

CTAO | CONSORTIUM

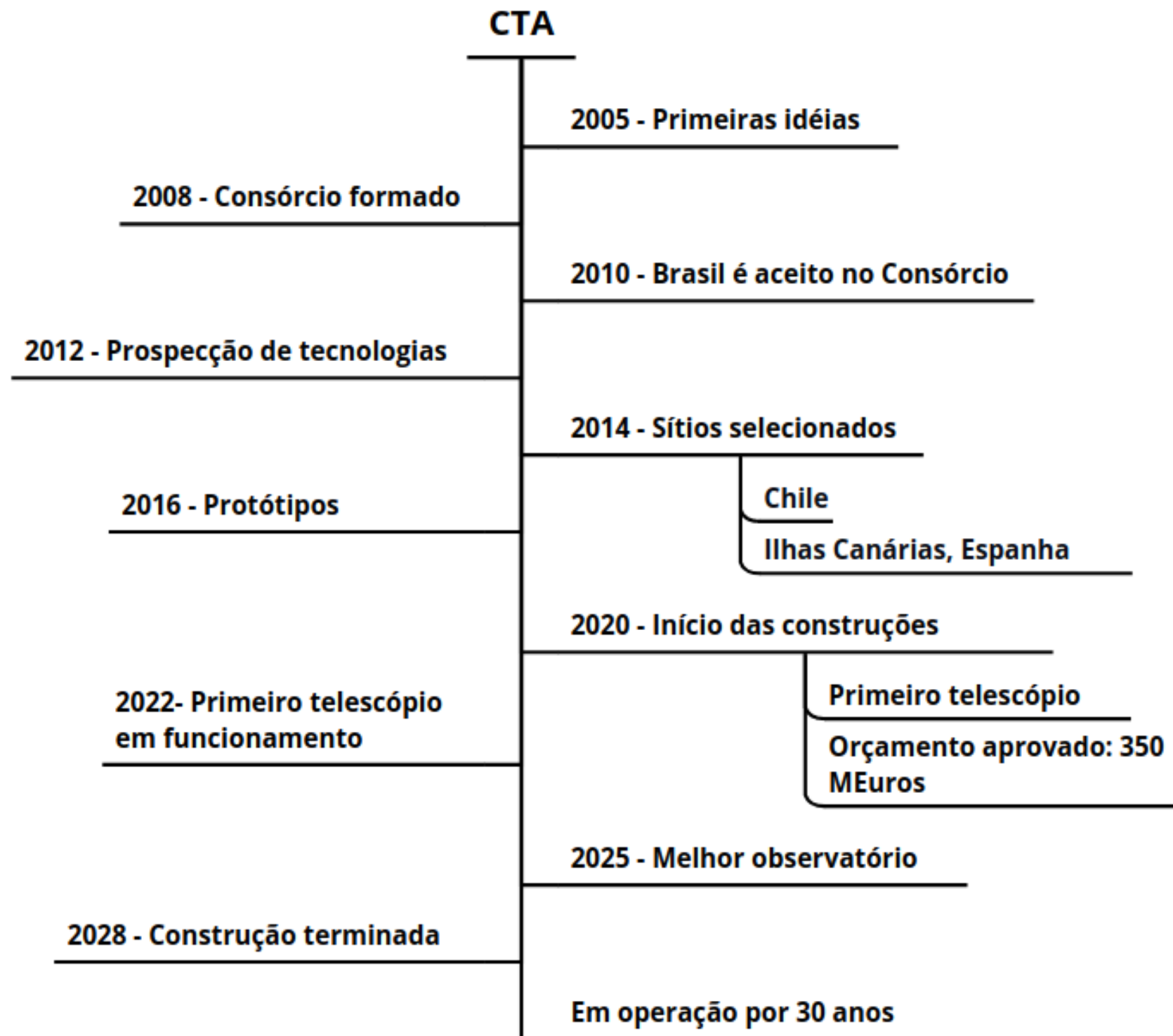


Vitor de Souza

vitor@ifsc.usp.br

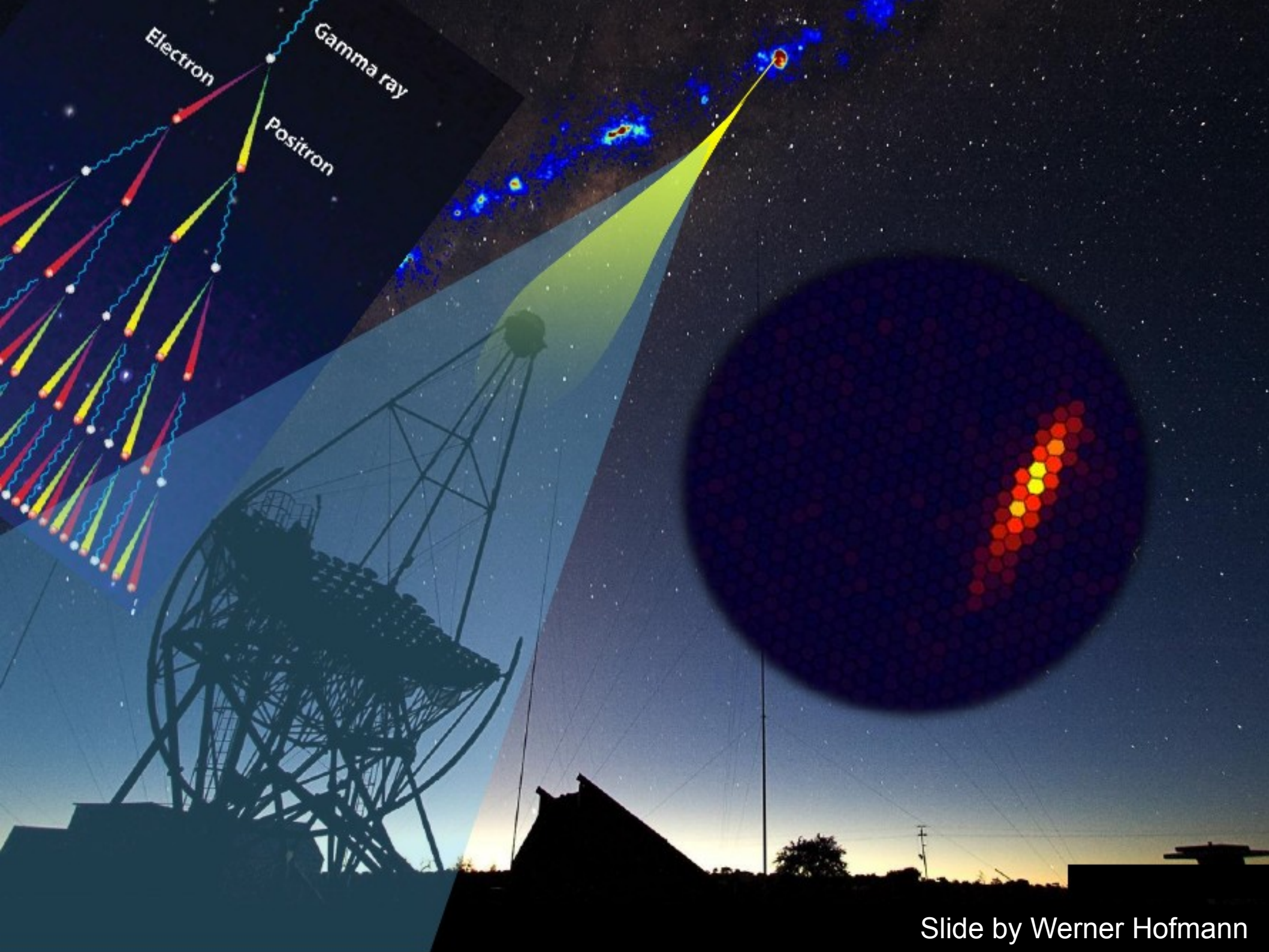


Next meeting: Nov 4-8 @ Bologna, Italy.



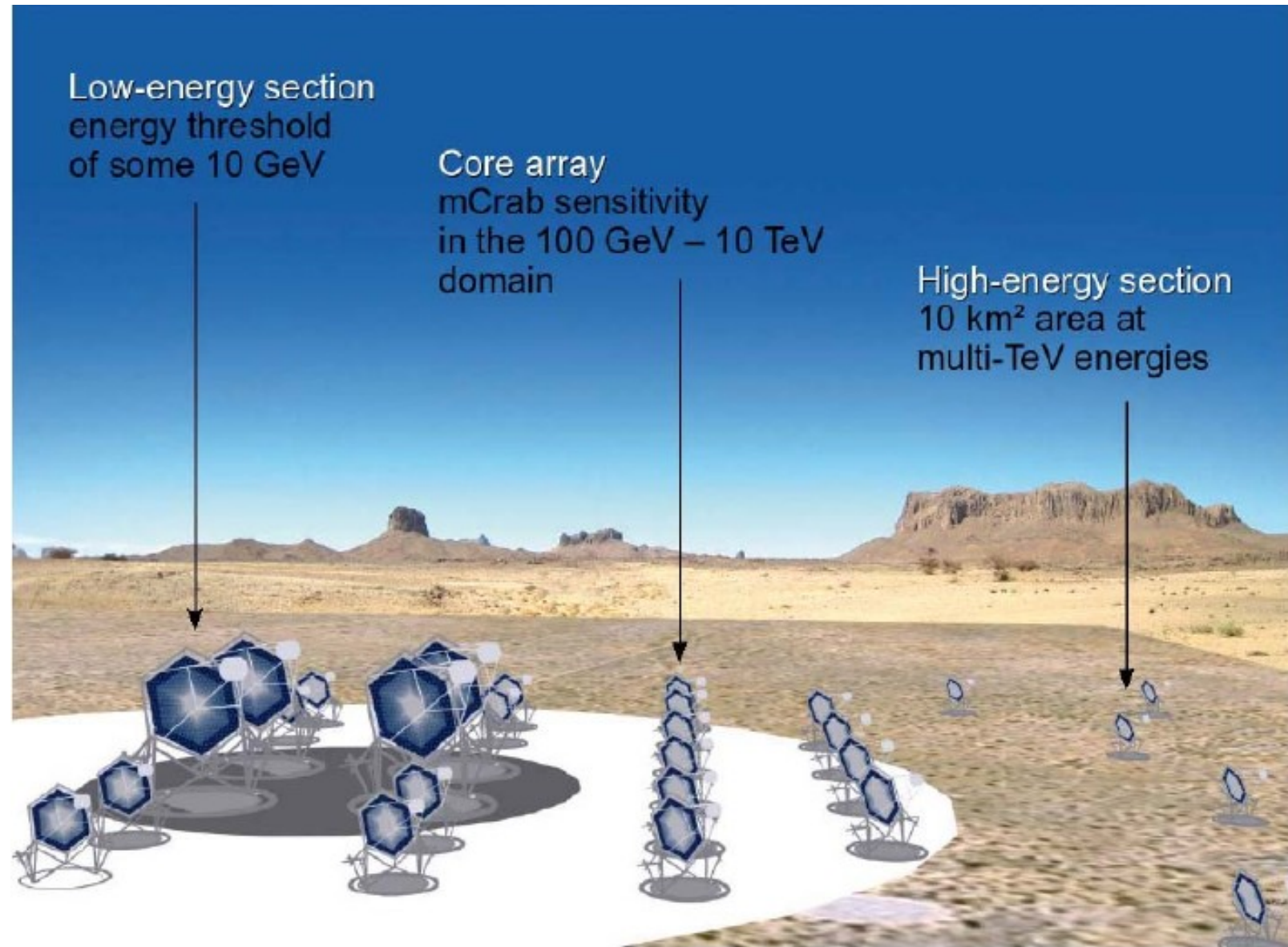
CTAO is:

- an effort being put together for more than 1000 people over the last two decades
- the first open gamma-ray Observatory
- an improvement of one order of magnitude
- the missing probe to the extremes of Nature
- being built now

