

# III LASF4RI for HECAP Symposium

## Humanities, Science, Technology and Innovation Policies in Mexico

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Conahcyt (Mexico)



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**MÉXICO**



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CONSEJO NACIONAL DE HUMANIDADES  
CIENCIAS Y TECNOLOGÍAS

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Conahcyt (Mexico)



**2024**  
AÑO DE  
*Felipe Carrillo*  
**PUERTO**  
BENEMÉRITO DEL PROLETARIADO,  
REVOLUCIONARIO Y DEFENSOR  
DEL MAYAB

1. Human Right To Science
2. HSTI policies in Mexico
3. Conahcyt
  1. Research Projects
  2. Public Research Centers
  3. National Laboratories
  4. International collaborations
4. Transition from council to ministry



# 1- Human Right to Science



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## Universal Declaration of Human Rights, Article 27

1. Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and **to share in scientific advancement and its benefits.**
2. Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.



Image by Freepik

# 2- HSTI Policies in Mexico



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New “General Law on Humanities, Sciences, Technologies and Innovation”

## Based on

Human right to Science (Art. 27) and the Political Constitution of the United Mexican States (Art. 1<sup>st</sup>)

## Promotes

- International cooperation and solidarity
- Reduction of inequalities
- Collaborative research
- Generation of social benefit
- Universal access to scientific knowledge



Credit: Conahcyt

# 3- Conahcyt



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## Conahcyt

National Council of Humanities, Sciences, Technologies and Innovation

## Objective

Formulate and guide the national policy on humanities, Sciences, Technologies and Innovation

## Mission

Promote and support research activities

## Vision

Guarantee the exercise of the human right to science



Credit: PhD Ana Torres

# 3- Conahcyt



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## Conahcyt

Basic and Frontier Science research promotion mechanisms

1. Research projects  
(Frontier Science Office)
2. Public Research Centers  
(Sectoral and Regional Articulation Unit)
3. National Laboratories  
(Deputy Office of Humanistic and Scientific Research)
4. International collaborations  
(Communication and International Cooperation Coordination)



Credit: Francisco José Palacios Can (Top-Left), INAOE (Top-Right), INAOE (Bottom-Left), Freepik (Bottom-Right).

# 3.1- Research Projects



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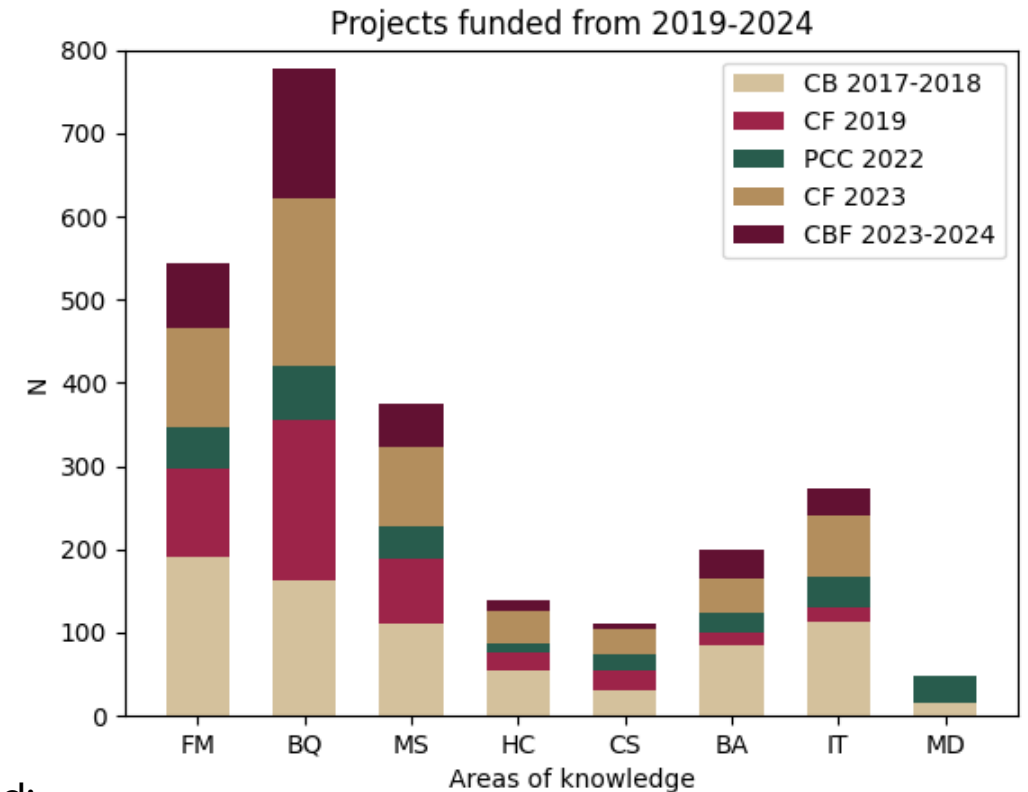
## Office of Frontier Science

