of this? This is a blank slate for you to share your strengths with others...
- What about your signature on emails? Do you have an associated webpage?
- How many clicks to get to your resume/CV? What about publications (Google Scholar)?

Beware of what you enter on twitter and other sites (mailing lists)!!!



The casual snapshot



Status:

"Like, whatever, i didn't just spend 3 hours trying to pick my profile picture."

Know your audience!!!

How do you make a good first impression (or not make a bad impression)?

- 1-on-1 meetings in professional or casual settings
- Presentations
 - Conference and otherwise...
- Asking questions
 - is your question/comment better "offline"?
 - is this someone that you can ask basic questions to?
 - is it something that can be found online?
- Get feedback from others. Have someone you can trust to be honest.
- What do you do (for research)?

C.C. Berndt: "People will only remember you from their last interaction with you."



Networking is important!

- Professional societies are great for networking
- Getting involved with committees
- Start locally – expand your network outside of your present work place (you never know when you will need these!)
- The **QUALITY** of your network is important!!!

Acknowledgments



- **Postdoctoral:**
 - D. Hossain, M. Lugo, A. Moitra, S. Nouranian, E. Asadi, A. Oppedal
- **Graduate students:**
 - CD Barrett (MSU), "Mechanisms of Twin Nucleation in Magnesium", Co-advisor, Fall 2014
 - MA Bhattia (ASU), I Adlaka (ASU), Co-advisor
- **Undergraduates:**
 - NR Rhodes, CD Barrett, CG Rhodes, M Shrivastava, M Patel, S Namdeo, S Kandel, D Zhuk
- **Graduate Advisor** (DL McDowell)
- **GT collaborators** (DE Spearot^{Arkansas}, GJ Tucker^{Sandia}, KI Jacob, S Tiwari)
- **AFRL collaborators** (AH Rosenberger, C Woodward, JE Spowart, GB Wilks, BB Bartha^{US Space Alliance}, MA Groeber, JP Simmons, *et al.*)
- **MSU/CAVS collaborators** (KN Solanki^{ASU}, MF Horstemeyer, DJ Bammann, JL Bouvard, JB .)
- **INL/PNNL/LA** Millett, M Ton

Who are your mentors?
Who can help you technically?
Who are your peers?
Who are your competitors?
All of these are important!



Materials Genome Initiative (C. Wadia)
"Instead of thinking as individuals, think as a network"

I'm done with my degree. Now what?

