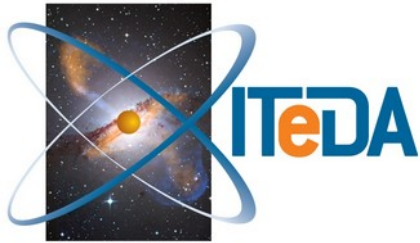




PIERRE
AUGER
OBSERVATORY



CONICET

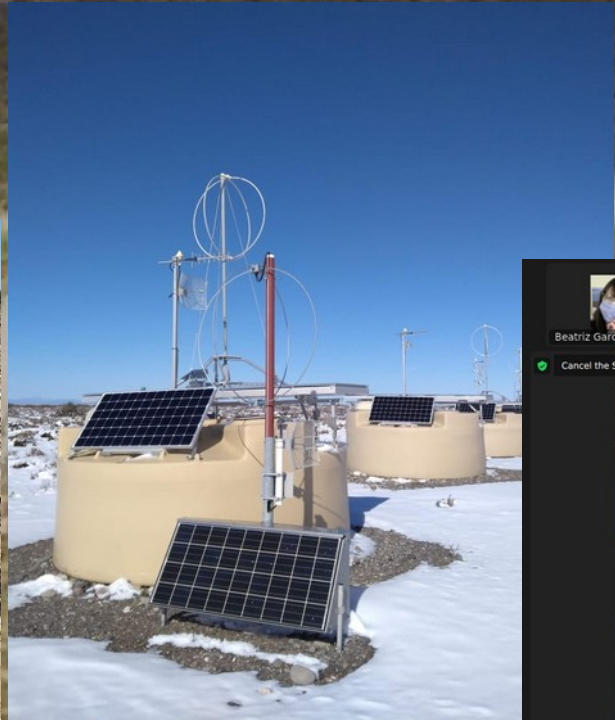


UNSAM
UNIVERSIDAD
NACIONAL DE
SAN MARTÍN

Social-Economic-Cultural Impact of the Pierre Auger Observatory

Conicet-CUIA Workshop 2022

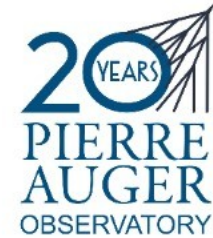
May 9th
2022



A screenshot of a Zoom meeting interface. The top bar shows the meeting title "Webinar is now streaming live on Facebook" and a "LIVE" indicator. The top right corner has icons for "Gallery View" and "Enter Full Screen". The main area shows a video feed of a worker in a white protective suit standing next to a large white cylindrical tank. The bottom bar shows the Zoom control panel with icons for "Start Video", "Security", "Participants" (22), "Polls", "Chat", "Share Screen", "Pause/Stop Recording", and "Leave".



Pierre Auger Observatory Malargüe Staff



43 permanent staff members

Management



Ingo Allekotte
(Project Manager)



Patrick Stassi
(PAO Deputy)



Gualberto Ávila
(Site Manager)

Ingo Allekotte (PM)
Gualberto Ávila (SM)

Surface Detectors



Ricardo Sato
(Science Operations Coordinator)



Fabián Gobbi
(SD Observer)



Miguel Salvadores



Oscar Sáez



Raúl Vidal



Pedro Barraza



Juan Pablo Góngora



Mauro Gajardo

SSD



Franco Yañi



Leonel Cortéz



Sergio Arenas



Lautaro Videla

Fuorescence Detectors



Mariano Del Rio
(Science Operations Coordinator)



Primo Gómez Vitale



Leandro Gómez

Secretary of Management



Rosa Pacheco

Computer Systems Admin.



Rubén Squartini

Outreach & Education



Analia Cáceres

Accountancy



Yamila Giménez

Health, Safety & Environment



José Escalona

Data Base - Systems



Jessica Velázquez

Atmospheric Monitoring



Jorge Rodríguez
(LIDAR-CLF-XLF)

Maintenance & General Services



Ricardo Pérez



Mario Rodríguez



Javier Salinas

Radio Detection



Marcos Cerda



José María Ferrada



Isabel Farías



Marta González

Cleaning Ladies



Alexis Rodríguez



Ivan Muñoz



Darío Villalobo

AMIGA



Nicolás Leal



Gustavo Ríos



Gabriel Morales



Agustín Morales

SDE Upgrade



Andrés Travaini



Gabriel Díaz



Martín Rojas

Pierre Auger impact - 2005



Status

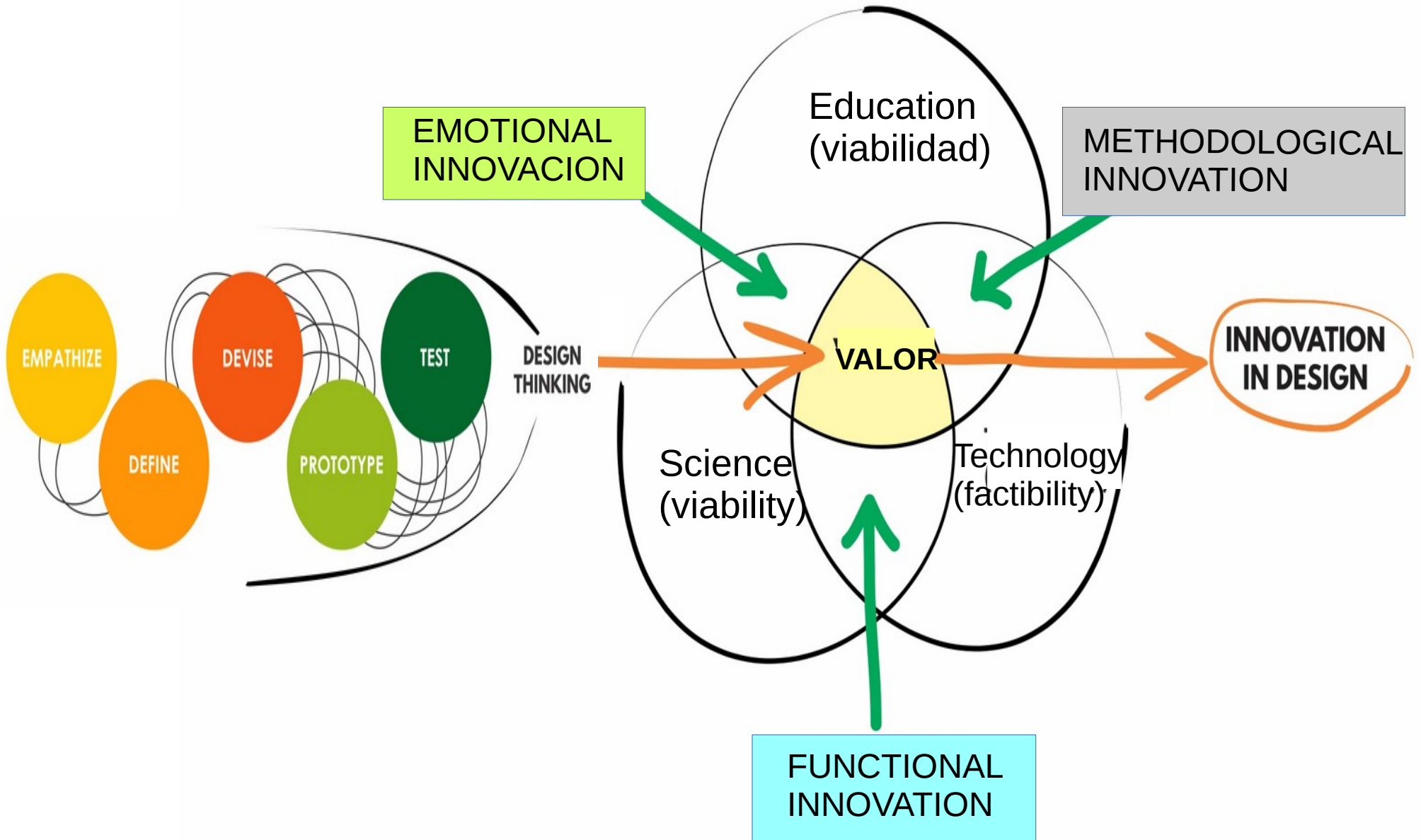
Local Community + General Public
Scientist in the Collaboration
Staff of the observatory



Study of Impact

Business Social Responsibility

DESIGN THINKING IMPACT



COMMUNICATION CHANNELS

www.auger.org (ENG)

The screenshot shows the English website at <https://auger.org/#>. The navigation menu includes Home, News, Observatory, Collaboration, Science, Outreach, and Internal. A main menu lists various categories: COSMIC RAYS, MALARGUE, PUBLIC DATA, EQUAL OPPORTUNITIES, and PHOTO & VIDEO. Under COSMIC RAYS, there are links for Cosmic Ray Mystery, Big Events, Detection, Shower Simulations, Timeline Cosmic Rays, About Pierre Auger, Games, and FAQ. Under MALARGUE, there are links for Auger Visitor Center, Virtual Tour, Science Fair, Google Earth, James Cronin School, Journey to Auger, and Edu & Outreach. Under PUBLIC DATA, there are links for Open Data, Data & Tables, Public Event Explorer, and VISPA. Under EQUAL OPPORTUNITIES, there are links for Int. Day of Women and Girls in Science, Women in Science, and Women hold up half the sky. Under PHOTO & VIDEO, there are links for Photo Galleries (flickr), Videos, Picture Stories, and Media Guidelines. A blue arrow points from the 'PHOTO & VIDEO' section to the Spanish website screenshot.

visitantes.auger.org.ar (SPA)

The screenshot shows the Spanish website at <https://visitantes.auger.org.ar>. The navigation menu includes Home, News, Observatory, Collaboration, Science, Outreach, and Internal. The main content area features a large graphic of the observatory with the text 'OBSERVATORIO DE RAYOS CÓSMICOS' and a button labeled 'Ubicación'. A blue arrow points from the English website screenshot to this one.

