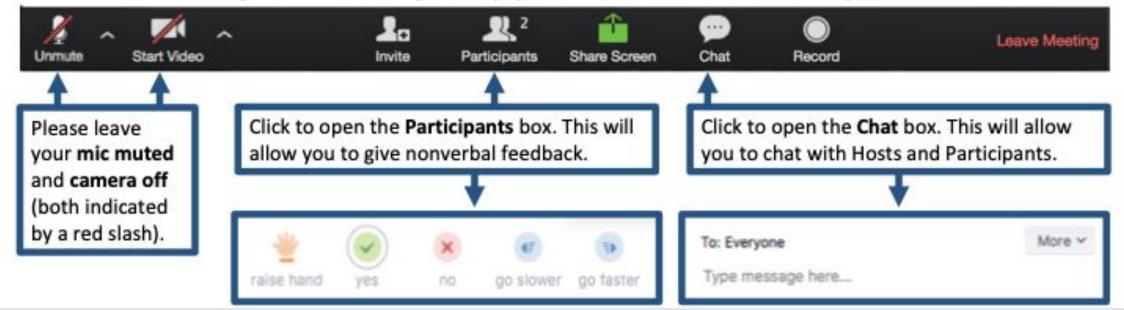


Welcome to the NAGT webinar series Improving Earth education one hour at a time

Science Communication for Social Justice

As you enter, please review the Zoom controls below. Leave your audio and video off, unless prompted by a host. You can post any questions in the chat box. Thank you!





Welcome to the NAGT webinar series Improving Earth education one hour at a time

NAGT sponsors a comprehensive webinar series that is sure to be your one-stop-shop for strengthening work in Earth education. Webinars feature novel and innovative work in Earth education research and pedagogy, new teaching materials, and classroom and professional experiences of people like you. The NAGT webinar series is free and we encourage you to invite your colleagues to attend and join the discussion.



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http://nagt.org/190616

Join or Renew http://nagt.org/37340

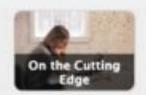
Get Involved in NAGT http://nagt.org/95944

Sponsoring Projects and Programs















Science Communication for Social Justice

Beth Bartel, formerly UNAVCO now Michigan Tech and Wendy Bohon, IRIS

August 27, 2020









Who We Are

Beth Bartel (she/her)

SciComm Specialist / PhD student

*Keweenaw Bay tribal land







Dr. Wendy Bohon (she/her)

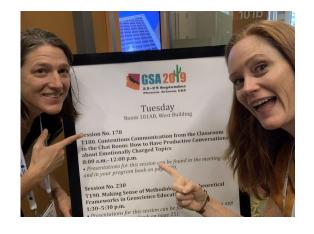
Geologist / SciComm Specialist

*Piscataway homeland















Acknowledgements

We would like to acknowledge the previous work done to address racism, DEI and social justice in STEM, especially work done by people of color, including

- · Dr. Chanda Prescod-Weinstein
- · Dr. Kuheli Dutt
- · Dr. Angela Saini
- · Dr. Danielle Lee
- · Dr. Keolu Fox
- · Dr. Kim Tallbear
- · Dr. Safiya Noble

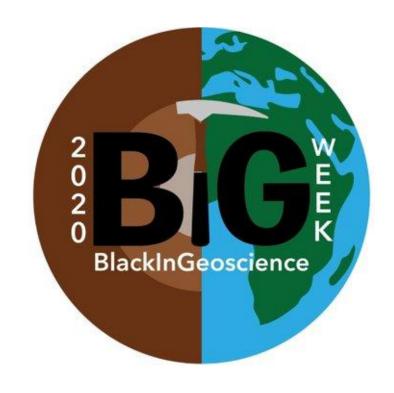


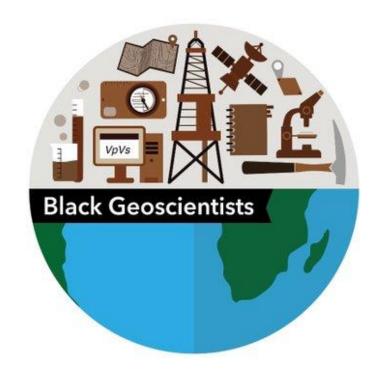




Black in Geoscience Week

Sept 6-12 | @BlkinGeoscience | #BlackInGeoscience









Your Goals

Thank you for showing up.