Promote the creation of humanistic and scientific knowledge through research projects

Design procedures to select, follow up and measure the benefits generated by research projects

Funding of 5 calls for project's proposals:

- Ciencia Básica 2017-2018
- Ciencia de Frontera 2019
- Convocatoria de Ciencia Básica y/o de Frontera Modalidad: Paradigmas y controversias de la Ciencia 2022
- Ciencia de Frontera 2023
- Ciencia Básica y de Frontera 2023-2024



FM – Physics, Mathematics and Earth Sciences  
BQ – Biology and Chemistry  
MS – Medicine and Health Sciences  
HC – Humanities and Conduct Sciences  
CS – Social Sciences  
BA – Agricultural, Forestry and Ecosystem Sciences  
IT – Engineering and Technological Development  
MD – Multi disciplinary



# 3.1- Research Projects



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## Humanistic and Scientific Funded Projects

- Basic or Frontier Science
- Technical excellence
- Interinstitutional collaboration
- Environmental and social responsible
- Generate social benefits



Credit: Conahcyt (Top-Left), Frances Paola Gamica Quiñones (Top-Right), José Efrén Marmolejo Hernández (Bottom-Left), Elisa Hortensia Tamariz Domínguez (Bottom-Right).

# 3.1- Research Projects



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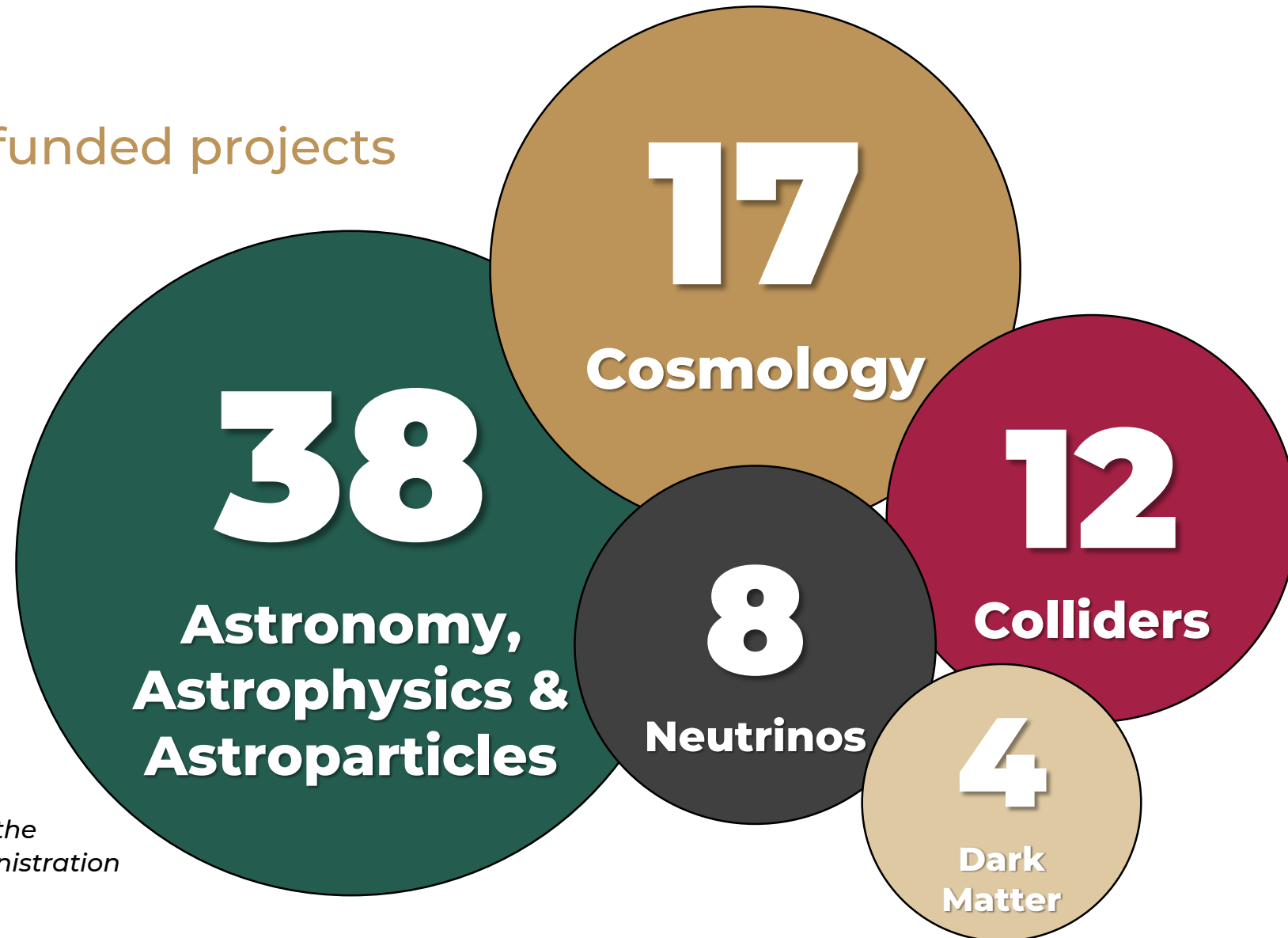
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~80 HECAP themed\* funded projects