Internships

Academia

Consulting

Industry

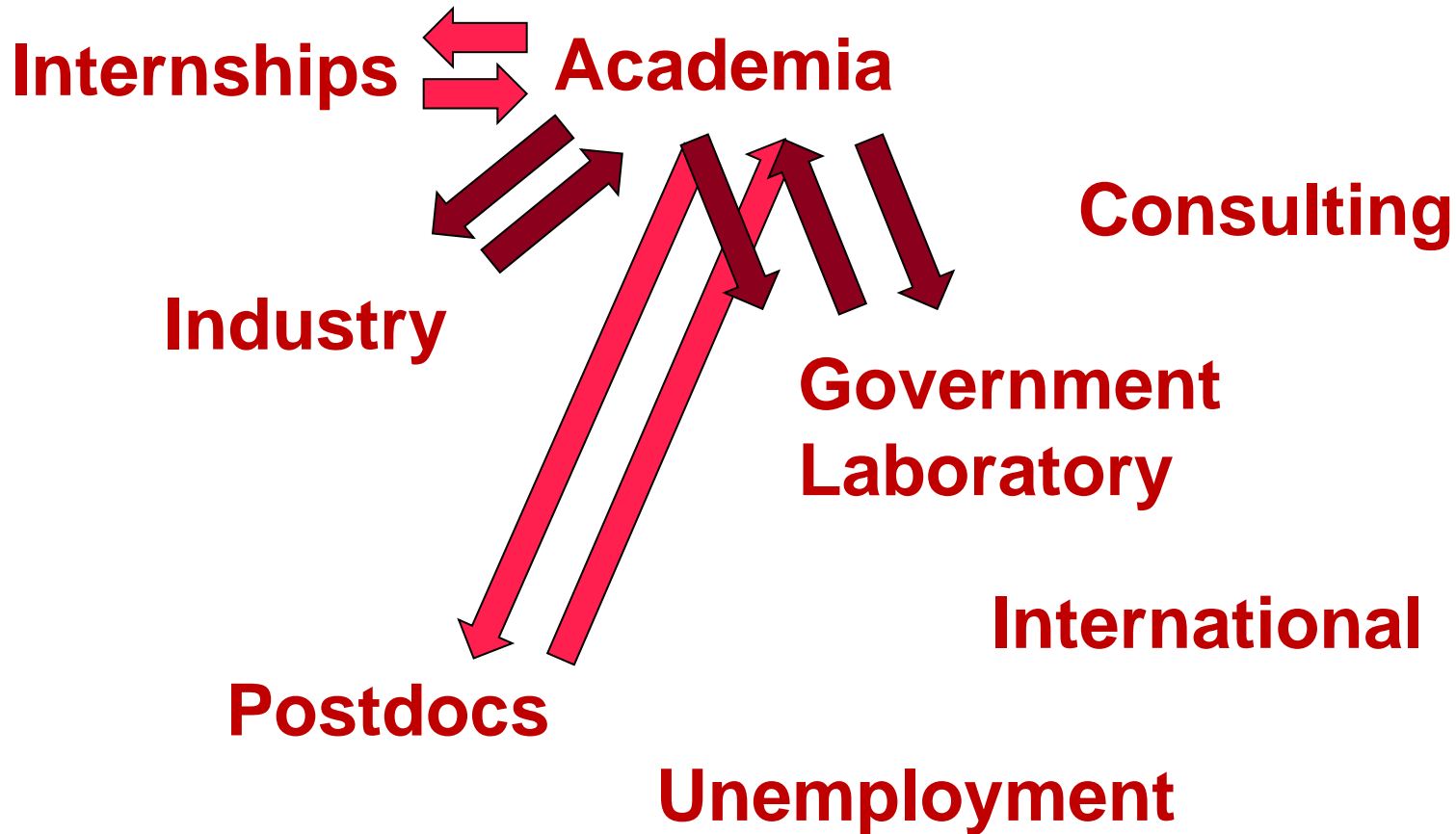
**Government
Laboratory**

International

Postdocs

Unemployment

I'm done with my degree. Now what?





<http://www.stat.gov.mk/>

(sadly, one of the top images when you type "industry" in GOOGLE)

Lessons Learned:

1. "Go fast" environment
 - Problem => Loss of Money => Do something!!! (and do it now)
2. Prioritization and goals are driven by \$\$\$
3. Staying technical w/o PhD degree is an option, but sometimes with little/no opportunities for advancement
4. Solutions to technical problems sometimes become repetitious. Many problems turn out to be people problems.
5. Managerial Roles are often only way for advancement
6. Flexibility with location and time off
7. Not as bad as some portray it to be

Conclusive proof it pays more to do nothing
than it does to get a Ph.D.:

Average Maximum Annual
Unemployment Benefit

\$21,060

Average Graduate
Student Stipend

\$18,779

Sources: U.S. Department of Labor (via SF Chronicle), The Chronicle of Higher Education 2008-2009 survey of pay and benefits for teaching and research assistants. Unemployment benefits computed from average maximum state weekly benefits (typically 50% of base wages, capped by state) multiplied by 52 (in some cases, benefits can be extended up to 79 weeks). Academic year stipends extrapolated to 12 months.