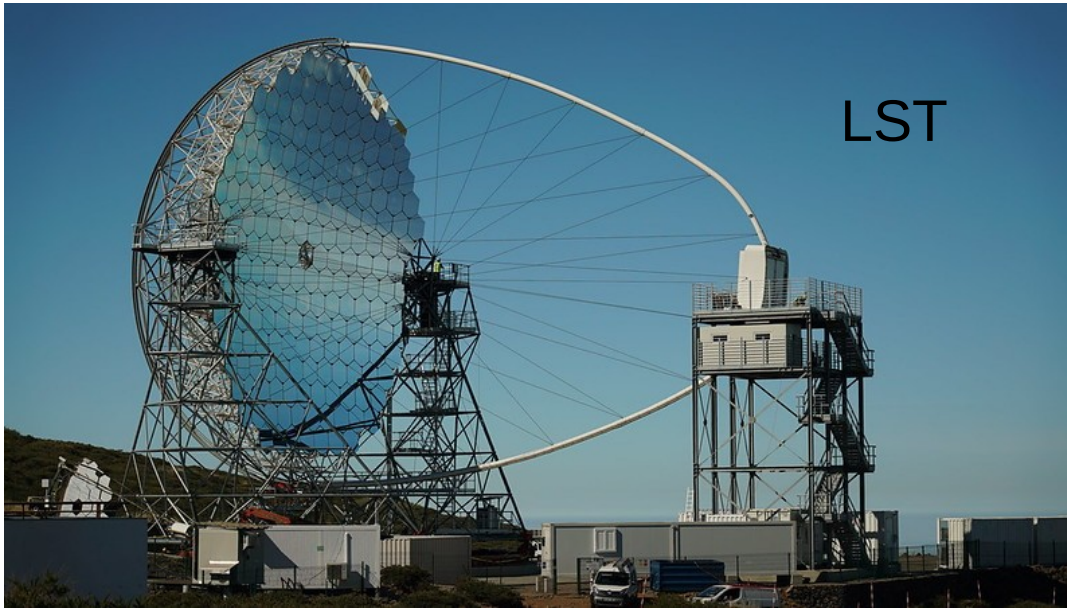


CTA Targets

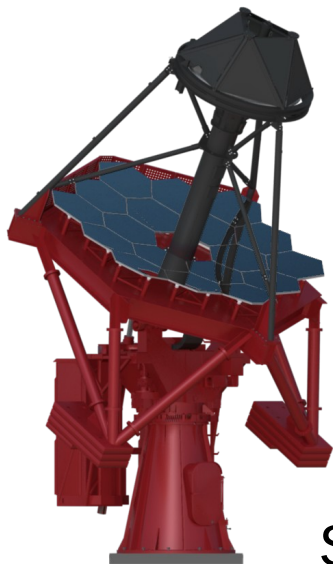
- Improve the sensitivity in one order of magnitude
- Widen the energy range
 - $20 \text{ GeV} < E < 300 \text{ TeV}$
- Increase the field of view
- Improve the angular resolution
 - 1- 3 arcmin
- Flexibility in operation



Telescopes in two sites: La Palma + Chile



LST



SST

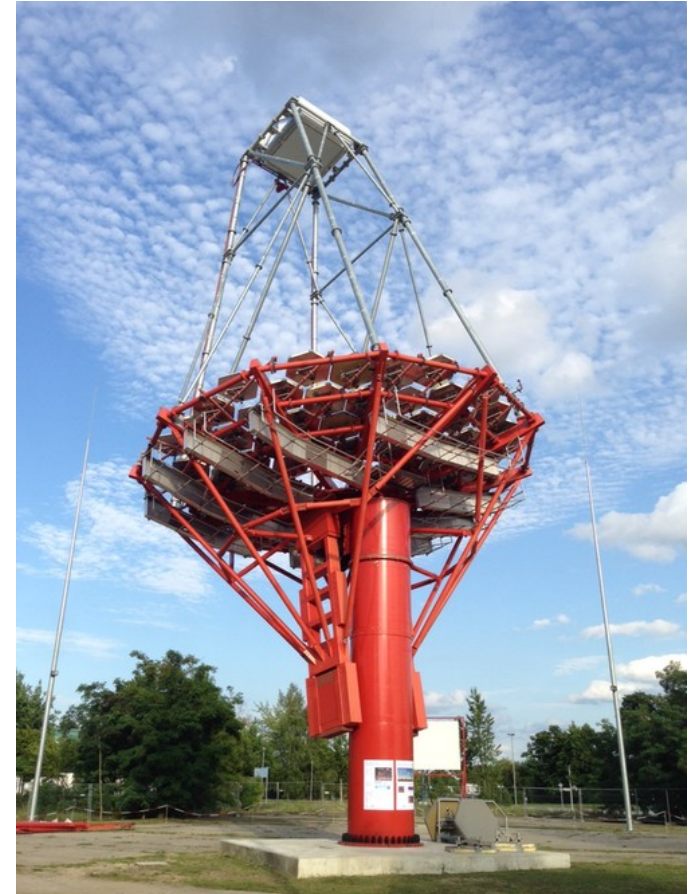
Alpha Configuration:

4 LST (La Palma)

9 + 14 MST

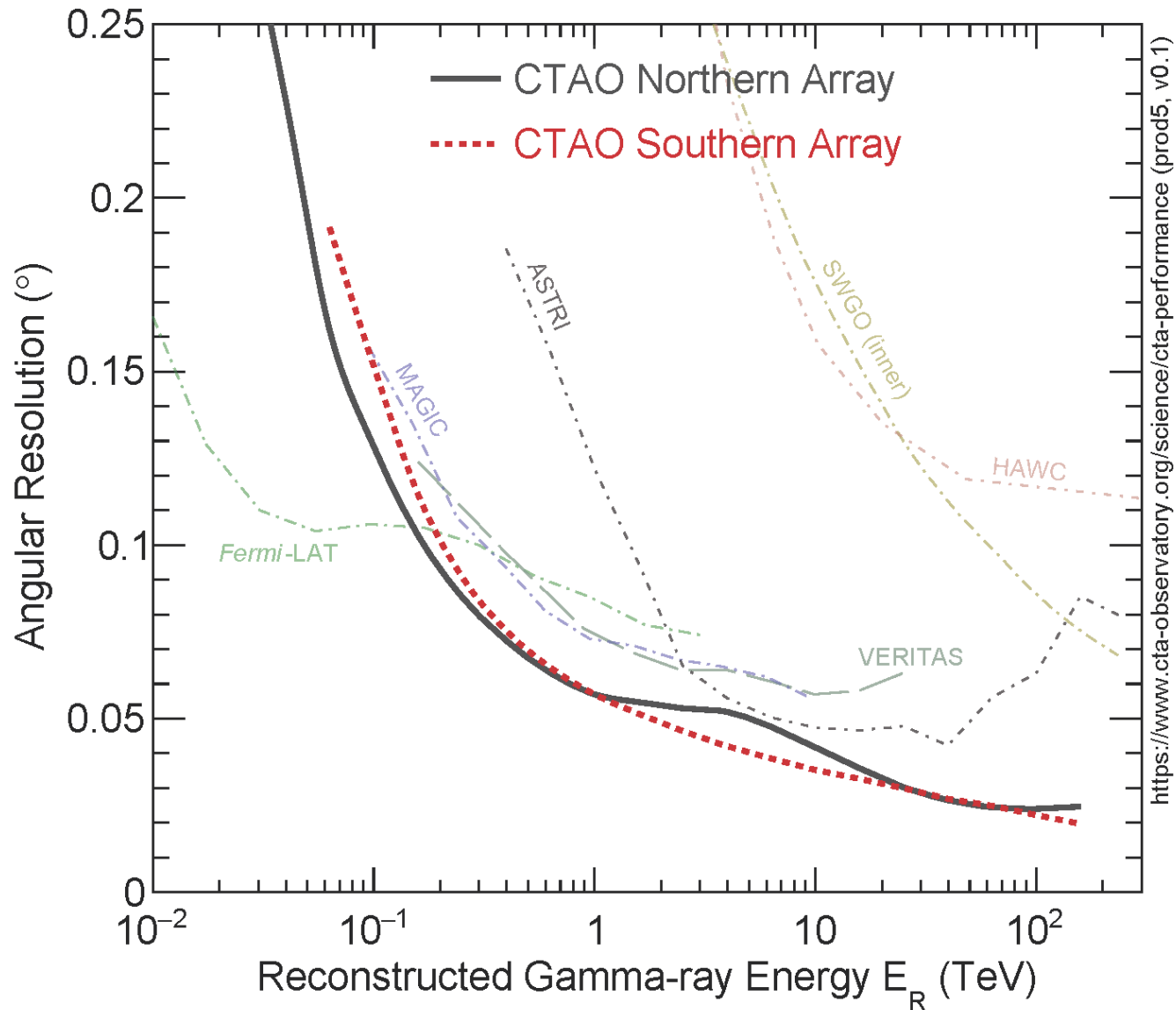
37 SST (Chile)