The screenshot shows the YouTube channel for Pierre Auger Observatory. The channel name is 'Pierre Auger Observatory' with 101 subscribers. The channel banner features the text 'PIERRE AUGER OBSERVATORY'. A blue arrow points from the Spanish website screenshot to this one.

The screenshot shows the YouTube channel for Pierre Auger Observatory, displaying a list of video uploads. The channel name is 'Observatorio Pierre Auger' with 86 subscribers. The video list includes: 'Día Internacional de la Mujer y la Niña en la Ciencia' (1,074 views), 'Transmisión en vivo de Observatorio Pierre Auger' (41 views), 'Visita Guiada Virtual - Observatorio Pierre Auger...' (93 views), 'Visita Virtual 30 de agosto de 2021 Observatorio Auger' (62 views), 'Visita Guiadas Virtuales - Observatorio Pierre Auger-' (205 views), and 'DJI Phantom 2 Vision Plus Andes Argentina HD' (350 views).

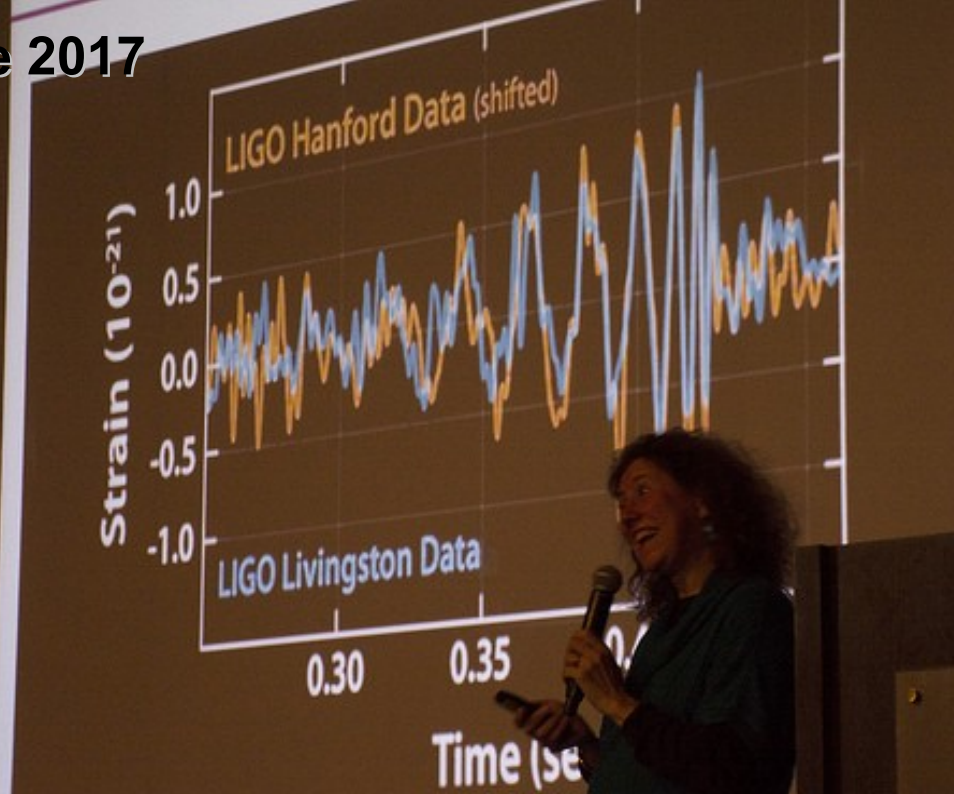
Reunion AAA Septiembre 2017

Interferometers



- Neutron star mergers
- Black hole mergers

Gabriela González LIGO

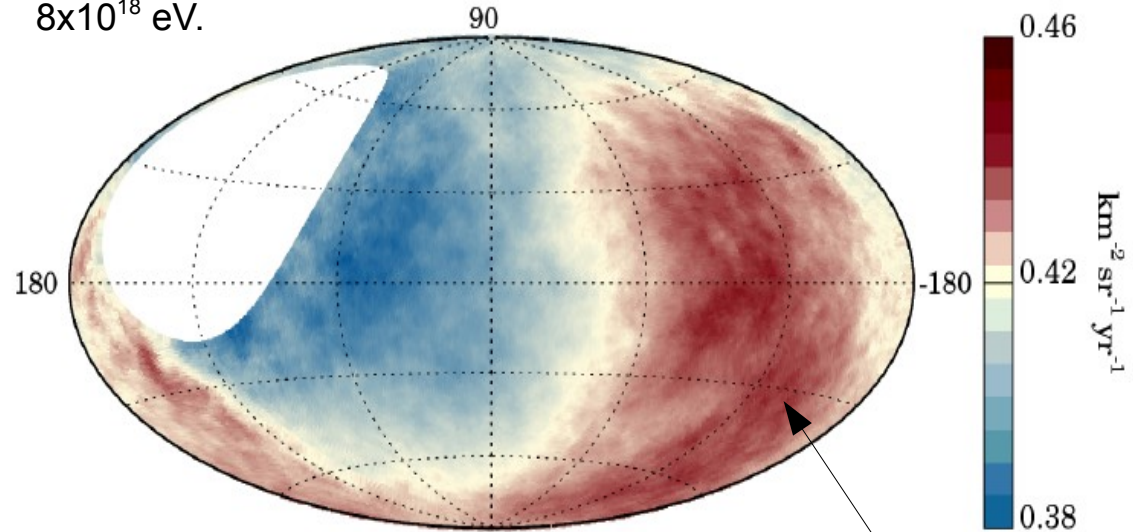


Esteban Roulet,
CONICET-IB
CAB



EMBARGADO HASTA LAS 3:00 PM hora argentina del Jueves 21 de septiembre 2017

Mapa en coordenadas galácticas del flujo medido de rayos cósmicos con energías mayores que 8×10^{18} eV.



primera evidencia observacional del rigen extragaláctico de los rayos cósmicos Estudio de más de 30,000 rayos cósmicos con energías superiores a 1 Joule.

exceso respecto al flujo promedio,

Pierre Auger, ANTARES, and IceCube Observatories: Search for Neutrino Emission from Merging Neutron Stars - GW170817

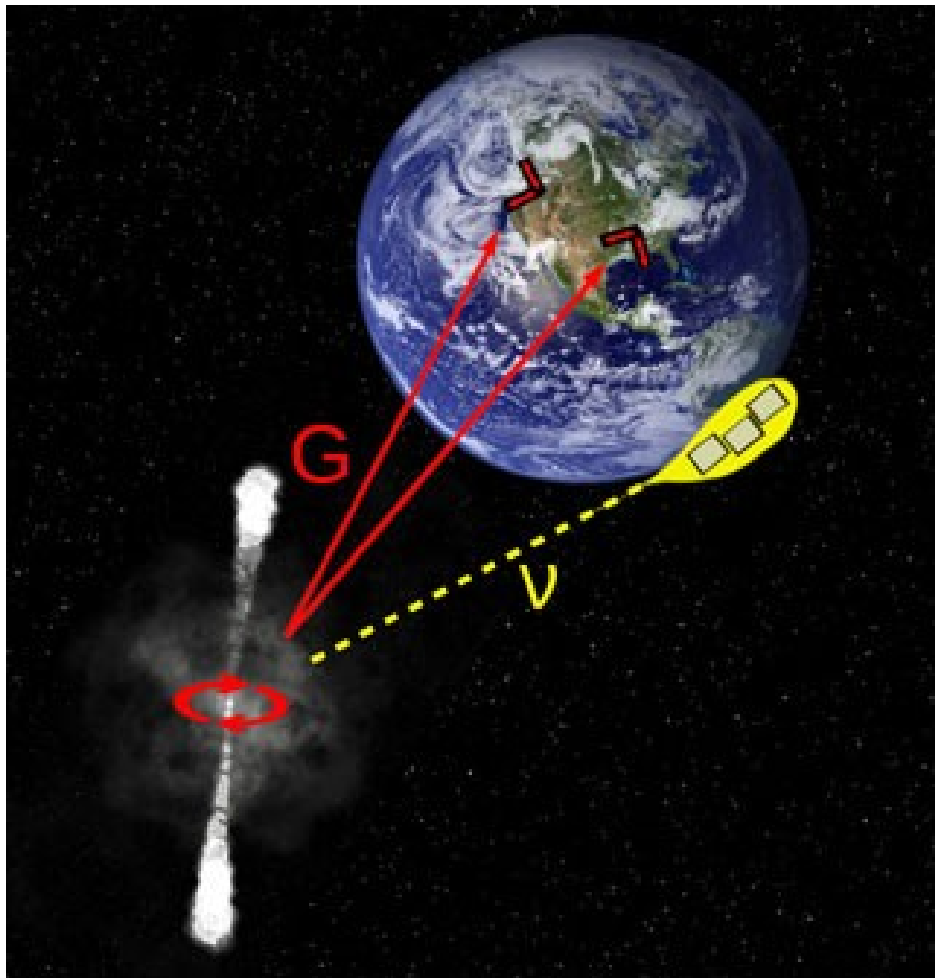


Illustration of the binary neutron star merger GW170817 emitting gravitational waves observed at the two LIGO sites in the United States.

The neutrino detection channel that skims the Earth is observed.

Pierre Auger Observatory in Argentina, in the right position for detection!



