



# LESSONS FOR DIVERSITY AND INCLUSION FROM GOOGLE'S PROJECT ARISTOTLE

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Paul Martini

Diversity Journal Club

November 13, 2018

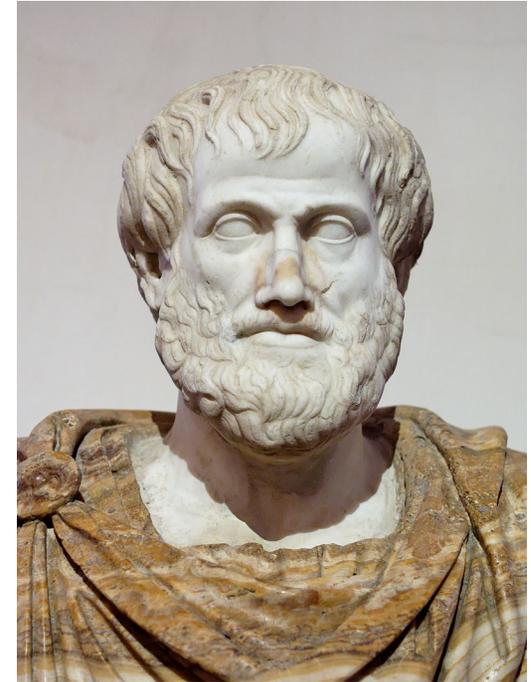


# Outline

- Group Intelligence
- Google's Project Aristotle
- Concept of Psychological Safety
- Application to Diversity & Inclusion

# Aristotle Quote

“The whole is greater than the sum of its parts.” \*



\* This is not what Aristotle wrote. Barbara Ryden sent me this correction: “In the case of all things which have several parts and in which the totality is not, as it were, a mere heap, but the whole is something besides the parts, there is a cause” (Metaphysics, book 8. part 6, W.D. Ross translation)

# Our Most Recent Faculty Job Ad

## Faculty Position in Extrasolar Planets and Planet Exploration

### Submission Information

**Publish Date:** Tuesday, October 17, 2017  
**Archive Date:** Tuesday, December 5, 2017

### Job Summary

**Job Category:** Faculty Positions (tenure and tenure-track)  
**Institution Classification/Type:** Large  
**Institution/Company:** The Ohio State University  
**Department Name:** Department of Astronomy  
**Street Line 1:** 4055 McPherson Lab  
**Street Line 2:** 140 W 18th Ave  
**City:** Columbus  
**State/Province:** OH  
**Zip/Postal:** 43210  
**Country:** United States of America

A key strength of the department is its extraordinarily collaborative and interactive scientific atmosphere, and we seek candidates who will contribute to and benefit from that atmosphere.

### Announcement

#### Job Announcement Text:

The Department of Astronomy in the College of Arts and Sciences at The Ohio State University invites applications for a tenure-track faculty position, effective Autumn Semester 2018. We seek candidates working in the field of exoplanets or the formation of planetary systems, and we welcome applications from instrumentalists, observers, and theorists. The intended rank is Assistant Professor.

A Ph.D. and postdoctoral experience in astronomy, or a closely related field, are required, as are an outstanding research record and commitment to teaching excellence. A key strength of the department is its extraordinarily collaborative and interactive scientific atmosphere, and we seek candidates who will contribute to and benefit from that atmosphere. Appointment is contingent on the university's verification of credentials and other information required by law and/or university policies, including but not limited to a criminal background check.

Please apply online through Academic Jobs Online at the link provided above. Complete applications include a C.V., a publication list, and a statement of past, current, and planned research. Applicants should also arrange for three letters of reference to be uploaded to Academic Jobs Online. The review of applications will begin 1 December 2017 and will continue until the search is concluded.

The Ohio State University is committed to establishing a culturally and intellectually diverse environment, encouraging all members of our learning community to reach their full potential. We are responsive to dual-career families and strongly promote work-life balance to support our community members through a suite of institutionalized policies. We are an NSF Advance Institution and a member of the Ohio/Western Pennsylvania/West Virginia Higher Education Recruitment Consortium (HERC).

