

An incomplete & biased view of



Equity, Diversity,  
inclusion, and bias in  
astronomy



Belén Alcalde Pampliega

# Who am I ?



- ❑ ESO fellow
- ❑ Duties at ALMA
- ❑ Experience OIR astronomy
- ❑ Galaxy evolution

# Who am I ?



- ❏ ESO fellow
- ❏ Duties at ALMA
- ❏ Experience OIR astronomy
- ❏ Galaxy evolution
  
- ❏ She/her
- ❏ Spanish accent
- ❏ White and small
- ❏ Approachable

Keep your expectations low



# Disclaimer



- ❑ I am not free of biases
- ❑ I am not an EDI expert
- ❑ I am just an extragalactic astronomer

Today's goals

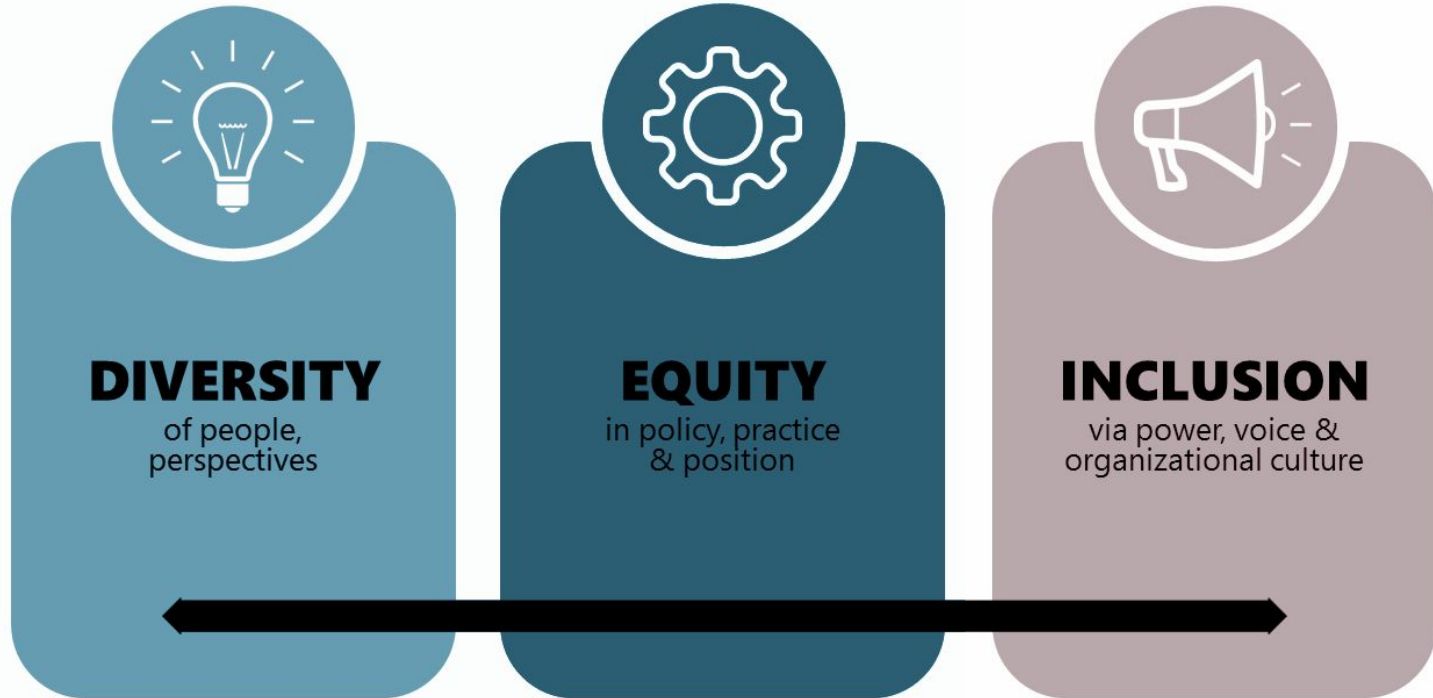


**Basic concepts**

**Open your mind**

**Make you think**

# Introduction DEI/EDI



# Introduction DEI/EDI



Credit: ESO

- Equity means fair treatment in access and opportunity for everyone.
- Equity is a process that begins by acknowledging that an unequal starting place exists and works to correct and address the imbalance.
- Equity ensures that all people have the opportunity to grow, contribute, and develop, regardless of their identity.

# Equity vs Equality

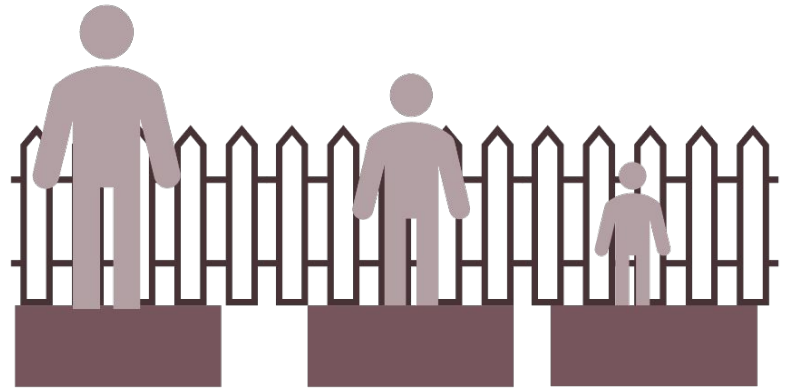
## Equity

Ensuring everyone has fair access to opportunities and resources.



## Equality

Provide all people with access to the same resources





# Equity vs Equality



## General examples

- ☐ Equal healthcare
- ☐ Equal access to education
- ☐ Equal pay for equal work

# Equity vs Equality



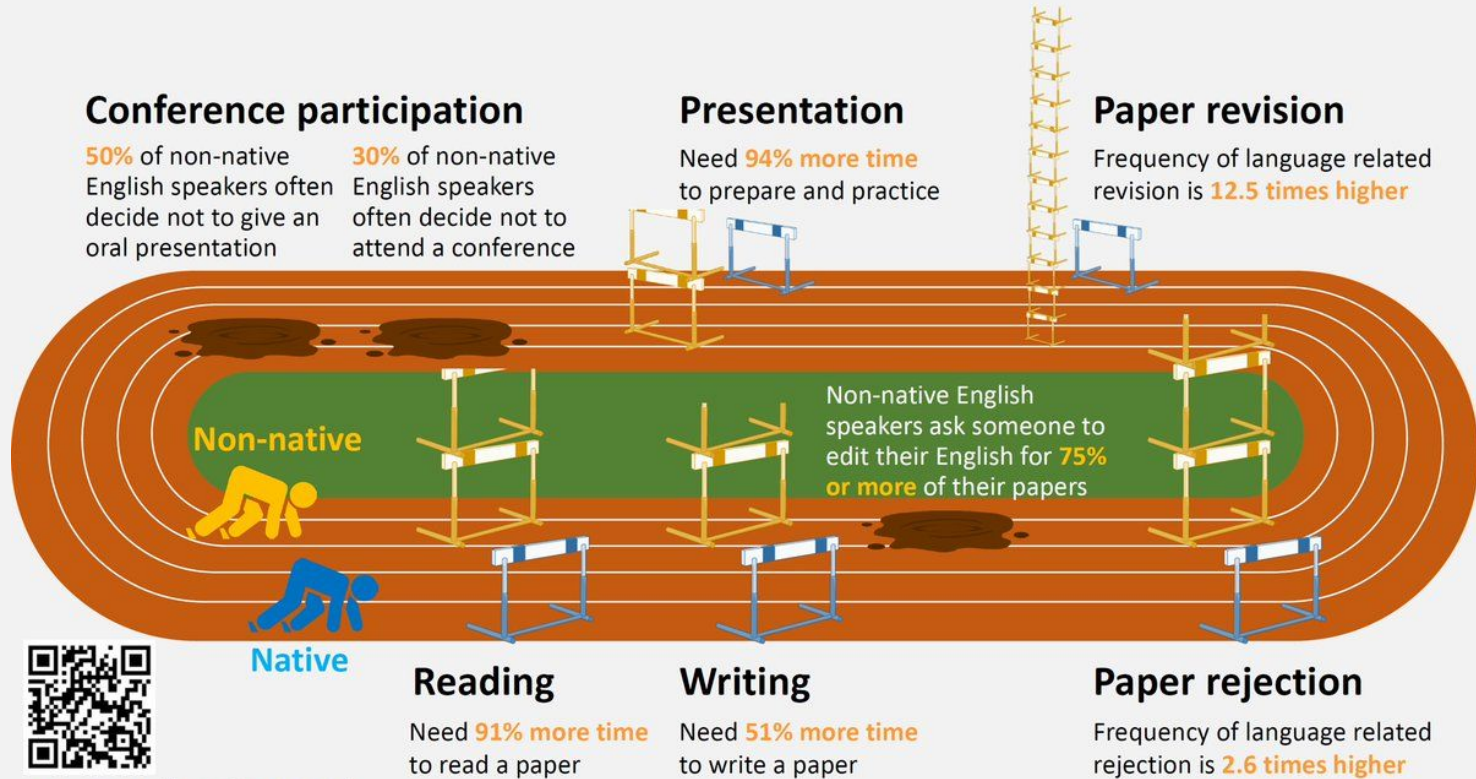
## General examples

- ❑ Equal healthcare
- ❑ Equal access to education
- ❑ Equal pay for equal work

## Examples in Astronomy

- ❑ Culturally relevant outreach programs
- ❑ Representation in leadership roles
- ❑ Equal access to telescopes and observing time

