

# Thriving Your Way Through Graduate School

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Texas Tech University

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Early Career Workshop  
KSMB-SMB Annual Meeting



## Overview of my journey

- BS Computational Mathematical Sciences, ASU May 2009
- MA Mathematics, ASU May 2011
- PhD Applied Mathematics, ASU August 2014
  - Adviser: Yang Kuang
- Postdoctoral fellow at NIMBioS, Aug 2014- July 2015
  - National Institute of Mathematical and Biological Synthesis, Knoxville TN
- Assistant professor at Texas Tech University, Aug 2015
- Associate professor at Texas Tech University, Sept. 2021



# Surviving your way through graduate school

- Getting into grad school - topic for another day - but most programs have “graduate student directors” on staff and these are great people to talk to.
- Math is hard!
  - Core classes
  - Written exams
  - Oral exams
  - Defense/Dissertation
- Student income/tuition/fees are complicated and usually graduate student pay is not ideal.



# ~~Surviving~~ Thriving your way through graduate school

- It's a good portion of your life. Aim to thrive - not just survive.
- Math is ~~hard!~~ fun!
  - Learn new things
  - Research - you have control to choose the area/problems to work on<sup>1</sup>
  - Your colleagues may become life-long friends
- Experience new places
  - Some move to new cities for graduate school
  - Travel to conference/workshops
- Find what works for you and take care of your mental health: exercise, meditation, talking to people, professional help

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<sup>1</sup>All programs are different and this transition from math classes/assignments to developing your own research program may not feel so clear yet.





# Student-advisor relationship

- The student-advisor relationship is one of the most important aspects of graduate school
  - They often serve as your biggest mentor in graduate school
  - They often help you navigate both academic and professional spaces
  - They often are a main source for new opportunities for career growth
  - They often are you co-authors
- Seriously think about what kind of advisor will help you **THRIVE**.
- This is a relationship
  - Takes work, commitment, and adaptation from BOTH sides
  - Talk with collaborators inside/outside your program and get all the advice you can on how to best start/maintain/improve this relationship throughout your entire graduate career



# What I did to ~~survive~~ love graduate school

- I found supportive colleagues
  - I still work with some of them today!
- ASU is huge! I took advantage of the resources.
  - Collaborated with biologist in my research
  - Took classes for fun: Drawing for non majors, yoga, Chinese calligraphy, introduction to woodworking





# What I did to ~~survive~~ love graduate school at ASU

- Attended **conferences** and workshops

The Third SIAM Gators Conference  
*SIAM*

March 2014  
*University of Florida*

Poster presented: A stoichiometric producer-grazer model: incorporating the effects of excess food-nutrient content on consumer dynamics

2013 Workshop for Young Researchers in Mathematical Biology (WYRMB) Aug. 2013  
*Mathematical Biosciences Institute* *The Ohio State University*

Talk title: A stoichiometric producer-grazer model incorporating the effects of excess food-nutrient content on consumer dynamics. Travel support awarded by the Mathematical Biosciences Institute.

AARMS Mathematical Biology Workshop July 2013  
*Atlantic Association for Research in the Mathematical Sciences* *St John's, Newfoundland Canada*

Talk title: Stoichiometric producer-grazer models. Travel support awarded by NSF.

Society for Mathematical Biology June 2013  
*Annual Meeting and Conference* *Arizona State University*

Talk title: The effects of excess food nutrient content on consumer dynamics in a Lotka-Volterra type model.

Association for the Sciences of Limnology and Oceanography Feb 2013  
*ASLO 2013 Aquatic Science Meeting* *New Orleans, Louisiana*

Talk title: A stoichiometric producer-grazer model incorporating the effects of the knife-edge.



# What I did to survive **love** graduate school at ASU

- Attended conferences and **workshops**

## **Woodstoich**

*5 days of peace and stoichiometry*

August 2014

*Sydney, Australia*

A workshop on ecological stoichiometry and the related framework nutritional geometry. I participated on a team project on exploring connections between ecological stoichiometry and rapid evolution. Travel support awarded by NSF.