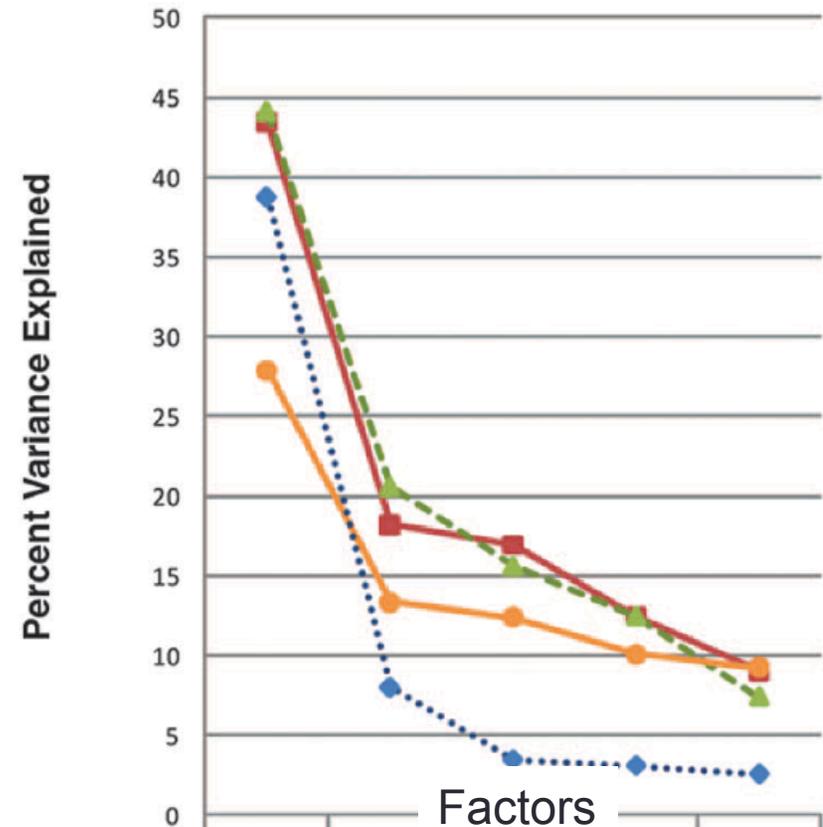
The Ohio State University is an equal opportunity employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation or identity, national origin, disability status, or protected veteran status. Flexible work options available. Ohio State is an NSF Advance Institution.

# Individual vs. Collective Intelligence

Evidence for general individual intelligence comes from the average correlation of an individual's scores on a diverse set of cognitive tests

Woolley and her colleagues showed that there is similarly strong evidence for the collective intelligence of groups

First factor from each study accounts for more than twice the variance as subsequent factors



	1	2	3	4	5
Study 1	43.39	18.18	16.93	12.46	9.04
Study 2 (five tasks)	44.07	20.54	15.57	12.44	7.39
Study 2 (ten tasks)	27.86	13.35	12.40	10.08	9.24
Indiv Intelligence Test	38.77	8.01	3.47	3.11	2.58