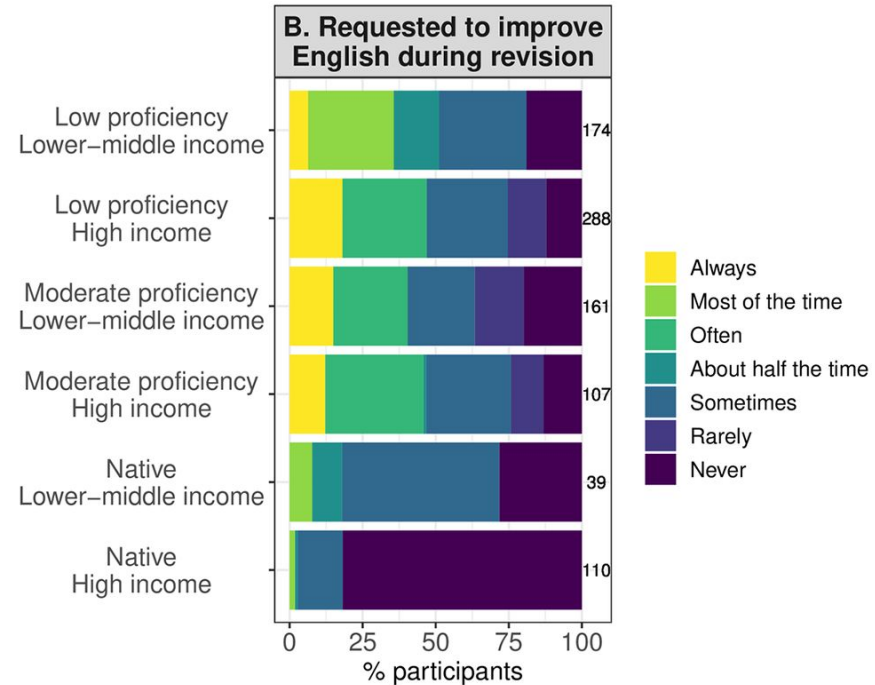
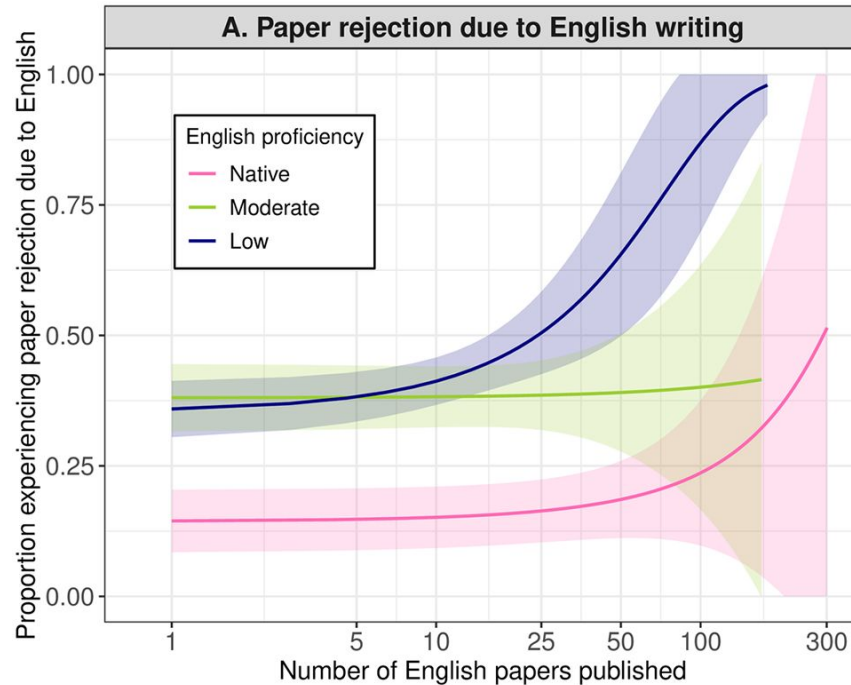
# Equity vs Equality: Example: language barrier



Amano et al (2023) PLOS Biol

# Equity vs Equality: Example: language barrier

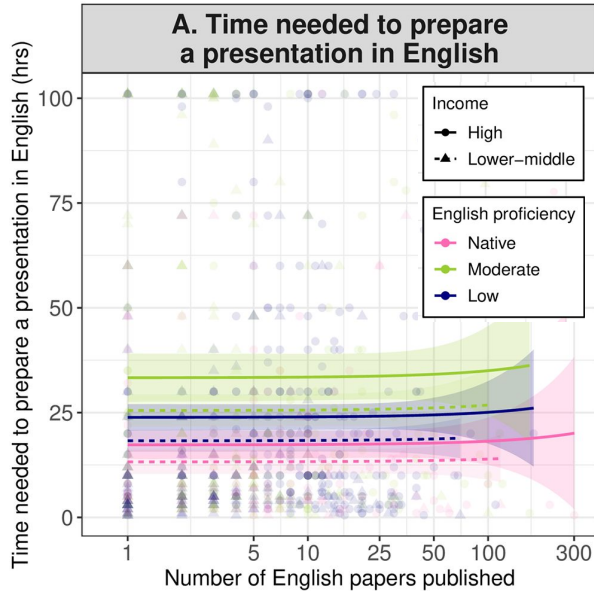
The manifold costs of being a non-native English speaker in science



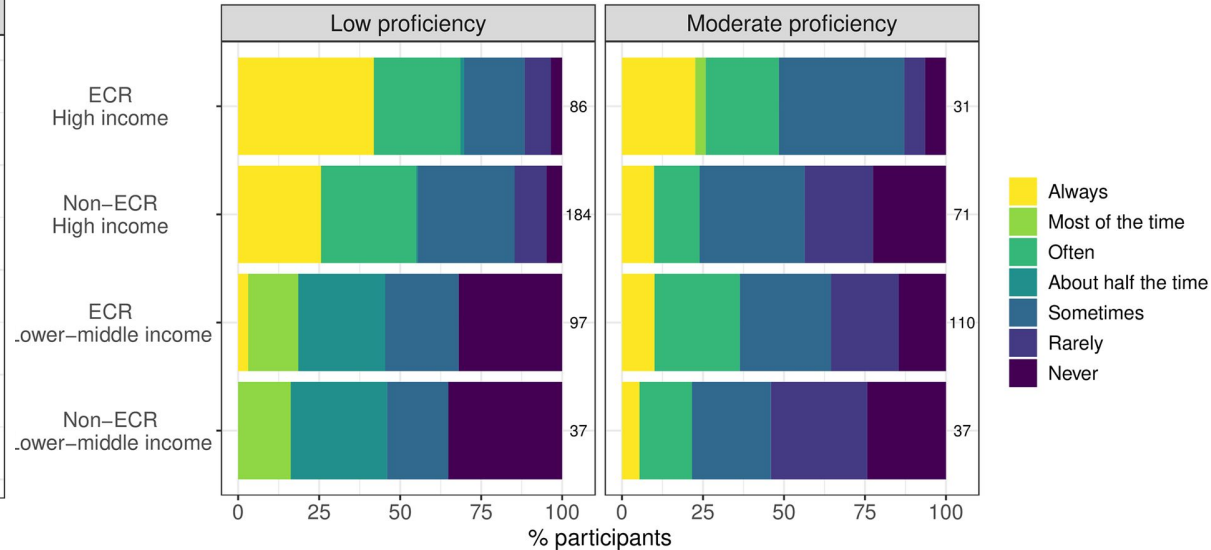
# Equity vs Equality:

## Example: language barrier

The manifold costs of being a non-native English speaker in science



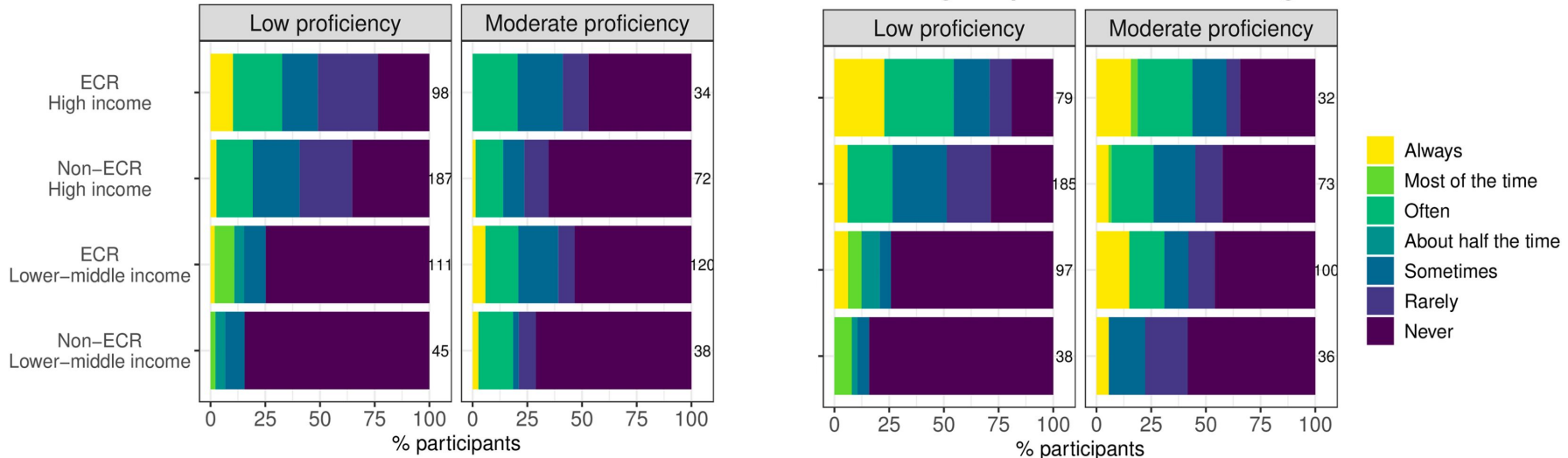
**C. Struggling with communicating research in English**



# Equity vs Equality: Example: language barrier

**A. Not attending a conference due to English barriers**

**B. Avoiding oral presentations due to English barriers**



# Equity vs Equality



- ❑ Equity considers existing disadvantages and aims at leveling.
- ❑ Equality assumes everyone starts from the same point.
- ❑ Both are important...



