



Materials Data in Action

# THE CITRINE NEXTGEN FELLOWSHIP

Diversity in the Minerals, Metals, and Materials  
Professions (DMMM) 3 @ UCSB, July 23 2018



**Chris Borg,  
Research Scientist,  
Community**

**Citrine NextGen is dedicated to training the next-generation of materials scientists and engineers in cutting-edge data science and data management skills.**

# | AGENDA

- What we do at Citrine
- The importance of diversity
- Details of the NextGen fellowship program
- How can NextGen facilitate diversity in STEM fields?

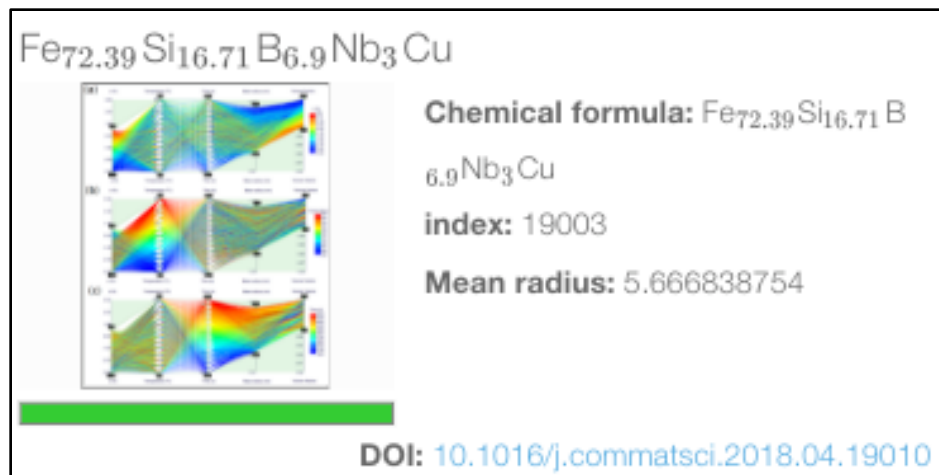




# | Citrine

Citrine is focused on applying computation and AI in order to radically accelerate materials R&D.

## Citrination



An AI-powered data platform to rapidly accelerate materials discovery.



# | Citrine community

Government  
lab partners



Consortia



Workshops



[mines.edu/middmi](http://mines.edu/middmi)



# | Diversity @ Citrine



- Monthly D&I luncheon
- Equal opportunity recruiting process
- Sponsored NextGen prototype Summer 2017

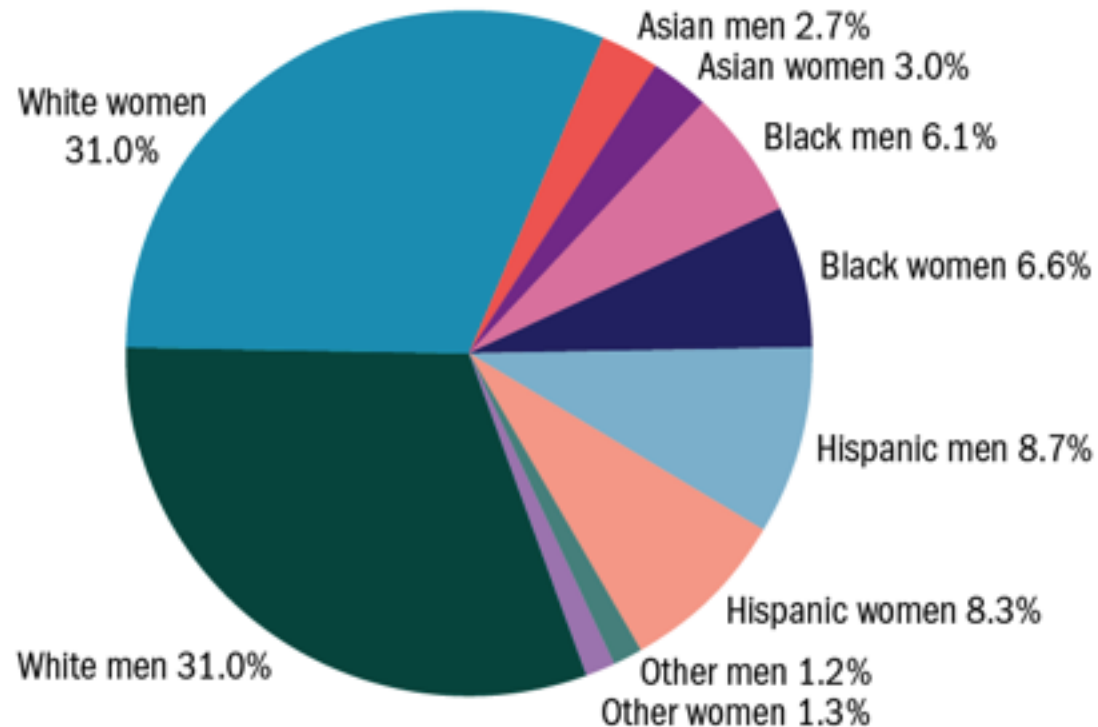


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# Demographics of the United States (2014)



