

ONLINE ASTRONOMY FOR BVI PEOPLE

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ABSTRACT

The “Astronomía inclusiva” (inclusive astronomy) group is made up of 110 people from more than 20 scientific institutions and different areas of knowledge, with and without disabilities, who have been collaborating on different initiatives to make science more accessible. The pandemic presented us with the challenge of bringing astronomy directly to the homes of Blind and Visually Impaired (BVI) people, leaving out previously prepared tactile models. Invited by the Central Library for the Blind (Bibliociegos 2021) of Chile, we held an Inclusive Online Astronomy Workshop, using sounds, materials that people can find in their homes, and detailed descriptions of how to manipulate them. In 13 sessions held by 10 institutions and personal projects from Chile and Mexico, various topics were addressed, such as celestial movements, constellations, star and planet formation, observatories, asteroids and dinosaurs, among others. In this work we presented the main lessons learned from the experience, the reception of which by those attending the workshop was excellent, allowing us to strengthen ties with the community of BVI people, and motivating us to continue with a second season, which is currently in preparation.

RESUMEN

El grupo “Astronomía inclusiva” está formado por 110 personas de más de 20 instituciones científicas y diferentes áreas del conocimiento, con y sin discapacidad, que vienen colaborando en diferentes iniciativas para hacer la ciencia más accesible. La pandemia nos presentó el desafío de llevar la astronomía directamente a los hogares de las personas ciegas y con discapacidad visual (BVI), dejando de lado los modelos táctiles previamente preparados. Invitados por la Biblioteca Central para Ciegos (Bibliociegos 2021) de Chile, realizamos un Taller de Astronomía Inclusivo en Línea, utilizando sonidos, materiales que las personas pueden encontrar en sus hogares y descripciones detalladas de cómo manipularlos. En 13 sesiones realizadas por 10 instituciones y proyectos personales de Chile y México, se abordaron diversos temas como movimientos celestes, constelaciones, formación de estrellas y planetas, observatorios, asteroides y dinosaurios, entre otros. En este trabajo presentamos las principales lecciones aprendidas de la experiencia, cuya acogida por parte de los asistentes al taller fue excelente, permitiéndonos estrechar lazos con la comunidad de personas de BVI, y motivándonos a continuar con una segunda temporada, que actualmente se encuentra en preparación.

Key Words: inclusive astronomy — tactile models

1. INTRODUCTION

Astronomy without seeing? When we first faced this question, at the end of 2015, it was shocking to realize how reliant we were on images to learn, teach, and communicate astronomy to the public.

Soon enough, we also realized the potential of this idea: it pushes us to be creative, to collaborate with specialists from other disciplines, to learn from people with disabilities about other ways of perceiving the world and, finally, to communicate all these new ideas to all our audience: people with, and without, disabilities.

The tools we used to meet this challenge were tactile models (Fig. 1), good storytelling, and lots of one to one interaction with the audience.



Fig. 1. Solar System tactile model, being explored by a visually impaired student during the first inclusive astronomical experience we created, in 2016.

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What did we learn? Among many other things:

- co-create with your public, BVI people;
- from scratch: sometimes you have to create a completely different experience;
- collaborate with specialists from other areas: design, education, art, social sciences, computing sciences, etc.;
- choose inclusion: same experience for all.

Perhaps one of the most valuable lessons we learned was the fact that all inclusion efforts must be collaborative, never competitive. There is a strong sense of purpose behind the transformation process towards a more inclusive science, and competition would only damage it. In the same way, the need to co-create together with people with disabilities is evident, just as their motto says: “nothing about us without us”.

In order to build together the right way to make science accessible, in 2019 we founded the group “Astronomía Inclusiva” (Inclusive Astronomy), with about 30 science communicators, scientists, students and people with disabilities.

2. “ASTRONOMÍA INCLUSIVA” GROUP

After two years, the group is currently formed of 110 members:

- coming from different areas, such as science, education, art, design, communication, social sciences, tourism, etc., including people with visual and hearing disabilities;
- representing 25 scientific institutions and projects (Fig. 2): universities, observatories, museums, government institutions, inclusion and artistic projects;
- and from about 10 countries: Chile, Argentina, Mexico, Panama, Guatemala, Peru, Spain, Ecuador, Colombia, Italy.

As a group, we have organized meetings to discuss our ideas, specific topics, such as inclusion in social networks, to share information and learn from inclusion experts. We have also coordinated national events, such as the “Inclusive Solar Eclipses” in 2019 and 2020, two series of online events, and we keep in touch through a WhatsApp group.

3. A NEW CHALLENGE: ONLINE INCLUSIVE ASTRONOMY

Astronomy without seeing and online? Due to the pandemic, this was the only option from the beginning of 2020.

The tools we used to face this new challenge were sounds, storytelling, but mostly homemade tactile models: elements that students can find at home, such as fruits, plates, beans, etc., along with very good instructions to place and move these elements, and use them as tactile models. To achieve this, we had to work on image description techniques and our storytelling skills. One of the members of the “Inclusive Astronomy” group, Catalina Marzzano, an expert in Astro Tourism, gave all the workshop creators a storytelling lesson.

What did we learn?:

- How to improve the storytelling.
- Allow time for interaction with homemade models and answer questions on the go.
- Look for non-visual examples (e.g.: If an orange were the Earth, where would the equator be?: On the line where you would cut the orange in two to squeeze it).
- Test the experience with one or more BVI people.