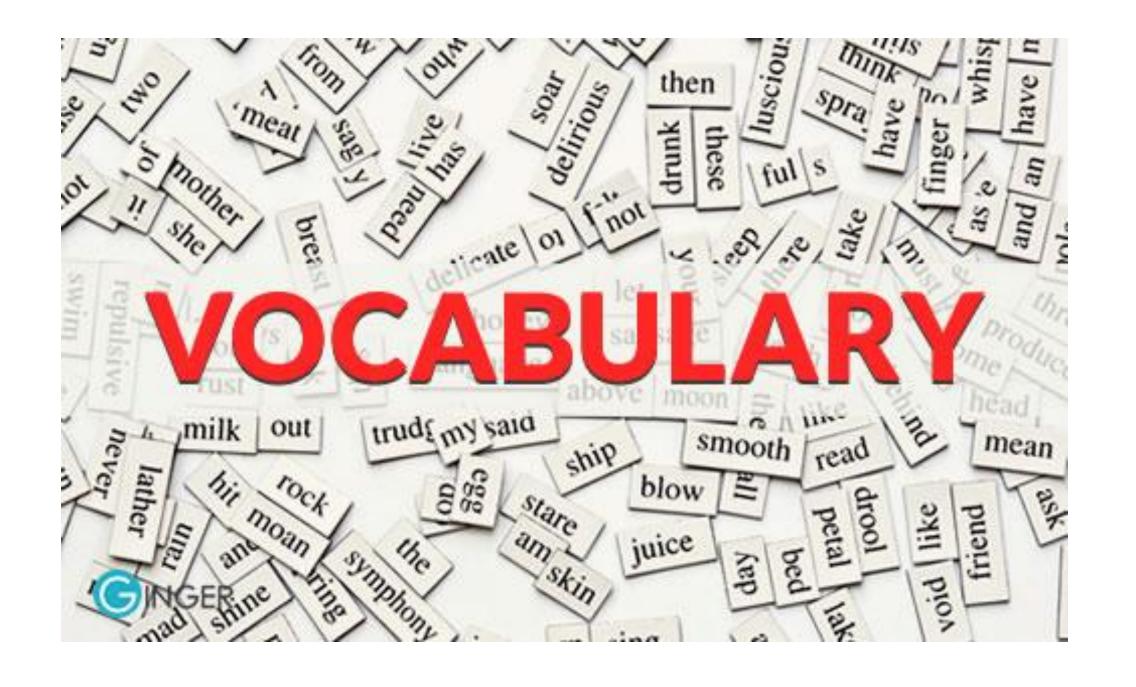
So... why are you here?

- · What do you hope to get out of this webinar?
- How do you hope to use it?













What is Science Communication?

Science communication is the practice of informing, educating, sharing wonderment, and raising awareness of science-related topics. - Wikipedia



- Communicator
- Audience
- Platform
- Often bidirectional communication channels
- · Social, emotional and physical context



What is Social Justice?

Justice in terms of the distribution of wealth, opportunities, and privileges within a society.

- Oxford Languages







What is Social Justice?

Justice in terms of the distribution of wealth, opportunities, and privileges within a society.

- Oxford Languages

www.menti.com

53 81 55 3



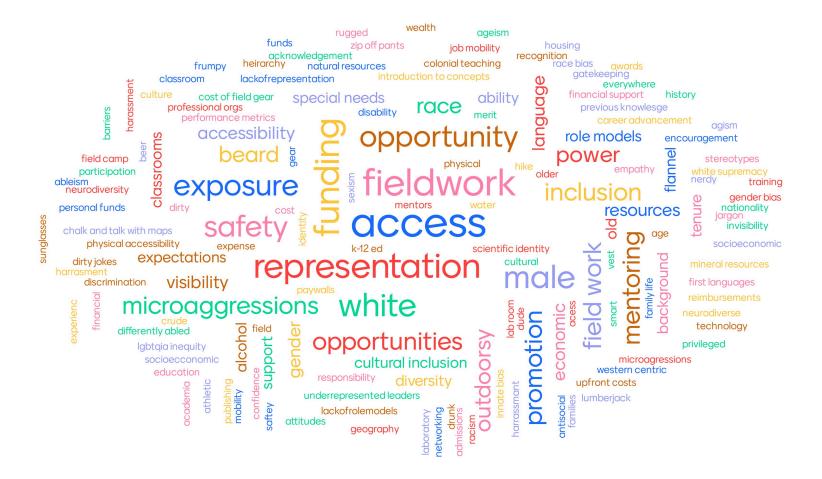
Where do the inequities lie in geoscience?





Mentimeter

Inequities in Geoscience





Equality



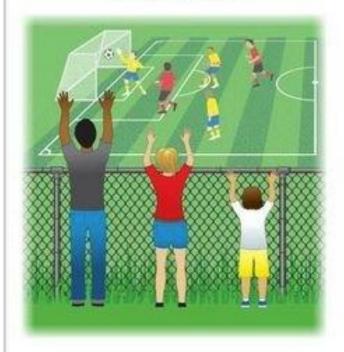
The assumption is that everyone benefits from the same supports. This is equal treatment.

Equity



Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

Justice



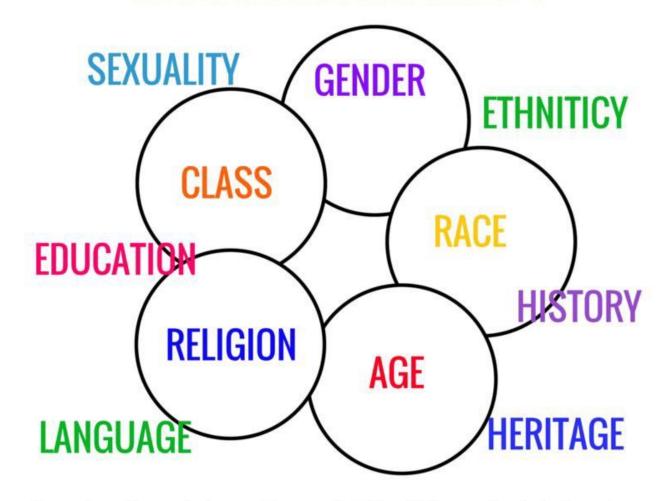
All 3 can see the game
without supports or
accommodations because
the cause(s) of the
inequity was addressed.
The systemic barrier has
been removed.