**Takeaways**

# Introduction DEI/EDI



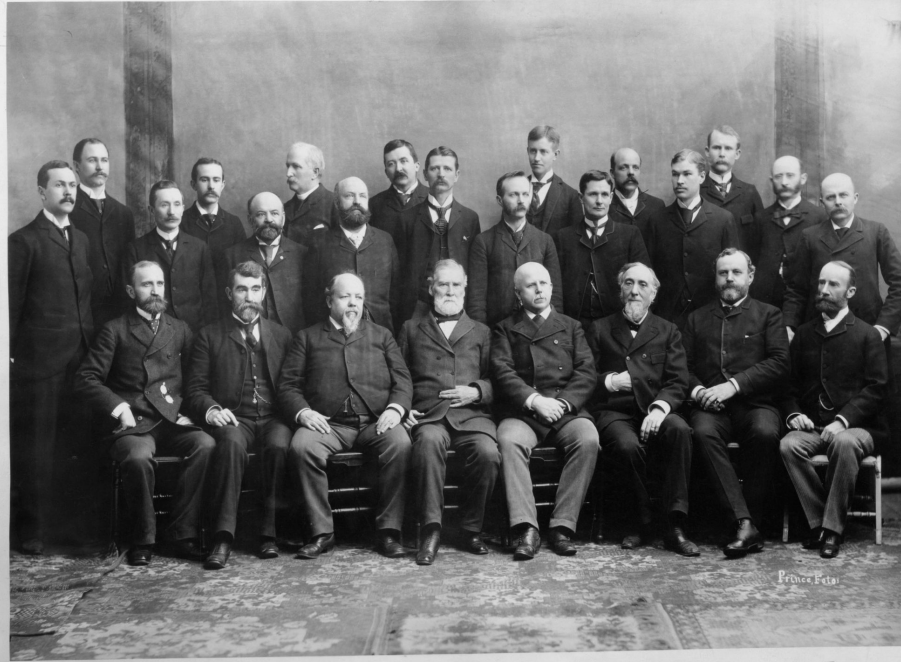
Credit: ESO

- The presence of differences within a given setting.
- This includes gender identity, age, ability, ethnicity, religion, nationality, communities, sexual orientation, place of practice, and practice type.
- The benefit of having a diverse workforce that brings a spectrum of perspectives in our teams and in decision-making structures is undoubted and proven.



# Diversity

Geodetic conference 1894



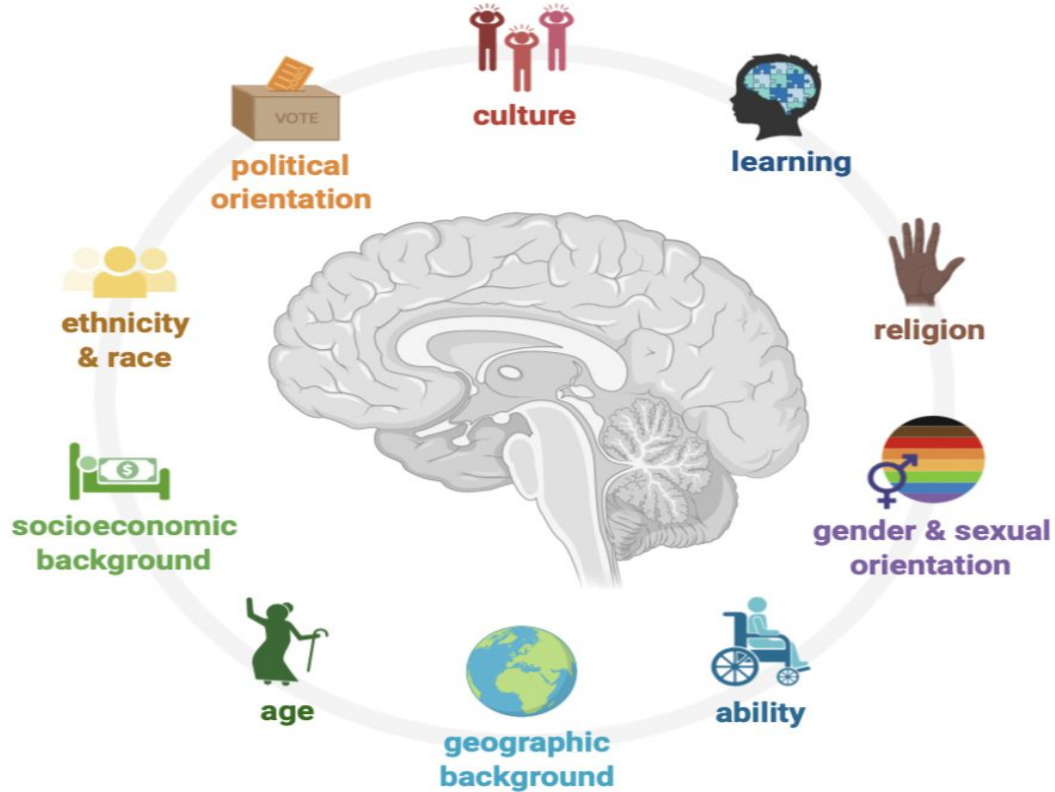
Carl Frenck, S. B. ... C. N. Van ... John E. ... W. ... A. L. ... Edward ...  
J. ... G. A. ... Wm. ... S. ... W. S. ... Wm. ... J. ... W. ...  
C. N. ... J. ... Wm. ... W. ... Wm. ... Paul ...

FAB 10551 GEODETIC CONFERENCE, 1894. SEE PAGE 4, ANNUAL REPORT, 1894.

# Diversity

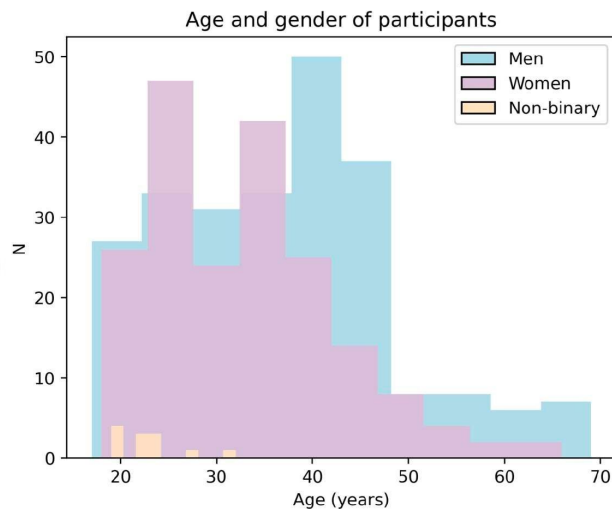
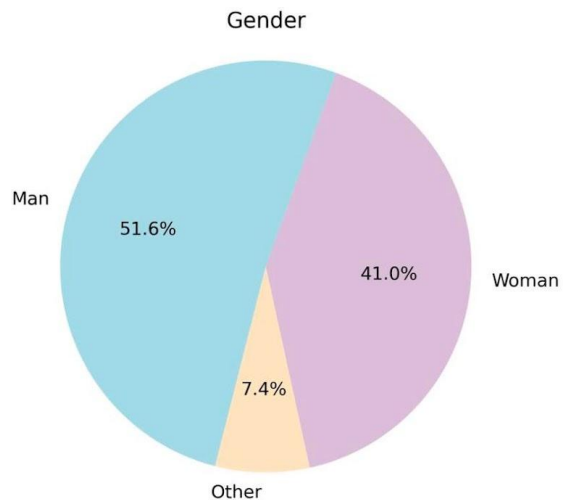
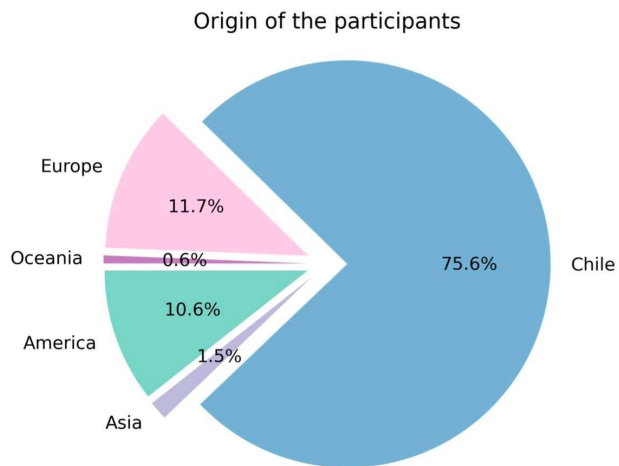


# Diversity



# Chilean astronomical community

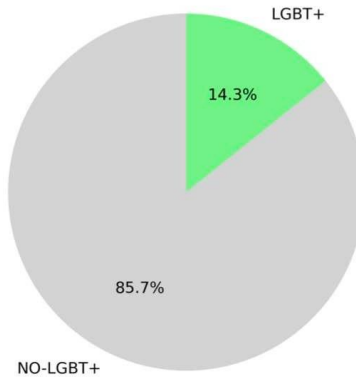
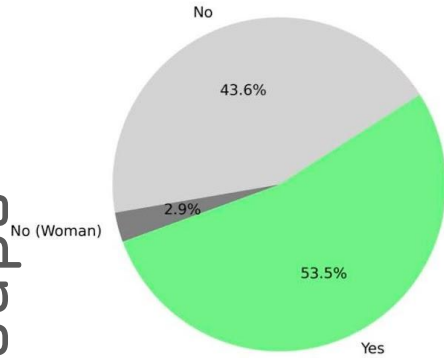
SOCHIAS, J. Carballo Bello