# Individual vs. Collective Intelligence

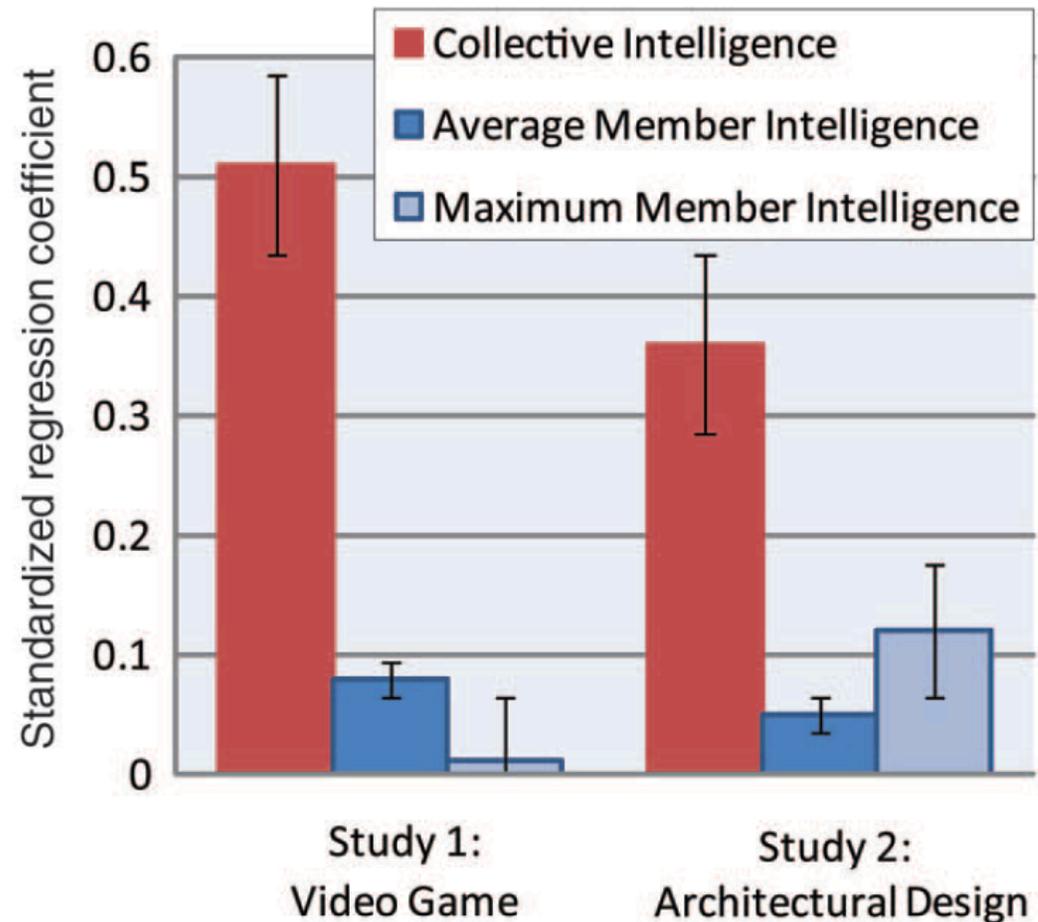
Collective intelligence predicts performance much better than average or maximum member intelligence

What predicts collective intelligence?

- Average social sensitivity
- Even distribution of speaking
- Proportion of female members

What does not?

- Average member intelligence
- Maximum member intelligence
- Motivation, satisfaction, cohesion



# Origin of Project Aristotle

- Google has a People Analytics division
  - Data-driven approach to answer people-related questions and make the best decisions



- Example questions: [g.co/rework](https://g.co/rework)
  - What are the traits of the most productive employees?
    - [One example: they rotate who they eat lunch with]
  - What are the traits of the best managers?
    - [Examples: Good communication skills, avoid micromanaging]

# Goals

- What are the traits of the most effective teams?
  - All the same personality traits?
  - Everyone is friends outside of work?
  - All the most individually successful employees?
- What does “effective” mean?
  - Combination of quantitative and qualitative measures
- What is a team?
  - Group working together on a problem or problems. Characterized by high interdependence.