INTERSECTIONALITY



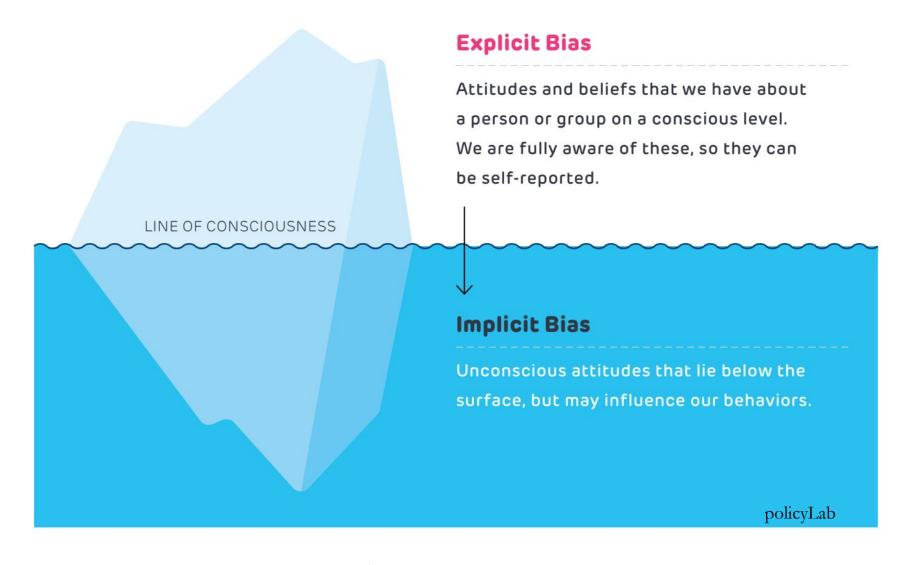
"overlapping or intersecting social identities and related systems of oppression, domination, or discrimination."

- Intersectionality coined by Kimberlé Crenshaw 30 years ago
- Describes how race, class, gender, and other individual characteristics "intersect" with one another and overlap.





Implicit and Explicit Bias



Test your implicit bias with "Project Implicit"





Microaggressions

Small differences in treatment can pile up, resulting in large disparities (Valian, 1998)

"Those who differ from the norm encounter a cycle of cumulative disadvantage, while those who fit the norm experience a cycle of advantage." (Turner, 2002, pp. 76-77)

MICROAGGRESSION:

A TERM USED FOR BRIEF AND COMMONPLACE DAILY VERBAL, BEHAVIOURAL, OR ENVIRONMENTAL INDIGNITIES, WHETHER INTENTIONAL OR UNINTENTIONAL, THAT COMMUNICATE HOSTILE, DEROGATORY, OR NEGATIVE PREJUDICIAL SLIGHTS AND INSULTS TOWARD ANY GROUP, PARTICULARLY CULTURALLY MARGINALIZED GROUPS.





What is harassment?

- Behavior which has the effect of humiliating, intimidating, or coercing someone through personal attack.
- Behavior that can cause the recipient to be embarrassed, uncomfortable, and cause distress.
- Any behavior that is <u>unwelcome</u>, <u>unwanted</u>, <u>or</u> <u>unsolicited</u> where the recipient regards it as offensive or undesirable. (When a person communicates that the behavior is unwelcome, it becomes illegal. Even if the conduct is not stated but implied, as long as it is unwelcome it is unlawful.)

















Institutional Discrimination is built into the foundation of science and society

- Colonialist and Euro-centric education
- Dominate gender and social norms
- . Unequal pay for equal work
- . Inadequate family leave policies
- . Inflexible work schedules
- . Workplace harassment
- . Culture of exclusion





of the STEM workforce are white men

only 1896 ar

of the STEM workforce are white women

49% of the STEM workforce are white men

only

of the STEM workforce are Black and Hispanic women

In the classroom, women of color have their authority and competency challenged and expertise discredited (Pittman, 2010)

Biases against people who identify as gay, bisexual, or transgender are particularly strong in STEM environments compared to other occupational fields (Cech and Pham, 2017).

<10% of geoscience PhDs go to recipients of color (AGI, 2016)</p>

Only 69 Black women and 20 Indigenous women have received PhD in the geosciences in 40 years (Bernard and Cooperdock, 2018)

Women (Holmes et al., 2015), people from sexual and gender minorities (Hughes, 2018), and Black and Hispanic people (Riegle-Crumb et al., 2019) all leave the field at higher rates than the average student or practitioner.







<u>www.menti.com</u> 53 81 55 3

Describe the stereotypical geoscientist.





Stereotypical Geoscientist



Representation Matters!

www.menti.com 53 81 55 3

Who do you see?







Representation Matters

- White
- Male
- Outdoorsy
- Fit
- Rock-hammer wielding
- Rock-holding
- Sexual orientation?
- Interests?
- Religion?





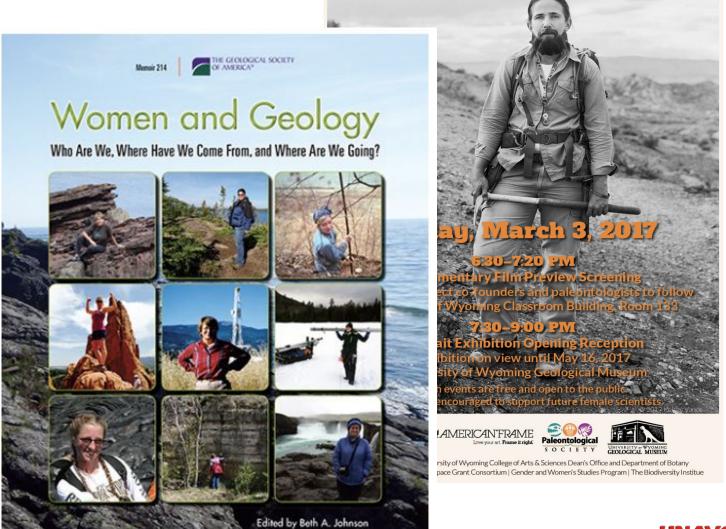






Efforts are being made!