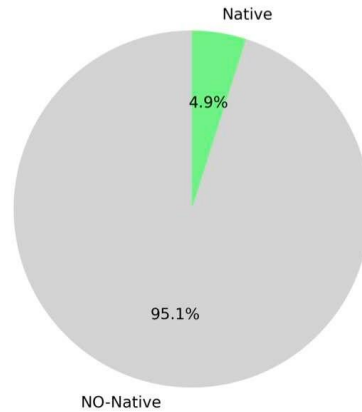
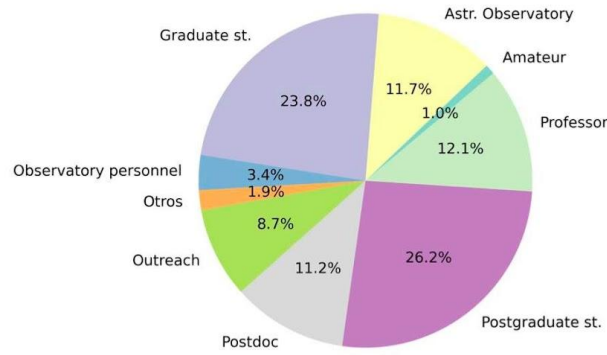
# Chilean astronomical community

Minority groups

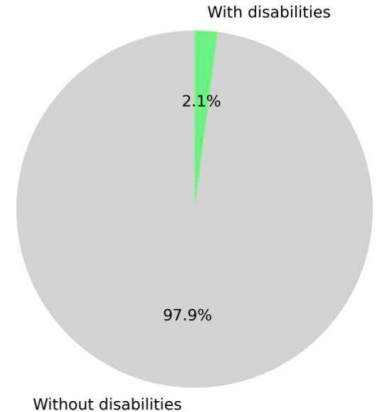
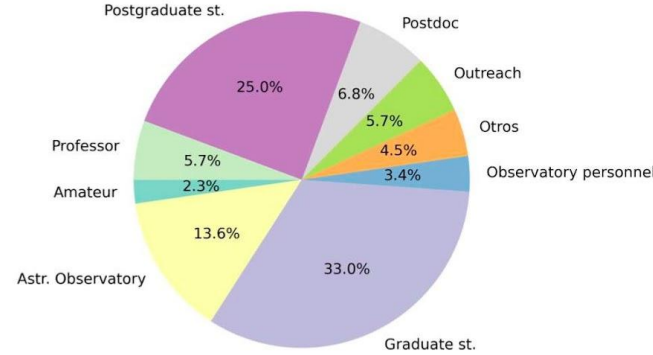
Minority groups  
Women, LGBT+, Native, Disability, Other



Occupation. N=206  
(Only minority groups)



Occupation. N=88  
(Excluding "women" as single answer)



# Introduction DEI/EDI



## **INCLUSION**

via power, voice &  
organizational culture

- Inclusion refers to the intentional effort to value people's differences and enable everyone to perform to their full potential no matter their background, identity, or circumstances.
- We aim at creating an inclusive working environment, that is, one in which everyone feels that they belong, and that their contribution matters.

# Inclusion

Credit: Nature astronomy

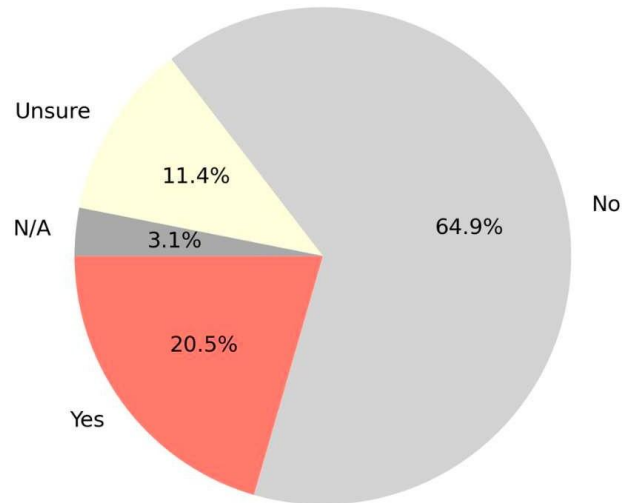


# Chilean astronomical community

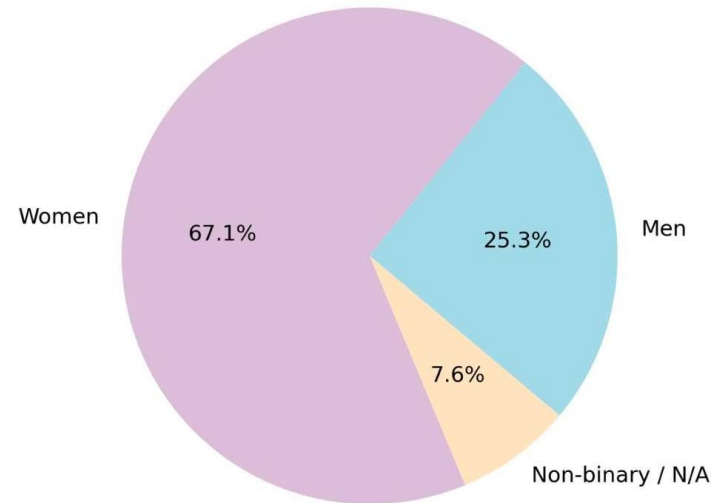
SOCHIAS, J. Carballo Bello

## Discrimination in astronomy

Have you also felt attacked?



Yes (N=79)



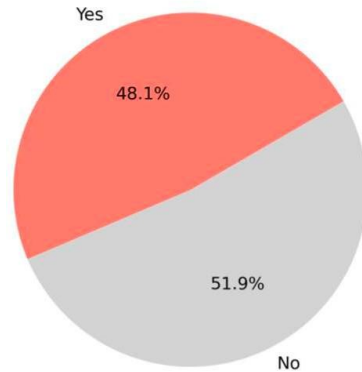


# Chilean astronomical community

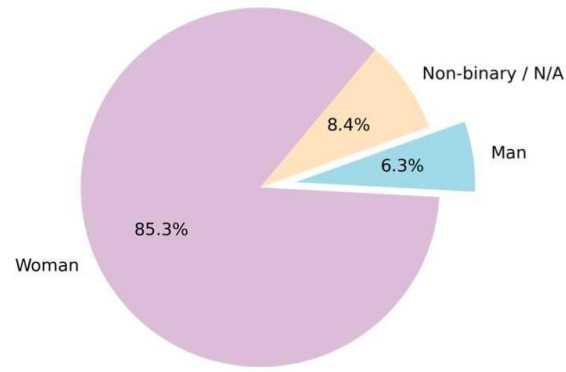
SOCHIAS, J. Carballo Bello

## Discrimination in astronomy

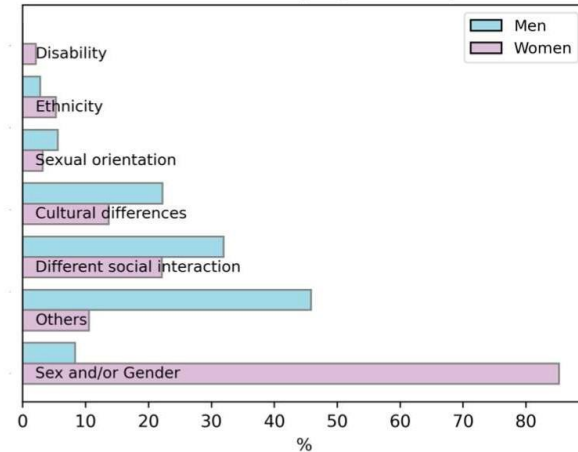
Have you ever felt discriminated?  
Only minority groups



Discriminated because of my gender (N=95)  
Only minority groups



Frequency of causes of discrimination (multiple choices)  
Others: nationality, age, hierarchy...



# Inclusion: hidden disabilities



# Inclusion: hidden disabilities

Enrique Pérez Montero



## Astronomía no visual



Una mirada no tan limitada  
al universo

ENRIQUE PÉREZ MONTERO



PIRÁMIDE



# EDI: why is important?

## DIVERSITY



of people and perspectives

## EQUITY



in policy and practice

## INCLUSION



of all voices and visions

## BENEFITS TO SCIENCE



Creativity &  
innovation



Enhanced  
productivity



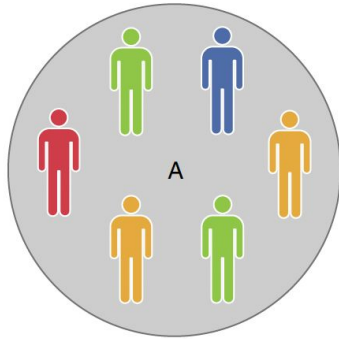
Team work  
& loyalty



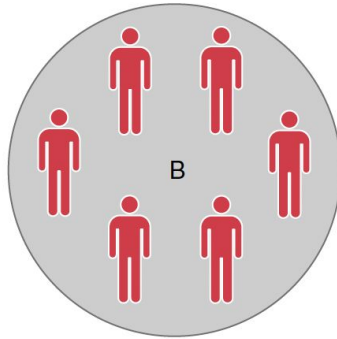
Stronger  
publications

# EDI: why is important?

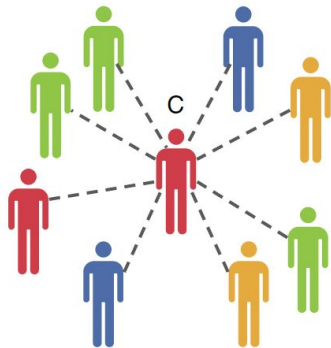
A paper with high  $d_x^G$



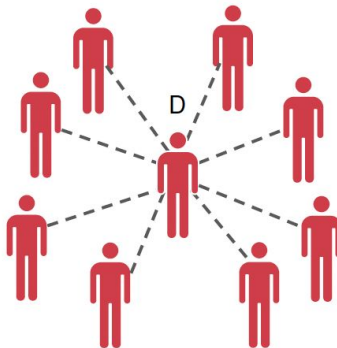
A paper with low  $d_x^G$



A scientist with high  $d_x^I$



A scientist with low  $d_x^I$



Effect of diversity in research impact

- 9 million papers
- 6 million scientists

ethnic diversity

- impact gain of 10.63% for papers
- 47.67% for scientists

# Then...why is not yet a reality?



# Microaggressions



## Microaggressions:

Everyday, subtle, intentional or unintentional interactions or behaviors that communicate some sort of bias toward historically marginalized groups.

