

# How to make paleo research more accessible for disabled scientists, now and in the future

Gabriela Serrato Marks<sup>1</sup>

<sup>1</sup>Massachusetts Institute of Technology

November 22, 2022

## Abstract

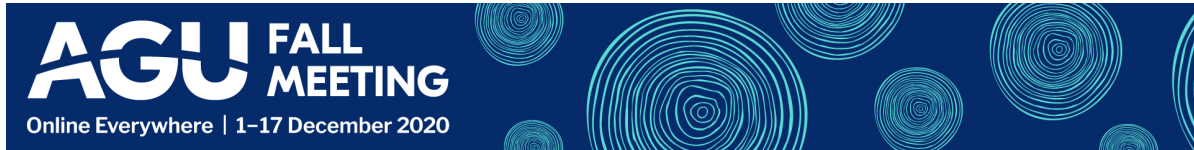
Disabled scientists are severely underrepresented in geosciences, including paleo-related fields. In this presentation, I will explain how potential benefits from remote work can help improve access for disabled scientists (broadly defined). Some improvements include fewer barriers due to commuting to work (which contributes to fatigue) or physical access to buildings and labs, reduced stimuli (potentially helpful for learning disabilities and migraines), and more flexible working hours (helpful for a range of disabilities). Although restricted access to labs may change research directions, it's possible for some computational research to continue. However, there are also new challenges arising from remote work, from social isolation to non-ideal work environments, that may have a disproportionate impact on disabled researchers. The pandemic has also forced some researchers to disclose their health conditions to explain that they are at a high risk for severe illness from COVID-19. I suggest that, even after COVID-19 is resolved, the paleo communities continue to support flexible work options, which could improve the representation of disabled scientists. Furthermore, we can use this period of reduced fieldwork and remote teaching to consider how to improve access for all scientists at field sites, in classrooms, and in labs.

# How to make paleo research more accessible for disabled scientists, now and in the future

Gabriela Serrato Marks

Massachusetts Institute of Technology

PRESENTED AT:



# ACCESSIBILITY AND DISABILITY 101

## Two common ways to understand disability:

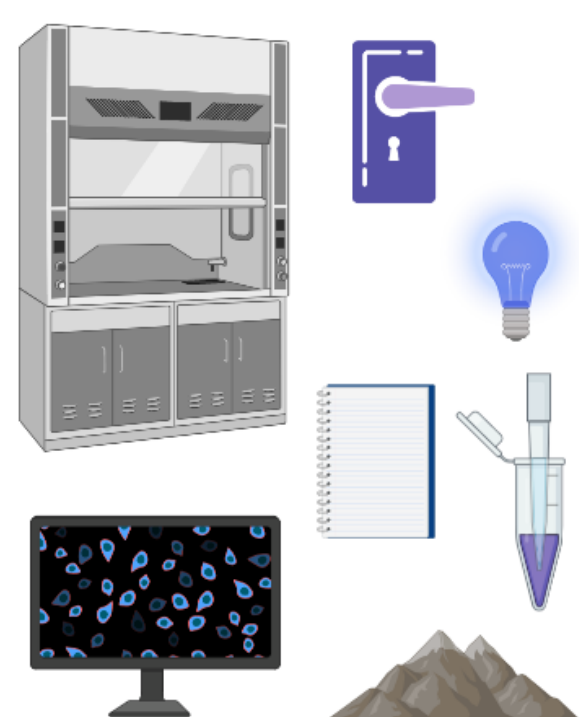
### Deficit model:

The person is "impaired"



### Social model:

The environment is inaccessible



Our differences (physical, mental, medical, etc.) are not something for paleo scientists to correct or fix. Instead, we all need to fix the school/work environment to make it more accessible.

When designing for accessibility, get rid of the deficit model.

### Vocabulary:

| Avoid                    | Use Instead     |
|--------------------------|-----------------|
| differently-abled        | disabled        |
| handicap accessible      | accessible      |
| special accommodations   | accommodations  |
| hearing impaired         | hard-of-hearing |
| disability as a metaphor | anything else   |
| suffers from [condition] | has [condition] |
| wheelchair-bound         | wheelchair user |

# COMMON BARRIERS FOR DISABLED SCIENTISTS

## Physical spaces

Despite laws mandating access (e.g. the ADA in the US), many labs are not accessible for people with physical or mobility disabilities. That's not because it's impossible - see below for a wheelchair accessible chemistry lab.



(<https://www.sciencemag.org/collections/college-careers>)

*AAAS, 2014*

It's just not prioritized.

Think about your lab or workspace - how would someone use it with crutches? Is standing the only option?