Efforts within the geosciences to change perceptions



The Bearded Lady Project
Challenging the Face of Science

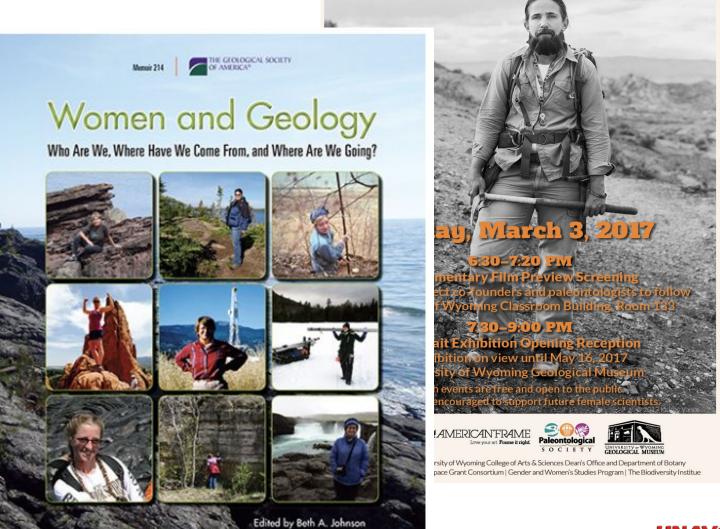




Efforts are being made!

Efforts within the geosciences to change perceptions

- White
- <u>Male</u>
- Outdoorsy
- Fit
- Rock-hammer wielding
- Rock-holding
- Sexual orientation?
- Interests?
- Religion?



The Bearded Lady Project
Challenging the Face of Science





Don't alter the mold; break it

- Need to think more about representation (and challenging assumptions) of all these factors:
 - Race and ethnicity
 - Gender identity
 - Style
 - Body type and physical ability
 - Tools
 - Field
 - Sexual orientation
 - Interests
 - Religion
 - Age



Dr. Danielle Twum

"Advertising also impact values. While it reflects society to a certain degree, it also has the effect of 'normalising' values or behaviours."

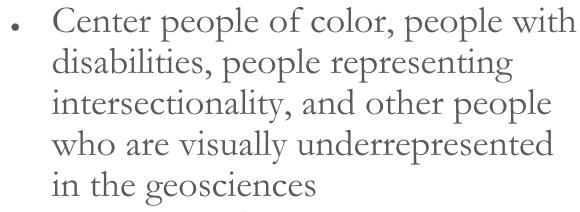
Jeremy Williams, "The Cultural Impact of Advertising"





We need to get specific and be intentional with the

imagery we choose



• Show these demographics in leadership roles









Help change geoscience culture by promoting an inclusive culture without assumptions of preferred behaviors or perspectives















Expand the view of what geoscience is by presenting all aspects of geoscience





Rocky Planet

« A Crater Lake and Pumice Raft in the Pacific right now

What Makes Earth So Unique? It's the Minerals »

Geology Isn't Rocks By Erik Klemetti | August 28, 2019 9:12 am















So, first off, I apologize for the clickbait headline, but don't worry, there actually is a payoff here. What I'm going to say is 100% true. Geology isn't just a pile of rocks, no matter what you might think. Sure, there are rocks involved ... but "geo" doesn't mean rocks. It means Earth, so when we talk about geology, we're talking about the our planet — and our planet is more than rocks.









Representation Checklist

- · Can we better represent a diversity of **geoscientists**?
- Can we better represent a diversity of **geoscience**, and ways to do it, that will appeal to an audience broad in interests, abilities, and skillsets?
- · Are we representing **people of color** and other minoritized peoples in positions of **leadership**, as opposed to only as

receivers of information and resources?



ta Black In The Ivory Retweeted



Accessibility and Inclusion







Word Choices

You We

He/She They

manned, man-made crewed / staffed, human-made

disabled person, handicapped person with a disability

people of color be specific

black, African American Black

Latino/Latina Latinx





Self-Awareness

Speak with humility

Speak with pride!

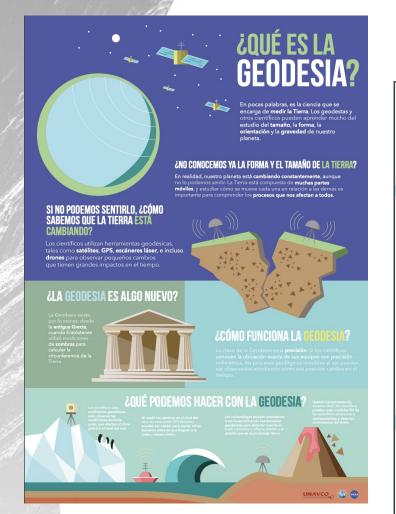
Recognize our biases to counter them

Explore a concept before negating it





Language









لازلزلا عقد))ى تم ((نعلا فسلا بجدنكلو ،لازلزلا عقو ولا اذام لاؤسلا سيلف النزلاز عوقول تضرعم قطانم عف شيعة تنك اذا

Animation

Novice Multilingual

EARTHQUAKE! Steps to take when it strikes—CHINESE (地震发生时)



如果你生活在地震多发地区,就不是一个"如果"问题了,而是 地震何时会发生。

这些是地震发生时保护自己的最好方法。

Animation Novice Multilingual

EARTHQUAKE! Steps to take when it strikes —RUSSIAN (Когда начнется землетрясение,)



Основной вопрос жизни в сейсмоопасном регионе не в том, СЛУЧИТСЯ ЛИ землетрясение, а КОГДА оно случится.