20 Institutes

12 Federal entities

Over 12 Observatories



*\*15% of all Physics, Mathematics and Earth Sciences research projects coordinated by the Frontier Science Office in the present administration*

# 3.2- Public Research Centers



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## Public Research Centers

- Coordinated by Conahcyt
- Part of the federal public administration
- Created to:
  - Humanistic or Scientific research
  - Technological and innovation activities
  - \*Offer graduate degree programs
- Technical and administrative autonomy



## 3.2- Public Research Centers



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INAOE (<https://www.inaoep.mx/>)

- National Institute on Astrophysics, Optics and Electronics
- Offers master's and doctoral degrees
- *\*Scholarships for national and foreign students*



Credit: INAOE

# 3.2- Public Research Centers



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## INAOE's Astrophysical Department international collaborations

- Large Millimeter Telescope (USA)
- Hawc observatory (USA)
- Gran Telescopio de Canarias (Spain, USA)
- Centro de Investigaciones Espaciales (Costa Rica)



Credit: Conahcyt (Top-Left, Top-Right), PhD David Gale (Bottom-Left), Wikipedia (Bottom-Right).

# 3.2- Public Research Centers



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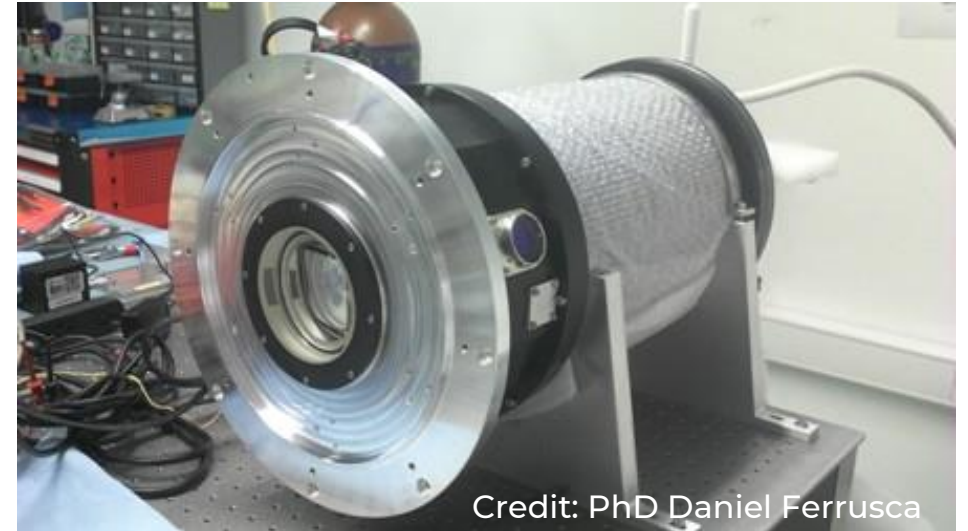


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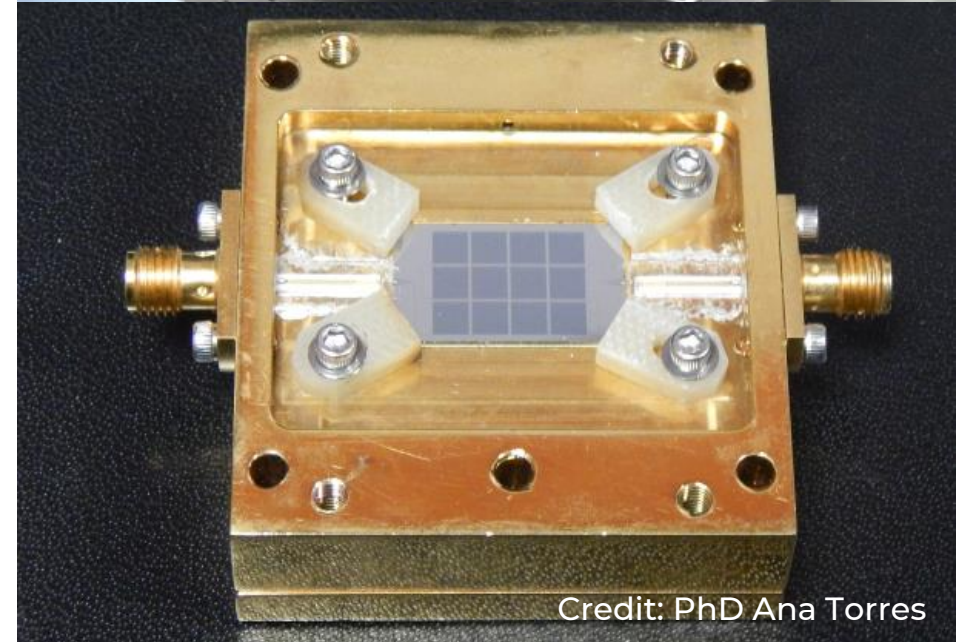
## INAOE