4. BIBLIOCIEGOS INCLUSIVE ASTRONOMY WORKSHOP

We organized an Inclusive Astronomy Workshop in collaboration with the Central Library for the Blind, also known as Bibliociegos. From March to September, 2020, the workshop lasted for 13 sessions. It was organized by ten institutions, with 15 to 20 BVI participants in each session, from all over Chile (Fig. 3). All sessions were recorded and posted on the YouTube channel of the “Núcleo de Astronomía UDP” (see reference Bibliociegos Recordings 2021), and on the Facebook Fanpage of each organizing institution.

The topics covered were:

- Celestial movements (Erika Labbé - AstroUDP)
- Constellations (Pamela Paredes - Dedoscopio)
- Stellar diversity (Sergio Vásquez - Museo MIM)
- Star formation (Erika Labbé - AstroUDP)
- Stellar energy production (Anaely Pacheco)



Fig. 2. Logotypes of 25 scientific institutions and projects represented by members of the “Astronomía Inclusiva” group, under the group logotype: a hand drawn with fingers of different colors, symbolizing diversity, holding a small sphere between the index finger and the thumb, which symbolizes the stars, and the whole is surrounded by a ring that symbolizes the union. Below this illustration are the words “Inclusive Astronomy” in Spanish.

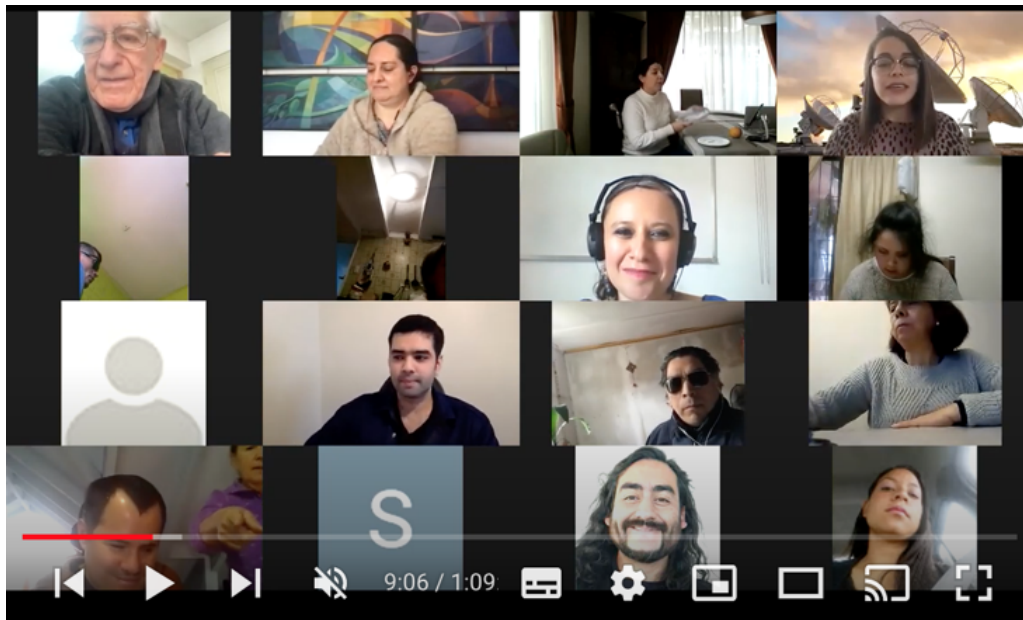


Fig. 3. Screenshot of the zoom meeting of one of the workshop sessions, on the ALMA Observatory, with 16 people connected.

- The inside of the Sun (Tracy Catalán, Makarena Estrella - Astrofísica MAS)
- Las Campanas Observatory (Carla Fuentes - LCO)
- Gravitational waves (Martha Saladino)
- Afterglow Access Sonification Software (Erika Labbé - AstroUDP)
- ALMA Observatory (Catherine Muñoz - ALMA)
- Music and astronomy (Amelia Bayo, Octavio Oyarzun - NPF)

- Meteorites (Sol Rios, Eduardo Lemus)
- Dinosaurs (Natalia Astudillo - SERNA-GEOMIN)

We had the opportunity to co-create some of the sessions working with blind people (Carlos Acevedo and Edwin Herмосilla) who tested and corrected the activities before running them.

As a result, we had a great response. Our students also became our friends as they appreciated our genuine interest in communicating the wonders of the Universe, and we have been keeping in touch through a WhatsApp group, sharing information and ideas. Some of their comments about the workshop:

“Thank you very much for the classes, I loved them” - Nicole Riquelme.

“Thank you for the inclusion, for that sensitivity of explaining how things are” - Flavio Pitriqueo.

“I think the work you do is spectacular. I do not know of other projects where disability is treated in this way” - Lorenzo Morales.

“Thank you for your professionalism, your dedication, and because you always keep us in mind (...) It is with you and all your management that I have

learned the most about the cosmos in my entire life. There are things that I may never fully understand, but it’s wonderful to know.” - Flora Magne.

So, what is next?: Workshop “Astronomía Inclusiva” part 2. We invite you all to be part of it, and to prepare a session. We can offer you help with the organization and testing. You just need:

- an astronomical topic to tell;
- a good imagination;
- a good story (in Spanish);
- and a Zoom connection.

Contact us at the email address: astrodifusion@mail.udp.cl, and find us on Instagram, Facebook and Twitter as @astroudp and @astro.inclusiva.

REFERENCES

Central Library for the Blind - Bibliociegos
List of Bibliociegos Inclusive Astronomy Workshop recordings