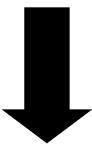


CTA dans le labex

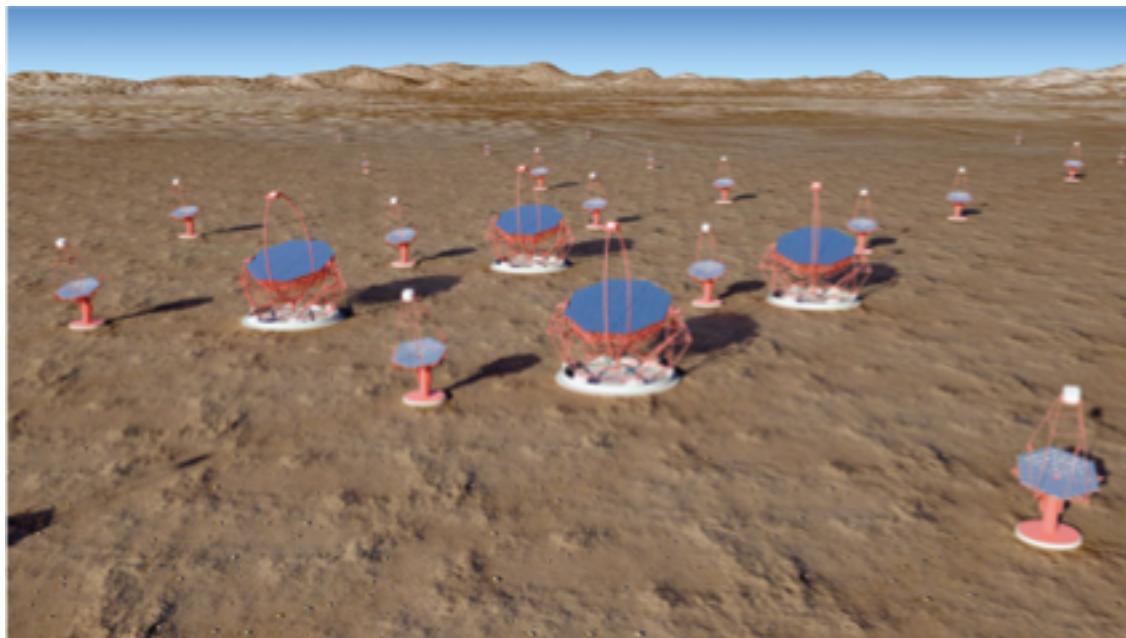
David Sanchez

