

January 28, 2014



$\sin(-x) = -\sin(x)$     $\csc(-x) = -\csc(x)$   
 $\cos(-x) = \cos(x)$     $\sec(-x) = \sec(x)$   
 $\tan(-x) = -\tan(x)$     $\cot(-x) = -\cot(x)$

$y = 2 / a^2 - x^2$     $e^{-2} = 1$

$\sin^2(x) + \cos^2(x) = 1$

PRICE vs QUANTITY graph showing SUPPLY and DEMAND curves intersecting.

$x = x_0 + v_0 t + 1/2 at^2$   
 $v_f = v_0 + at$

$\tan^2(x) + 1 = \sec^2(x)$

$a = v^2 / R$   
 $F = ma = mv^2 / R$


$\sin x - \sin y = 2 \sin((x-y)/2) \cos((x+y)/2)$   
 $\cos x - \cos y = -2 \sin((x-y)/2) \sin((x+y)/2)$

$E = MC^2$

A	v	B
v	0	v
0	0	v
0	0	0

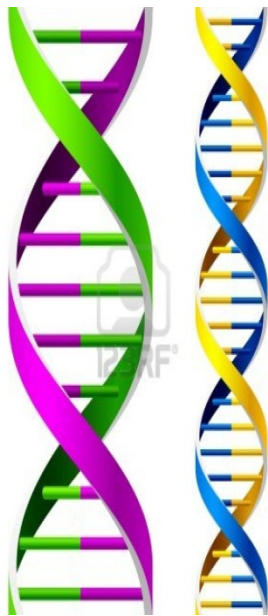
$R_{eq} = R_1 + R_2 + R_3 + \dots$

$Mg(NO_3)_2$

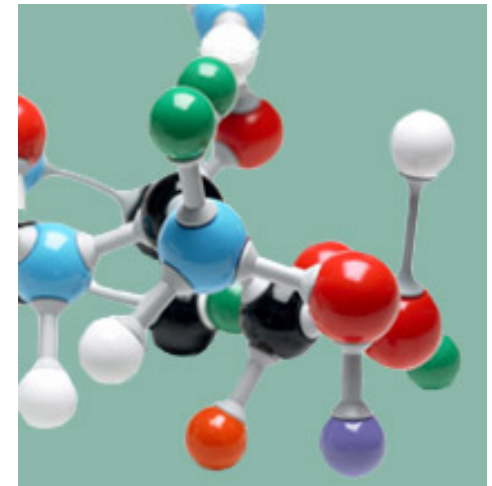


# Diversity Dialogues on Graduate Education

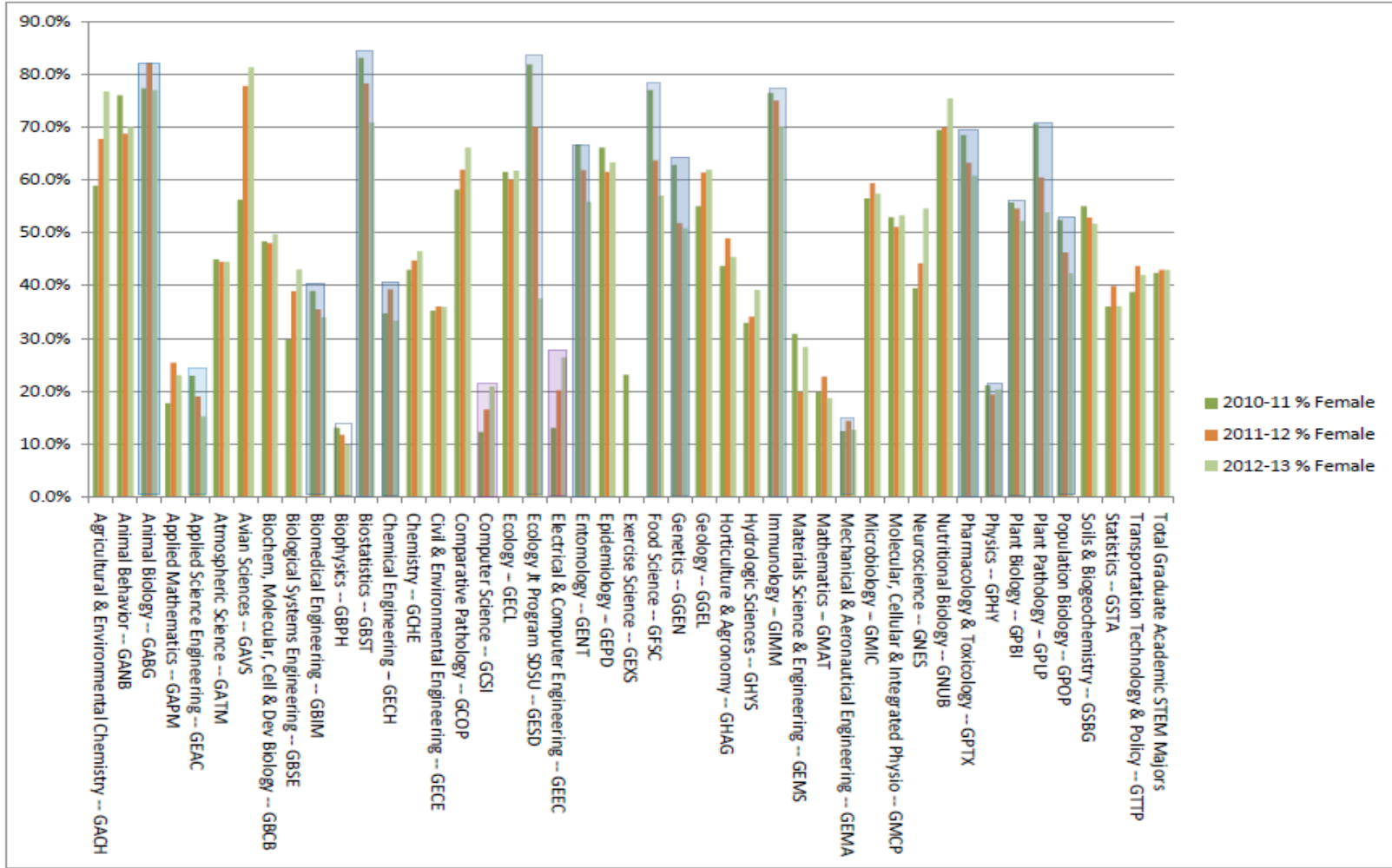
## Dialogue 1: Empowering Women in STEM



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# STEM enrollment statistics



# Preliminary STEM Survey results: Demographics

- 223 students have taken the survey – **98 males, 121 females, 1 transgender, 2 didn't wish to answer**

## Department

Physics 7	Chemistry 13	Mathematics 9	Statistics 4	Biostatistics 1	Economics 1
Earth and Planetary Sciences 5	Geography 2				
Civil and Environmental Engineering 14	Electrical and Computer Engineering 8	Mechanical and Aerospace Engineering 10			
Biomedical Engineering 8	Chemical Engineering and Material Science 3	Computer Science 10			
Biological and Agricultural Engineering 1	Engineering 2	Institute of Transportation Studies 2			