OPEN ACCESS

Multi-messenger Observations of a Binary Neutron Star Merger

LIGO Scientific Collaboration and Virgo Collaboration, Fermi GBM, INTEGRAL, IceCube Collaboration, AstroSat Cadmium Zinc Telluride Imager Team, IPN Collaboration, The Insight-Hxmt Collaboration, ANTARES Collaboration, The Swift Collaboration, AGILE Team, The IM2H Team, The Dark Energy Camera GW-EM Collaboration and the DES Collaboration, The DLT40 Collaboration, GRAWITA: GRAVitational Wave Inaf TeAm, The Fermi Large Area Telescope Collaboration, ATCA: Australia Telescope Compact Array, ASKAP: Australian SKA Pathfinder, Las Cumbres Observatory Group, OzGrav, DWF (Deeper, Wider, Faster Program), AST3, and CAASTRO Collaborations, The VINROUGE Collaboration, MASTER Collaboration, J-GEM, GROWTH, JAGWAR, Caltech-NRAO, TTU-NRAO, and NuSTAR Collaborations, Pan-STARRS, The MAXI Team, TZAC Consortium, KU Collaboration, Nordic Optical Telescope, ePESSTO, GROND, Texas Tech University, SALT Group, TOROS: Transient Robotic Observatory of the South Collaboration, The BOOTES Collaboration, MWA: Murchison Widefield Array, The CALET Collaboration, IKI-GW Follow-up Collaboration, H.E.S.S. Collaboration, LOFAR Collaboration, LWA: Long Wavelength Array, HAWC Collaboration, **The Pierre Auger** team, Pi of the Sky Collaboration, The Chandra Team at McGill University, DFN: Resolution Universe Survey, RIMAS and RATIR, and SKA South Africa/MeerKAT (see the end matter for the full list of authors.)

2017 October 6; accepted 2017 October 6; published 2017 October 16

AUGER VIDEOS

- **Messengers from Space**
(6 to 11 years)
- * **A knowledge adventure**
(all audiences)

Guión y Dirección: Cristina Raschia Producción: FOPAA-CICUNC-CNEA

The Proton



Design by
Jaime Suarez

Hess, Cronin,
Auger



Voices Of The Universe

Voices of the Universe

James Cronin School
16-Nov. 2006



Auger Stamp, 2007



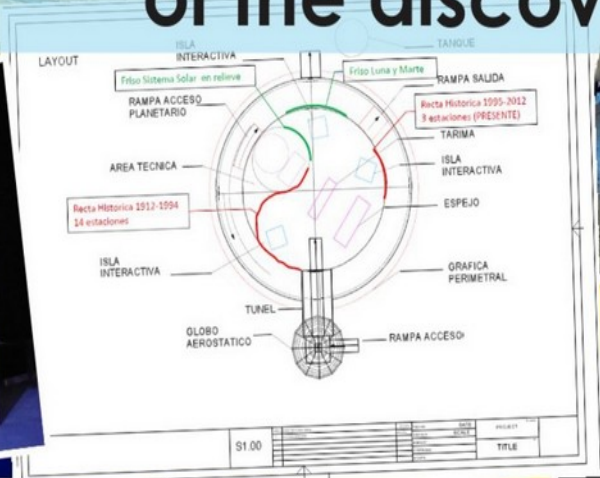
Planetario Malargue
(inaugurated on August 9th, 2008)

Light Pollution
Ord. 1298/15, April 14th, 2005

2012

Tecnópolis 2012

“A century of high energies: 100 years of the discovery of cosmic rays”







INTERNATIONAL
YEAR OF LIGHT
2015

COSMIC
LIGHT ΦAU



#descubrí



BIG BANG



La Brújula

April, 2015
Mendoza







Fair of Science & Technology

Malargüe 2015

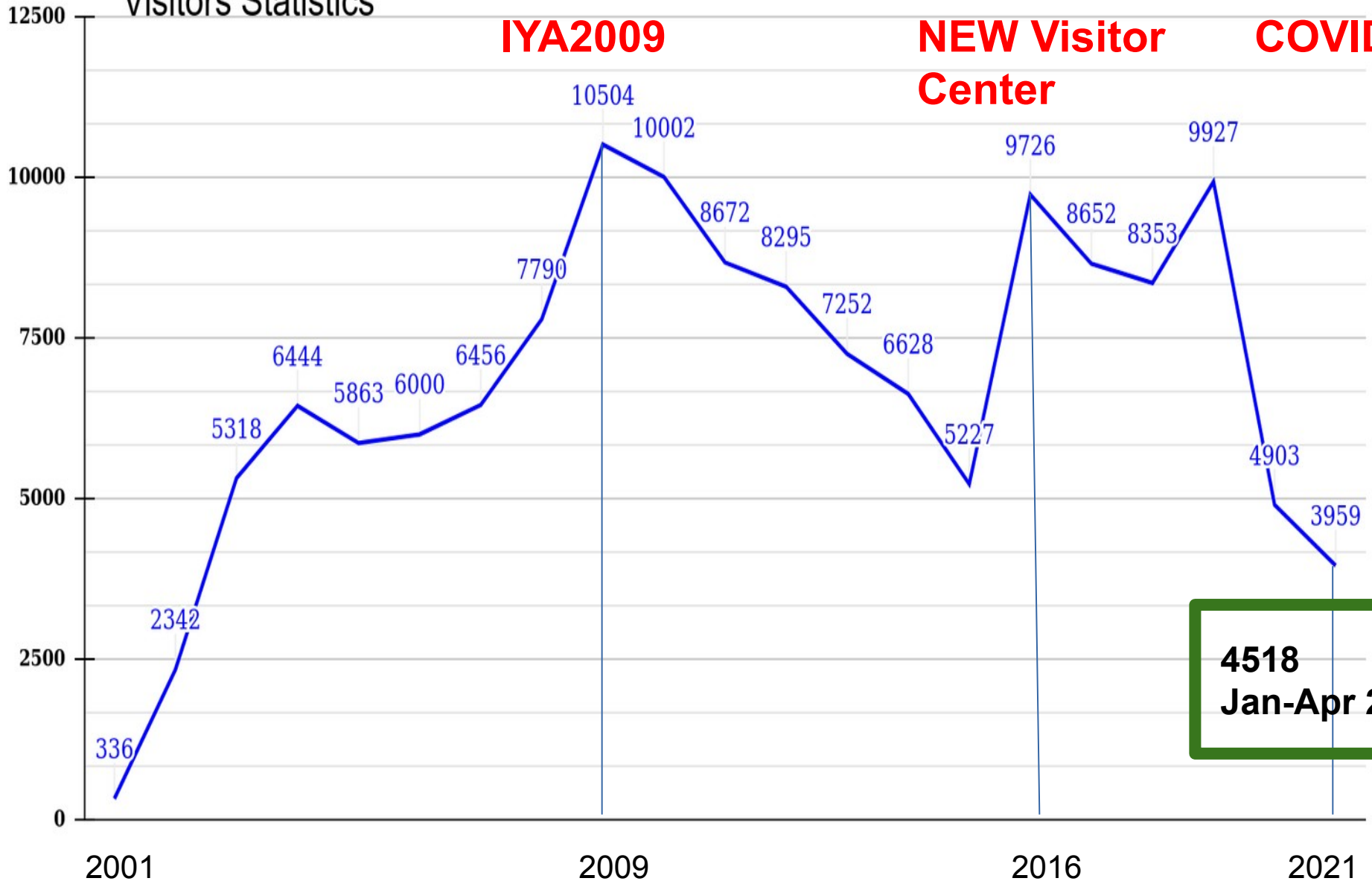
PUBLIC WAVE - Traction

Visitors Statistics

IYA2009

NEW Visitor Center

COVID



4518
Jan-Apr 2022

2015 y más allá
and beyond

"El mayor placer que un científico puede experimentar es encontrarse con un descubrimiento inesperado"

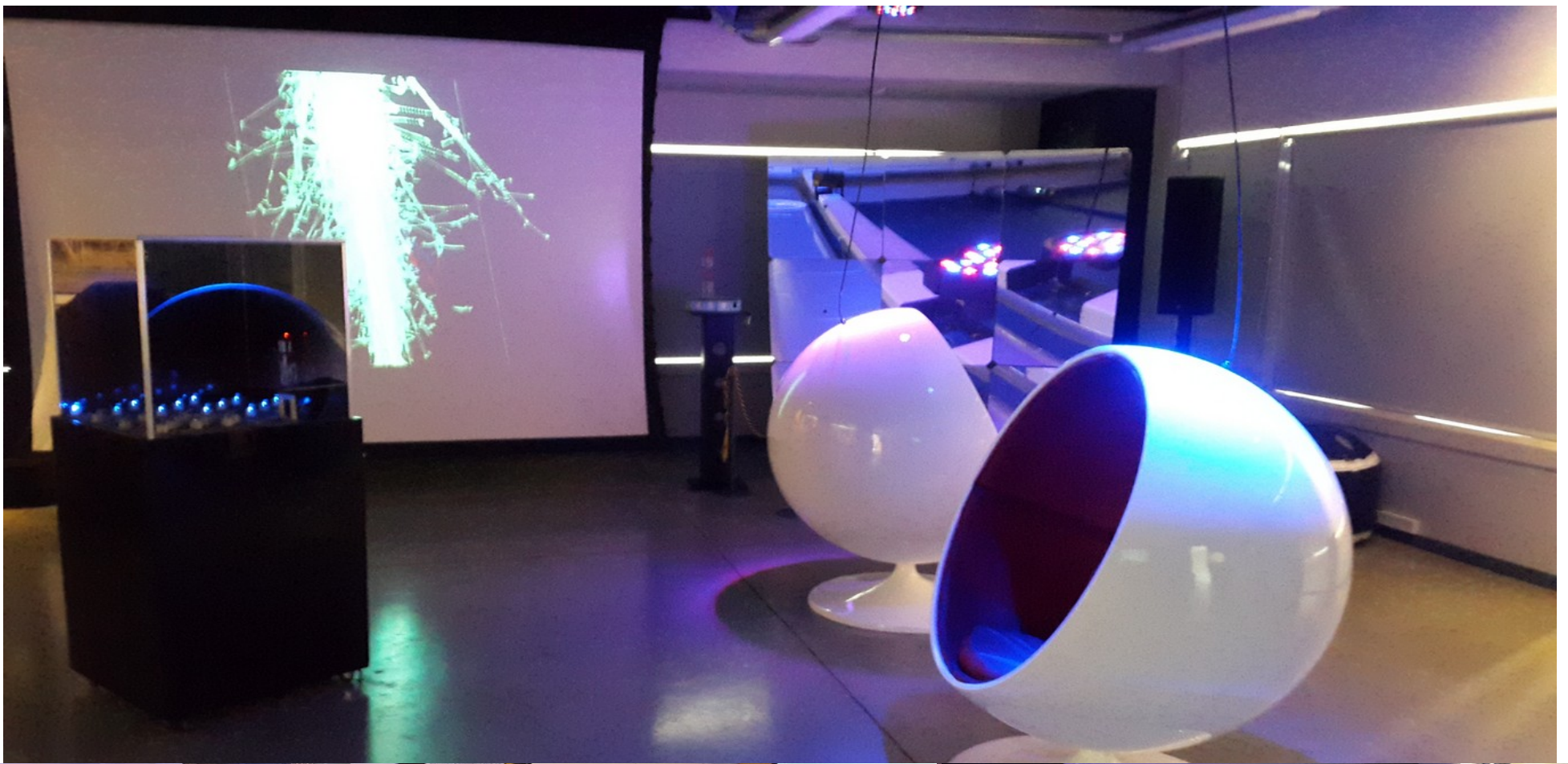
"The greatest pleasure a scientist can experience is to encounter an unexpected discovery."