10/12/2020

From 2-5 Tel arrays

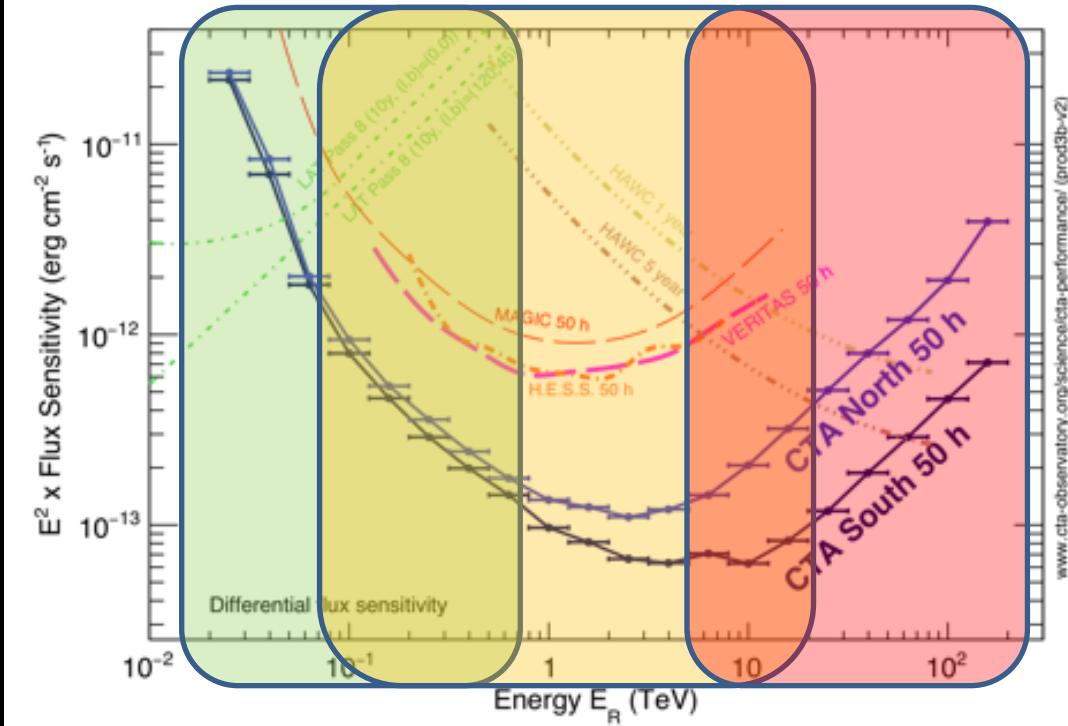
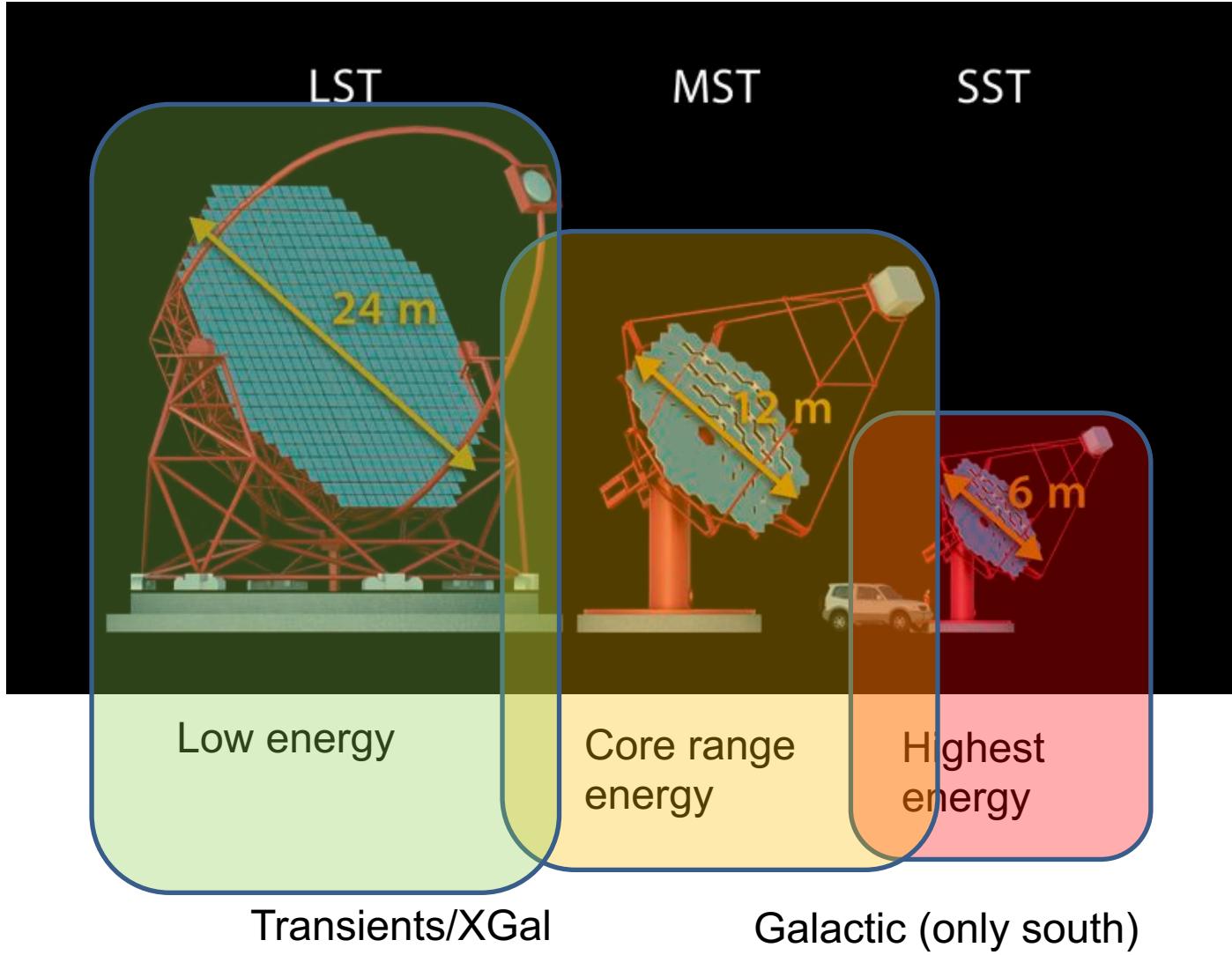