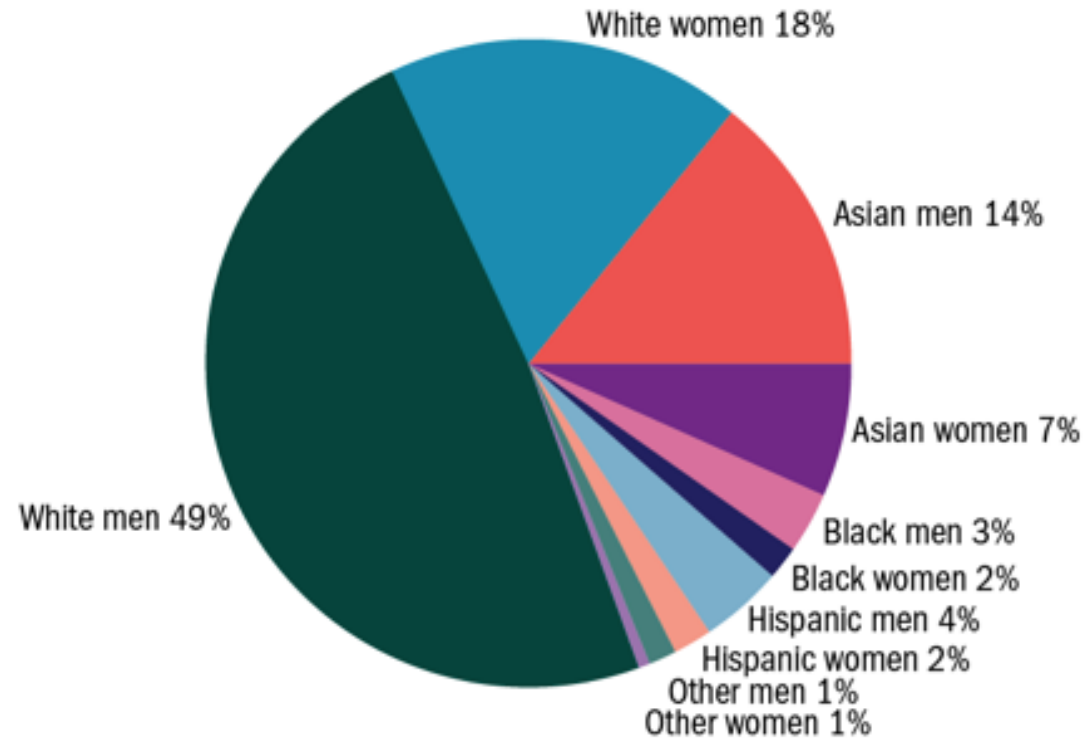
white men population = 31%

woman population = 50%

minority population = 38%



# | Demographics of STEM employment (2015)



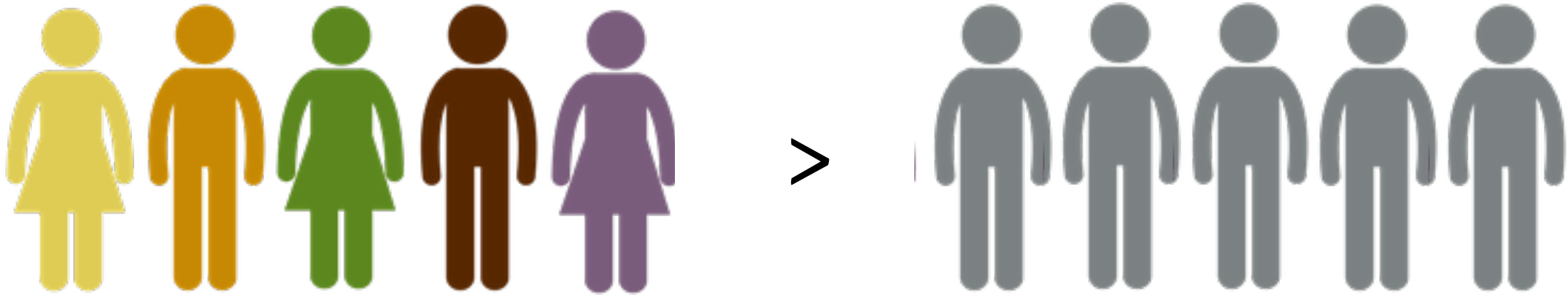
white men population = 49% (+18%)

women population = 29% (-21%)

minority population = 34% (-4%)