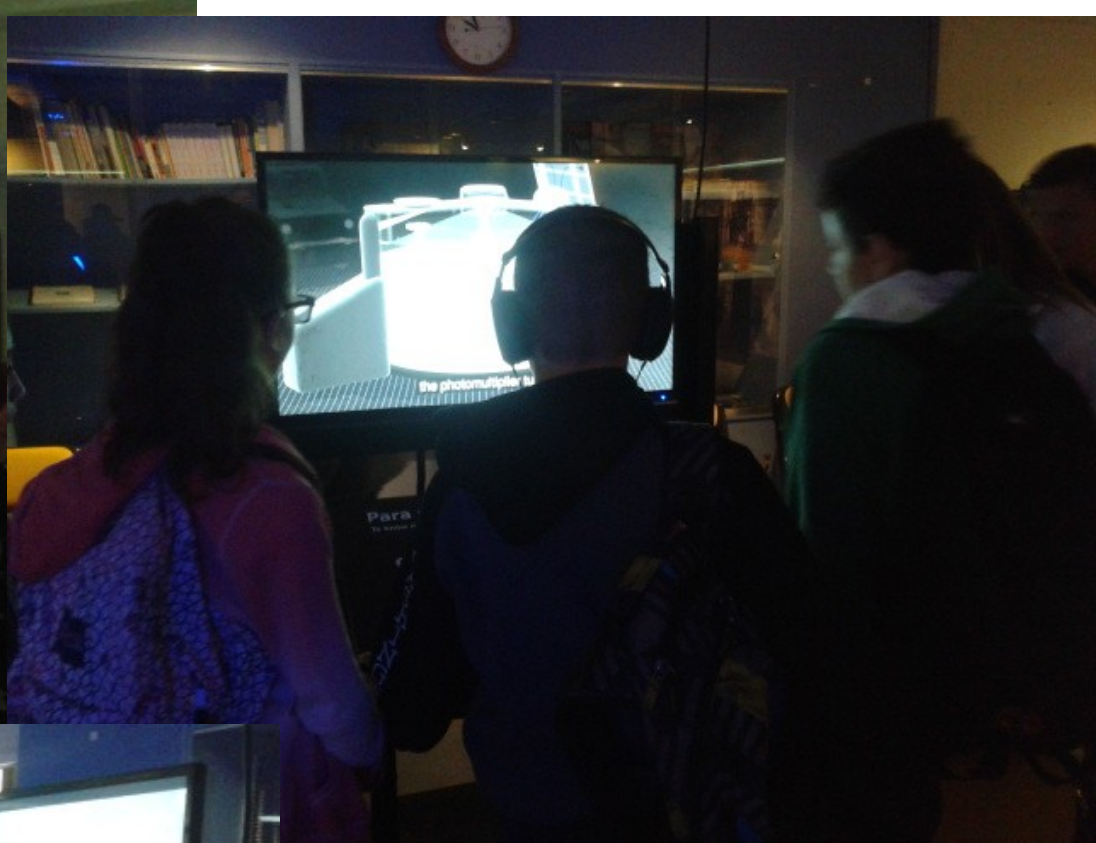
James Cronin



**Visitor Center
remodelation 2015**





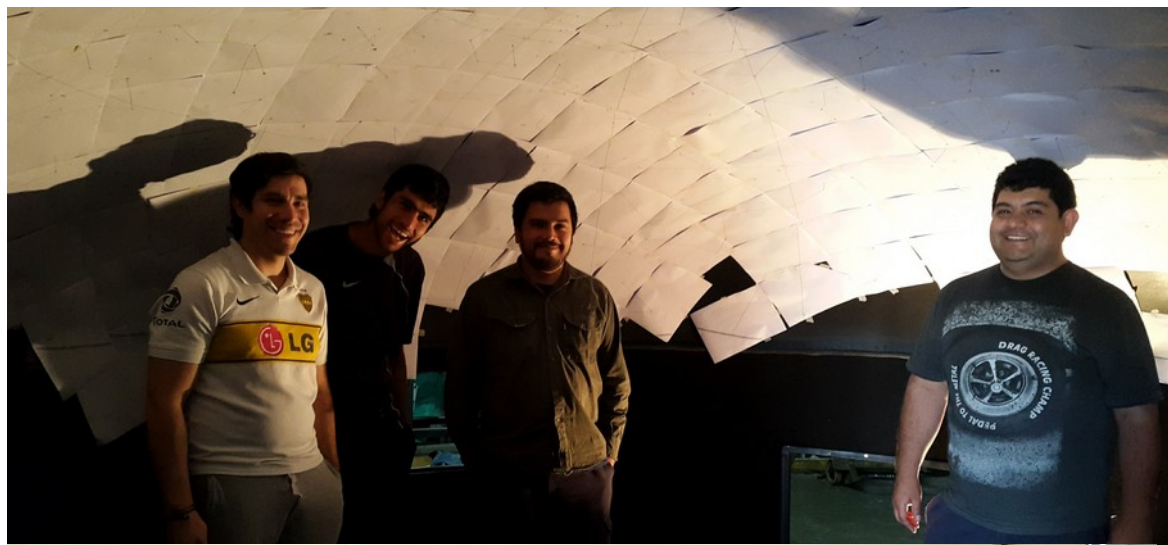




Inclusive Planetarium

1st version, 2010
finaced by FOPA







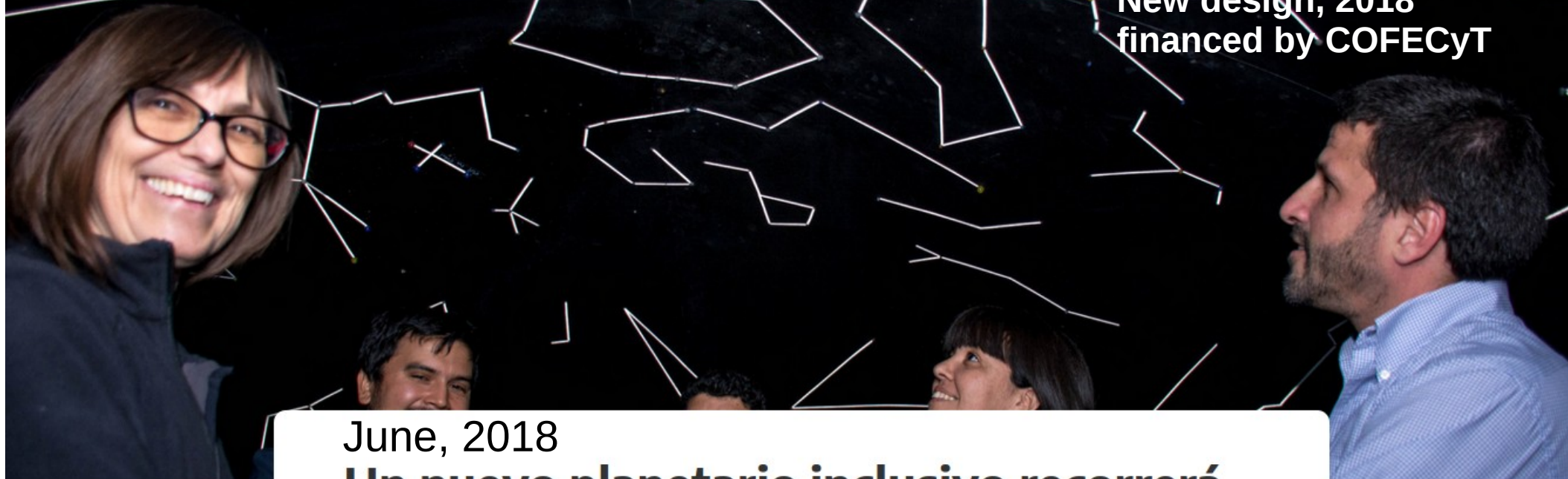
Inclusive Planetarium

Different audiences: children, older adults, marginalized populations



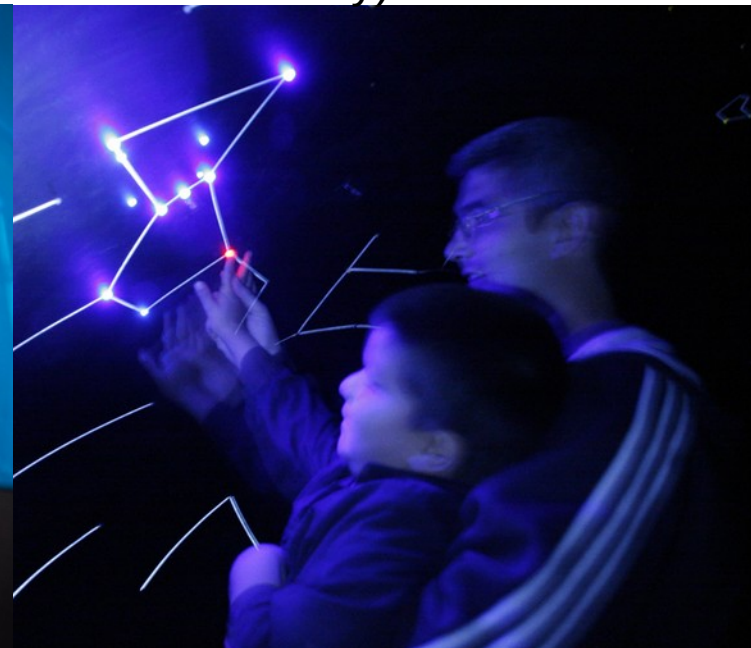
Inicio / Ministerio de Ciencia, Tecnología e Innovación / Consejo Federal de Ciencia y Tecnología - COFECyT / Un nuevo planetario inclusivo recorrerá el país

**New design, 2018
financed by COFECyT**



June, 2018

Un nuevo planetario inclusivo recorrerá el país (A new inclusive planetarium will tou the country)



Inclusive Planetarium

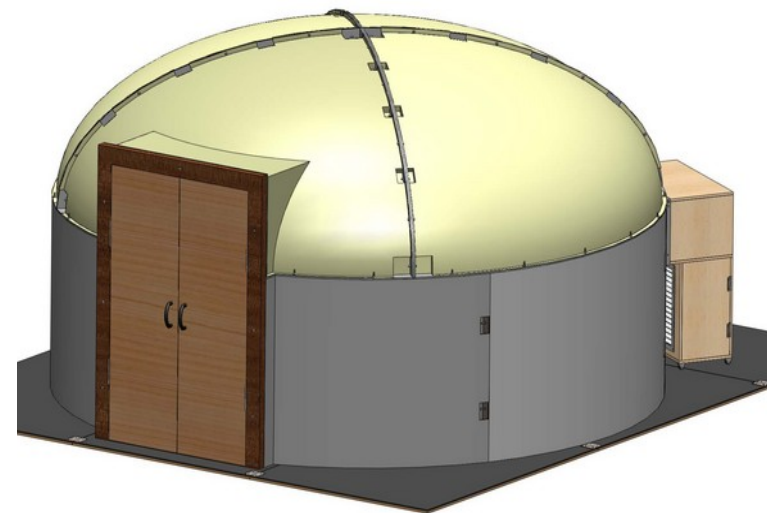


+3M of visitors

Inclusion achievements

Original development in

- ✓ Electronics.
- ✓ Software design.
- ✓ Scripts and music.
- ✓ Models and prototypes.
- ✓ 3Dprint and Braille texts
- ✓ Sign Language.
- ✓ Documentation, repositories



Auger Outreach Team as part of Citizen Scientists Projects