### Instrumentation Laboratories

- Visible and High Energy Astronomical Instrumentation Laboratory
  - Megara (Integral Field Unit for the GTC 10 m Telescope in Spain)
- Millimeter Wave Astronomical Instrumentation Laboratory
  - Muscat (Mexico UK Sub-mm camera for Astronomy)



Credit: PhD Daniel Ferrusca



Credit: PhD Ana Torres

# 3.3- National Laboratories



## Conahcyt's National Laboratories

- Interinstitutional infrastructure
- More efficient use of scientific resources

## Purpose

- Interstate collaboration
- Knowledge and technology transfer to society
- Build bridges and bonds with industry and society
- New generation of scientists



National Astrophysics Laboratory  
in San Pedro Mártir, B.C.

(UNAM)

## National Astronomical Observatory

- 3 telescopes  
(2.1, 1.5 and 0.85 m diameter)
- Optical and Near Infrared bands

<https://labunam.unam.mx/micrositios/OAN/index.php?il=MjE4>





## National Gamma Ray Laboratory Hawc (UNAM)

### The High-Altitude Water Cherenkov Gamma-Ray Observatory

Binational collaboration (Mexico-U.S.A.)

Pico de Orizaba National Park, at 4100  
m.a.s.l.

<https://labunam.unam.mx/micrositios/HAWC/>



# 3.3- National Laboratories



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## Hawc

Latitude 19° North

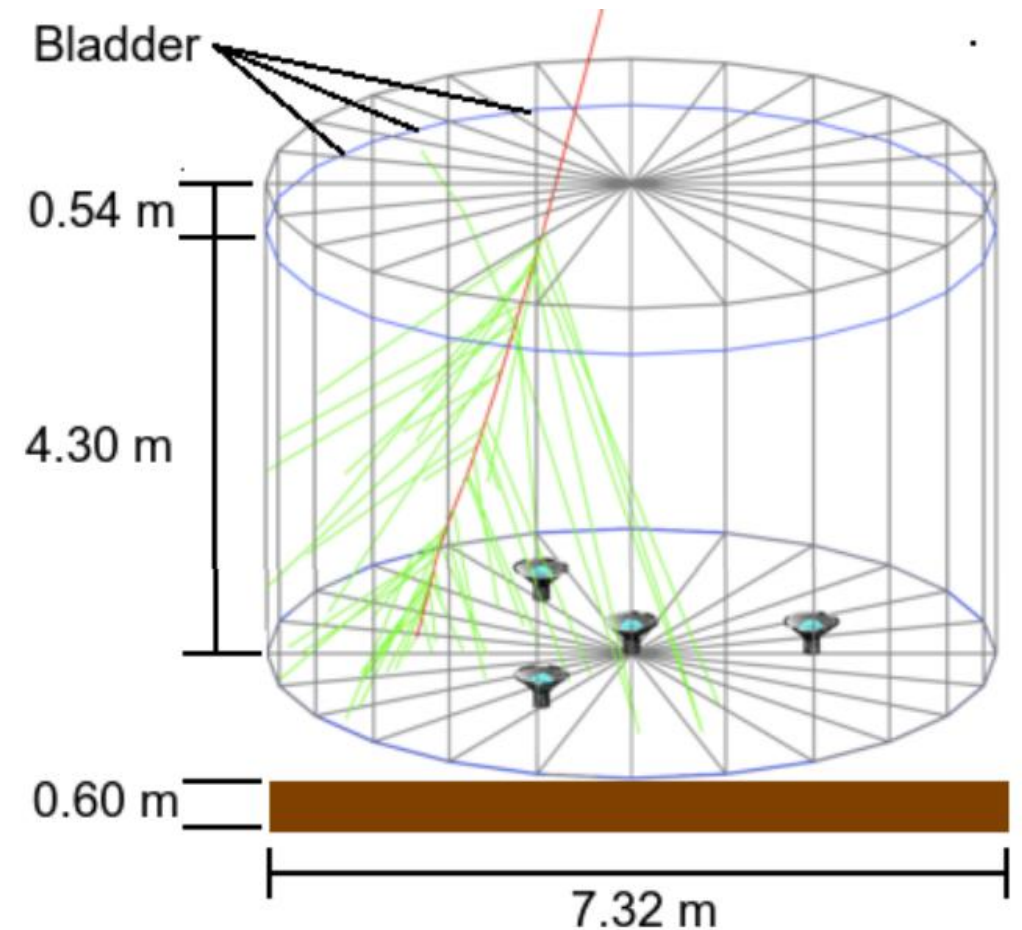
Primary Detector:

300 water Cherenkov detectors

(4 photomultiplier tubes each)

Area covered 22,000 m<sup>2</sup>

Spectral response 300-652 nm,  
peak at 420 nm



Credit: Hawc collaboration

# 3.3- National Laboratories



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National Large Millimeter Telescope  
Laboratory: Advanced Astrophysics  
Research and Millimeter Technologies  
LANGTM (INAOE)

**Large Millimeter Telescope Alfonso  
Serrano**

Binational Project (Mexico-U.S.A.)

Sierra Negra Volcano, 4600 m.a.s.l.

<http://www.langtm.org/>



Credit: INAOE

# 3.3- National Laboratories



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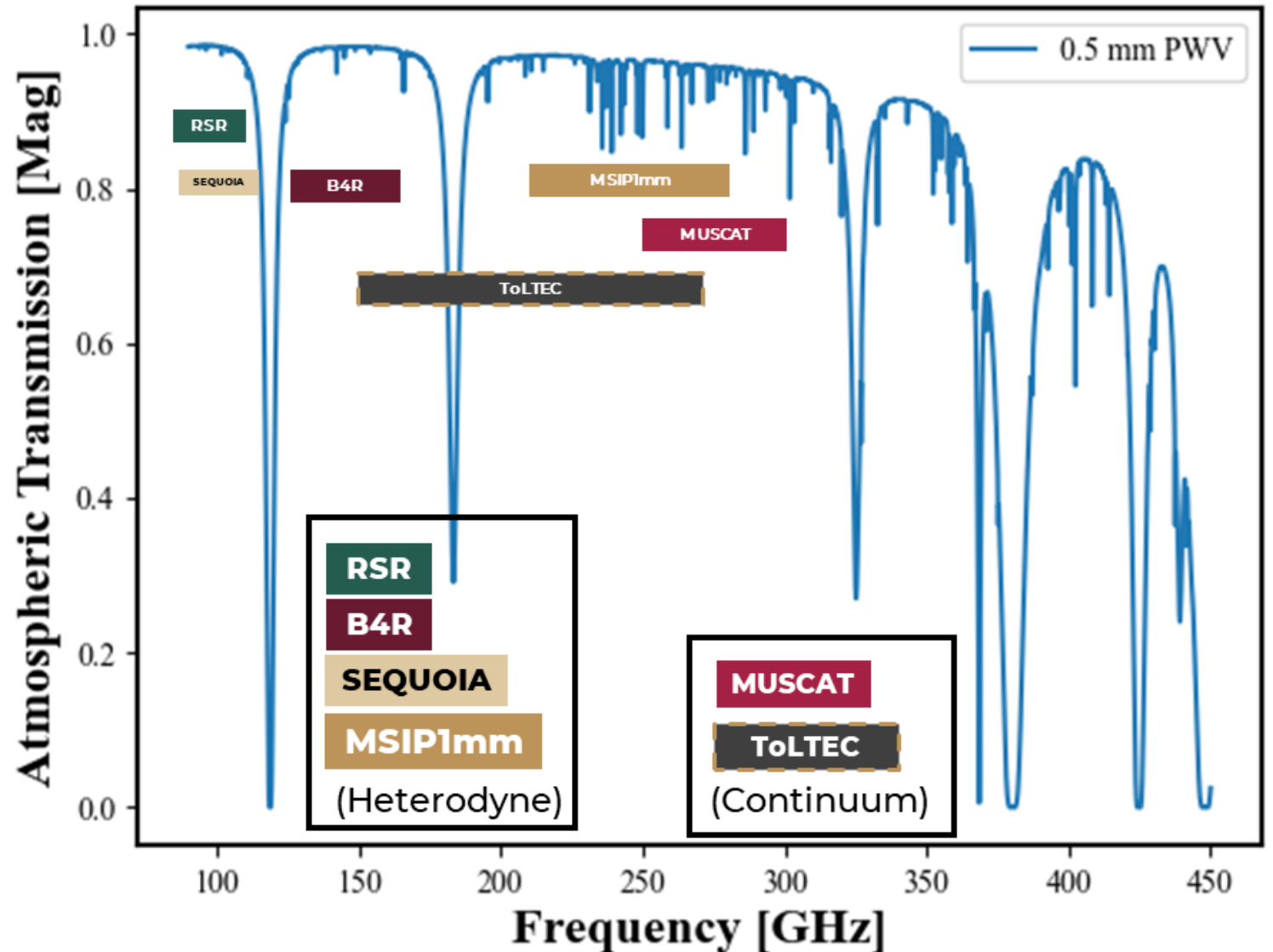
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## LANGTM