# | Why diversity matters

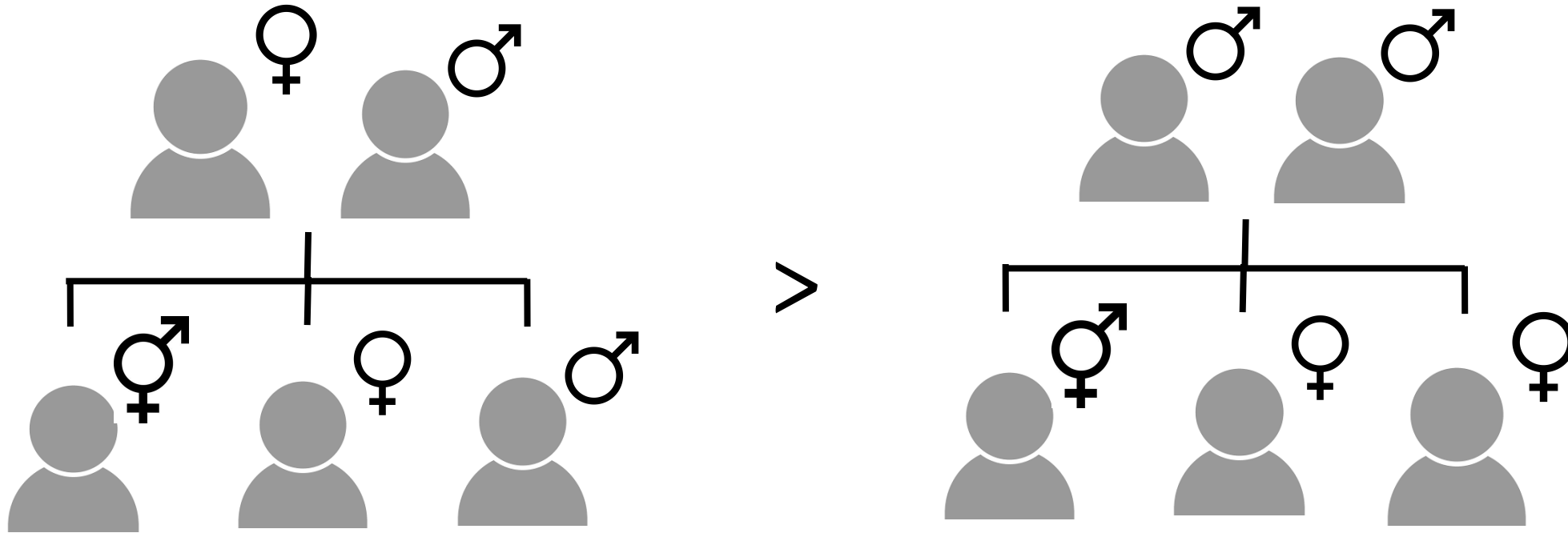


Groups of diverse problem-solvers outperform groups of high-ability problem solvers.

Hong, L., & Page, S. E. (2004). Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences*, 101(46), 16385-16389.



# | Why diversity matters



Businesses with gender diversity at the management level outperform those with only male managers.

Dezső, C. L., & Ross, D. G. (2008). 'Girl Power': Female participation in top management and firm performance. *Arbeitspapier, University of Maryland und Columbia Business School.*





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# | NextGen is a REU-style fellowship program



Summer 2018, 10 weeks, 33  
Fellows, 5 host universities

Focus on building data science  
and engineering skills

Sponsored by the Schmidt  
futures foundation



SCHMIDT FUTURES



# NextGen headlines

## Materials Informatics fellowship trains cutting-edge next-generation workforce

June 8, 2018

// MATERIALS SCIENCE & ENGINEERING

Tags: Faculty, research, students



Citrine NextGen fellows with Professor Dane Morgan. Credit: Sam Million-Weaver.



MME Associate Professor Jeff King, left, and students Ryan Collette and Charlie Becquet conduct testing in the lab.



UPRM undergraduate student receives the Citrine Research NextGen Fellowship

## NextGen Scholars Get Machine Vision Tools Working!

Posted on June 27, 2018 by [ddmorgan@cae.wisc.edu](mailto:ddmorgan@cae.wisc.edu)



# | What makes NextGen different?

- Focused on increasing data science literacy for materials scientists and engineers.
- Specialized project mentors.
- Directed efforts to promote diversity.