REINFORCE

The REINFORCE project (Research Infrastructures FOR Citizens in Europe) aims to engage and support citizens to cooperate with researchers and actively contribute in the development of new knowledge for the needs of science and society.

GOALS



REINFORCE

REsearch INfrastructures FOR Citizens in Europe

FRONTIER

Do you believe that exciting discoveries such as the *Discovery of Gravitational Waves* or the *Discovery of the Higgs Boson* can be brought in the classroom in a consistent and understandable fashion?

FRONTIERS Winter School invitation to Pierre Auger

GRAVITATIONAL WAVE
NOISE HUNTING

DEEP
SEA HUNTERS

SEARCH FOR NEW
PARTICLES AT THE LHC

COSMIC MUON
IMAGES

WELCOME TO FRONTIERS

FRONTIERS winter school

BROADCAST

FRONTIERS winter school

BROADCASTING LIVE

facebook.com

facebook.com/frontierseu

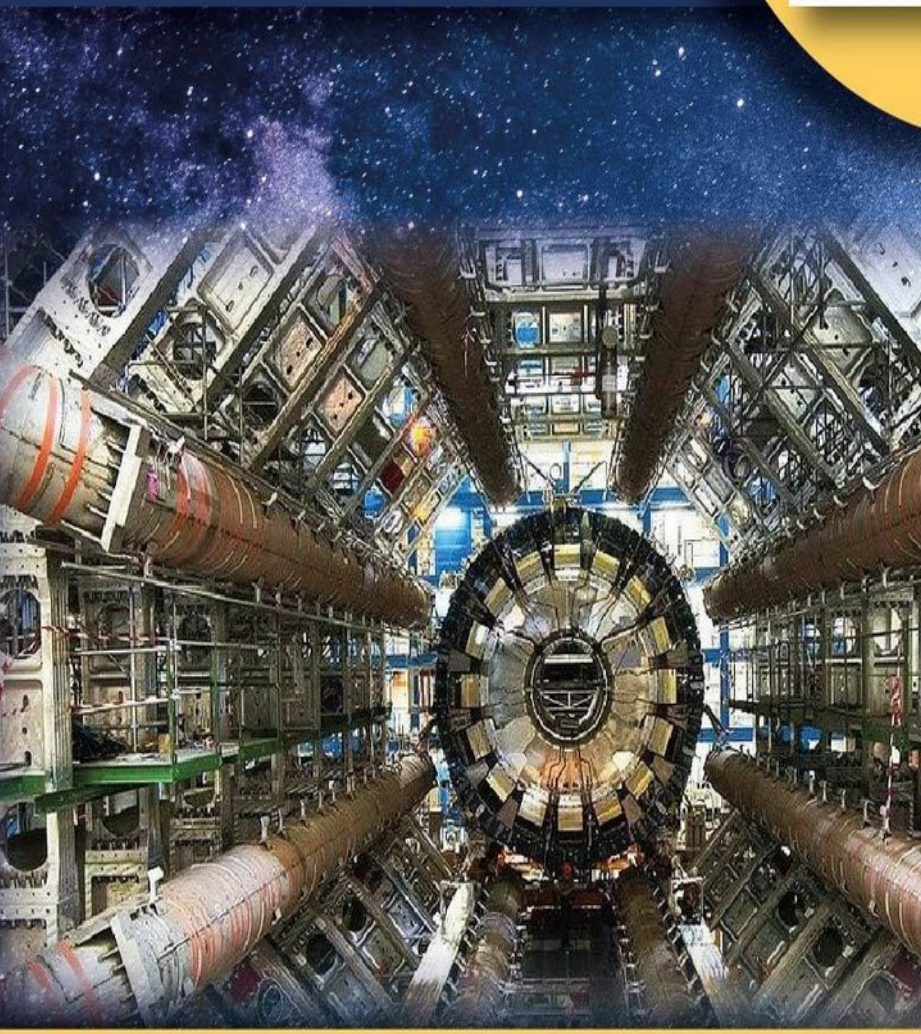
VIRTUAL VISIT TO CERN

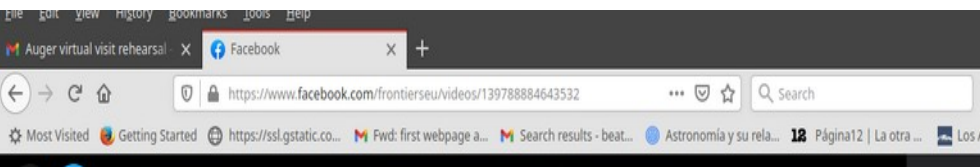
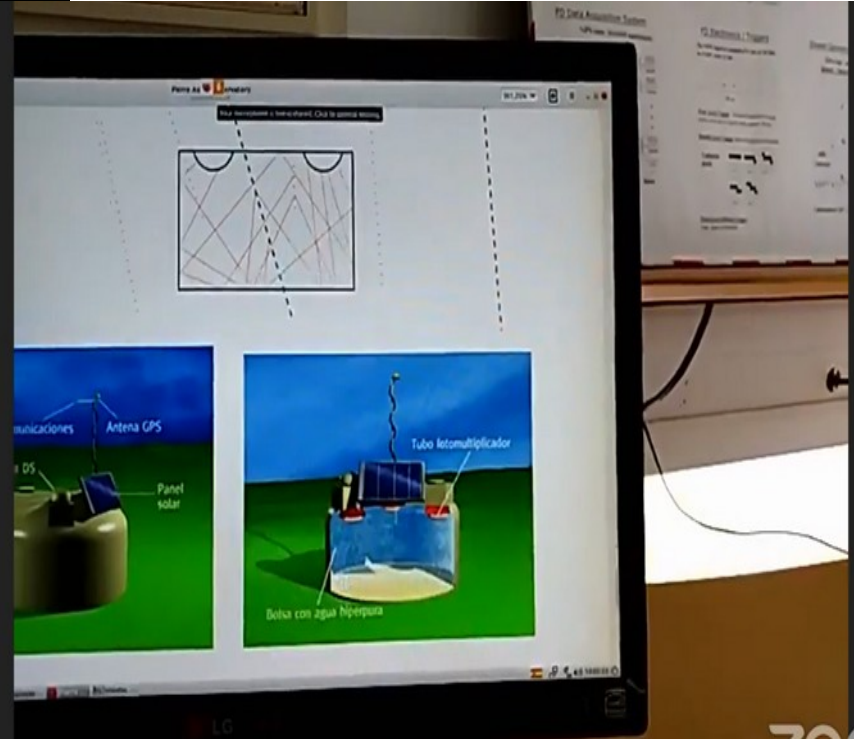
Friday 29 January 2021
18.00-19.00 CET