Agricultural and Resource Economics 1	Land Air & Water Resources 6	Plant and Environmental Sciences 1			
Plant Biology 7	Plant Pathology 4	Food Science 3	Nutrition 6		
Plant Sciences 14	Environmental Science & Policy 5	Evolution and Ecology 3	Animal Science 10		
Vet Med: Anatomy, Physiology and Cell Biology 2	Human Ecology 4	Molecular Biosciences 2	Molecular and Cellular Biology 3		
Horticulture and Agronomy 1	Microbiology and Molecular Genetics 1	Biochemistry and Molecular Medicine 1			
Orthopedic Surgery 1	Entomology 3	Wildlife, Fish & Conservation Biology 5	Genome Center 2		
Medical Pharmacology and Toxicology 1	Environmental Toxicology 1	Biological Sciences 2			
Vet Med: Wildlife Health Center 1	Medical Pathology and Lab Medicine 1	NPB 2			
Division of Rheumatology, Allergy and Clinical Immunology 1	Vet Med: PMI 1				
Immunology and Medical Microbiology 1	Population Health and Reproduction 1	Membrane Biology and Physiology 1			
Department of Medical Sciences 1	Microbiology and Molecular Genetics 1				
Psychology 8	Viticulture and Enology 1				
Center for Mind and Brain 1	Psychiatry & Behavioral Sciences 1				
Anthropology 1	Neurology 1				

# Demographics: Ethnicity and Nationality

## ETHNICITY

Answer Choices	Responses
Latino	3.14% 7
Caucasian	26.91% 60
African	0.90% 2
Asian	16.59% 37
European	46.64% 104
Hispanic	10.31% 23
Middle Eastern	3.59% 8
Native American/First Peoples	3.59% 8
Pacific Islander	0.90% 2
South East Asian	1.35% 3
Other	5.83% 13
Total Respondents: 223	