50-m diameter  
single-dish telescope

FOV: ~8 arcmin

Wavelength Range:  
 $0.85 \text{ mm} < \lambda < 4 \text{ mm}$   
(75 – 350 GHz)



Credit: PhD Víctor Gómez (LANGTM)

# 3.3- National Laboratories



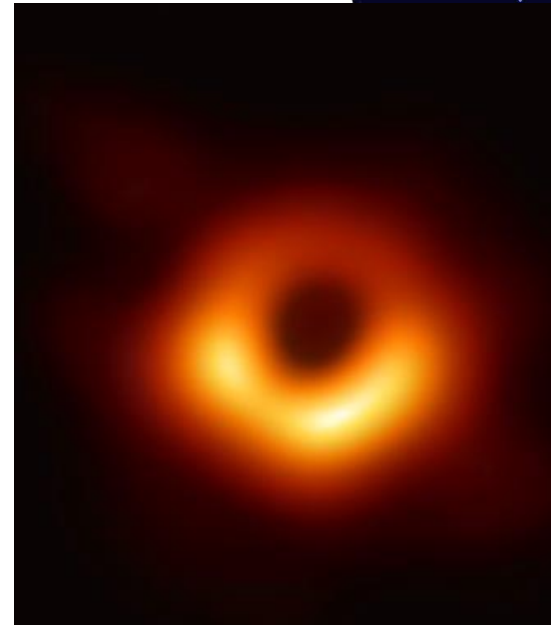
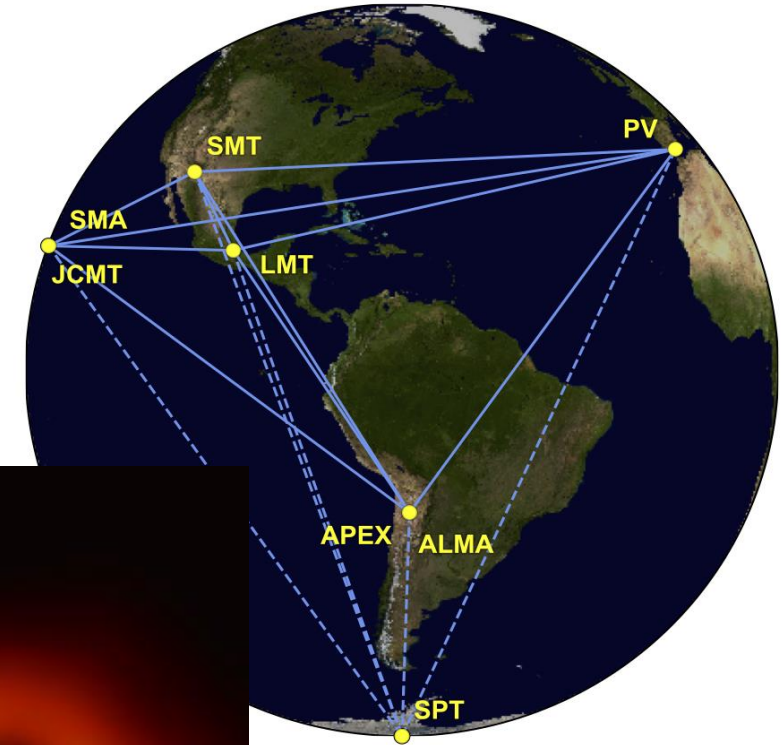
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LANGTM