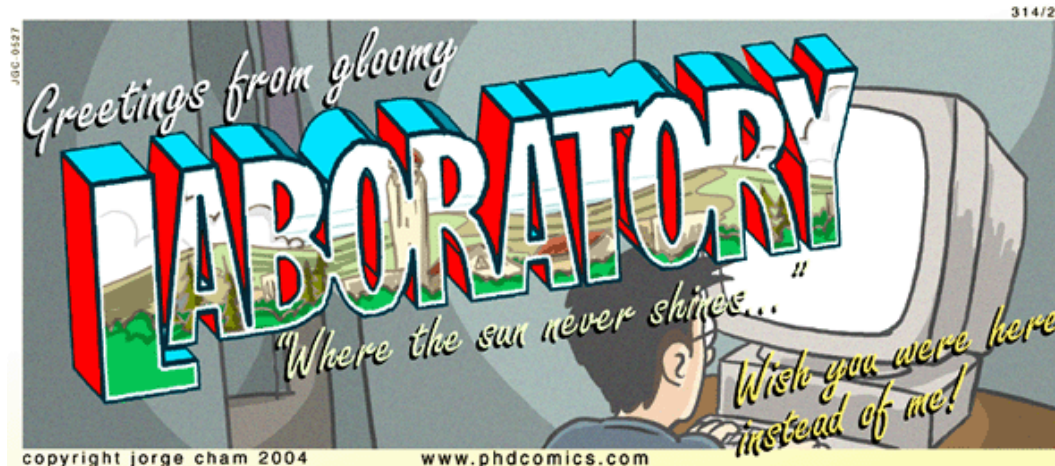
JORGE CHAM © 2009

WWW.PHDCOMICS.COM

Questions:
What are you
passionate about?
Where is the best
opportunity based
on this?

Lessons Learned:

1. Visit many universities/departments – rankings aren't always what they are cracked up to be...
2. Technically challenging (and rewarding!)... R&D affords the opportunity to always work on something cutting edge or novel
3. Industry helped – Having an 9-5 work mentality is good (unfortunately, the hours are a little longer than that and you often can't stop thinking about research after you go home)
4. Easy to become focused on just research => think ahead about your next career step as well (where will you go? Who do you need to contact?)



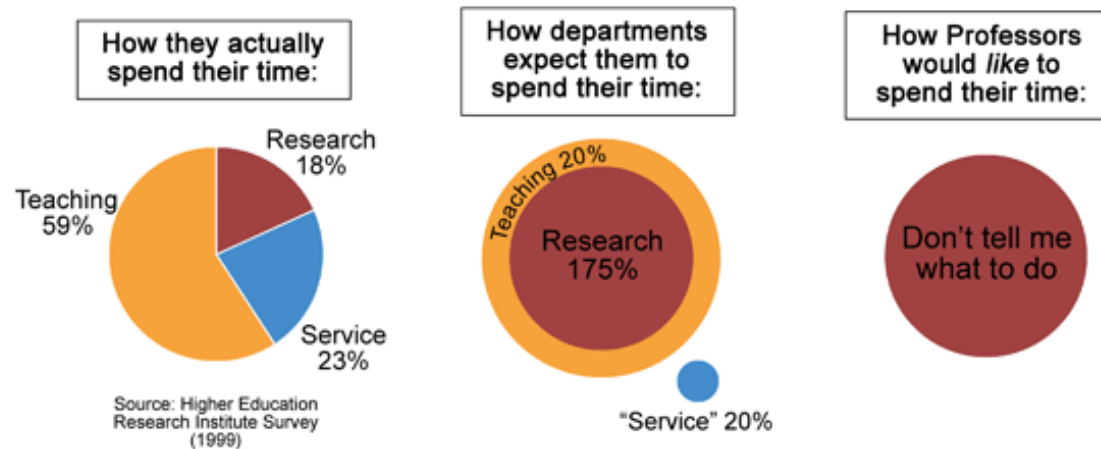
Lessons Learned:

1. More red tape... Don't use this as an excuse to not be productive. Find ways to become efficient and productive! (Hint: Ask for advice)
2. Ability to change research directions is highly desired:
 - Restructuring/reassigning can be common
 - Contractors may need to be flexible in research. Can you handle switching research every few years?
3. Emphasis on metrics (publications/presentations) as well as delivering on projects/contributing to the mission
 - Need to find a way to do both