### Ethnicity: Female nos.

Latino **6**, Caucasian **38**, African **2**, European **55**, Hispanic **12**, Middle Eastern **2**, Native American **3**, Pacific Islander **1**, South East Asian **2**, Greek **1**, Portuguese **1**, Black Caribbean **1**

## NATIONALITY

Bangladesh **1**

Columbia **1**

India **3**

Mexico **1**

Russia **1**

USA **193**

Chile **1**

Costa Rica **1**

Iran **1**

Peru **1**

Taiwan **3**

China **8**

Greek **1**

Jamaica **1**

Romania **1**

Turkey **1**

# Demographics: Degree type & year of study

Answer Choices–	Responses–
Master's student	17.49% 41
Doctoral Student	80.72% 180
Postdoctoral Scholar	0.90% 2
Exchange Student	0% 0
Total	223

YEAR OF STUDY 

Answer Choices–	Responses–
1	27.35% 61
2	19.73% 44
3	16.14% 36
4	15.25% 34
5	12.11% 27
6	8.07% 18
7	0% 0
8	0.45% 1
9	0% 0
9+	0.90% 2
Total	223

# Graduate Program Climate

**How satisfied are you with your graduate school experience at UC Davis ?**

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Total
<b>Q7: Female</b>	<b>22.31%</b>	<b>51.24%</b>	<b>14.88%</b>	<b>8.26%</b>	<b>3.31%</b>	
	27	62	18	10	4	121
<b>Total Respondents</b>	27	62	18	10	4	121

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Total
<b>Q7: Male</b>	<b>25.51%</b>	<b>55.10%</b>	<b>12.24%</b>	<b>5.10%</b>	<b>2.04%</b>	
	25	54	12	5	2	98
<b>Total Respondents</b>	25	54	12	5	2	98

# Graduate Program Climate

**How would you rate the support from staff in your graduate program?**

	Very Supportive	Somewhat supportive	Neither supportive nor unsupportive	Somewhat unsupportive	Very unsupportive	Total
<b>Q7: Male</b>	<b>64.29%</b>	<b>28.57%</b>	<b>6.12%</b>	<b>1.02%</b>	<b>0%</b>	
	63	28	6	1	0	98
<b>Total Respondents</b>	63	28	6	1	0	98

	Very Supportive	Somewhat supportive	Neither supportive nor unsupportive	Somewhat unsupportive	Very unsupportive	Total
<b>Q7: Female</b>	<b>51.24%</b>	<b>35.54%</b>	<b>9.09%</b>	<b>4.13%</b>	<b>0%</b>	
	62	43	11	5	0	121
<b>Total Respondents</b>	62	43	11	5	0	121

# Graduate Program Climate

**How would you rate the support of faculty in your graduate program?**

	Very Supportive	Somewhat supportive	Neither supportive nor unsupportive	Somewhat unsupportive	Very unsupportive	Total
<b>Male</b>	<b>48.98%</b>	<b>40.82%</b>	<b>4.08%</b>	<b>4.08%</b>	<b>2.04%</b>	
	48	40	4	4	2	98
<b>Total Respondents</b>	48	40	4	4	2	98
<b>Female</b>	<b>40.50%</b>	<b>40.50%</b>	<b>12.40%</b>	<b>3.31%</b>	<b>3.31%</b>	
	49	49	15	4	4	121
<b>Total Respondents</b>	49	49	15	4	4	121



# Graduate Program Climate

**How would you rate your relationship with your primary adviser?**

	Very Good	Good	Neutral	Poor	Very Poor	Total
<b>Male</b>	<b>52.04%</b>	<b>36.73%</b>	<b>7.14%</b>	<b>4.08%</b>	<b>0%</b>	
	51	36	7	4	0	98
<b>Total Respondents</b>	51	36	7	4	0	98

	Very Good	Good	Neutral	Poor	Very Poor	Total
<b>Female</b>	<b>43.80%</b>	<b>30.58%</b>	<b>19.83%</b>	<b>4.13%</b>	<b>1.65%</b>	
	53	37	24	5	2	121
<b>Total Respondents</b>	53	37	24	5	2	121
<b>Additional Comments</b>					<b>Total</b>	

# Graduate Program Climate

## Overworked Faculty

- *People are kept very busy by numerous obligations, making it difficult to find time for adequate advising*
- *I get the impression that faculty do view graduate education as neither enjoyable nor as a vocation. Instead, I believe they feel it is an obligation they would rather avoid.*