To ~ 100 telescopes



Open observatory
30 years operations
2 sites
32 nations





Large Sized Telescope



Science drivers

Lowest energies (< 200 GeV)
Transient phenomena, DM, AGN, GRB,
pulsars

Characteristics

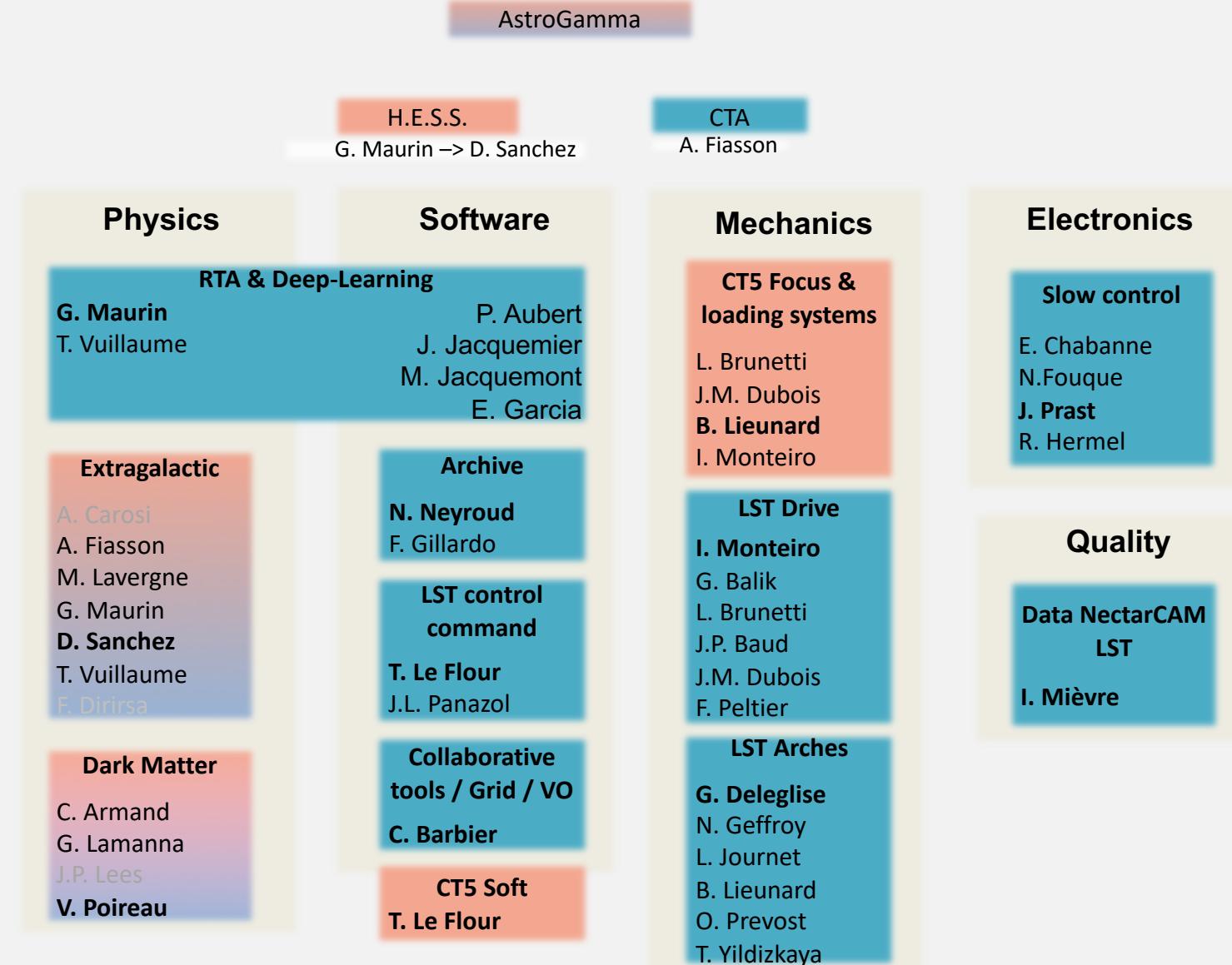
23m diameter parabolic design
370 m² effective mirror area
28 m focal length
1.5 m mirror facets with active mirror control
4.5° field of view composed of 0.11° PMT pixels
Carbon-fibre arch structure (fast repointing)