3 LST (Chile)

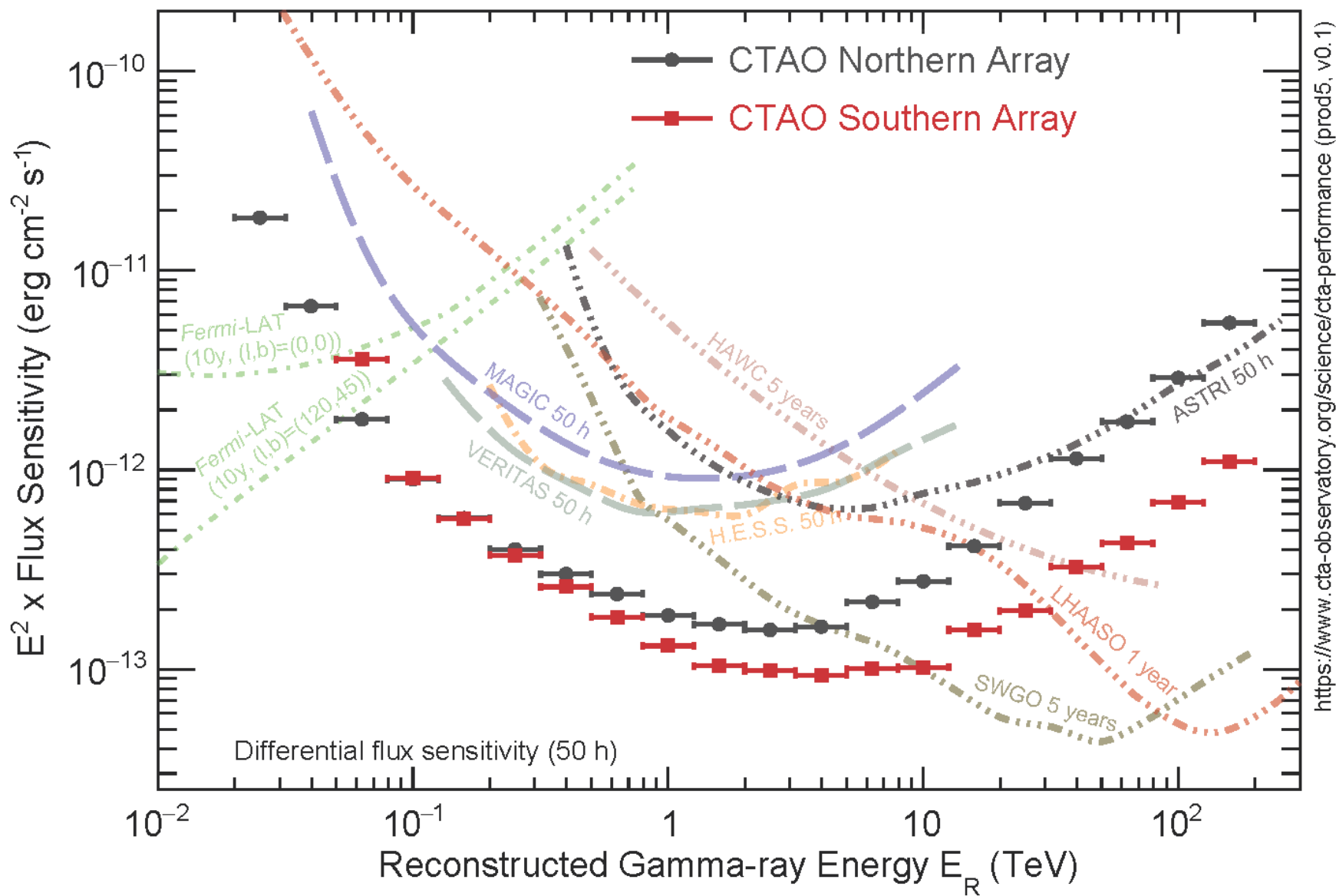


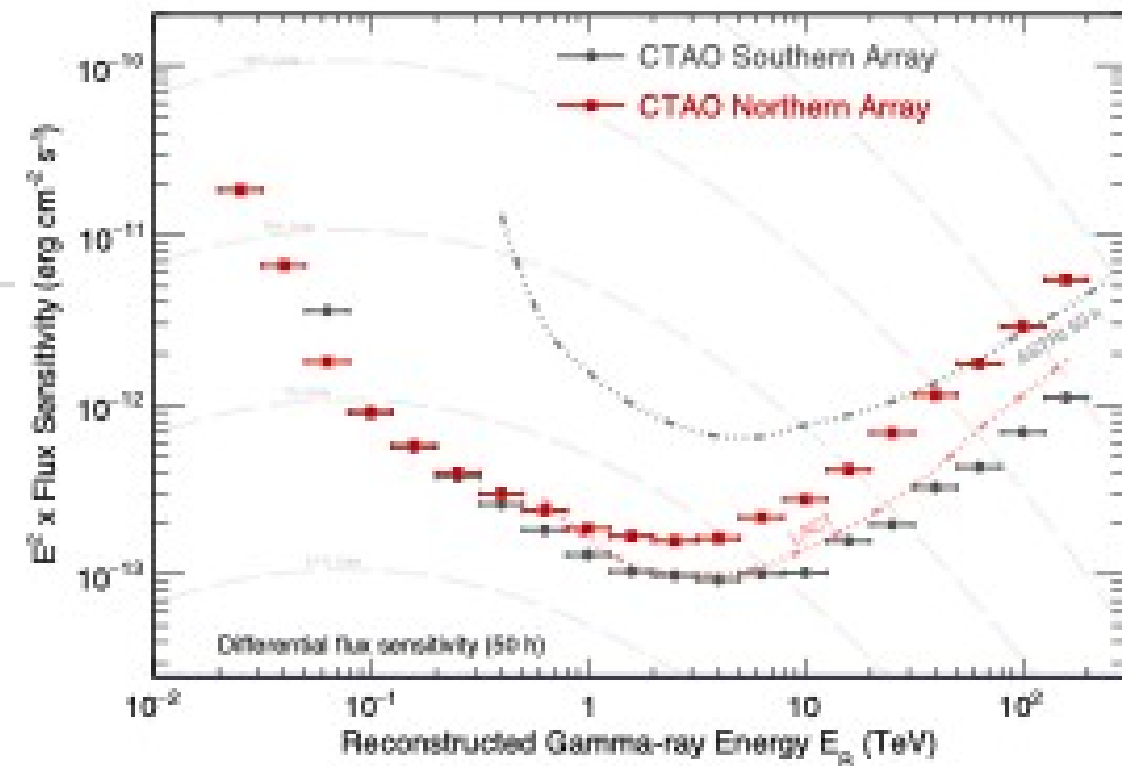
MST

Angular Resolution