## "It's impossible to make this trip accessible, so you can skip it."

For fieldwork, a common "accommodation" is to make the trip optional, rather than changing the work plan to make it more accessible.

However, by skipping the field trip, people with disabilities...

- are excluded from social interaction and bonding, which is a key part of developing a sense of belonging in geoscience
- do not get to access the field experience and/or learning objectives, which may have consequences later in their career
- are at a disadvantage during follow-up activities, such as data analysis during the next class period
- might be "outed" if they have a non-apparent disability, especially if they are the only one who misses the trip

## Measures of merit and success

In STEM, productivity and "intelligence" are the most valuable currency. But ableism can come into play when measuring those metrics.

For example, some recommendation forms ask about the "intellectual ability" and "emotional maturity" of prospective students.

Some faculty may unfairly underestimate these characteristics for trainees with learning disabilities or mental health issues.

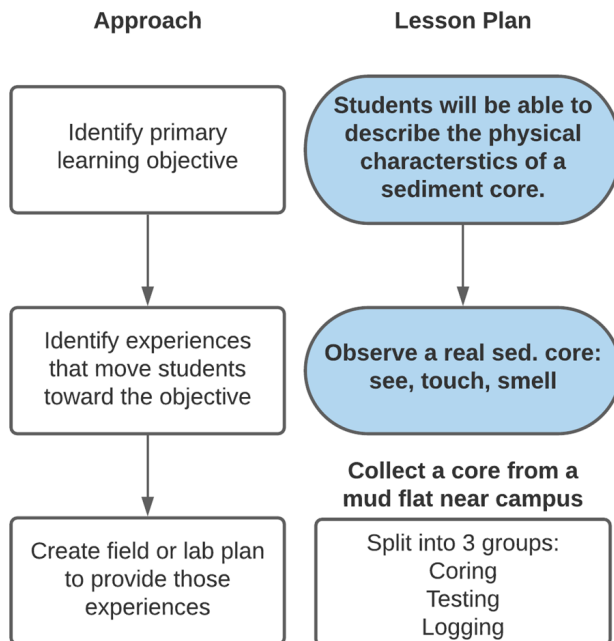
# ACTION ITEMS

## Class field trips:

**Goals: Instructors can teach effectively. Students can effectively achieve the learning objective(s) and fully participate in active learning.**

Though most courses are not happening in person right now, this is a great time to revamp future field trips.

Instead of planning based on specific field activities, or even a physically challenging experience, center planning on the learning objectives.



- In this example, only the **Coring** team needs to put on waders and extract a core. The testing and logging teams can stay in the van or on a paved location.
- **Logging** doesn't have to mean writing by hand in a Write in the Rain notebook. Students can take audio notes, take photos or videos, use a phone or tablet to take text notes.
- **Testing** might require some manual dexterity, but tasks can be split up among team members based on interest.
- Students can have the option to switch groups halfway through the period.
- All students can fully participate, even if their actions were not identical.

## Physical space:

**Goals: Anyone who wants to work or learn in the space can safely access all necessary equipment.**

- Prioritize accessibility when designing new labs or classrooms, even if you don't think anyone in the group "needs" it
- Determine who pays for changes to physical space to accommodate disabilities - department, PI, disability office?
- For some people, in-person learning and working is never the most effective approach. Keep remote work options available after COVID-19

## Meetings:

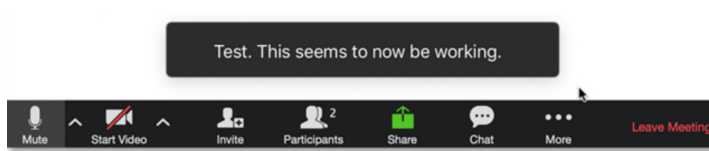
**Goals: Attendees are able to participate in the discussion, take in information, and leave with the same take-home messages.**

- Speak one at a time.
- Make the agenda/minutes document available to all.
- If you know that someone with a disability is attending, ask if they have a preferred meeting location (in person) or platform (virtual).

## **Panels and Presentations:**

**Goals: Presenters can understand each other and the attendees and can share their message clearly. Attendees can ask questions and fully understand the presentation.**

- Share accessibility info in advertising materials - just like the time and date.
- Record the session and make the recording available afterward.
- Provide live captions, ideally human-generated.



*This is what captions can look like on Zoom.*

- Allow for multiple participation methods, e.g. take questions via both chat and voice.