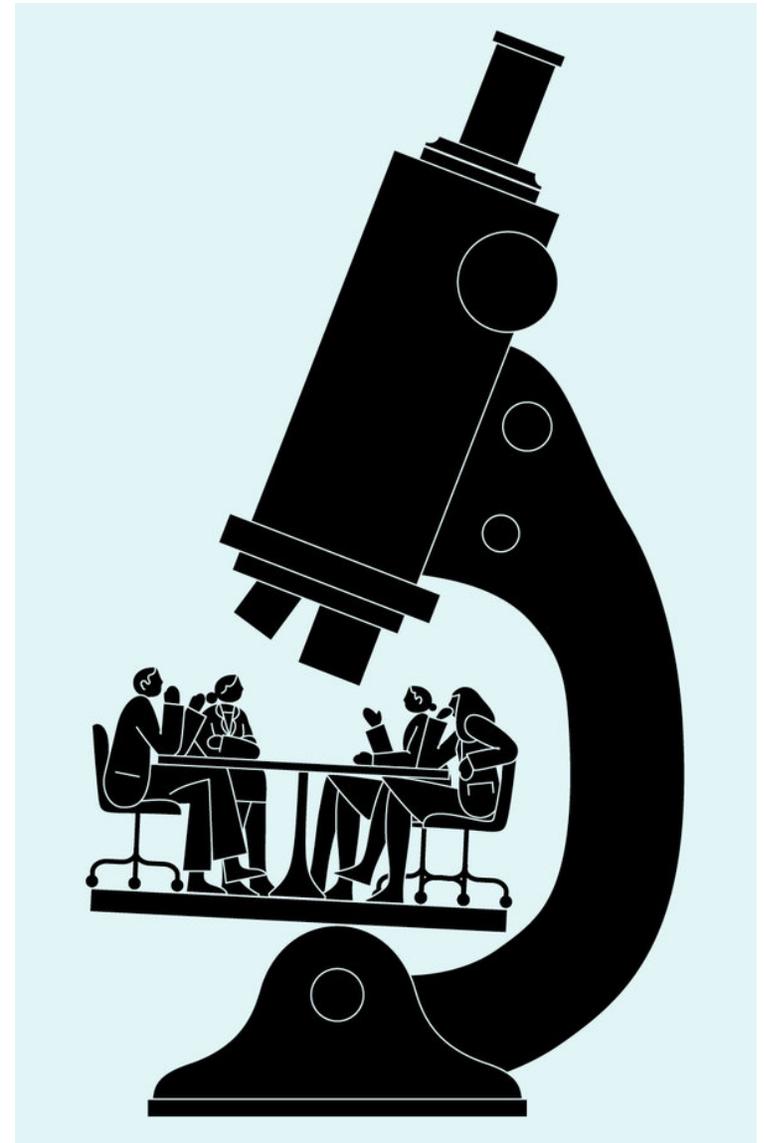


Illustration by James Graham for the NY Times

# Examples of Teams

- Proposal Review Panel
- Committee writing a white paper
- Several faculty and students working together on a research project
- Working group writing a software pipeline for a survey
- Your example here

# Results

Group norms are an important factor in whether a team is successful or not

Norms are behavioral standards that typically dominate over individual traits

Pointed to earlier studies on group intelligence and the concept of psychological safety



# Definition of Psychological Safety

Psychological safety is a belief that one will not be punished or humiliated for speaking up with ideas, questions, concerns, or mistakes.

# Why might it not exist?

**No one wants to look**

Ignorant

Incompetent

Intrusive

Negative

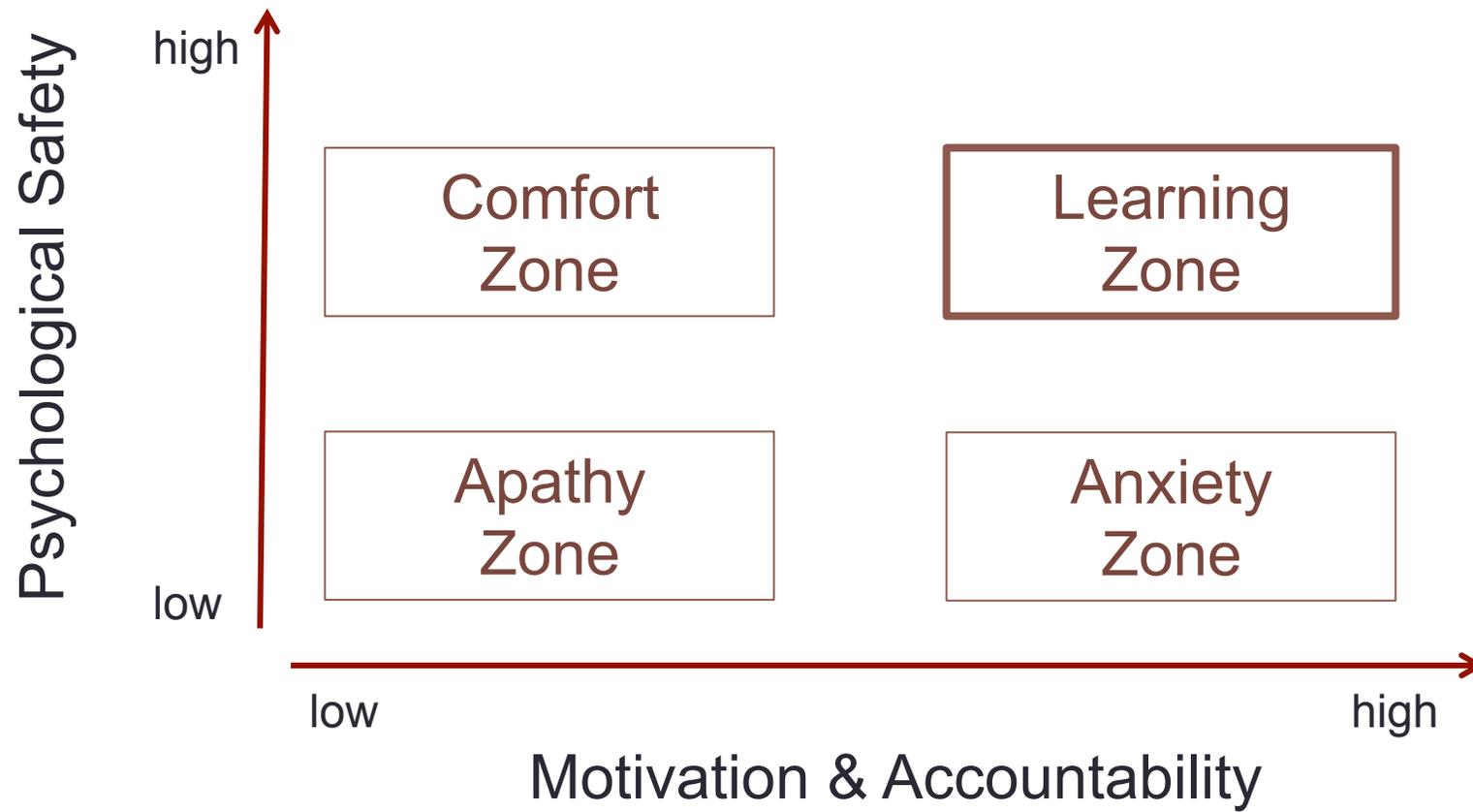
# Why might it not exist?