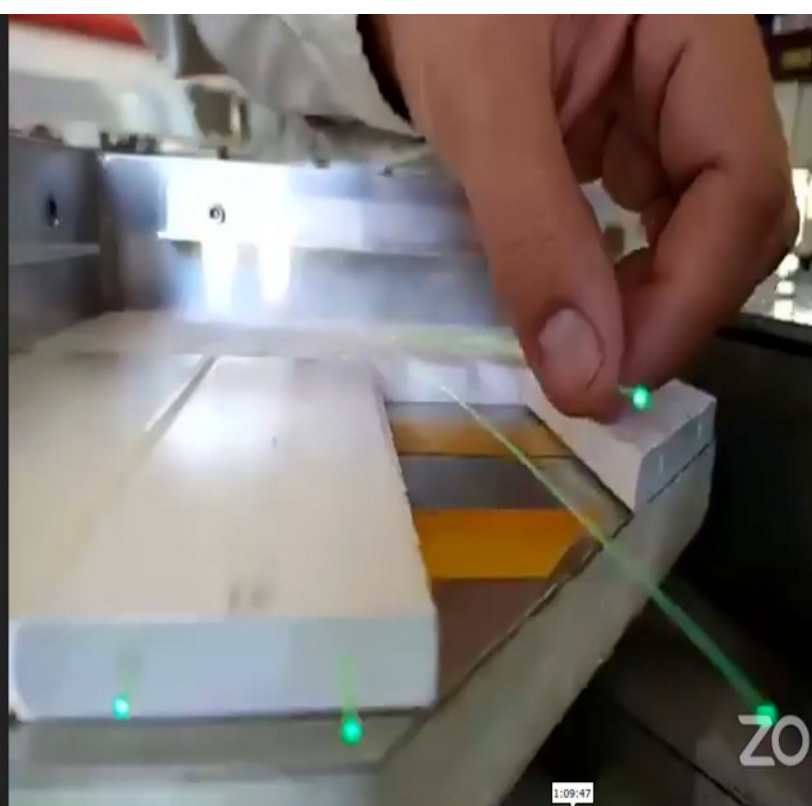


VIRTUAL VISIT TO PIERRE AUGER OBSERVATORY

Friday 5 February 2021 -17.30-18.30 CET







zoom

1:09:47

Mariano Del Río



zoom

1:15:00

Frontiers Project transmitió en vivo.
5 de febrero a las 13:31 · 🌐

👍 24 🗨️ 26 comentarios 🔄 796 reproducciones

Me gusta Comentar

Comentarios

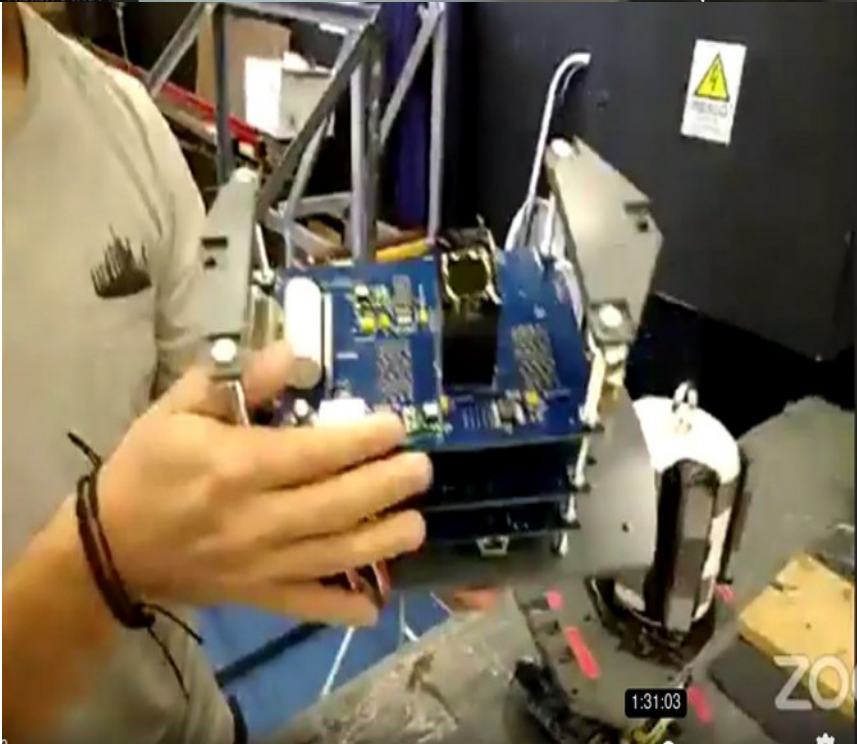
Más relevantes

Frontiers Project 1:21:26
Are there any questions for the Auger scientists?
Me gusta Responder Ver traducción

Frontiers Project 1:50:45
Thank you all!!
Me gusta Responder Ver traducción

Ver 24 comentarios más

👤 Escribe un comentario...



zoom

1:31:03

ricardo Sato



zoom

1:01:11

Impact of virtual Visits

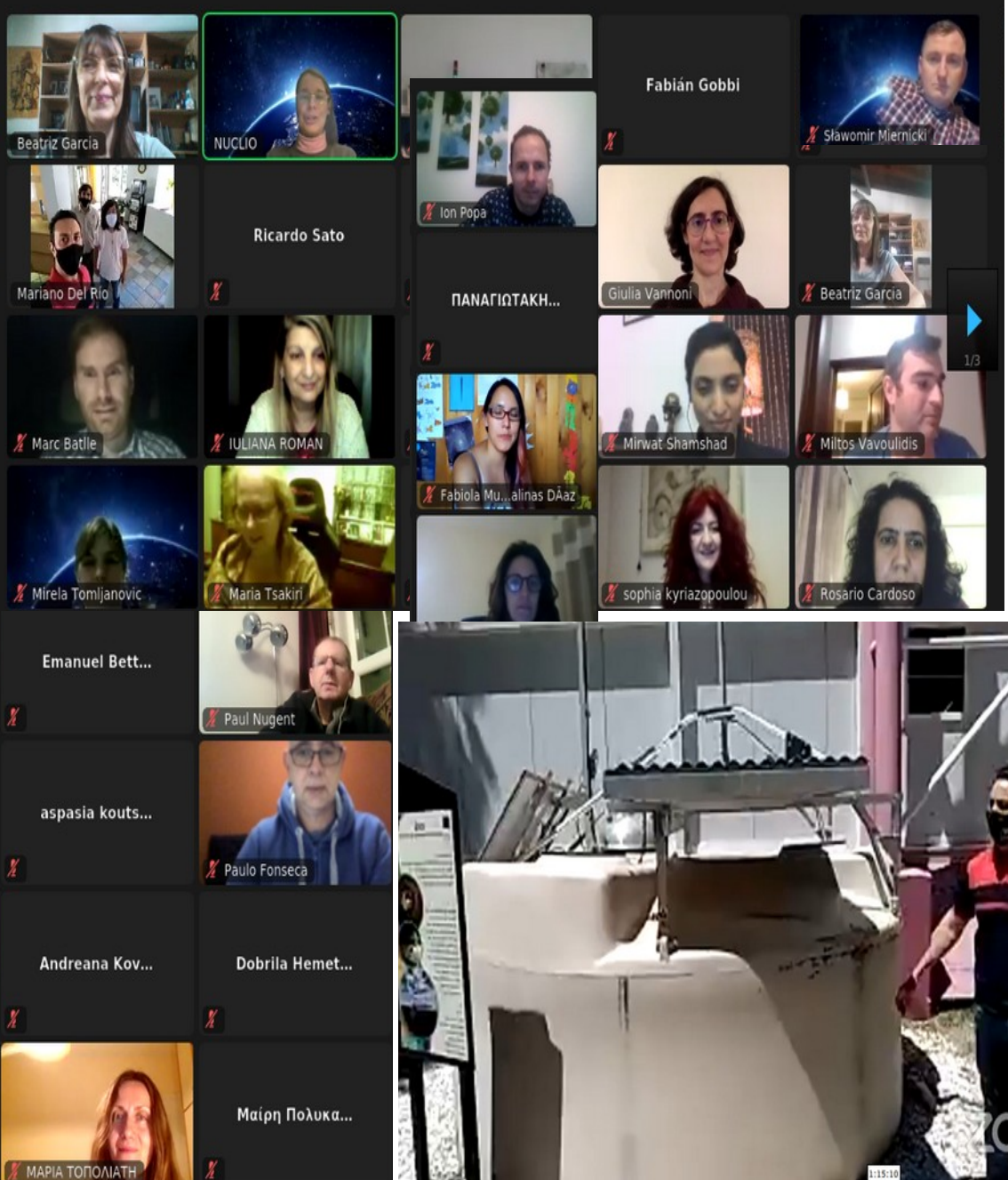
📊 People reached

Total People Reached 2,525



📊 Reactions, comments and shares

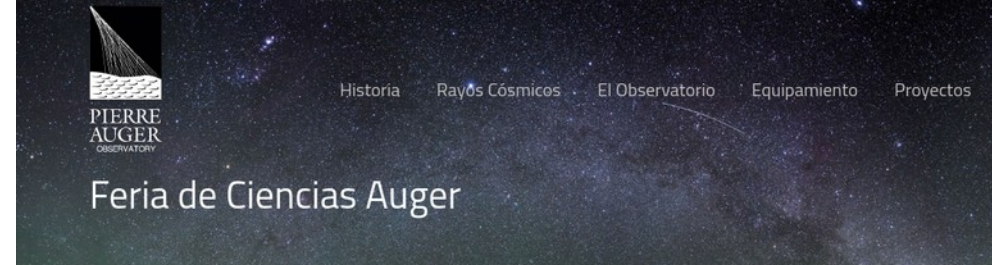
Total reactions, comments and shares 70



General impact

Contact with the community and the government

- International Grants for High School students
- Faires of Sciences
- The Nights at the Museums
- The S&T week (MINCyT)
- Scientific vocations promotion (VoCar-CONICET)
- Educational and outreach material
- Astronomical Tourism