**ON OUR SLEEVES<sup>®</sup>**

# Microaggressions

A woman with dark, curly hair is holding a white sign in front of her chest. The sign has the text "No, where are you really from?" written on it. She is looking directly at the camera with a neutral expression. The background is a solid blue color. Above the woman, there is a horizontal bar with several colored segments: black, light blue, dark blue, brown, purple, and red.

No, where are you  
really from?



# Microaggressions



"Are you a man or a woman?"



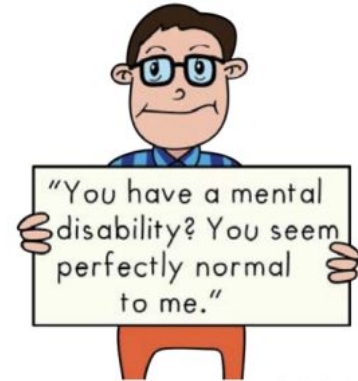
"You Natives don't have to work, doesn't the government give you everything for free?"

©Turner Consulting Group Inc.



"YOU were born in Canada?"

©Turner Consulting Group Inc.



"You have a mental disability? You seem perfectly normal to me."



"You're going to stay home with the baby? Are you really going to let your wife wear the pants in the relationship?"



"Do you know where I can buy marijuana?"

©Turner Consulting Group Inc.



"You speak really good English for an immigrant."

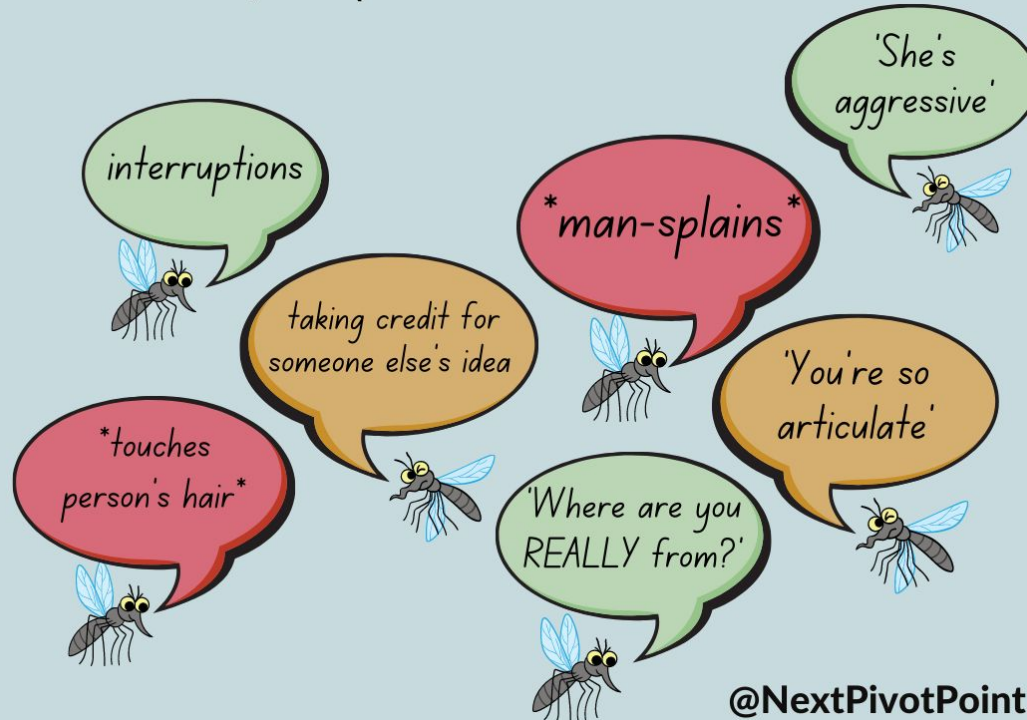


"Why haven't you found a husband yet?"

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# Microaggressions

like millions of mosquito bites over time



@NextPivotPoint

# Then...why is not yet a reality?



# Biases



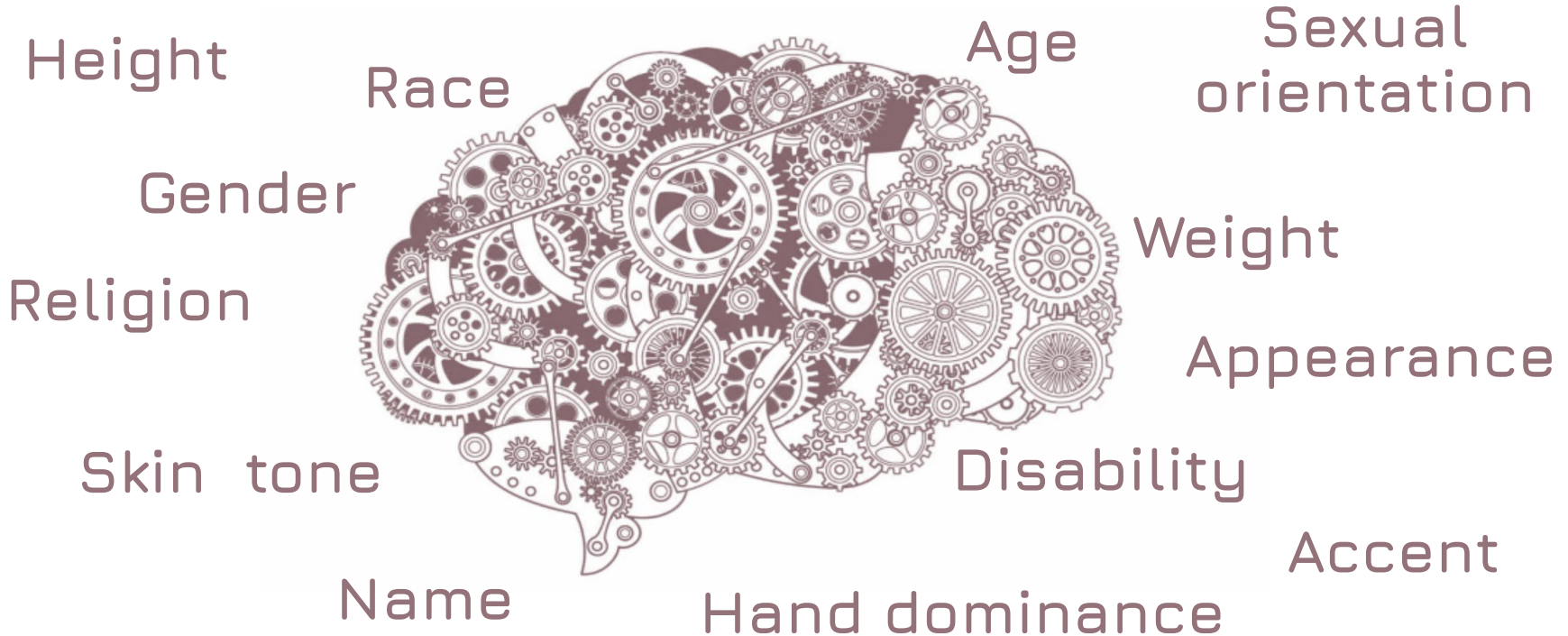
## BIAS

Biased refers to an unfair prejudice for or against someone or something. It refers to an inclination towards one way of thinking, often based on how we were raised and what we have been exposed to in our lives.

Unconscious bias = The autopilot

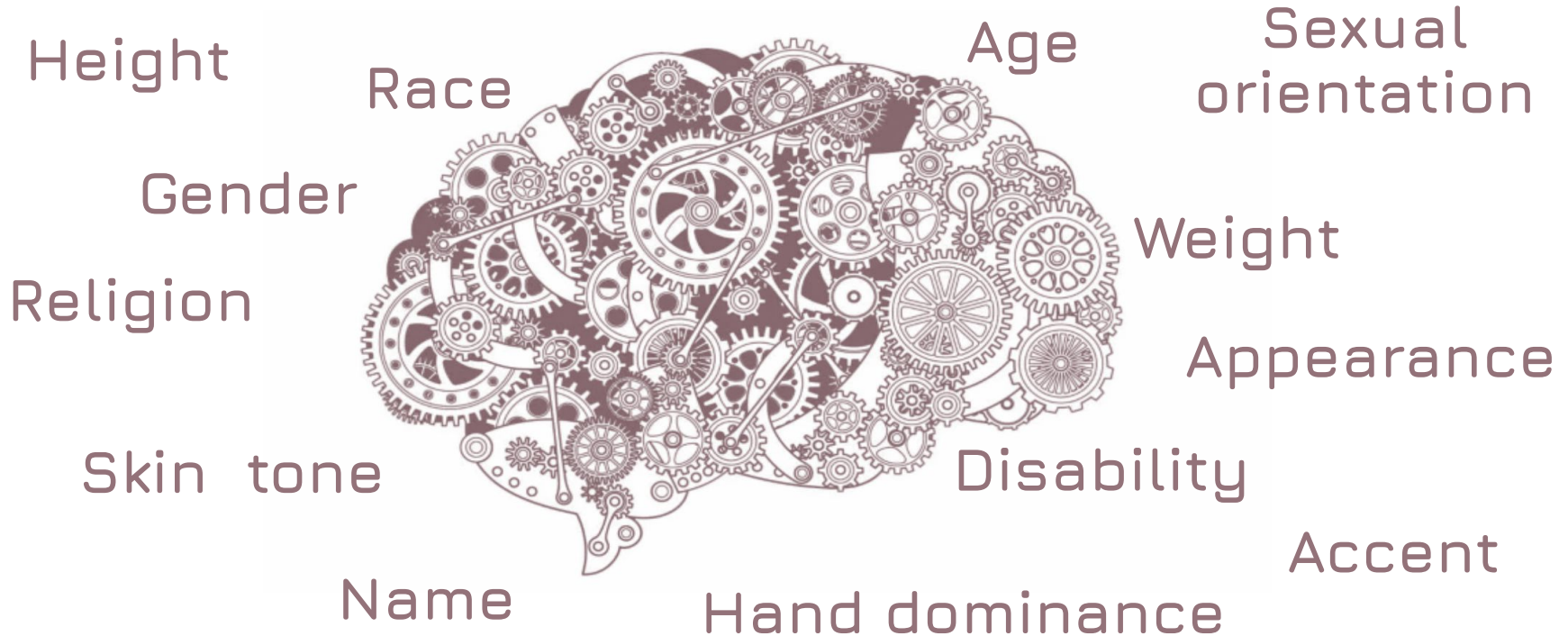
# Unconscious biases

## Why do we have biases?



# Unconscious biases

## Which are ours?



# Microaggressions



What does a leader look like?