## **WhAM! A Research Collaboration Workshop for Women in Applied Math**

*Institute for Mathematics and its Applications*

Sept 2013

*University of Minnesota*

A workshop on dynamical systems with applications to biology and medicine. I participated on a team project on 'Intermittent Preventive Treatment and the Spread of Drug Resistance to Malaria'. Travel support awarded by Institute for Mathematics and its Applications.

## **Mathematical Problems in Industry**

*29<sup>th</sup> Annual Workshop*

June 2013

*Worcester Polytechnic Institute, Massachusetts*

I participated on a team project collaborating with the company Pall on Changes in Capture Efficiency Due to Folding. Pall makes very fine porous filter media and are interested in predicting the changes that may occur in the ability of the membrane to capture particles of various sizes when the filter is folded. Travel support awarded by Institute for Mathematics and its Applications.

## **European Study Group with Industry**

*91<sup>st</sup> Annual Study Group*

April 2013

*University of Bristol, England*

I participated on a team project collaborating with the Norwegian company Teknova/Elkem on modeling heat transfer and solidification in the process of continuous casting of silicon. Travel support awarded by Oxford Center for Collaborative Mathematics.

## **UK Graduate Modelling Camp 2013**

*5<sup>th</sup> Annual Modelling Camp*

April 2013

*St. Anthony's College Oxford, England*

I participated on a team project on assessing molecular properties for oral drug delivery. Travel support awarded by Oxford Center for Collaborative Mathematics.

## **Mathematical Problems in Industry**

*28<sup>th</sup> Annual Workshop*

June 2012

*University of Delaware*

I participated on a team project on Fuel Cell Assembly Process Flow for High Productivity. Travel support awarded by Institute for Mathematics and its Applications.

## **Graduate Student Mathematical Modeling Camp**

*9<sup>th</sup> Annual Modeling Camp*

June 2012

*Rensselaer Polytechnic Institute, New York*



# What I did to ~~survive~~ love graduate school at ASU

- Publish/submitted papers before I defended
- Applied for postdocs in November/December 2013
  - Received offers in February
  - Accepted NIMBioS postdoctoral fellowship with start date August 2014





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- Applied for postdocs in November/December 2013
  - Received offers in February
  - Accepted NIMBioS postdoctoral fellowship with start date August 2014
  - Defended and graduated in the summer



**NIMBioS**  
National Institute for Mathematical  
and Biological Synthesis





Arizona is beautiful. Go see it



## **Work-life balance:**

- Guard your time and try to find a rhythm of graduate school and life outside graduate school.
- I got married in the middle of my first year



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## **What I wish I had done differently as a grad student:**

- Embraced TA duties
  - got more comfortable in the classroom
  - focused on improving my teaching
  - focused on enjoying my teaching
- Prepared for rejections
  - Seen more examples, from the professors, of their rejected papers and declined grant applications



Grad School is Training

**You will learn invaluable  
life skills in grad school**



What do I do now as a professor?

I started with what I know.