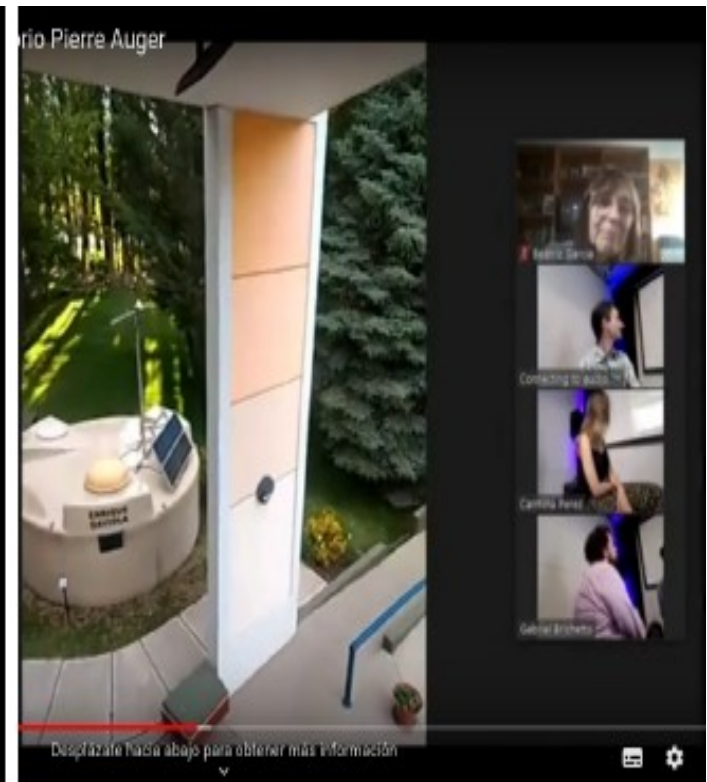


2019

7ª FERIA DE CIENCIAS DEL OBSERVATORIO PIERRE AUGER



10 YEAR OF TECNOPOLIS AND AUGER IN TECNOPOLIS



¿De qué hablan las mujeres cuando hablan de ciencia?

11 de febrero, 2022 - 15:00 hs
Argentina (-3UTC).

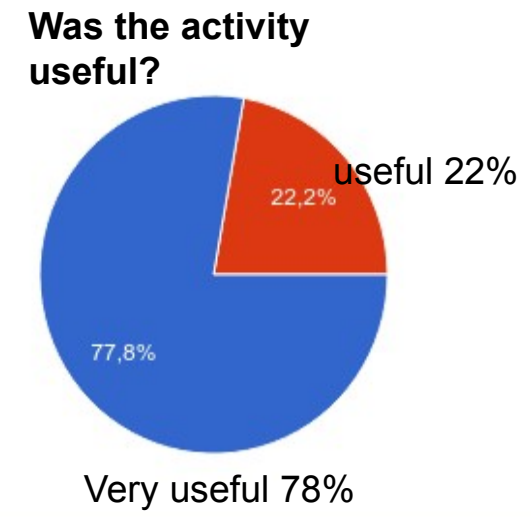
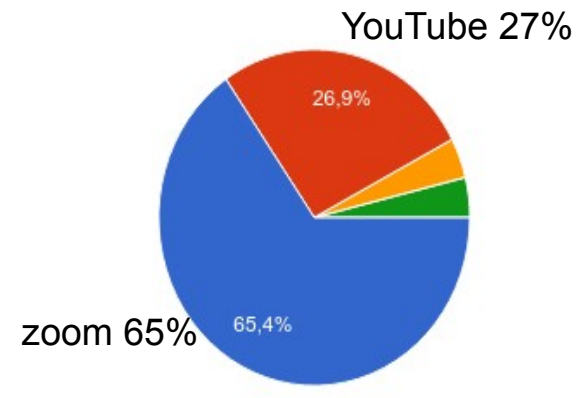
Día Internacional de las Mujeres y Niñas en Ciencia



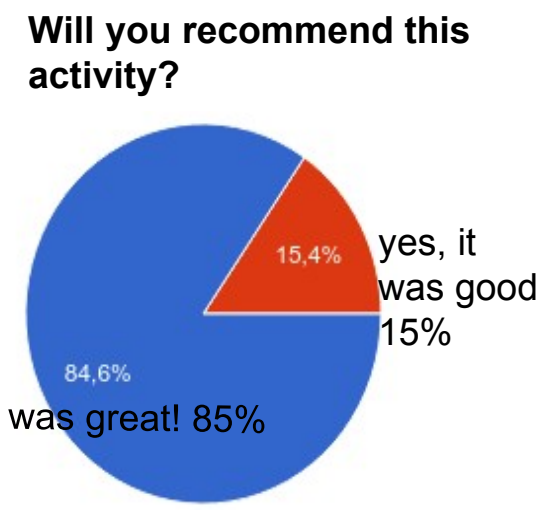
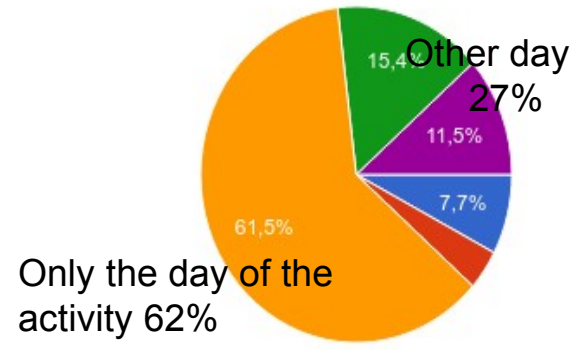
Día Internacional de la Mujer y la Niña en la Ciencia
149 visualizaciones... 21 likes NO ME GUSTA COMPARTIR GUARDAR

Para participar por ZOOM, registrarse aquí:
<https://forms.gle/Tn7A2bhrvWGbieaf8>

Canal Youtube: Observatorio Pierre Auger
@observatoriopierreauger
<https://visitantes.auger.org.ar/>



Vio el conversatorio más allá del 11 de febrero por youtube
respuestas



Inspiring and revealing talk about the role and daily life of women in science. The dynamic was very well directed by the moderators. I look forward to seeing more disclosure. Thank you very much.



Clearly state the objectives of the meeting and designate someone to present an analysis and summary of what was discussed at the end



SOCIAL NETWORKS

Publicaciones

Información

Fotos



Observatorio Pierre Auger
Malargüe

5 feb. · 🌐

Más lugares para ver estrellas: inauguran un centro de interpretación astronómico en Divisadero Largo. (Diario Los Andes, Feb 5 2022. Nota: Cecilia Corradetti. Foto: Mariana Villa/Los Andes).

<https://www.losandes.com.ar/sociedad/mas-lugares-para-ver-estrellas-inauguran-...> Ver más



Ver estadísticas

Promocionar publicación

👍❤️ 40

9 veces compartido

19:11 🌞

🔔📶 22%



Estadística...



Nuevos seguidores de la página

53

Ver detalles

Mejor rendimiento



Día Internacional de las Mujeres y Niñas en Ciencia ...

4 de febrero a las 11:20

Impresiones

10 077

Alcance

9658

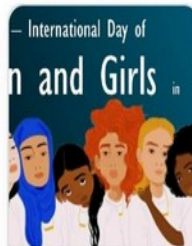
Interacción

937

Ver detalles

Contenido

Contenido más reciente



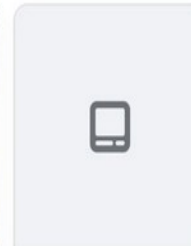
Publicaciones

Ver publicacio...



Historias

Ver historias



Anuncios

Ver anuncios

18:53 📶📶📶

🔔📶 26%



Estadísticas



Últimos 7 días ▾

4 feb. - 10 feb.

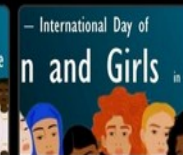
Resumen de las estadísticas

Llegaste a un **+297%** más de cuentas en comparación con 28 ene. - 3 feb.