Novice Multilingual



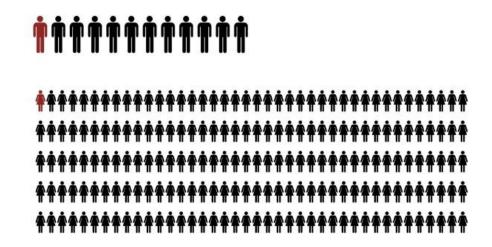


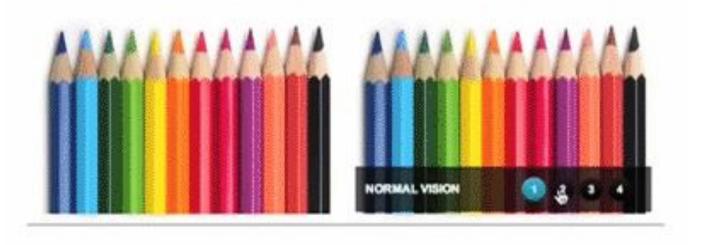


Visuals

- · Color schemes for vision-impared
 - 300 million people worldwide are colorblind (http://www.colourblindawareness.org/)
 - · Use an online or in-program/app tool for colorblindness
- · Use alt text for images

Color bilindness prevalence





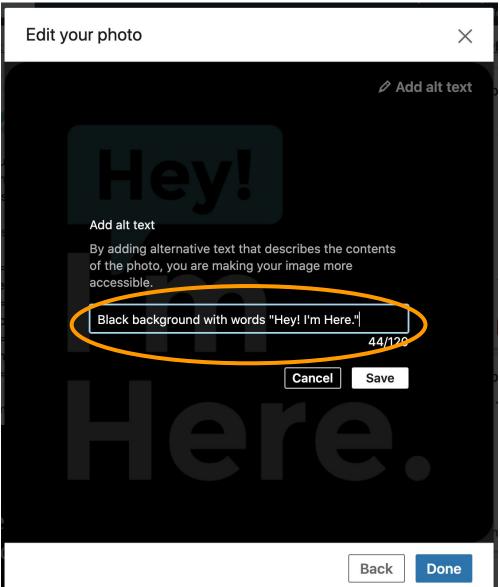


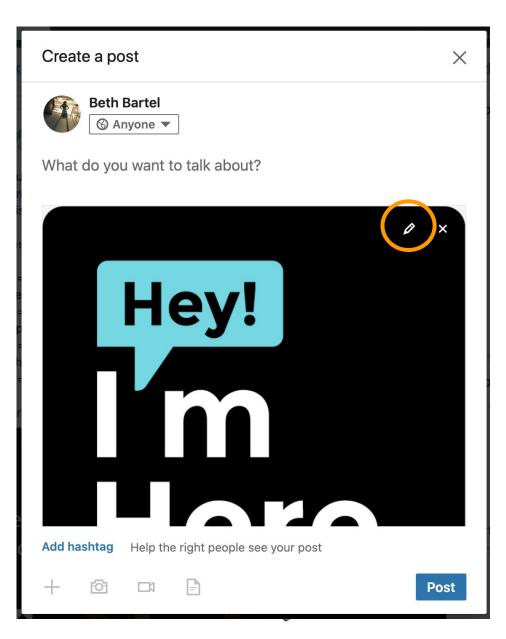


Alt Text: LinkedIn



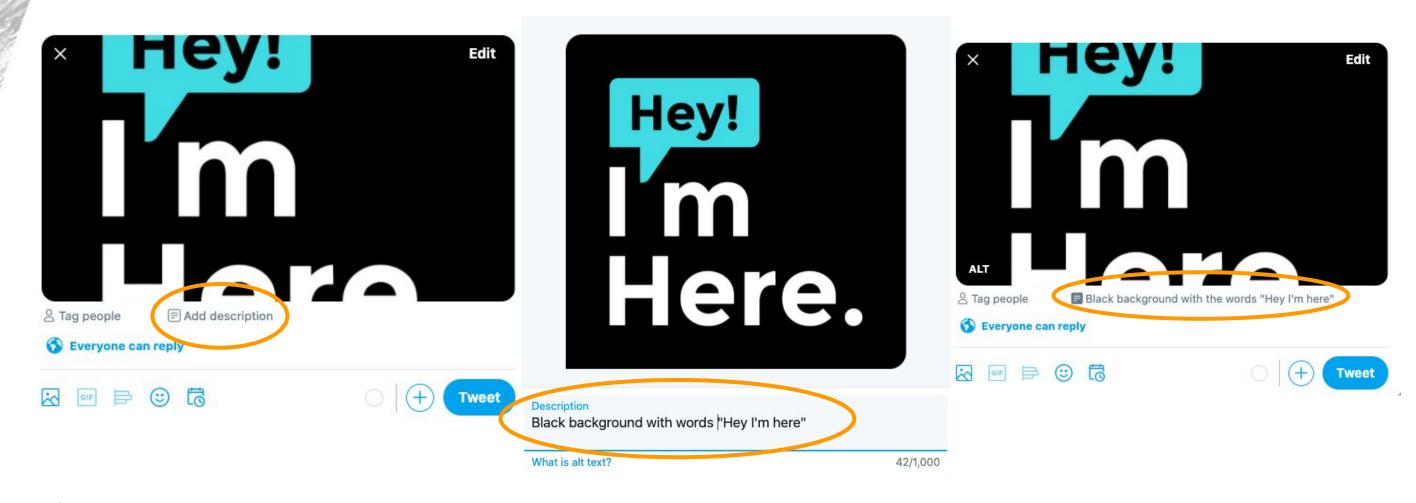






Alt Text: Twitter









Audio

- · Provide closed captioning
- · Provide a sign language interpreter
- Use a mic