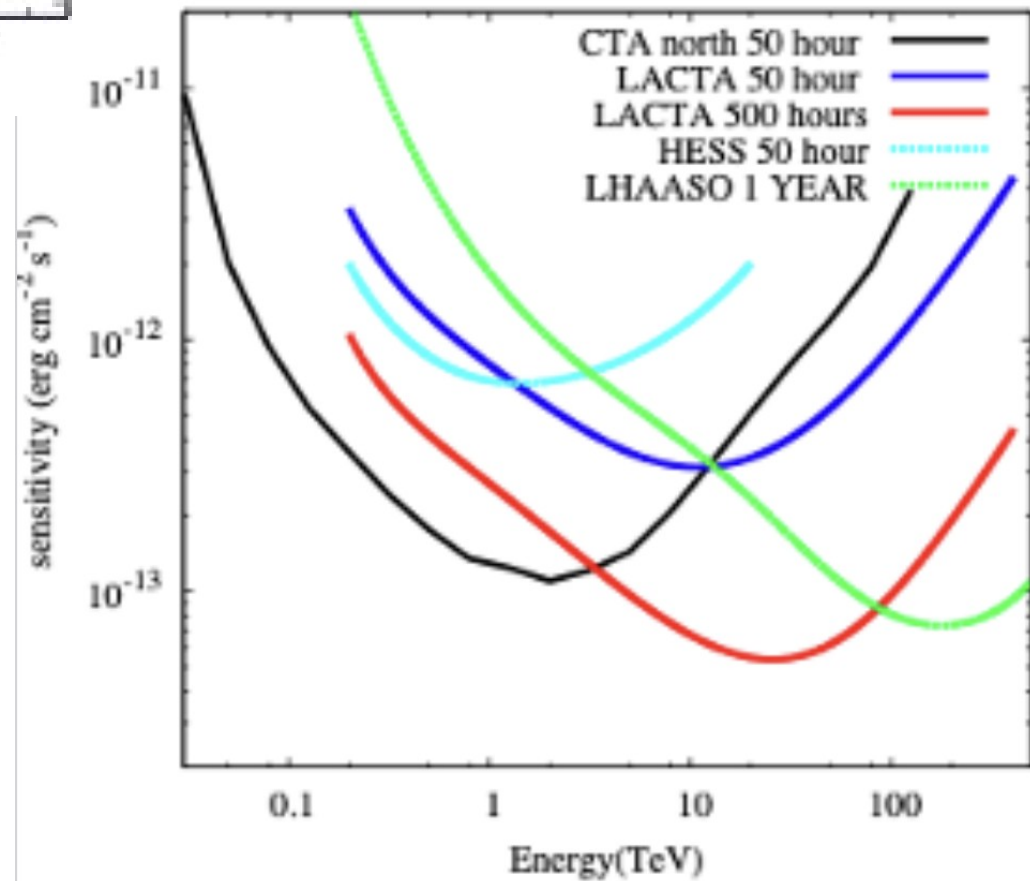


Sensitivity



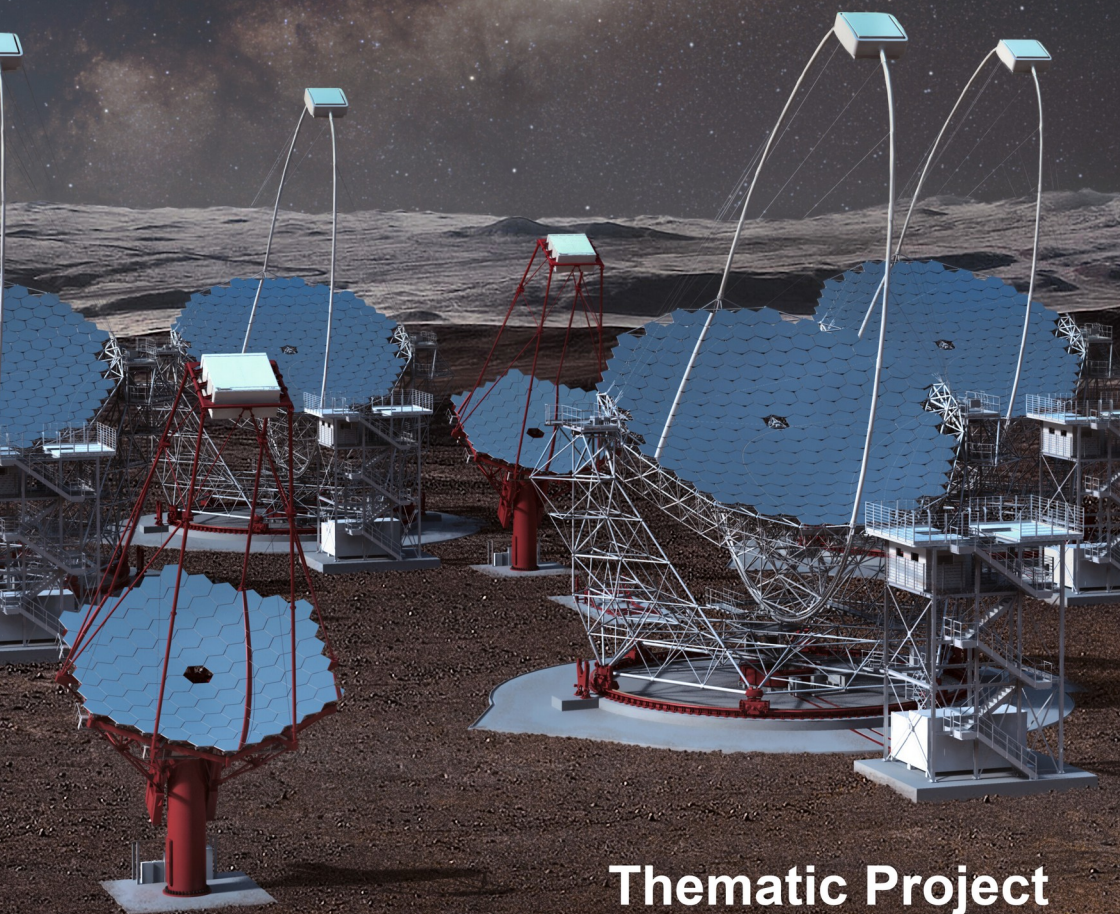


LACT - LHAASSO



CHERENKOV TELESCOPE ARRAY:

Construction and First Discoveries



Thematic Project



CBPF

Centro Brasileiro de
Pesquisas Físicas



INSTITUTO DE
ASTRONOMIA,
GEOFÍSICA
E CIÊNCIAS
ATMOSFÉRICAS



Our project

- Dark matter
- Lorentz Invariance Violation
- Sources and propagation
- Shower simulation and reconstruction
- Instrumentation
- Outreach and education

CTA Brasil

2011 - Financiamento

Prospecção de indústrias

Construção colaboração nacional

2015 - Inovação Brasileira

Camera Support Structure

Interface de atuadores

2019 - Primeira Patente

Dispositivo de posicionamento

2010 - Convite

2014 - Consolidação

IFSC/USP - Vitor de Souza

IAG/USP - Elizabete dal Pino

CBPF - Ulisses Barres de Almeida

2018 - Posições de Liderança

2018: SAPO Chair: Vitor de Souza

2018: MWL Coord.: Ulises Barres de Almeida

2022: Chair do CB: Vitor de Souza

2022 - Habilitados

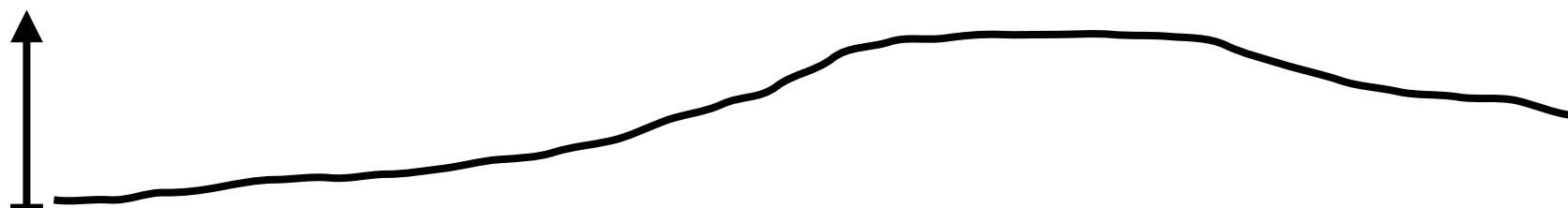
Liderança científica

Envolvimento da indústria nacional

CIÊNCIA BÁSICA: Resultados científicos de impacto

CIÊNCIA APLICADA: Inovação em instrumentação

COMUNICAÇÃO E EDUCAÇÃO: Presencial, virtual e inclusiva



P
E

7

10

12

17

30

15

45

21



300k

400k

> 1M

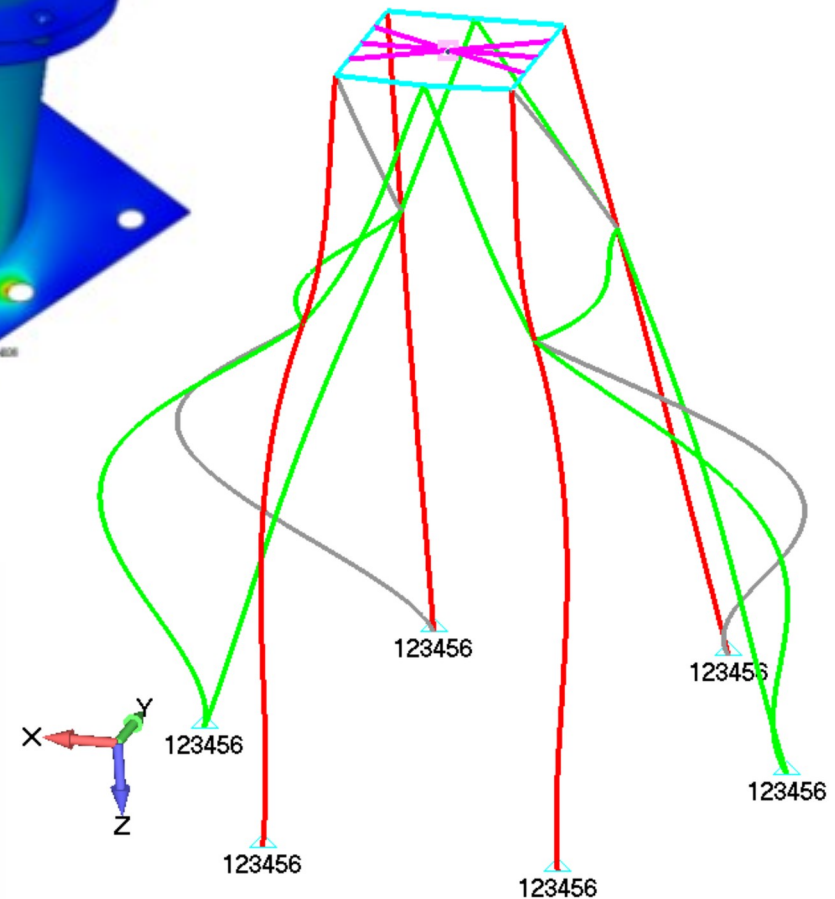
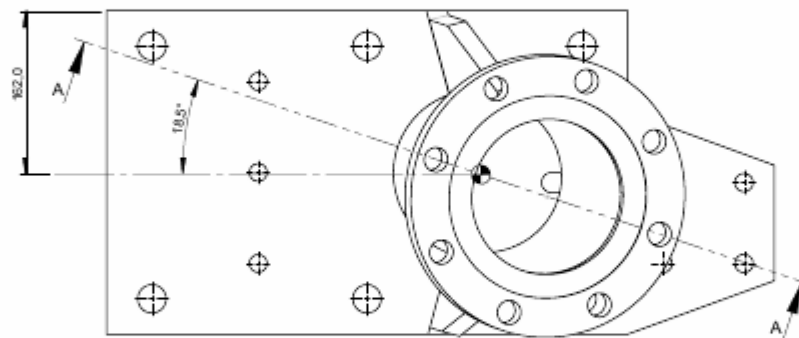
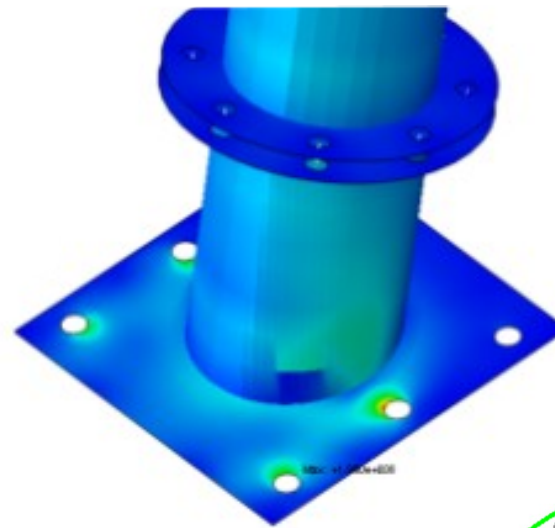
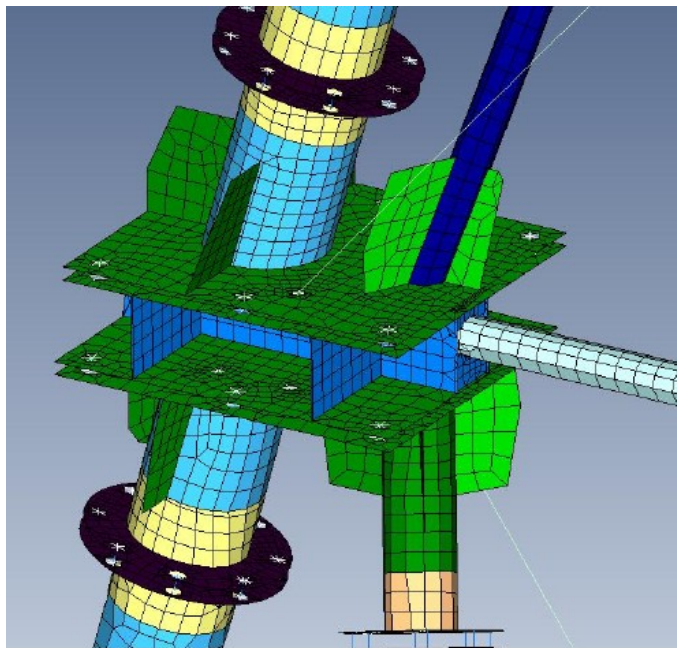
> 10M