No one wants to look	Easy to avoid
Ignorant	Don't ask questions
Incompetent	Don't admit weakness or a mistake
Intrusive	Don't offer ideas
Negative	Don't critique the status quo

**Result: Not everyone on a team is fully engaged**

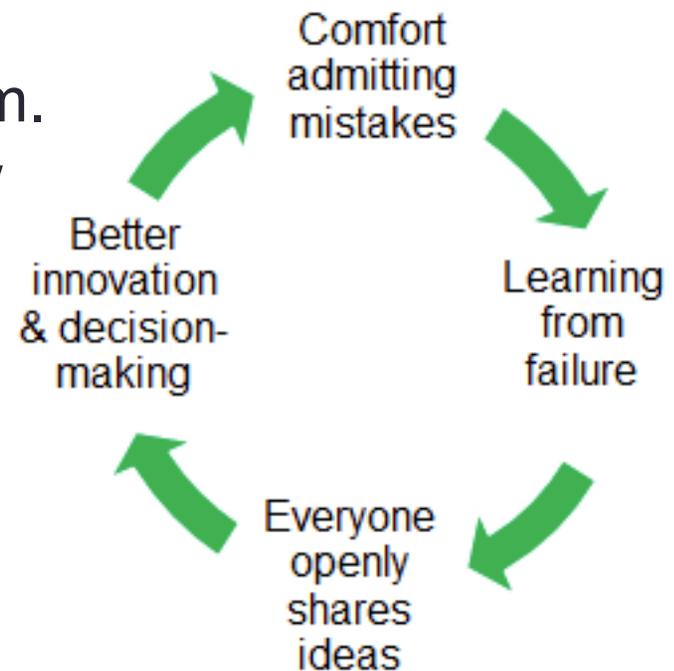
# Pushback

Does this mean dial back on excellence? No.



# How to foster psychological safety

- Frame the work as a learning problem, not an execution problem. Emphasize uncertainty about how to achieve the goal.
- Acknowledge your own fallibility. Encourage people to speak up.
- Model curiosity and ask lots of questions.



# Connection to Diversity & Inclusion

- There are strong cognitive biases toward similarity, yet this can lead to “group think” and stifle creativity
- Diversity in all forms can lead to outcomes that would not be possible from homogeneous groups
- An inclusive environment is a critical aspect of high psychological safety, and for diverse groups to thrive



# Leaky Pipeline

- The STEM pipeline is more “leaky” for members of underrepresented groups
- Undermining comments from colleagues are a major reason members of underrepresented groups leave STEM jobs
- Membership in an underrepresented group is part of an individual’s identity, and can be tied how an individual will perceive they will be evaluated.