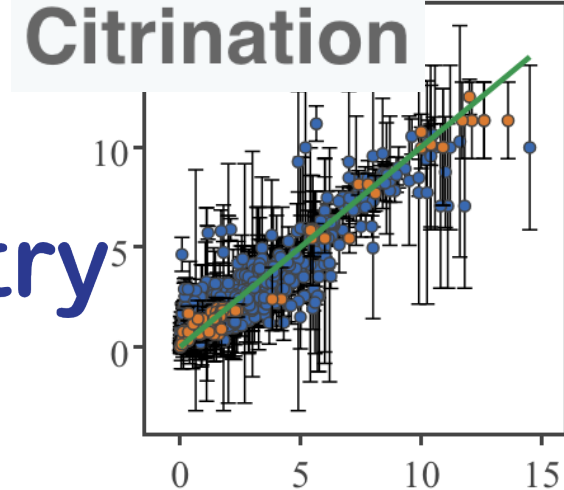
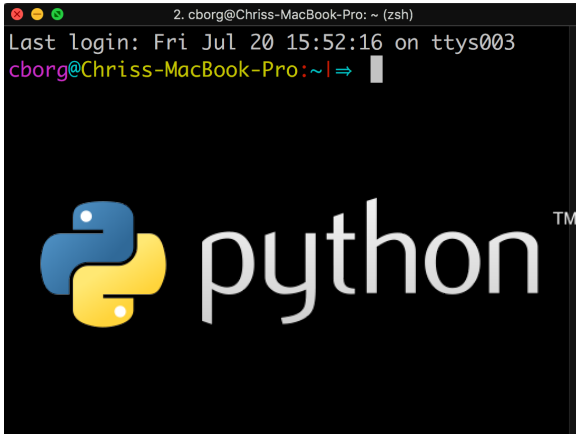


# | Students are excited about informatics

Materials science students are very interested to acquire programming and data science skills.

NextGen is the only fellowship program focused on materials informatics.

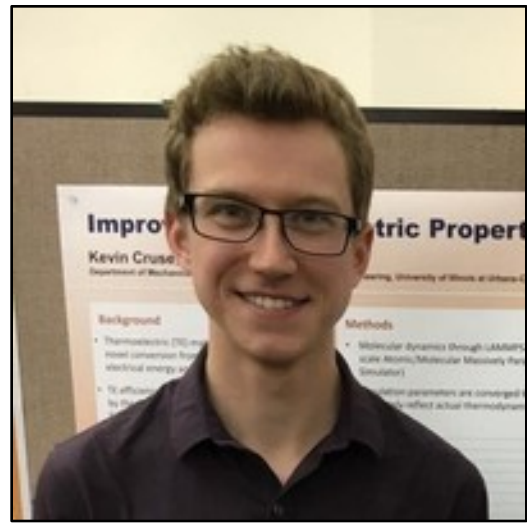
Mines software carpentry workshop consistently exceed capacity.



# | NextGen mentors



Vanessa Nilsen:  
UW-Madison  
Carnegie Mellon



Kevin Cruse:  
NC State  
Texas A&M

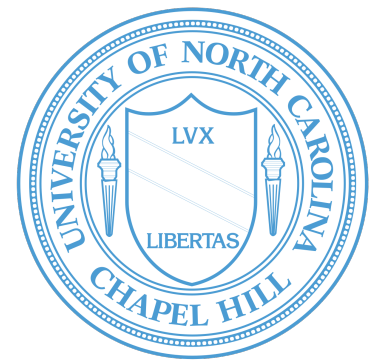


Malcolm Davidson:  
Colorado School of  
Mines





# | NextGen fellows are from 15 universities



# | NextGen participants promote diversity



50% of NCSU fellows are women and 50% belong to underrepresented minority groups.



Active collaborations between UW-Madison and the University of Puerto Rico gave access to new pool of applicants.



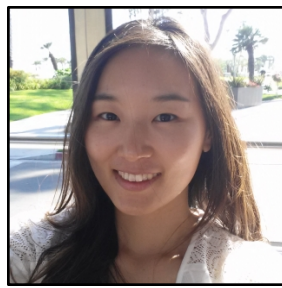
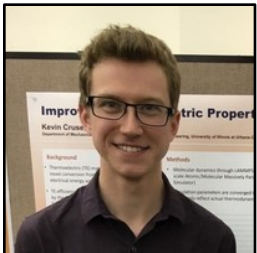


# | Discussion

- How can we promote diverse cohorts for academic fellowships in STEM?
- How can we create an inclusive application process that is unbiased and can reach a diverse set of applicants?



# Acknowledgements



SCHMIDT FUTURES



***[citrine.io/ddms-newsletter](https://citrine.io/ddms-newsletter)***

# THANK YOU!



CITRINE   
INFORMATICS