## Poor Mentoring

- *Adviser has short temper and during beginning of grad school it was very difficult to learn new things without getting scolded/yelled at. After a while of dealing with this as a student I learned more about my field and my adviser was less angry during our meetings. I wish that one's ability to teach students new things was taken more seriously when choosing research professors at this school. Students shouldn't have to deal with these type of people in academia*
- *He never had a clear research plan for me neither resources to follow up. I have to change topic several times*
- *In spite of being well versed in educational and learning theories, my adviser does not apply that knowledge to the mentorship and support of graduate students. Extremely low feedback and non-committal.*

# Graduate Program Climate

## III Environment

- *Some faculty are extremely supportive while other faculty in the program could not care less about students and are verbally abusive. Despite my complaints to the chair of XYZ GG about the abusiveness of a particular faculty member nothing was done.*
- *On the whole, the average level of support from faculty in the ABC Graduate Group has been somewhat supportive. Some faculty members have been very supportive, many somewhat supportive, and a few unsupportive. I do not believe that the few adversarial interactions I have had are characteristic of the culture of the graduate group. Unfortunately, the culture of the graduate group does not seem to deter such interactions nor to support students who experience these interactions.*

# Graduate Program Climate

- Do you believe you have faced or encountered any difficulties or problems in your department or graduate group based on your

	Gender	Ethnicity	Nationality	No I haven't faced any difficulties based on the choices above	Total
Male	1.02%	2.04%	3.06%	93.88%	
	1	2	3	92	98
<b>Total Respondents</b>	1	2	3	92	98
Female	17.36%	6.61%	4.96%	76.86%	
	21	8	6	93	128
<b>Total Respondents</b>	21	8	6	93	121

# Other issues

## Inappropriate behavior

- Inappropriate conversations about sex and relationships runs rampant around mixed gender company, with men nearly always being the perpetrators of initiated inappropriate conversations between each other in a public space
- Even faculty I respect and value as mentors have made comments that caused me to feel excluded from my lab/less valued than my male colleagues. Though faculty members and staff of my graduate group have always been professional (I've never experienced harassment from them,) I have experienced repeated unwanted sexual advances from a male peer. Because I did not want to cause difficulties in our workplace, I did not report or address these unwanted advances (invitations to sex with this student and his girlfriend that I repeatedly refused). I do feel that my initial entry into the graduate group was rendered more difficult by my gender and stature (I'm petite, and look young,) because of bias on the part of one faculty member who described me as emotional, unstable and immature.

## Gender/Unconscious Bias

- I have experienced a few micro aggressions based on my eligibility for particular grants/fellowships on the basis of gender and ethnicity
- Once people know you, they treat you with respect, but as a woman in engineering, you have to "prove" yourself first to many people
- Yes, in my field it can sometimes still feel like an "old boys' club", and as a non-white woman, I feel like I am often judged/undermined based on my appearance

## Lack of good female role models

- There are very few female professors with whom to interact, and many of them are off putting in their aggression and intensity. Do STEM fields attract those types of women? Do only those types of women end up succeeding? Or does the career path mold the women into volatile individuals?
- There are not many female role models to follow the STEM fields and also very few female faculty in my program. It can be daunting to think about setting up a career as a researcher and about building a family, when there are not many examples of success around you

## **Lack of diversity & special needs**

- Yes, in my field, it can sometimes still feel like an "old boys' club", and as a non-white woman, I feel like I am often judged/undermined based on my appearance
- I am autistic and have PTSD, and I worry about revealing either to my peers, as I fear bias/discrimination.

## **Woman Safety**

- Research that occurs in tough, relatively remote outdoor locations that can be physically demanding (extreme weather-heat, cold, wind) with mild dangers (wild animals, poisonous spiders). Research that requires long hours and/or measurements that need to be taken at all hours (e.g. late at night). As a female, in some of these situations I felt vulnerable, especially when working in an agricultural field alone.

## **Work Life Balance**

- Balancing work and family is difficult in a STEM graduate program as the laboratory hours required mean that graduate students need access to affordable childcare options

# Graduate Program Climate

- **Have you considered quitting graduate school because of the challenges you have faced as a graduate student ?**

	Yes	No	Not sure	Total
<b>Male</b>	<b>26.53%</b>	<b>64.29%</b>	<b>9.18%</b>	
	26	63	9	98
<b>Total Respondents</b>	26	63	9	98

<b>Female</b>	<b>46.28%</b>	<b>46.28%</b>	<b>7.44%</b>	
	56	56	9	121
<b>Total Respondents</b>	56	56	9	121

## Reasons for thinking about quitting

- Isolation
- Depression
- Not able to meet expectations of graduate school
- Poor relationship with the adviser
- Self doubt
- Gender Bias
- Work Life Balance
- Poor Mentoring
- Funding



# Career Pipelines

- What type of career do you plan to pursue after graduate school ?