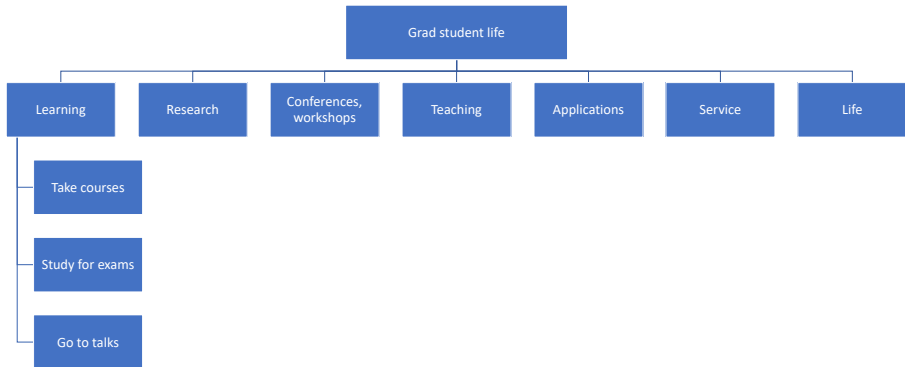
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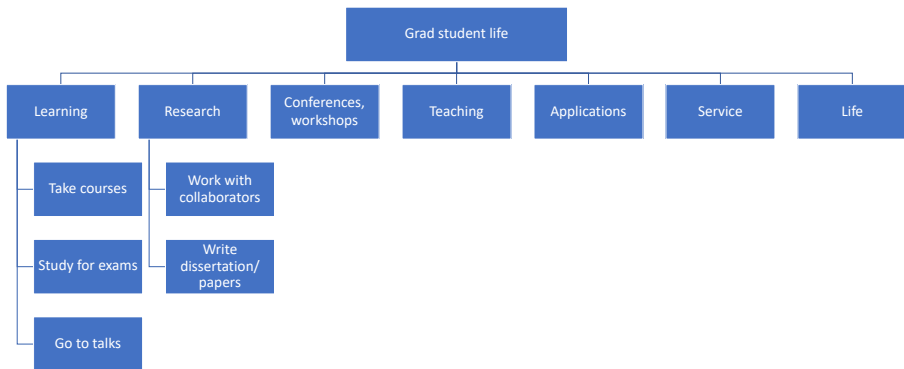
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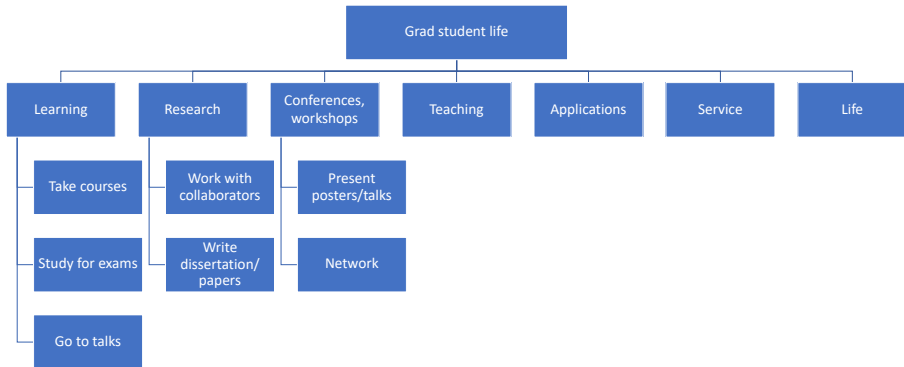
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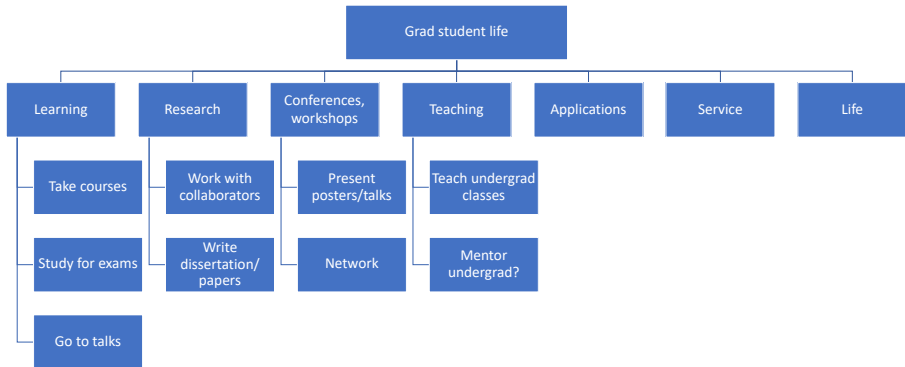