Event Horizon Telescope Collaboration



Credit: Conahcyt

Credit: EHT collaboration

# 3.4 International Collaborations

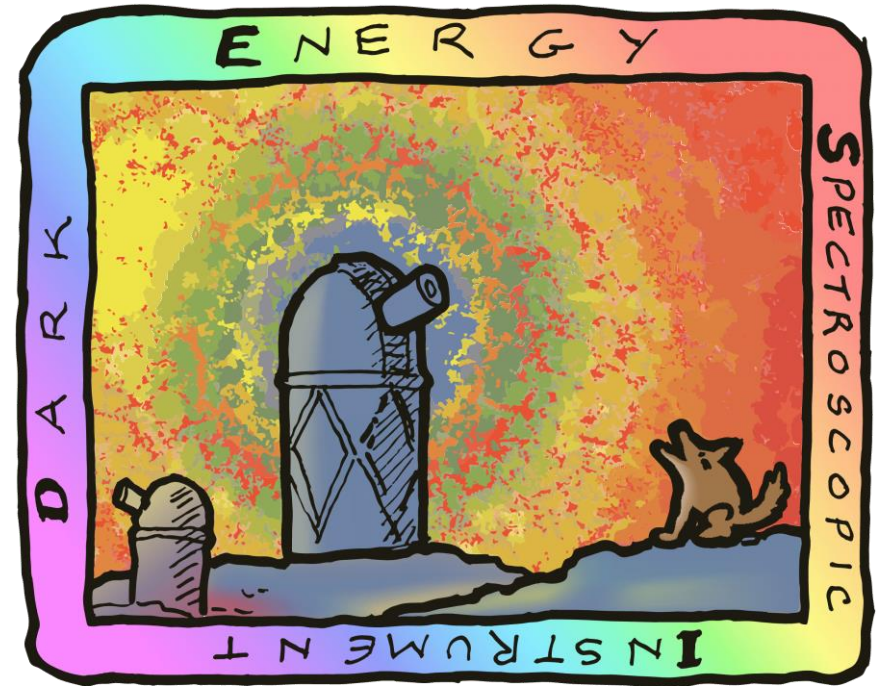
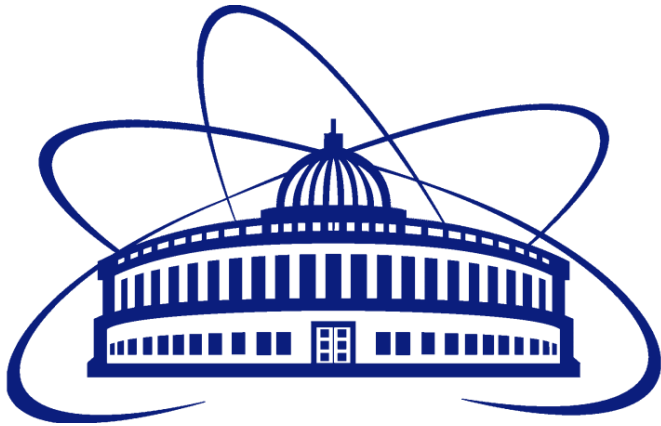


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## International Collaborations



Event Horizon Telescope

# 4- Transition to Ministry



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## Federal Electoral Proces 2023-2024

PhD Claudia Sheinbaum Pardo  
President-Elect 2024-2023

Announced transition from council  
to ministry

October 1st beginning of the transition  
phase for the humanistic and  
scientific research