	Academic	Careers beyond academia	Not sure	Total
<b>Male</b>	<b>25.51%</b>	<b>47.96%</b>	<b>26.53%</b>	
	25	47	26	98
<b>Total Respondents</b>	25	47	26	98
<b>Female</b>	<b>25.62%</b>	<b>43.80%</b>	<b>30.58%</b>	
	31	53	37	121
<b>Total Respondents</b>	31	53	37	121

## Non – Academic Preferences

Answer Choices–	Responses–
Industry	67.96% 70
Government	48.54% 50
Public and Science Policy	25.24% 26
Non Profit	31.07% 32
University administration	0.97% 1
Military	3.88% 4
National Laboratory	33.98% 35
None of the above	4.85% 5
Other	7.77% 8
Total Respondents: 103	

## Academic

Answer Choices–	Responses–
Research Scientist	29.82% 17
Postdoctoral Scholar	52.63% 30
Research: Tenure-Track	59.65% 34
Teaching: 4 year college	47.37% 27
None of the above	1.75% 1
Others	8.77% 5
Total Respondents: 57	

## Not Sure

Answer Choices–	Responses–
Industry	71.88% 46
Government	64.06% 41
Public/Science Policy	39.06% 25
Non Profit	51.56% 33
Military	6.25% 4
National Laboratory	50% 32
University Administration	14.06% 9
Research Scientist	79.69% 51
Postdoctoral Scholar	67.19% 43
Research: Tenure-Track	73.44% 47
Teaching: 4 year college	64.06% 41
None of the above	0% 0
Other	10.94% 7
Total Respondents: 64	

# Why increased preference for careers outside academia?

## Family constraints

- Don't want to move around the country chasing after post-doc and professor positions. May need to change career plans to fit my lifestyle and my family's needs

## Work Life Balance

- Desire to have more career flexibility and impact outside of academia
- Academic research still holds some possible interest for me, but observing the daily frustrations, stresses, and level of expectation placed on professors at UC Davis has made me seriously rethink teaching at an R1 university

## Poor role models

- The pressure to produce and the obsession with trivial research that produces papers but has little real world use and departmental politics and many professors poor communication and interpersonal skills has made an academic career seem to be a poor choice

# Why increased preference for careers outside academia?

## Poor role models

- Originally I thought I might want to be a professor, but after seeing the kinds of things they do, I decided it isn't for me
- I had been considering both academia and industry. Upon starting grad school I realized that academia is too bureaucratic for me

## Academia is demanding/competitive

- High competition, low stability, low job security
- Academic jobs are very hard to get. Oversupply of candidates, undersupply of jobs
- I realized that the life of a tenure track professor is not what I want. I want to have a family and I can't see myself working crazy hours for the next 10 years to get a faculty position. I do not want to leave California, so my academic options would be very limited. I am not competitive enough as a person to be a successful candidate in the current academic funding climate

# Challenges – Career Advising

## Preparing for Careers outside of academia

- I believe my professors are mainly focused on preparing students for a career in academia which does not align with my desired career path. Given my previous work experience both in the industry and in local government, I have found that there are few resources and/or advisers to help me further develop marketable skills and knowledge which will be meaningful given my chosen career path
- I need more information, and networking opportunities, on science careers outside of academia - specifically state government and non-profits. Though my adviser is very helpful, his experience is with academia and doesn't have much advice for other choices

## Advising for International Graduates

- There should be a dedicated person for International Graduates at Career center to help and assist international students to prepare for typical questions asked in interviews, invite industries that are willing to sponsor work visas, organize international student alumni meets

# Challenges – Career Advising

- **Career in teaching**

As someone who wants to make a career of teaching in academia, it is hard to find role-models, when all the professors are researchers. My goal is to teach at a community college or liberal arts college, with a small research component. It is sometimes challenging to bring this up with professors because I fear I might be judged for "only" wanting to teach, or that I might offend them for "wasting their time" by getting a PhD and then not pursuing a career that revolves around scientific research. I just don't know if my career goals would be respected by most UC professors

**Thanks for your attention !!**