?

2010 2015 2020 2025 2030 2035 2040

térmico – carga (vento, gelo, água, areia)

vibração (terremoto) – deformação





Protótipo 0



Protótipo 1





Part of the MST

Camera Support Structure

Brazilian project



2 prototypes
already
constructed,
delivered
and
approved

Patent of
positioning
system



Budget approved for 10
structures to be build in
the next two years.

9 x  **FAPESP**
+ 1 x  **ARAUCARIA**

CTA observation modes

very deep field



deep field



deep field



monitoring



survey mode






cherenkov
telescope
array

Science with the Cherenkov Telescope Array

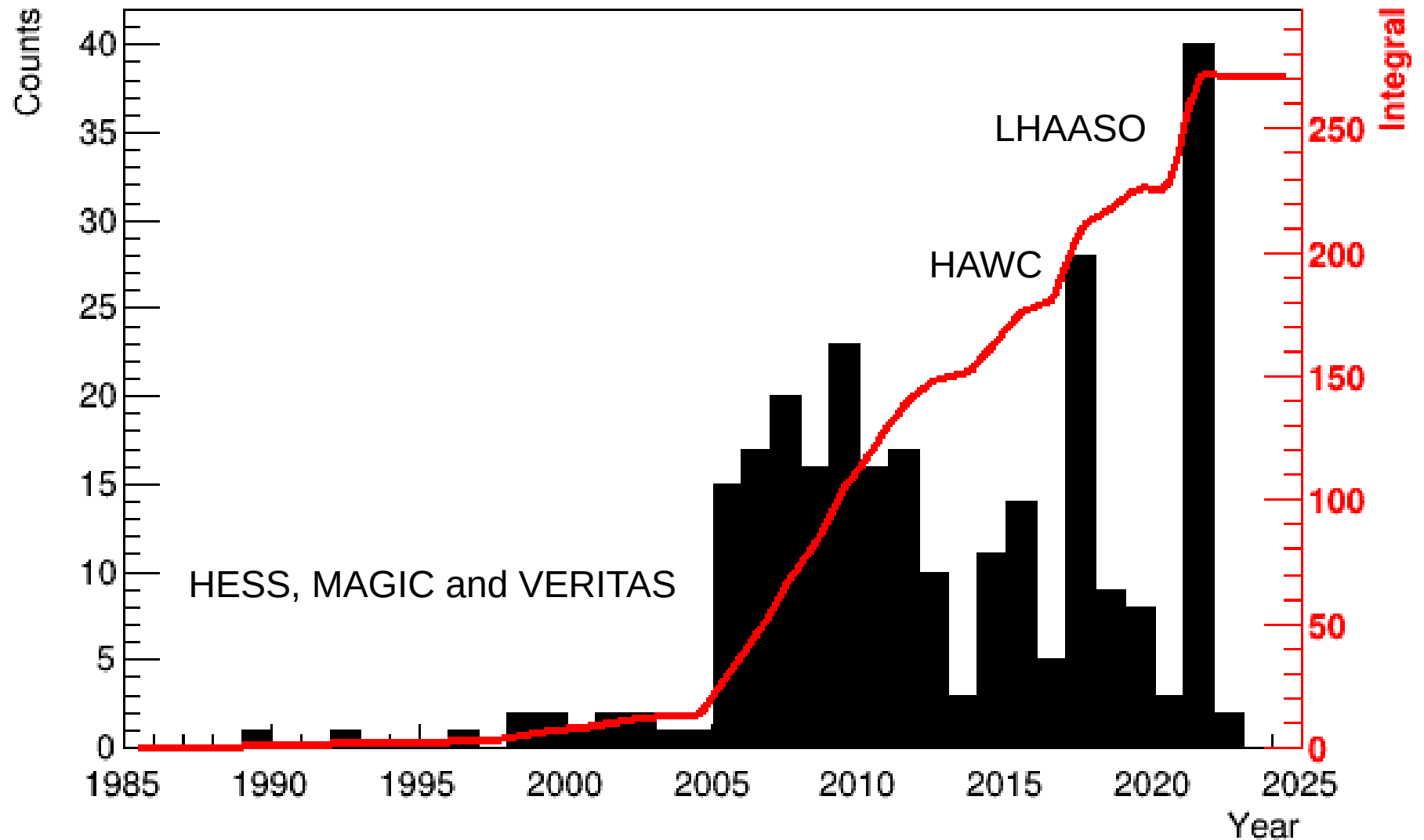
The CTA Consortium

 World Scientific

**Unveil the extremes
of the Universe**

[https://arxiv.org/abs/
1709.07997](https://arxiv.org/abs/1709.07997)