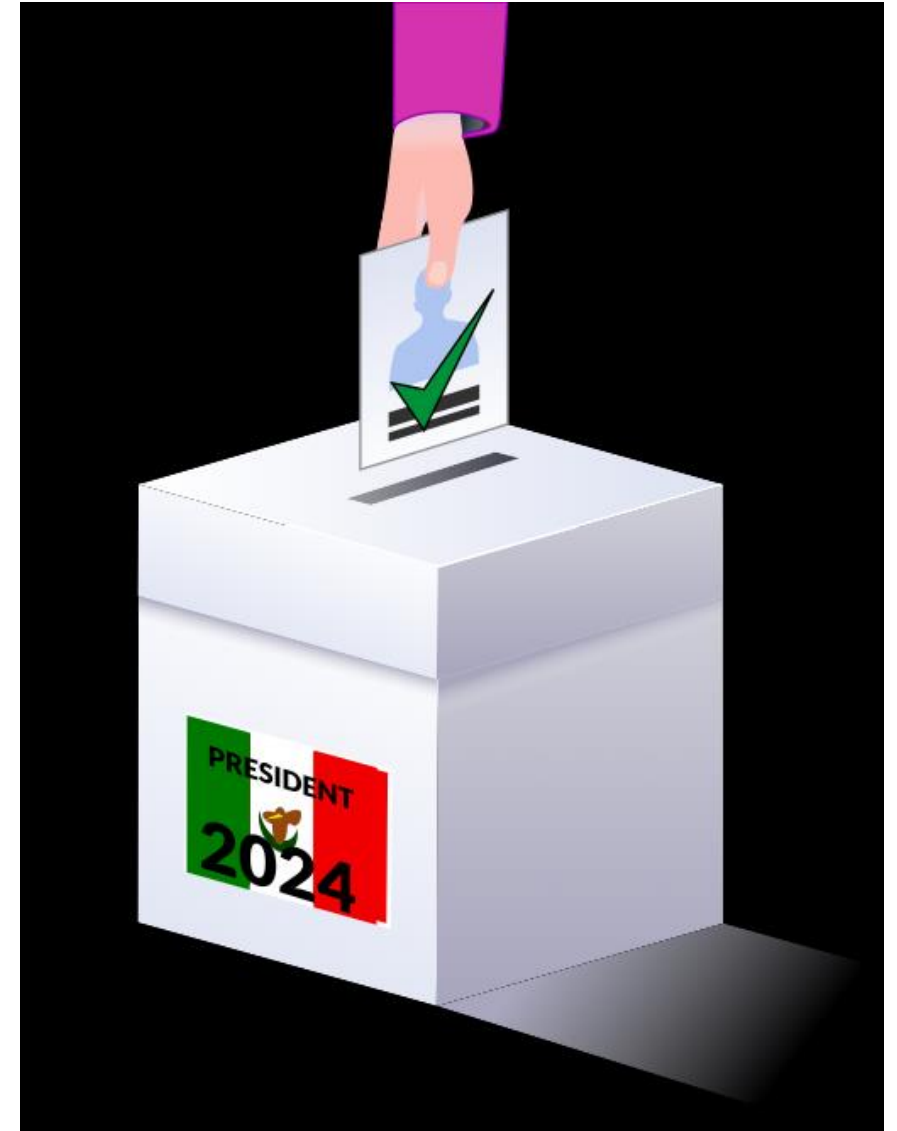


Image by Freepik

# Take-home message



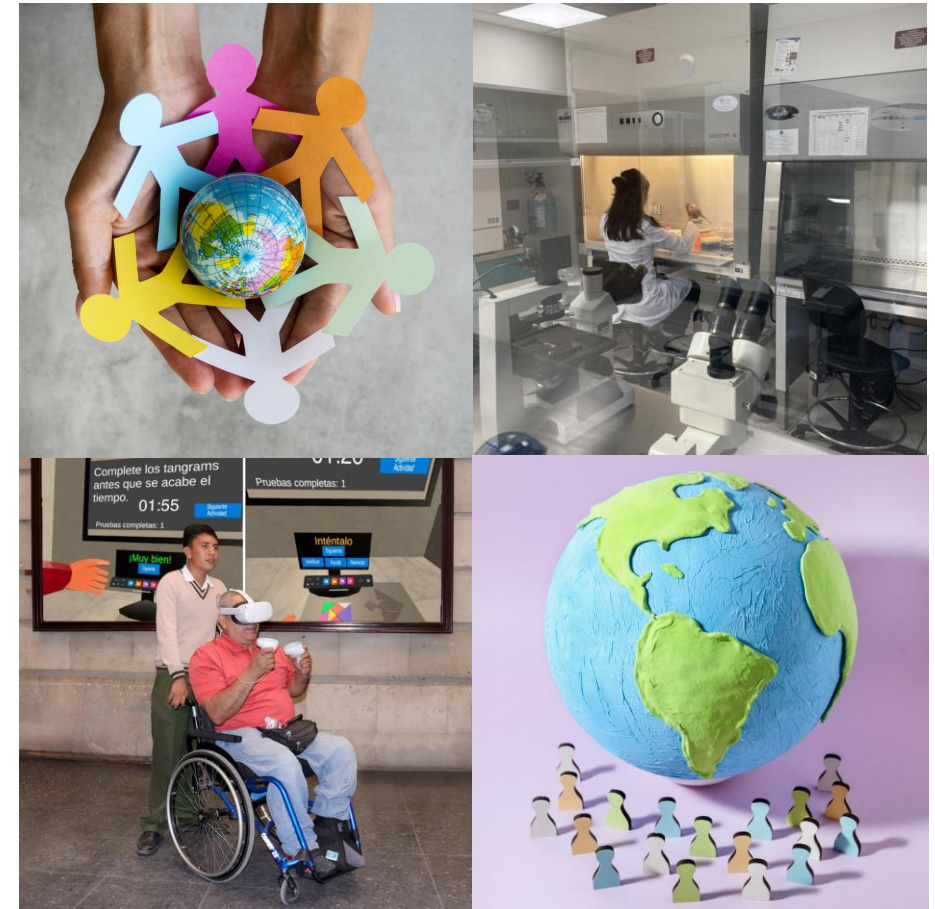
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## Mexican government funded science

- Technical excellence
- Collaborative research
- Industry knowledge transfer
- Intersection with the 2030 Agenda for Sustainable Development
- Generation of social benefits



Credit: Freepik (Top-Left), Elisa Hortensia Tamariz Domínguez (Top-Right), José Efrén Marmolejo Hernández (Bottom-Left), Freepik (Bottom-Right).



# Thank you



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For further information  
please contact:

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