

The advantages of making science accessible



Erika Labbé Waghorn, AstroUDP



How it
Started

Diversity

Inclusive
Astronomy?

How to
start?

Who am I?

MSc. in Physics.
Learning how to communicate science
since 2006.
With a taste for new challenges.



Importance
of SciComm

Astronomy for
BVI people

Collaborations

SciComm for a better world

More information -> better choices

An outreach challenge!

2016:
Experience about star formation without images: Through an story and tactile models



1st inclusive experience at Bibliociegos, 2016.

We started to build something new!

Train astronomy students and educators on Inclusive Astronomy
Create an interdisciplinary group:
Astronomía Inclusiva




**ASTRONOMÍA
INCLUSIVA**



115 members from 24 institutions

What is Inclusive Astronomy?

A work in progress



Barriers

Levels

Barriers in science for people with disabilities

- Mainly visual representations.
- Lack of sign language signs for technical terms.
- Physical barriers to access labs and science buildings.
- High productivity standard.
- Prejudices.

Accessibility must be addressed at all levels

- Outreach
- Education
- Research

What does it means?

Fun!

Motivation

Collaborations

Reasonable
Accommodations

Change of
mentality

A lot of fun

- Learn about other ways of perceiving the world
- Creating new ways to communicate
- Observing people reactions to this new ways



Work on motivation

Tough audience?

Not really, only less easy than normal (in Chile)

- Visually impaired people: Less exposed to astronomical images
- Hearing impaired people: not used to have sign language interpretation on talks
- Just as curious as anyone.

Need to collaborate

- With communities of people with disabilities
- Schools: Teachers, disability experts, parents, etc.
- Artists, designers, other scientists, etc.



Santa Lucía School BVI students, teachers and scientists (Dedoscopio project and I) creating an online inclusive experience about celestial movements.

Reasonable Accommodations

"Necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms"

"Convention on the Rights of Persons with Disabilities". United Nations.
Retrieved 7 July 2021.

Some important mentality changes

A person with disability knows their own limits better than the rest

"Common sense" is not always enough.

A person with a disability does not seek pity, but equity

Even if our first reaction is exactly that one.

More adaptability, less perfectionism

Let's allow ourselves to fail.

Potential of diversity

Creativity

Diversity

Change
mentality

Make us to start from scratch

Inclusive experiences are generally not just adaptations, but redesigns.
An opportunity to be creative.



Using heat to explain light to a Hellen Keller School BVI Student.
Bibliociegos 2016

Diversity

People with different ways of facing challenges bring creativity and tools to achieve better solutions.



Sonification

Data sonification

"multimodal stimulus in synchrony with the sound helps space scientists identify events masked by noise in 2D data"

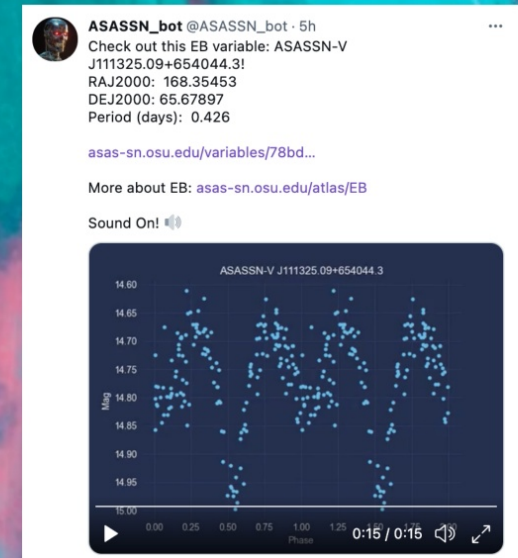
Diaz Merced, Wanda L. (2013) **Sound for the exploration of space physics data.** PhD thesis, University of Glasgow.



**Sonification
tools**

Some sonification tools

- xSonify (NASA Space Physics Data Facility (SPDF))
- Sonification Sandbox (Georgia Institute of Technology)
- Sonifyer (Berne University of the Arts (BUA))
- SoniPy (David Worrall)
- Astronify (HST)
- Afterglow Access (IDATA, High school level)



Sonification on
@ASASSN_bot in Twitter

Change of mentality

Through these inclusive astronomical experiences, the general public begins to change their expectations of people with disabilities, as do they.