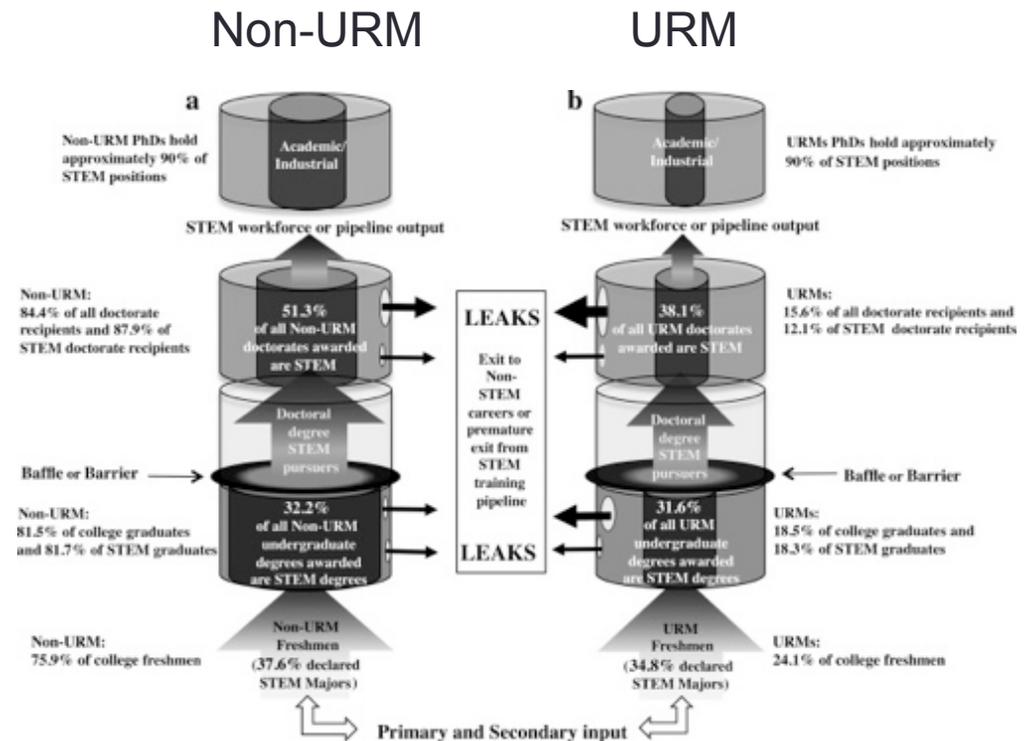
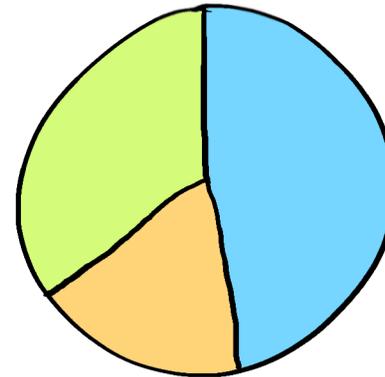


Image Credit: Allen-Ramdial & Campbell (2014)

# Need for Inclusion

- Members of underrepresented groups can be aware of negative stereotypes and may be hindered by a perceived need to 'overcome' negative stereotypes
- Unconscious negative stereotypes can hinder open communication about differences, and hinder effective communication
- Environments with poor psychological safety will have more difficulties with recruitment of underrepresented groups



- PEOPLE WHO GET IMPOSTER SYNDROME
- OTHER PEOPLE WHO GET IMPOSTER SYNDROME
- LITERALLY EVERYONE ELSE (THEY ALSO GET IMPOSTER SYNDROME)

EVERYONE FEELS LIKE AN IMPOSTER  
SOMETIMES, AND THAT'S OKAY

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# Stuff to Remember

- Science is increasingly done by interdependent teams of researchers with diverse skills and experiences
- A larger fraction of science can only be done by teams
- More and better science happens if everyone working together contributes fully
- Teams with high levels of psychological safety have more complete engagement and are more inclusive
- Ways to foster psychological safety include:
  - Encourage everyone to contribute
  - Acknowledge fallibility
  - Model curiosity

# References

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