Wow, you are so articulate!

You don't have to be that loud!

Are you really capable?

Who's actually in charge here?

Is that a professional hairstyle?

**We are  
loosing talent**

# Who has faced more barriers?

Option A



Option B





# Who has faced more barriers?

Option A



- ❑ Nationality: Ukrainian (non-native)
- ❑ Income: low

Option B



- ❑ Nationality: South African (native)
- ❑ Income: very high

# Who has faced more barriers?

## Option A



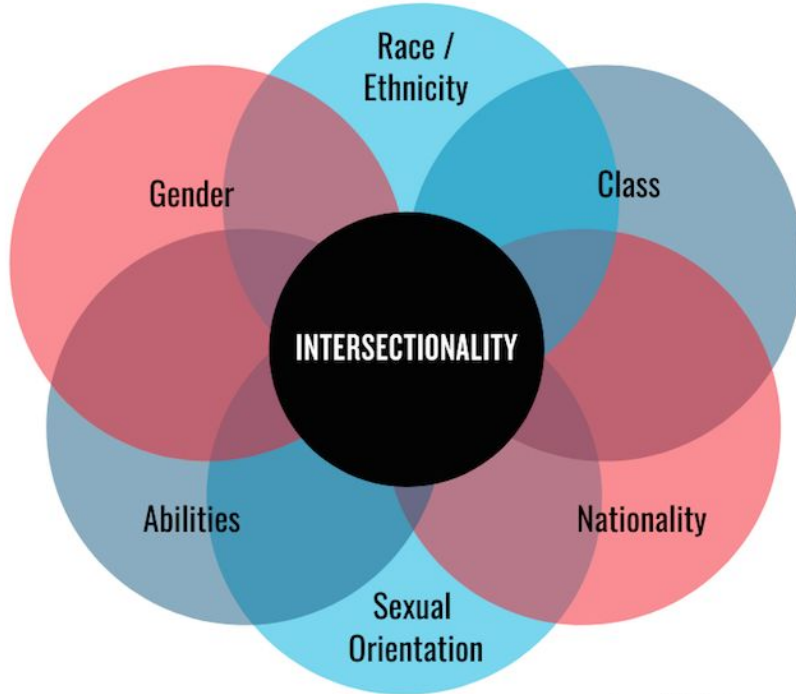
- ❑ Nationality: Ukrainian (non-native)
- ❑ Income: low
- ❑ Heterosexual man
- ❑ Disabilities: none

## Option B



- ❑ Nationality: South African (native)
- ❑ Income: very high
- ❑ Transgender
- ❑ Disabilities: deaf

# Intersectionality



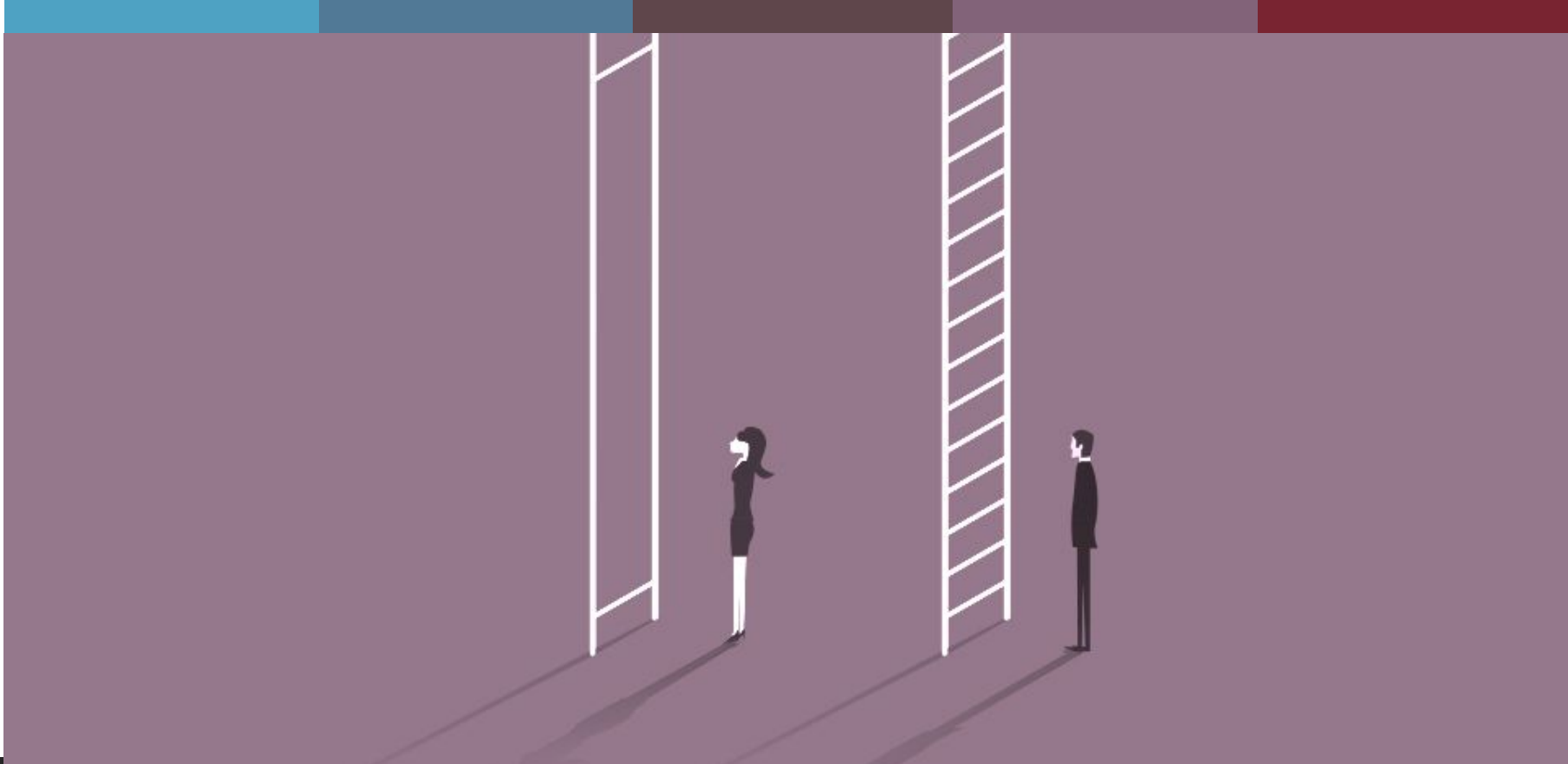
Refers to the **overlap**, or in intersection, of **various identity factors**

Biases and discrimination



**Gender and  
minorities in  
astronomy**

# Perspective of gender biases



# Perspective of gender biases



## Expectations for **men**

- provider
- assertive
- strong
- driven

taking “charge”

## Expectations for **women**

- supportive
- emotional
- helpful
- sensitive
- fragile

taking “care”

# Perspective of gender biases



I am a woman,  
but I still have a bias  
Yes, **AGAINST MYSELF**

# Nine out of 10 people are biased against women, says 'alarming' UN report

Researchers 'shocked' at lack of progress, and entrenched social norms that curtail women's chances in politics, business and work

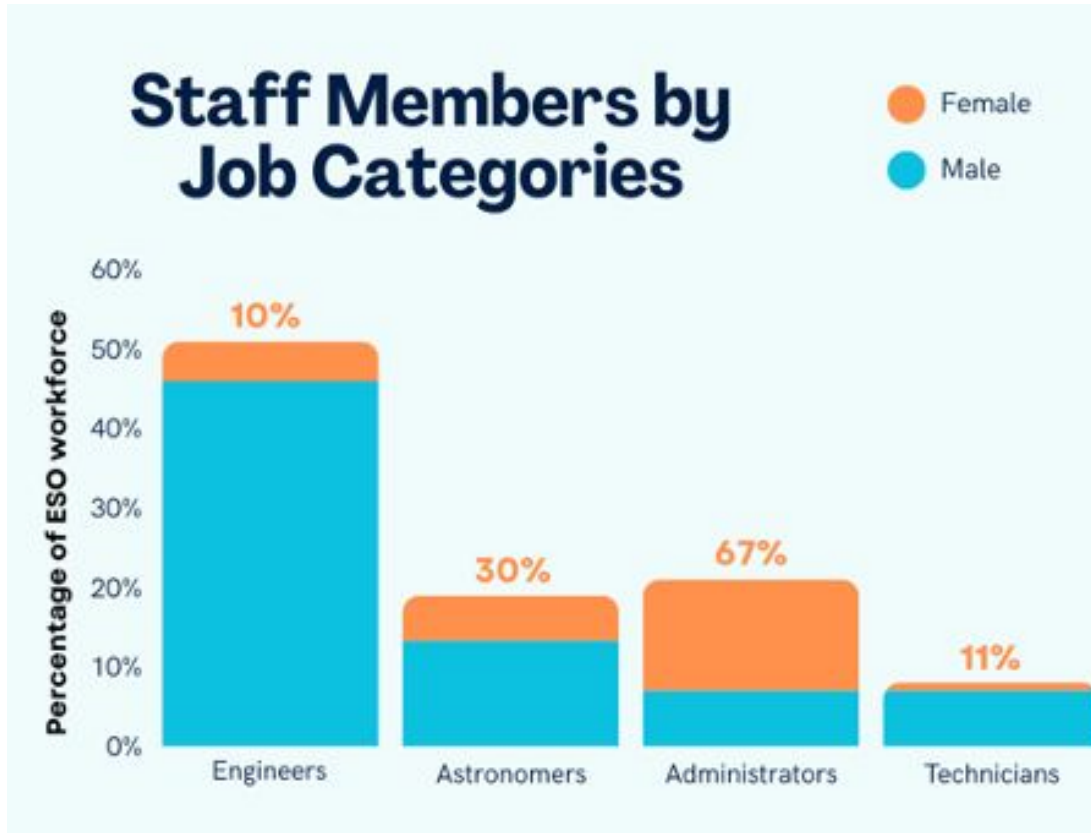


Participants arrive at the Generation Equality Forum organised by UN Women in Paris, France, June 2021. Photograph: Ludovic Marin/AFP/Getty Images