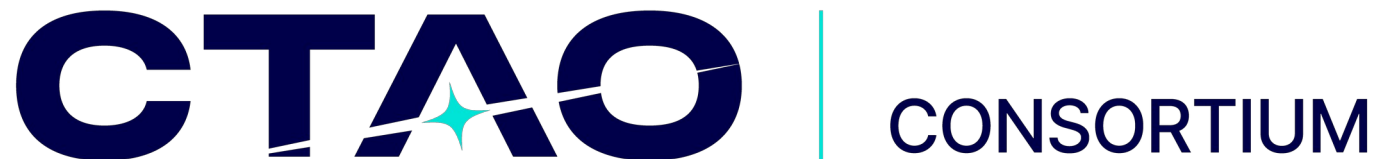
TeV gamma-rays sources



Re-branding



Reason: transition to full construction

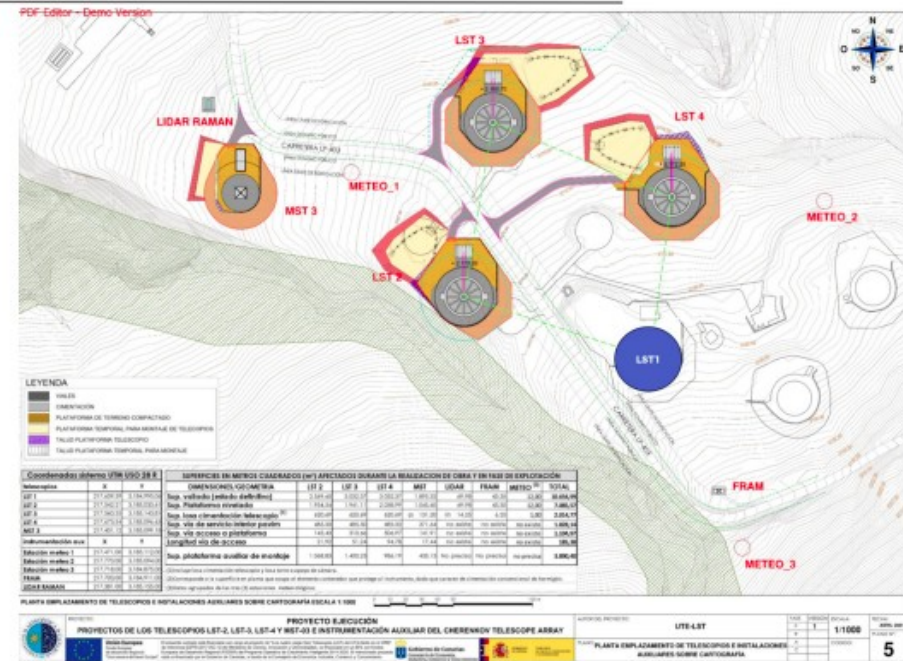


LST-1: Ready and taking data



<https://www.lst1.iac.es/webcams.html>

Toward the LSTs Array

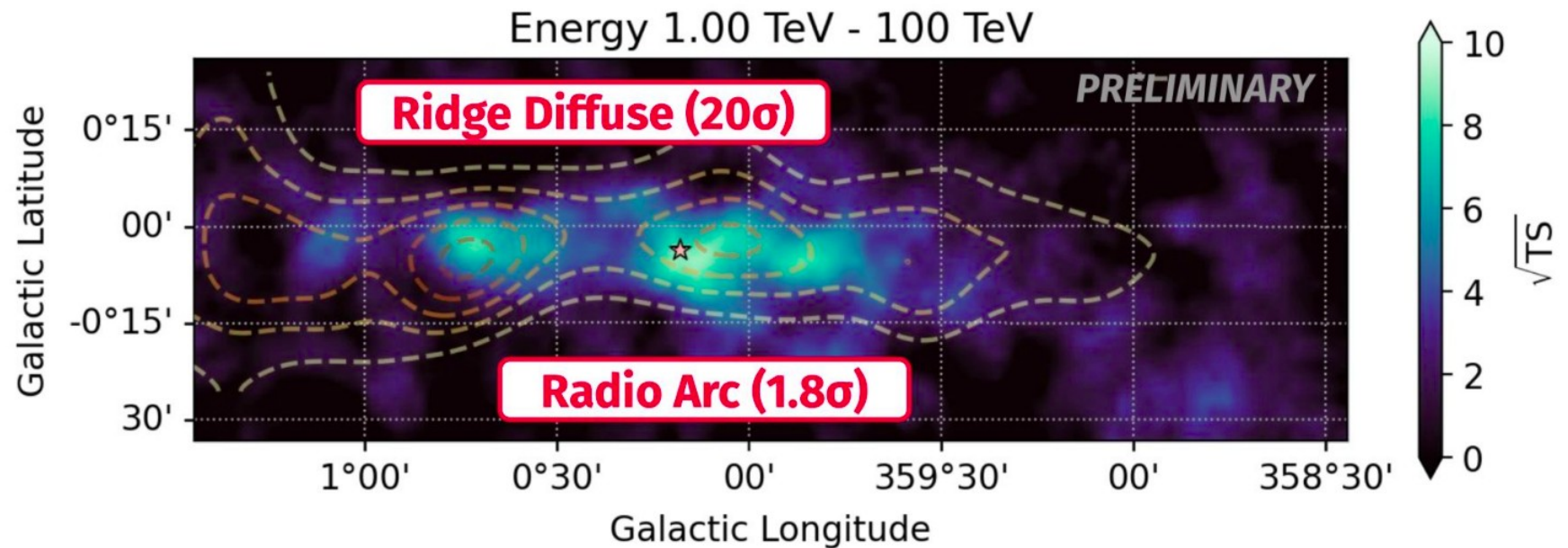


- works ongoing for LST-2, -3 & -4
- End of Installation foreseen by 2025
- + LST in the south founded by PNRR

We can access LST data !

Early Science: Galactic Center

Sgr A* & G0.9+0.1
subtracted



Spokesperson election

- The candidates are:
 - Patrizia Caraveo
 - Francesco Longo
 - Thierry Stolarczyk
 - Masahiro Teshima

Take away message

- CTAO is launching
- Even prior to launch, CTAO is making many important contributions
- CTAO is a great opportunities for young people and safe environment for group's inception
- CTAO will open a new window of discoveries