# REMOTE WORK AND COVID-19

## Key ideas:

- Everyone's COVID risk tolerance is different. People with compromised immune systems or other underlying conditions may be more hesitant to return to work
- Allowing remote work might make the school/work environment more accessible for some people, but...
- Remote work does not remove *all* barriers to participation. Therefore, some people will still need to miss class or work due to their disability
- Masks create a significant communication barrier

*"While folks rightfully complain about Zoom fatigue, the weariness that accumulates with hours of Zoom meetings, I prefer Zoom fatigue than fatigue that comes from conversing in masks." - Dr. Michele Cooke*

## OTHER RESOURCES

Social Media:

#DisabledInSTEM (<https://twitter.com/hashtag/DisabledInSTEM>), #AcademicAbleism (<https://twitter.com/hashtag/AcademicAbleism>)

Report: AAAS Report on Fostering Inclusion of Persons with Disabilities in STEM ([http://www.sciencemag.org/site/products/collectionbooks/CtC\\_full.pdf](http://www.sciencemag.org/site/products/collectionbooks/CtC_full.pdf))

Organization: The International Association for Geoscience Diversity (<https://theiagd.org/>)(IAGD)

[VIDEO] <https://www.youtube.com/embed/KBDgVma3o0U?rel=0&fs=1&modestbranding=1&rel=0&showinfo=0>

Resource: Signing Earth Science Dictionary (<https://signsci.terc.edu/video/SESD.htm>)



# ABSTRACT

Disabled scientists are severely underrepresented in geosciences, including paleo-related fields. In this presentation, I will explain how potential benefits from remote work can help improve access for disabled scientists (broadly defined). Some improvements include fewer barriers due to commuting to work (which contributes to fatigue) or physical access to buildings and labs, reduced stimuli (potentially helpful for learning disabilities and migraines), and more flexible working hours (helpful for a range of disabilities). Although restricted access to labs may change research directions, it's possible for some computational research to continue. However, there are also new challenges arising from remote work, from social isolation to non-ideal work environments, that may have a disproportionate impact on disabled researchers. The pandemic has also forced some researchers to disclose their health conditions to explain that they are at a high risk for severe illness from COVID-19. I suggest that, even after COVID-19 is resolved, the paleo communities continue to support flexible work options, which could improve the representation of disabled scientists. Furthermore, we can use this period of reduced fieldwork and remote teaching to consider how to improve access for all scientists at field sites, in classrooms, and in labs.

# REFERENCES

American Association for the Advancement of Science AAAS. (2014). From college to careers: Fostering inclusions of persons with disabilities. *Science*, 344(6185), 765–765. <https://www.sciencemag.org/collections/college-careers> (<https://www.sciencemag.org/collections/college-careers>)

Christopher L. Atchison, Anita M. Marshall & Trevor D. Collins (2019) A multiple case study of inclusive learning communities enabling active participation in geoscience field courses for students with physical disabilities, *Journal of Geoscience Education*, 67:4, 472-486, DOI: 10.1080/10899995.2019.1600962

Ivan G. Carabajal, Anita M. Marshall & Christopher L. Atchison (2017) A Synthesis of Instructional Strategies in Geoscience Education Literature That Address Barriers to Inclusion for Students With Disabilities, *Journal of Geoscience Education*, 65:4, 531-541, DOI: 10.5408/16-211.1

Chronically Invisible. @ChronInvisSTEM. <https://twitter.com/ChronInvisSTEM> (<https://twitter.com/ChronInvisSTEM>)

Cooke, Michele. Accommodating a pandemic. *The Mind Hears*. <https://themindhears.org/2020/10/09/accommodating-a-pandemic/> (<https://themindhears.org/2020/10/09/accommodating-a-pandemic/>)

EarthLabs for Educators. Lab 6: Analyzing Sediment Cores. TERC. <https://serc.carleton.edu/earthlabs/climatedetectives/lab6.html> (<https://serc.carleton.edu/earthlabs/climatedetectives/lab6.html>)

Locke, S. (2005) The Status of Persons with Disabilities in the Geosciences White Paper, RASEM2 Symposium. [https://www.researchgate.net/publication/333670646\\_The\\_Status\\_of\\_Persons\\_with\\_Disabilities\\_in\\_the\\_Geosciences](https://www.researchgate.net/publication/333670646_The_Status_of_Persons_with_Disabilities_in_the_Geosciences) ([https://www.researchgate.net/publication/333670646\\_The\\_Status\\_of\\_Persons\\_with\\_Disabilities\\_in\\_the\\_Geosciences](https://www.researchgate.net/publication/333670646_The_Status_of_Persons_with_Disabilities_in_the_Geosciences))

People With Disability Australia. Words To Describe People With Disability. <https://pwd.org.au/resources/disability-info/language-guide/words-to-describe-people-with-disability/> (<https://pwd.org.au/resources/disability-info/language-guide/words-to-describe-people-with-disability/>)