Bias against women is as entrenched as it was a decade ago and gender equality progress has gone into reverse, **according to a UN report.**



# Perspective of gender biases



# Racial bias



**Racial Ethnocentrism**  
One's race is "normal"

**Religious Ethnocentrism**  
One's religious group is superior

# Black in astro

Q&A | [Published: 13 June 2022](#)

## The representation of Blackness in Astronomy

[Paul Woods](#) & [Ashley Walker](#) 

[Nature Astronomy](#) 6, 622–624 (2022) | [Cite this article](#)

2574 Accesses | 237 Altmetric | [Metrics](#)

**The Black In Astro Community formed through a need for support and community among predominantly early-career Black people working in astronomy. In just two years, Black In Astro has grown to have members across the globe. Its founder and organizers explain how it came about.**

# Racial bias

🕒 MAY 22, 2023

✓ Editors' notes

## Harvard study finds implicit racial bias

An overwhelming majority—over 90 percent—explicitly stated that white people and non-white people are equally human.

But on an implicit measure, white US participants, as well as white participants from other countries, consistently associated the attribute "human" (as opposed to "animal") with their own group more than other racial groups.

### Implicit Association Test

The research relied on the Implicit Association Test (IAT), a tool developed in the 1990s and now widely used in the field.

The idea is that easier pairings, as measured by faster key responses, are more strongly associated in the mind than difficult pairings, as measured by slower responses.

But.. there are many others



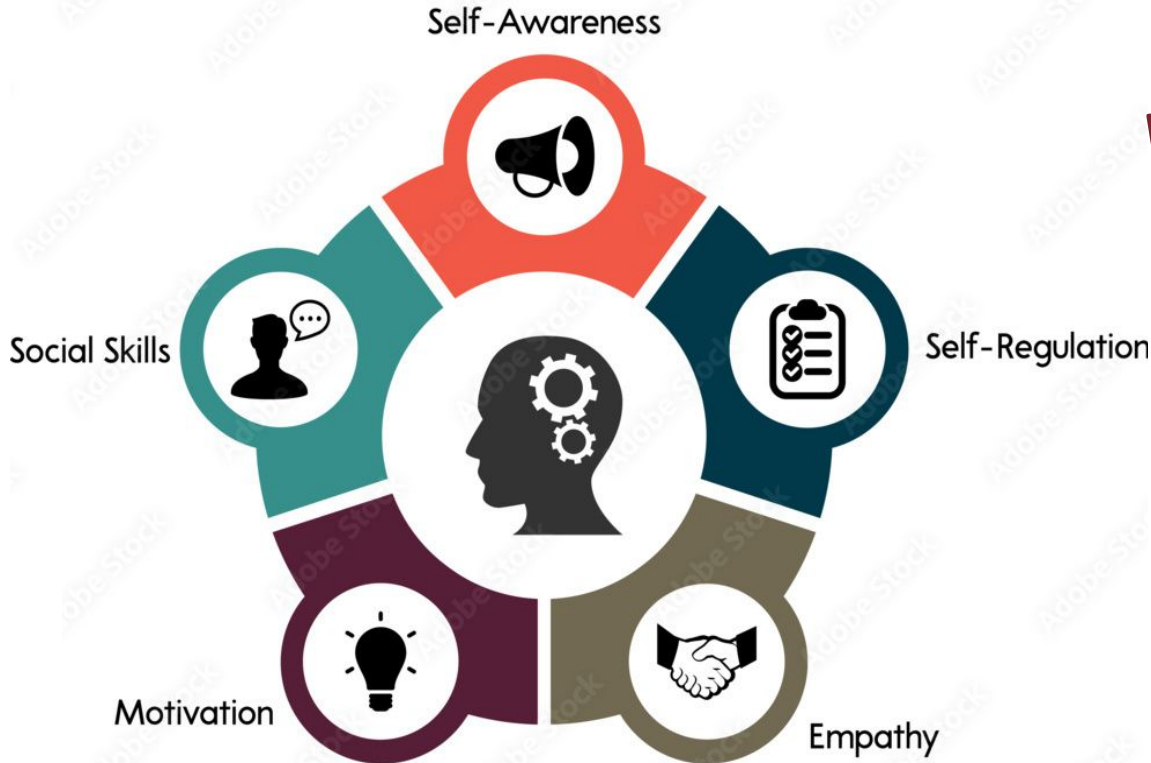
Building a better community



# How do we foster EDI?

[incomplete list!]

# Awareness, empathy & emotional intelligence



**We need to avoid  
Stereotypes**

# The agony of stereotyping

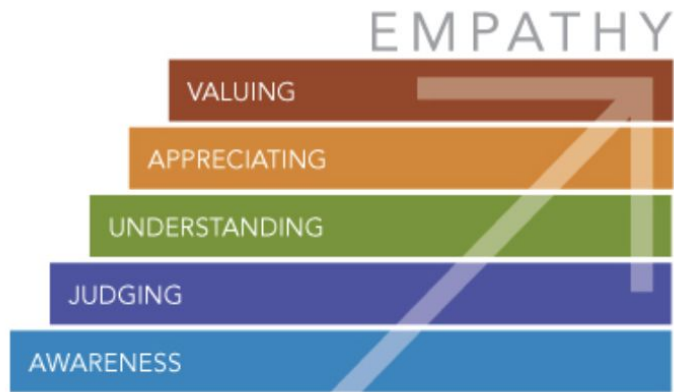


## How to Avoid Stereotyping Others?

- Get to know others who appear different from you.
- Stop yourself before making snap judgments about others.
- Consider what you have in common with other people—it may be more than you think!
- Develop empathy for others. Try to walk in their shoes.
- Educate yourself about different cultures and groups.



# Let everyone grow to their full potential



# Open access to resources

[nature](#) > [nature human behaviour](#) > [editorials](#) > [article](#)

Editorial | [Published: 19 December 2023](#)

## Post a preprint of your next research paper

[Nature Human Behaviour](#) 7, 2039 (2023) | [Cite this article](#)

9074 Accesses | 19 Altmetric | [Metrics](#)

**Fewer than one in ten research articles are posted as preprints. Yet sharing research on public repositories comes with many advantages and few caveats. At *Nature Human Behaviour*, we encourage researchers to embrace preprints to jumpstart the communication of research findings.**

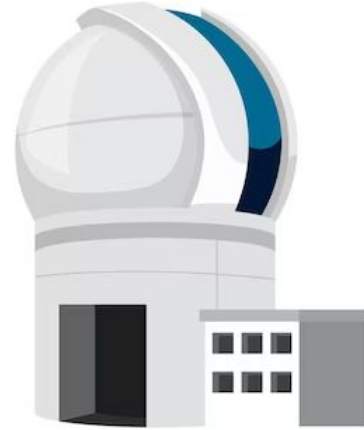
We – along with all other Nature Portfolio journals – [encourage](#) the posting of preprints for research articles, as we believe that they have a functional role in the science ecosystem and can benefit both researchers and the public. Yet, fewer than 10% of the research articles published in *Nature Human Behaviour* in 2022 had a preprint associated with them.