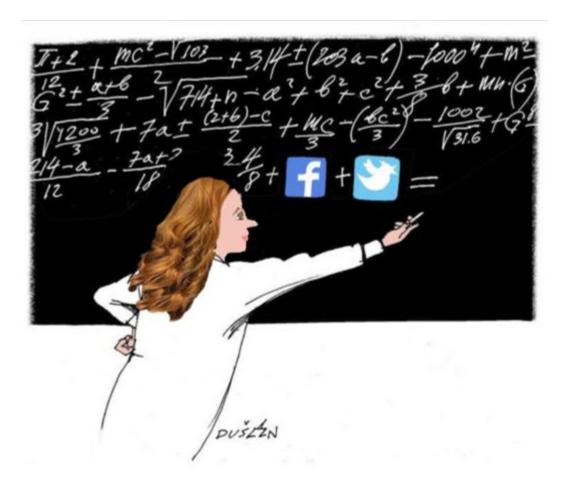
Accessibility Checklist

- Is the language sufficiently simple to be understood by target audience(s)? Address or eliminate jargon.
- Are we using references that are cultural, making assumptions that everyone will understand them?
- Can it be translated?
- Are there closed captions and/or a sign language interpreter?
- Do we use alt text?
- Does it pass a color blindness test?
- Is linked text descriptive, as opposed to using the word "here"?
- Is there a mic?
- Can we make the text/font larger?





Social Media







Perception of science

Science is a process, not a set of facts.

- Ideas
- Challenges
- Observations
- Discoveries
- Null Results



"My concern is that we just keep making this up as we go along...the govt needs to get a grip on our scientists...how can the science change from one day to the next?"

Huw Merriman, senior backbench Conservative MP, who opposes masks in schools #R4Today



Face masks U-turn for England's secondary schools

Pupils must wear masks in corridors in local lockdown areas after the government reversed its guidance.

By bbc.co.uk





Representation of scientists

- Diversity not all older white men in lab coats
- Visibility
 - #blackandSTEM, #vanguardandSTEM, #GirlsWhoCode #disabledandSTEM #LatinandSTEM #BiandSci #scimom
 - @500QueerScientists, @500womensci, @Also_AScientist, @IfThenSheCan, @ESWN, @blackandSTEM, @geolatinas, @SACNAS
 - #StillAScientist, #ThisIsWhatAScientistLooksLike, #DayofScience, #BlackInGeoscience













A visibility campaign for the LGBTQ+ STEM community — aka a powerful scientific progress. Find many of our contributors at bit.ly/2JxNumM

© Everywhere & 500queerscientists.com III Joined March 2018

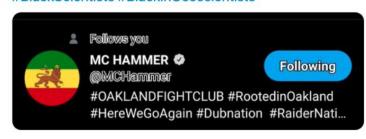
Followed by Jae, Diverse Geologists, and 48 others you follow

Yay! @MCHammer liked this tweet \P \P and now

following @BlkinGeoscience for #BlackinGeoscienceweek.

@MCHammer is the #NewFaceofScicomm.

#BlackScientists #BlackinGeoscientists



















Cultivate communities of support

- Provide connection, community, mentoring, sponsorship and advocacy (Gerrero-Medina et al., 2013; Matthew, 2016; Tull et al., 2017)
- Low cost, low barrier engagement tool (Montgomery, 2018)
- Increase structural **diversity** and **representation** (Hurtado et al., 1998), promote and bring awareness to **intersectionality** (Montgomery, 2018), reduce feelings of **isolation** for minority scientists (Simard, 2009), promote an increased **sense of belonging** and cultural wealth (Tull et al., 2017)

"[People are] using digital spaces to intentionally cultivate communities to support the success of individuals underrepresented in particular spaces and in the academy as a whole."—Montgomery, 2018





Krystal Vasquez @caffeinatedkrys · Apr 17 Happy #BilnSci day! I'm a bisexual atmospheric chemist!

Fun fact: I had no idea I was bi until 2 yrs ago! All I knew was gay & straight. I wasn't gay so obv I must be straight, right?

This is why representation matters.





Latinas in Earth and Planetary Sciences @Ge... · Sep 9 There are no limits for @GeoLatinas. Meeting with Ambassadors, Leaders and Directors located in 5 different countries: Argentina, Australia, Mexico, Norway & the United States. Wherever you are, we can and will get there. We are here to stay and to conquer #StrongerTogether



Taking Action







Educate Yourself

- Educate yourself before speaking
- · The less intersectionality we have, the more education we may need

nores the reality of discrimination and alienation ex

best and brightest can fail to be recognized and admi-

Research and academic instit

scholarly academies, and scientific pub-lications in the Western world all show

a paucity of Black scientists in leader

ship positions, on editorial boards, and as authors. And although the Western

scientific establishment has severa

ecognition systems for meritoriou

scientific discoveries, rarely are Black

scientists represented among the

rican scientists have told me that their

esearch was credited to their superior

their involvement. Sadly, Black scien

changes and health crises can cause some Black scien

Racism in science has a long history throughout the tion, recognition, funding, and promotion. The scientifi

the station. For equality in the global scientific enter

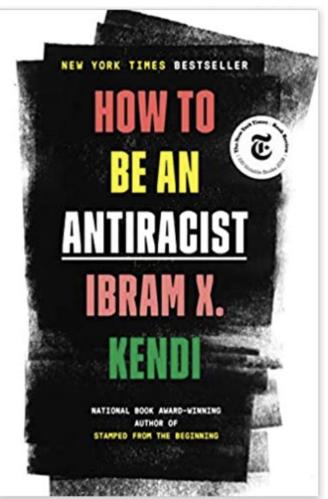
environment must be created in which not only Black

scientists but all scientists can thrive—one that value

in these Western nations.