Inclusive Solar Eclipse



Santa Lucía School BVI students hosting the UDP 2019 solar eclipse activities at Chile.

How to start to become inclusive?

Learn what it
is about

Start simple

Collaborate



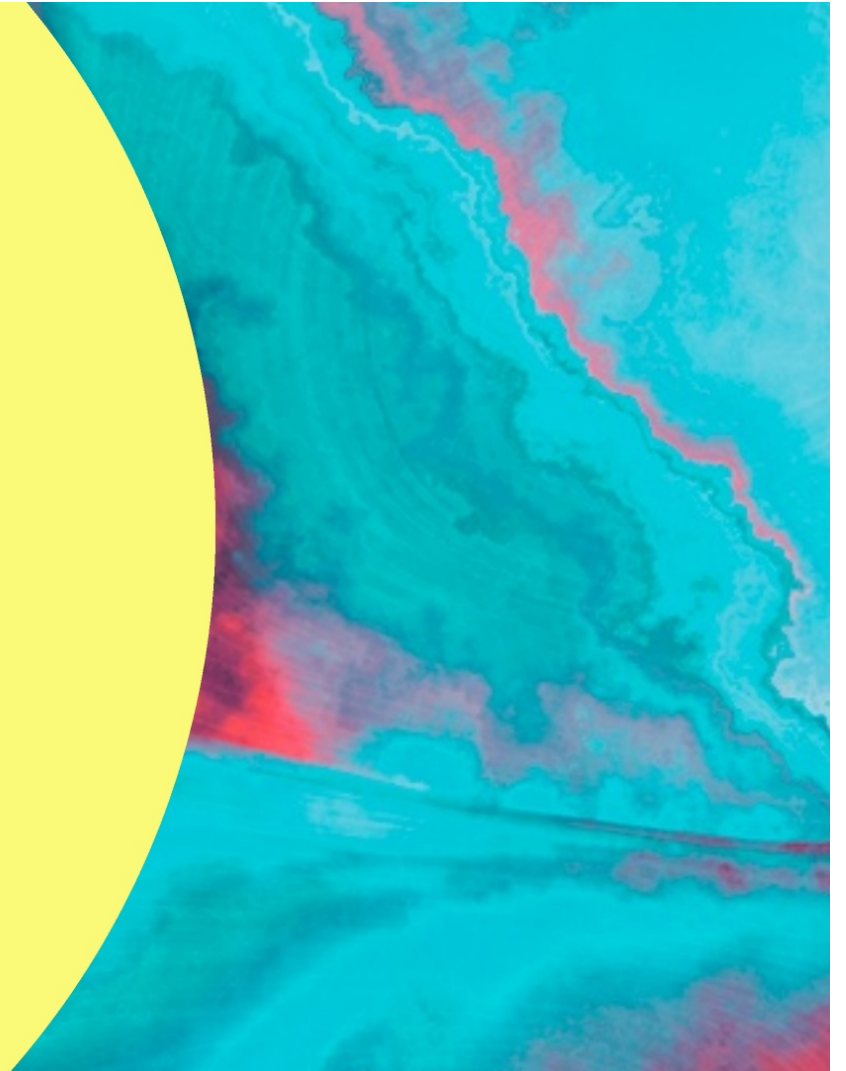
Choose a disability to start, and learn what is about.

Communities of people with disabilities are usually open to help others.

"Nothing about us without us"

Try something simple to start, and find the potential on it

For me: Images alone don't tell the whole picture.
This is an opportunity to rethink our way of telling it.



Go collaborate!

Forming interdisciplinary teams,
including people with disabilities.

- Astronomía Inclusiva group (Spanish)
- IAU WG on Astronomy for Equity and Inclusion
- Resources
- Publications
- Good practices

@AstroUDP

@AstroInclusiva

astrodifusion@mail.udp.cl

www.astronomia.udp.cl



Astronomía Inclusiva group meeting at
MIM museum. January 2020

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