# Mentoring



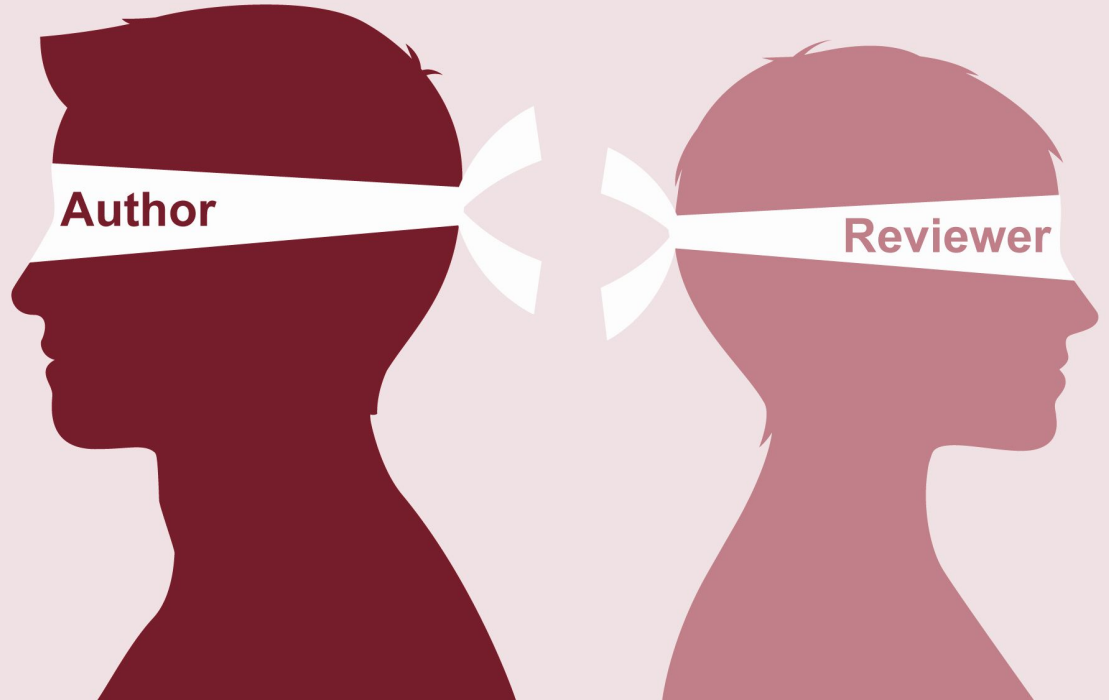
# Do things differently

- Define goals
- Understand by looking at data
- Develop tools
  - to incorporate
  - measure
  - evaluate
  - show progress of initiatives



# Double-blind selection processes

- Reduces Subjectivity and Bias.
- Promotes Objectivity and Fairness
- Encourages Openness and Transparency
- Improves efficiency



# Selection processes

## Challenges vs CV screening

- 60% more minorities selected for interview
- 125% more women selected for interview.



# Why should we foster EDI?

# Who should carry this responsibility?

## WHY?

equity?

diversity benefits?



## WHO?

Which individuals?

organizations?



# Who should carry this responsibility?

Get everyone involved

- reconsider candidates' **'requirements'**
- identify who else could represent minority perspectives.
- filling the positions through **open calls**.
- we should educate ourselves, be aware of our own biases, and include everyone in the process, training, and discussions.





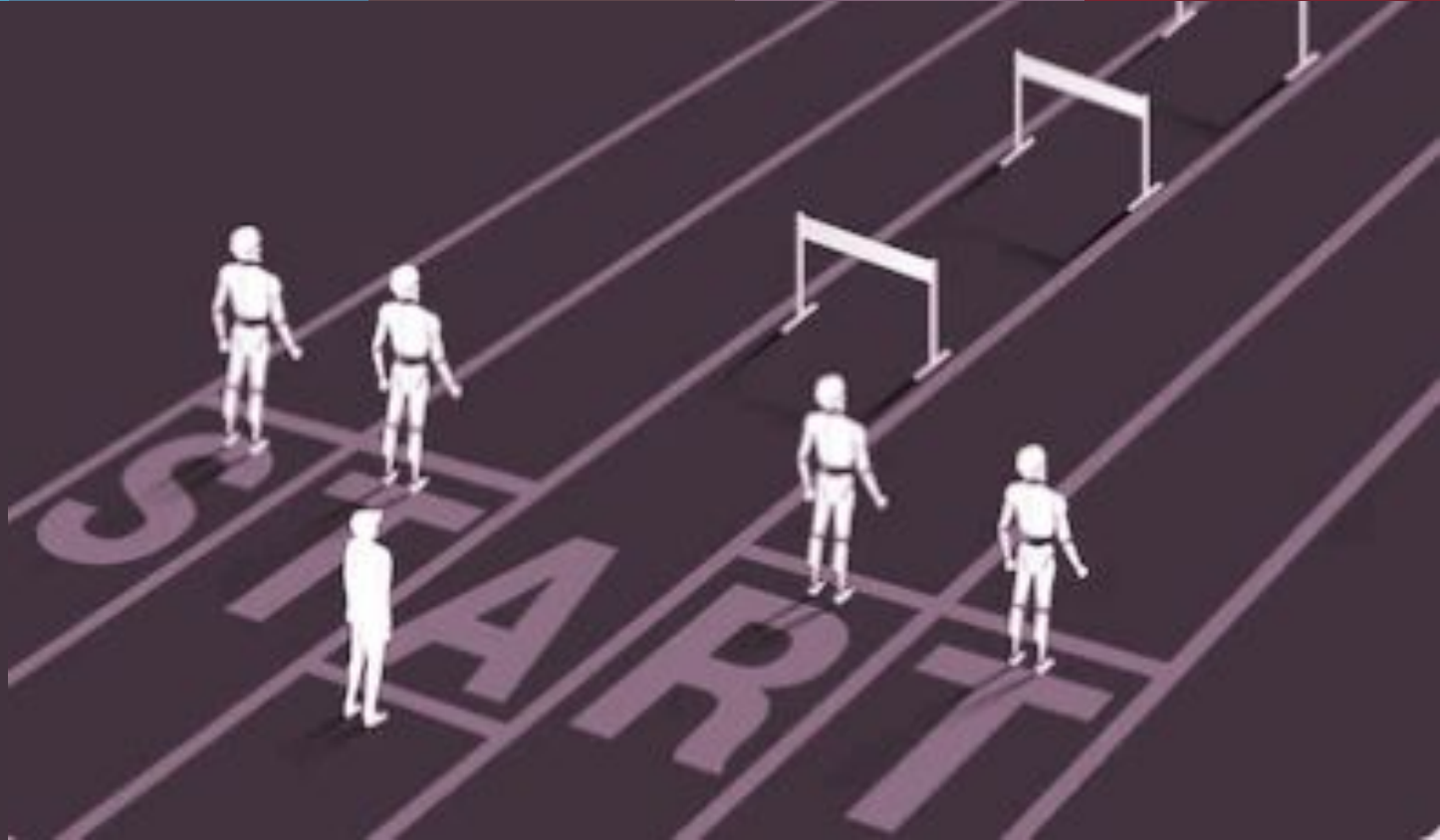
# The burden of EDI engagement



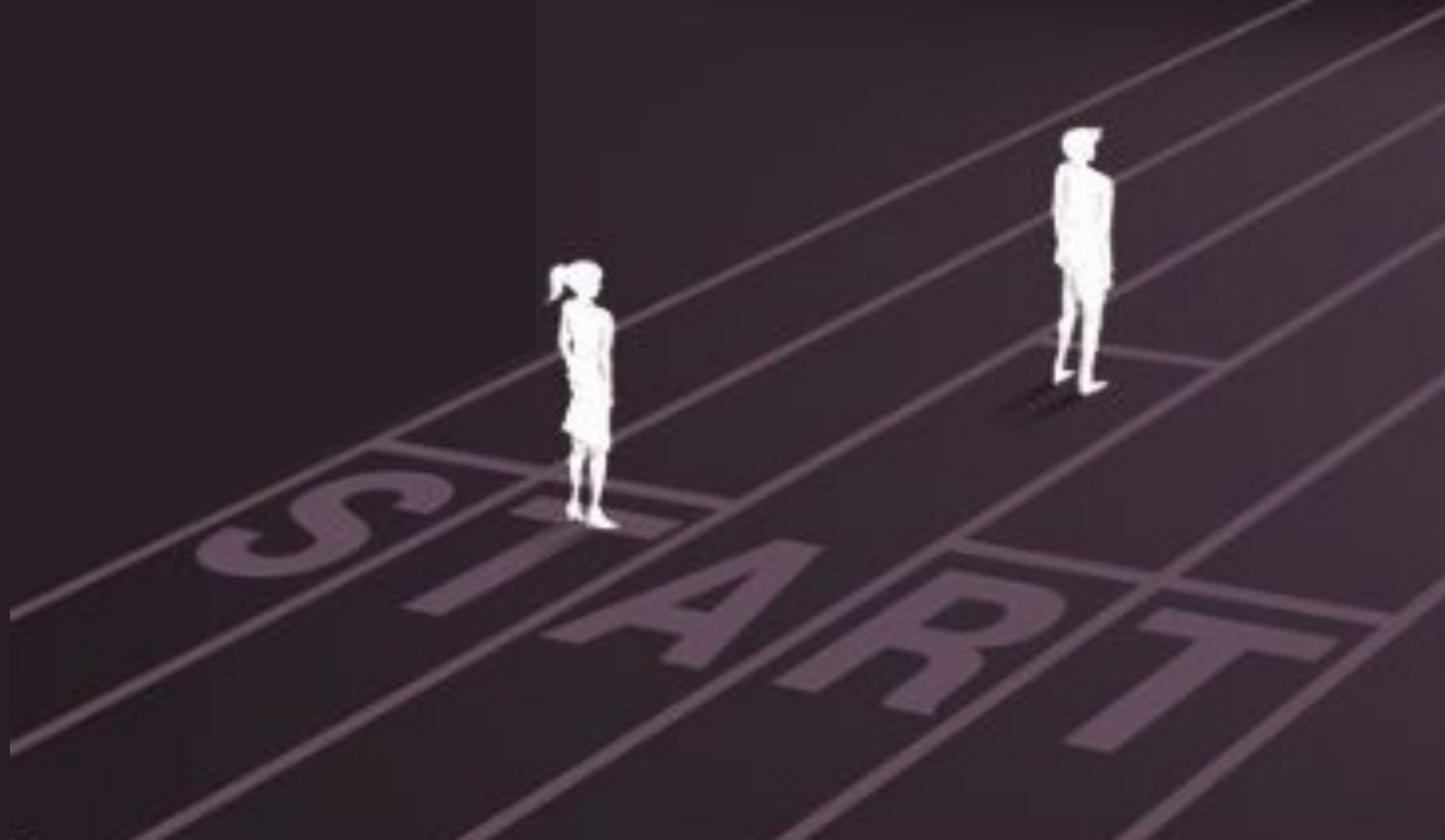
How to catch up: it is not that easy



# How to catch up: it is not that easy



# How to catch up: it is not that easy



How to catch up: it is not that easy

**The future is in  
your hands**