Cuentas alcanzadas	1.558	>
	+297%	
Cuentas que interactuaron	165	>
	+157%	
Total de seguidores	1.859	>
	+0,5%	

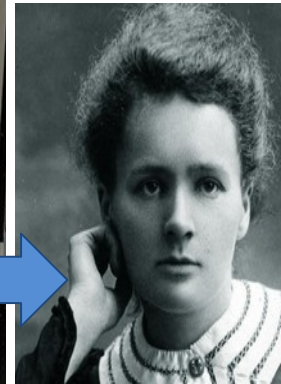
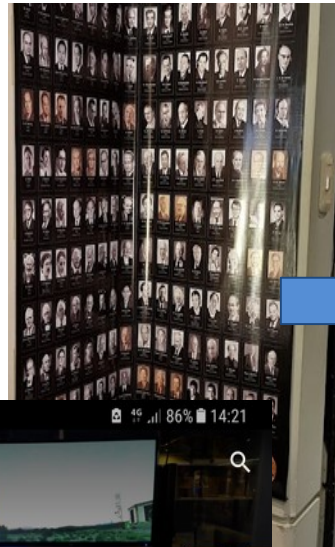
Contenido que compartiste

6 publicaciones >



Visitor Center revisited (2022)

A progressive change in the content and of exhibitions and the communication with the public permit better results with high impact



Marie Skłodowska



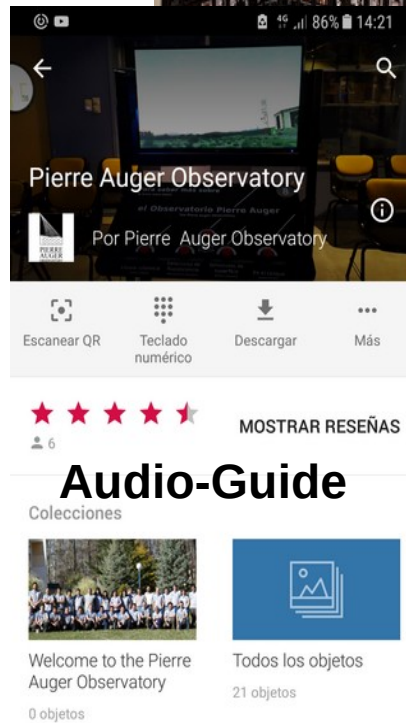
Maria Goeppert



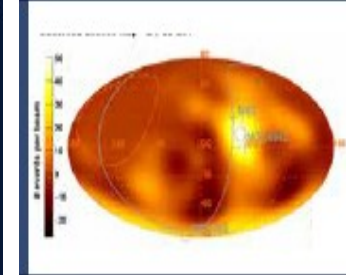
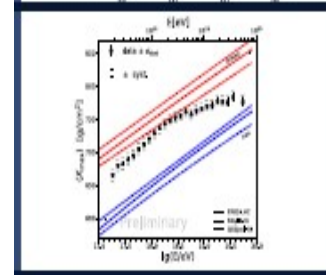
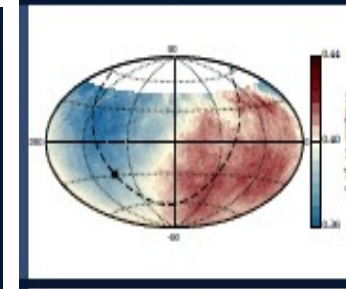
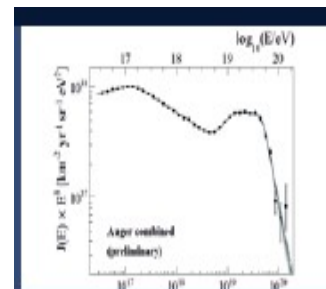
Donna Strickland



Andrea Ghez



Pierre Auger Observatory Discoveries



Astronomy in Protected Natural Areas in Mendoza Payunia 2022

- **Science:** Physics, Astronomy, Biology
- **Technology**
- **Tourism**
- **Equity, inclusion, diversity**
- **Integration:** Auger + DS3 + Planetarium + Payunia

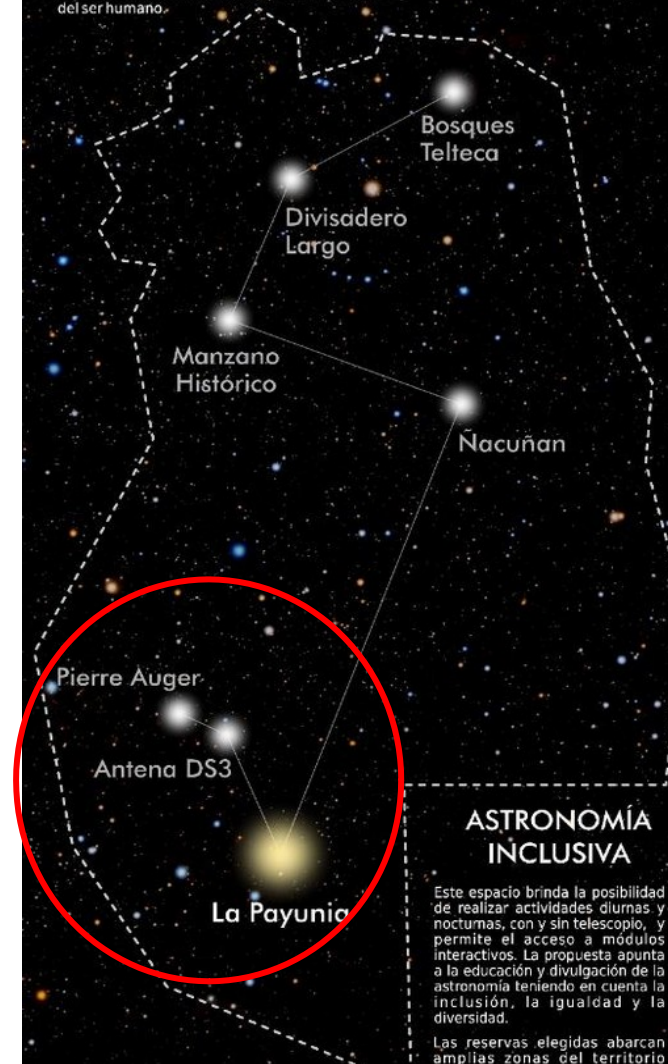
Astronomía en Áreas Protegidas Naturales de Mendoza



El Turismo astronómico es una actividad en auge y Mendoza cuenta con cielos adecuados para la observación. Los Centros de Interpretación Astronómica en Áreas Protegidas, naturalmente oscuras, brindan un valor agregado a la actividad, tendiente a:

- declarar algunas de estas áreas "reservas astronómicas".
- promover la toma de conciencia respecto de la contaminación lumínica, cuya solución depende del ser humano.

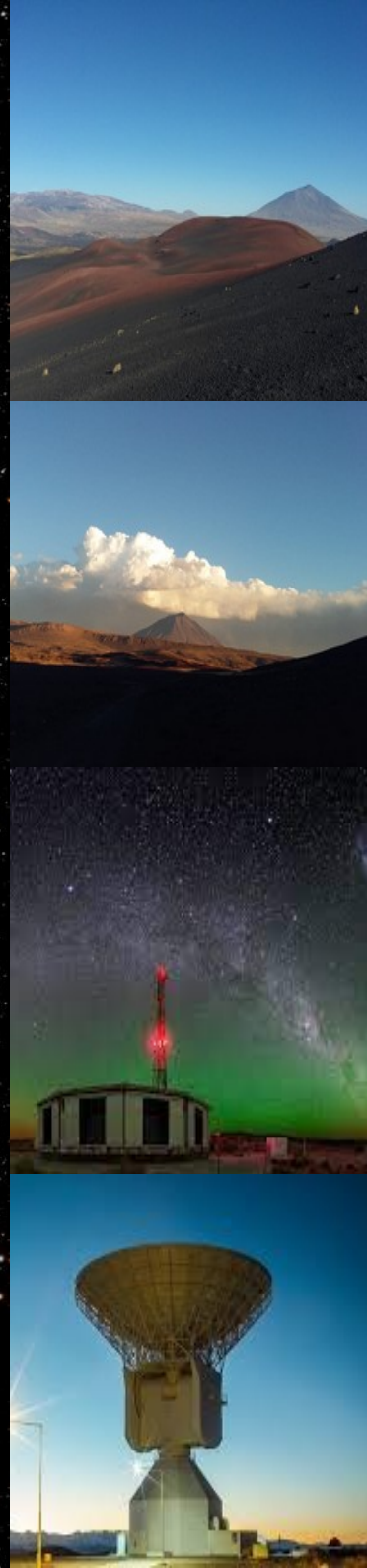
CONSTELACIÓN MENDOZA



ASTRONOMÍA INCLUSIVA

Este espacio brinda la posibilidad de realizar actividades diurnas y nocturnas, con y sin telescopio, y permite el acceso a módulos interactivos. La propuesta apunta a la educación y divulgación de la astronomía teniendo en cuenta la inclusión, la igualdad y la diversidad.

Las reservas elegidas abarcan amplias zonas del territorio provincial, muestran diversidad de paisaje terrestre, sus flora y fauna, y no poseen contaminación lumínica.





PIERRE
AUGER
OBSERVATORY

Conclusion

The arrival of the PAO to Malargüe has fostered the reinforcement a set of values

- **A growing interest in sciences**
- **Promotion o Sci&Tech culture**
- **Increased cultural and environmental awarnesss**
- **Effort and training as a key to success in a course study or profession**
- **Integration internal and with other cities.**





Conclusion

PAO and the relationship with the staff

- **Pride in working for the PAO, increased identity reinforcement.**
- **Feel the need of permanent training and high quality standards at the prospect of getting a job at the PAO.**





Conclusion

PAO and its relationship with the community and the consumers

- **Acceleration of the development process.**
- **Scientific tourism is growing in importance.**
- **Direct and indirect economic growth of certain sectors.**
- **Increase in direct and indirect employment.**
- **Changes in the attitudes of the local people and the scientists.**





Conclusion

PAO and its relationship with the political power

- **The relationship between the PAO and the government has existed since the very beginning**

The scholarships to Michigan Tech. University, involving: the Council, the Municipal School of English, local schools.

Cronin School and the Planetarium

Activities and guided visits at the observatory, involving the Council, the Tourism Directorate, the media, tourist companies, individuals



Thank you