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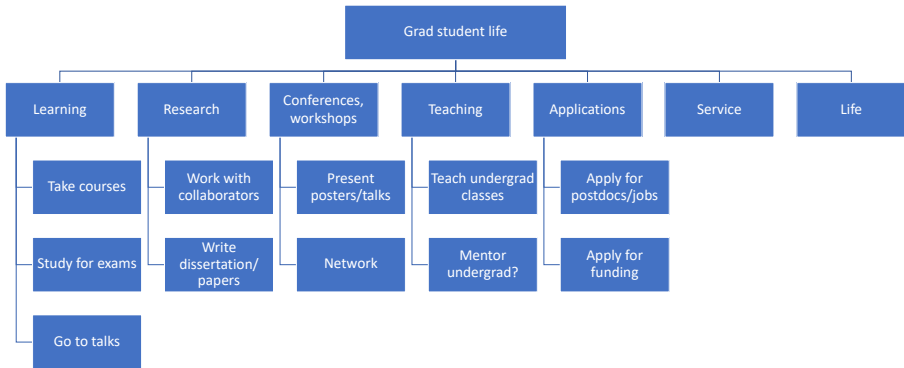
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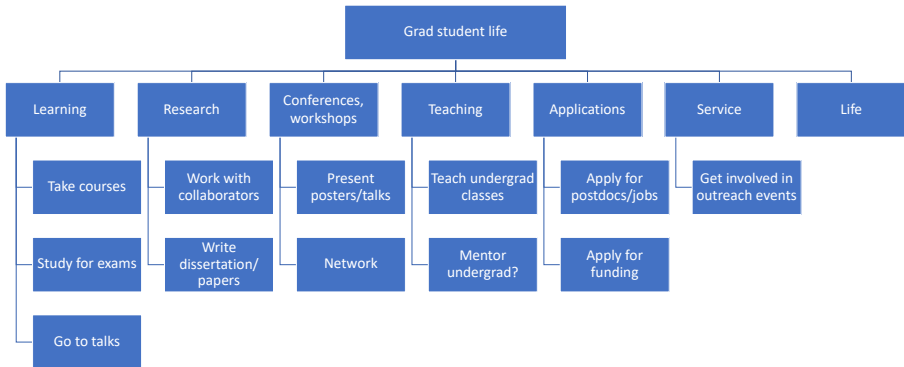
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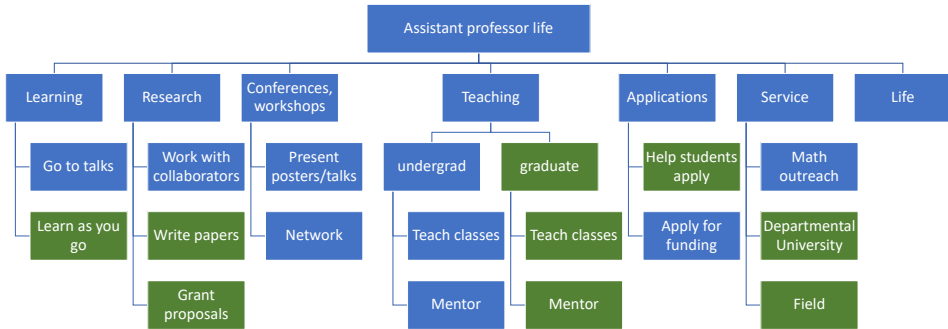
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# What do I do now as a professor?

Life now is similar in many ways. Things certainly shift around - but lots of the skills are already there





# Work-life rhythm: A mathematician and a mom

- Started my position in August 2015
- Had Oliver in July 2016.
- Had Benjamin in April 2019





# Work-life rhythm: A mathematician and a mom

## Recommendations:

- Shift expectations and allow them to KEEP shifting
- Look for resources!
  - Family leave policies?
  - Travel support for conferences?
  - NSF career-life balance initiatives
  - Can't find what you need? Get the ball rolling for others!



# Work-life rhythm: A mathematician and a mom

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- Look for resources!
  - Family leave policies?
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  - NSF career-life balance initiatives
  - Can't find what you need? Get the ball rolling for others!

## What I wish I had done differently:

- Looked into maternity policies.
  - TTU now has a modified instructional duties policy
- Set aside more time for pregnancy



## I love my job

- I work on cool science with people I like
  - Life is too short to work on boring projects with people you don't like
- I like teaching, mentoring, traveling
- I still struggle with rejections and its difficult to find the rhythm - but I do love my job.





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### **What I'm working on doing differently now:**

- Devoting more time to my writing skills
- Trying to aim for rejections
  - Failure is an important part of life and success- dont take it personally.
  - Failing to fail means I probably didn't aim high enough
- Learn when/how to say no
  - I get excited about new ideas...but I am busy



Thank you and good luck!

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