tiete who do not assimilate or conform

perienced by Black scientists. These realities includ-





EDITORIAL **Black scientists matter** the United States, the Black Lives Matter pro-tests around the world, and racial inequali-ties everywhere that have been exposed by know what racism is and that they can better explain ne coronavirus disease 2019 (COVID-19) panto Black scientists the experiences that those Black nerability and mortality in African-American, ture, and reimagine its beliefs and behaviors. It's imortant to recognize that beneath overt racism are abtle forms of structural and institutionalized racism that have existed for a very long time, unabated, influential career networks. Consequently, even the tions-throughout the Western world Now, societies are being provoked to ponder fundamental questions about racism. What about the scientific world? Do Black scientists matter? My perspective is based on my experiences as a Black and African scientis have felt like n South Africa, the United Kingdom and the United States, as well as in aliens of the African nations through the African AIDS Vaccine Program. I've had the opportunity to interact with a range of Black African colleagues, from young African scientists to African scientific leaders in their fields or in heir institutions. We often discussed as well as work environments in the Western world bean or Latin American identity altogether in exchange where Black scientists (African or otherwise) are not well-represented or valued—where Black scientists have felt like aliens of the scientific enterprise. entific enterprise is in denial about its inherent racism. Black scientists encounter discrimination when The overwhelming message from their experiences is that the culture of academic science where Black entrenched racism of various forms and subtleties. or example, although science is supposed to be obterprise refuse to believe and acknowledge the racism

and alienation that is articulated by Black scientists regarding their work and career. I have experienced,

and have heard of, some white scientific leaders who

#BlackInTheIvory

TIME TO

LISTEN!



elle lett, No-MD, No-PhD (they/them) @madblgscientist · Aug 25 #Blackinthelvory is having a candidacy exam in two days and carefully avoiding looking up any details about the Jacob Blake story because you can't afford to be derailed. No idea what happened, but can piece together enough to know that it is not the time for me to read further











Angeline Dukes @FutureDrDukes · Aug 24 Why was all of this necessary?? For WHAT?

Black people can't just peacefully exist in academic spaces 7 yet another terrible instance of being #BlackInThelvory



Danielle Fuentes Morgan @mos daf · Aug 22

Santa Clara University security just harassed me and my brother and forced me (a faculty member) to show my campus ID to prove I live in the house WHERE I OPENED THE DOOR. A thread. (1/n)

Show this thread

Start a Movement, Join a Movement, Amplify a Movement, Fund a Movement

#blackandSTEM, @blackandSTEM #vanguardandSTEM, #GirlsWhoCode #disabledandSTEM #LatinandSTFM #BiandSci #scimom **#LGBTSTEMday** #ThisIsWhatAScientistLooksLike @500QueerScientists @500womensci @Also AScientist @IfThenSheCan @ESWN @geolatinas **@SACNAS** @GeoSpaceLatinx @PridePolar

Before

#BlackinEngineering #BlackInNeuro #BlackInNature #BlackBirdersWeek #BlackInGeoScience. @BlkinGeoscience #BlackInGeoscienceWeek #BiGweek #BlackGeoscientist #BlackInChemistry @BlackInNeuro @BlkLivesMatter #BlackInThelvory #ShutDownSTEM #ShutDownAcademia **#Strike4BlackLives #SayHerName**

#BlackLivesMatter



#StillAScientist

#DayofScience



Start a Movement, Join a Movement, Amplify a Movement, Fund a Movement

#blackandSTEM, @blackandSTEM #vanguardandSTEM,

#GirlsWhoCode

Sometimes centering certain voices means not adding our own.

Listen to the people who are leading - if they ask allies to take a step back, do it.

@geolatinas

@SACNAS

@GeoSpaceLatinx

@PridePolar

#StillAScientist #DayofScience After

#ShutDownSTEM
#ShutDownAcademia
#Strike4BlackLives
#SayHerName
#BlackLivesMatter





Start a Movement, Join a Movement, Amplify a Movement

#blackandSTEM, @blackandSTEM #vanguardandSTEM,

#GirlsWhaCade

Sometimes centering certain voices means nown.

Listen to the people who are leading - if they take a step back, do it.

@geolatinas

@SACNAS

@GeoSpaceLatinx

@PridePolar

#StillAScientist

#DayofScience







#BlackLivesMatter

Call out Injustices as You See Them

We can all share the burden of this work. Be ready to step in thoughtfully.







Make a Statement

Authentic

Thoughtful

Direct

Aware

Specific and actionable









The Paleontological Society Statement on Anti-Racism

JUNE 1, 2020 BY TARA LEPORE

The Paleontological Society affirms that Black lives matter. Anti-Black violence—including the murders of George Floyd and Breonna Taylor at the hands of police, the murder of Ahmaud Arbery at the hands of white supremacist vigilantes, and the racialized threats made against Christian Cooper—must end. The Society stands in support of its Black members and calls all its members to action.