Lessons Learned:

1. **Optimization problem:** How do you maximize the time spent on items that go into your CV?
2. Have to learn to say 'No' (just not too early in your career)
3. Are your research ideas transformative enough? It depends on who is asking. Know your audience...
4. Perception is important (sometimes too important)
5. Publications are important, but aren't everything

HOW PROFESSORS SPEND THEIR TIME

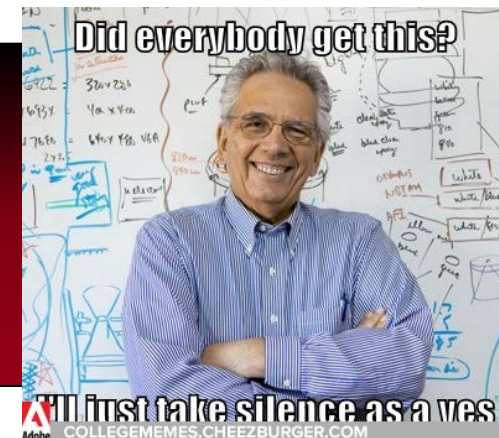
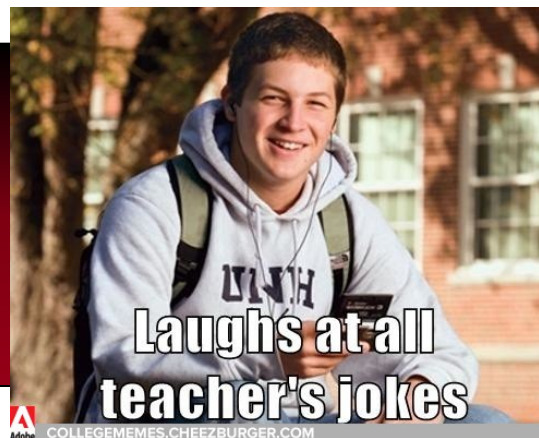
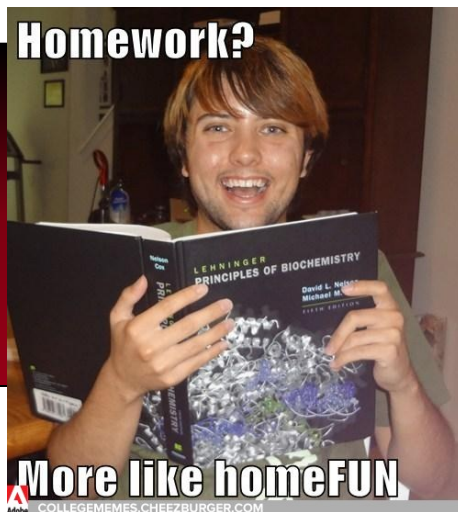


JORGE CHAM © 2008

WWW.PHDCOMICS.COM

Lessons Learned:

6. Opportunities aren't quite as easy to come by:
 - Right research area, right personality, right fit, right school/advisor, etc.
 - Departments and search committee take on their own persona
 - Want an academic position? Start acting like a tenure-track professor...
7. Be conscious of productivity versus time from PhD (not time in PhD)
8. Don't be in a rush to exit before you are ready to independently conduct research.
9. Collaborate. Find mentors. Ask for advice (some professors are extremely helpful – they gladly tell you what's wrong with you or your application – just listen!)
10. Unfortunately, the best time to move to the next position is probably the worst. Keep applying and don't restrict your opportunities by not applying.





www.dilbert.com/

- What is the correct balance for you (and/or your significant other)? Dual career family?
- Do you like a small town? City? Metropolis?
- What do you like to do in your free time?
- Do you have regional preferences?
- What about opportunities/activities for kids (or future kids)?

Find out what direction you want your career to go in....

Stay the course...

Keep doing the right things...

Be open to opportunities...

Keep your CV up-to-date...

Remember to have a life outside of work...

**Good
Luck!!!**

The End

(no more slides!)