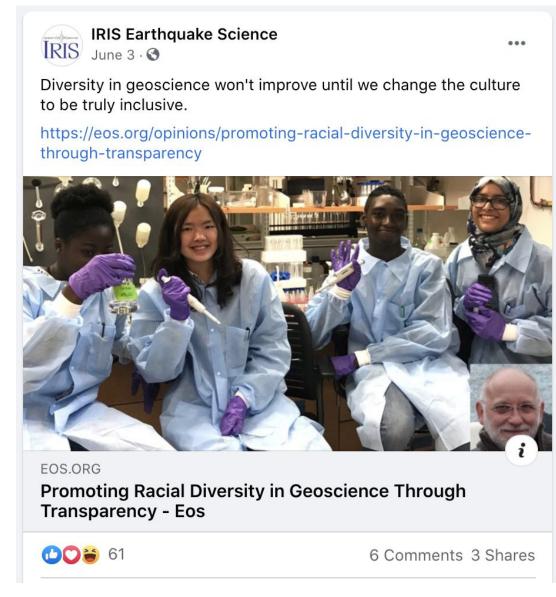
The United States was built on a foundation of white supremacy, and systemic racism and oppression continue to be expressed in many ways that negatively impact the lives of people of color. Unpunished police brutality of Black bodies and the disparagement of ensuing protests are manifestations of white supremacist culture in the United States.

No field of science is neutral or "colorblind". The sciences, including paleontology, have participated in the discrimination, oppression, and erasure of people of color throughout

If You Can't Make a Statement,

Make a Statement

- Post articles, statistics and information on social media to advocate and educate
- Center BIPOC scientists in your work or feeds
- Think of places where you have relative power and push for inclusion, equity and justice
 - · Classrooms, boardrooms, chatrooms









Teach the History

- Colonial history of geoscience
- · Inequities in harm caused by environmental damage
- · AND the work of minoritized scientists in addressing it



GreenMatters



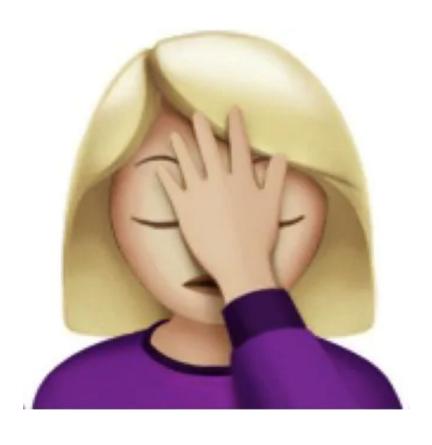




Own up to Mistakes

We WILL make mistakes.

If you make a mistake, own up to it. We can't hold institutions accountable if we don't hold ourselves accountable. Acknowledge harm, apologize, and do the research yourself, without asking someone else to do the work for you.









Not the solution - but part of it

Every time we communicate about science, we have the opportunity to challenge pre-existing beliefs and work towards greater equity and justice in science and society.









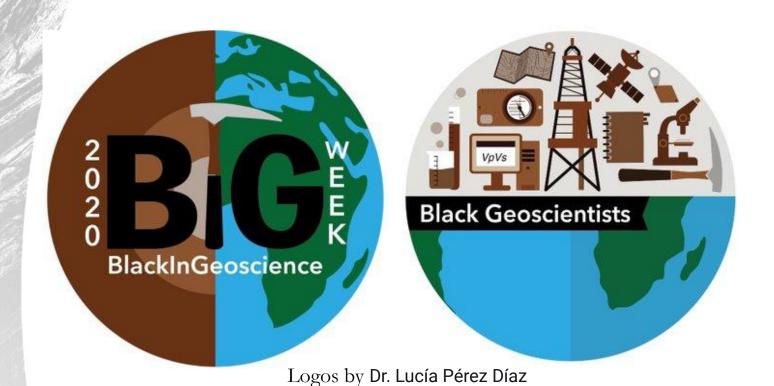






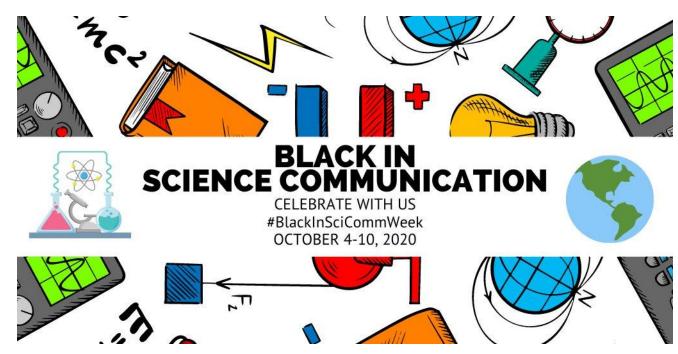
Black in Geoscience Week

Sept 6-12 | @BlkinGeoscience | #BlackInGeoscience



Black in SciComm Week

Oct 4-10 | #BlackInSciCommWeek









@Reclaiming_STEM

Diverse & inclusive #SciComm workshop on both coasts created by @wardofplants &

@Microbe_Meows to empower scientists to use STEM for social justice







Improving Earth education one hour at a time

Upcoming webinar:

NGSS-ESS Mini-series: Remote Teaching & Learning Resources, part 1

Thursday, September 10, 2020

1:00 pm PT | 2:00 pm MT | 3:00 pm CT | 4:00 pm ET

Webinar Page - http://nagt.org/238695

Please take a moment to fill out our webinar survey

http://nagt.org/238968

Resources:

Consider your department, program, or course for NAGT's Traveling Workshops Program

Join or Renew http://nagt.org/37340 See the full schedule and archives at the NAGT Webinar Series Homepage

http://nagt.org/190616

Get Involved in NAGT http://nagt.org/95944