Array layout

South site: 4 LST
North site: 4 LST

Status

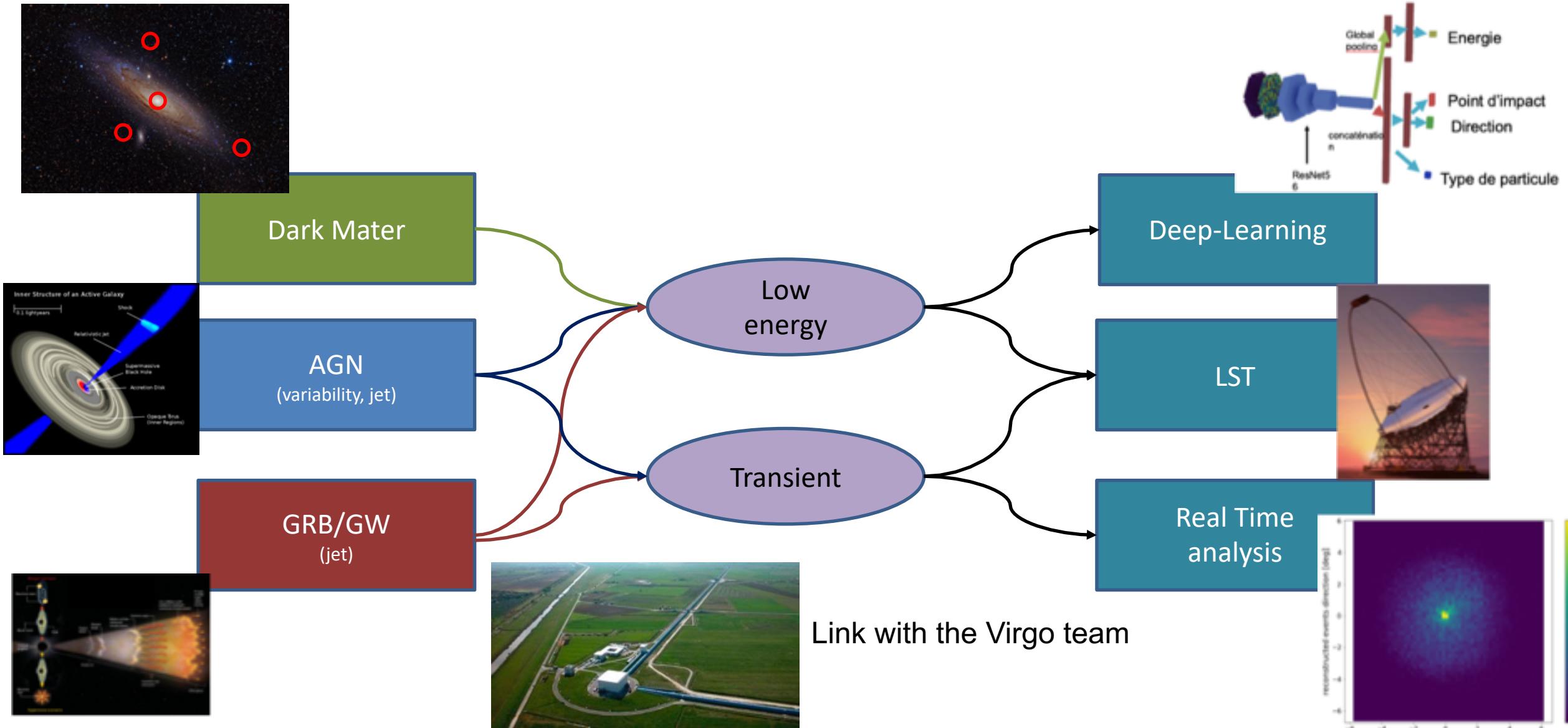
First Telescope build and in commissioning phase (to become first full LST)
LST2-4 will be build soon

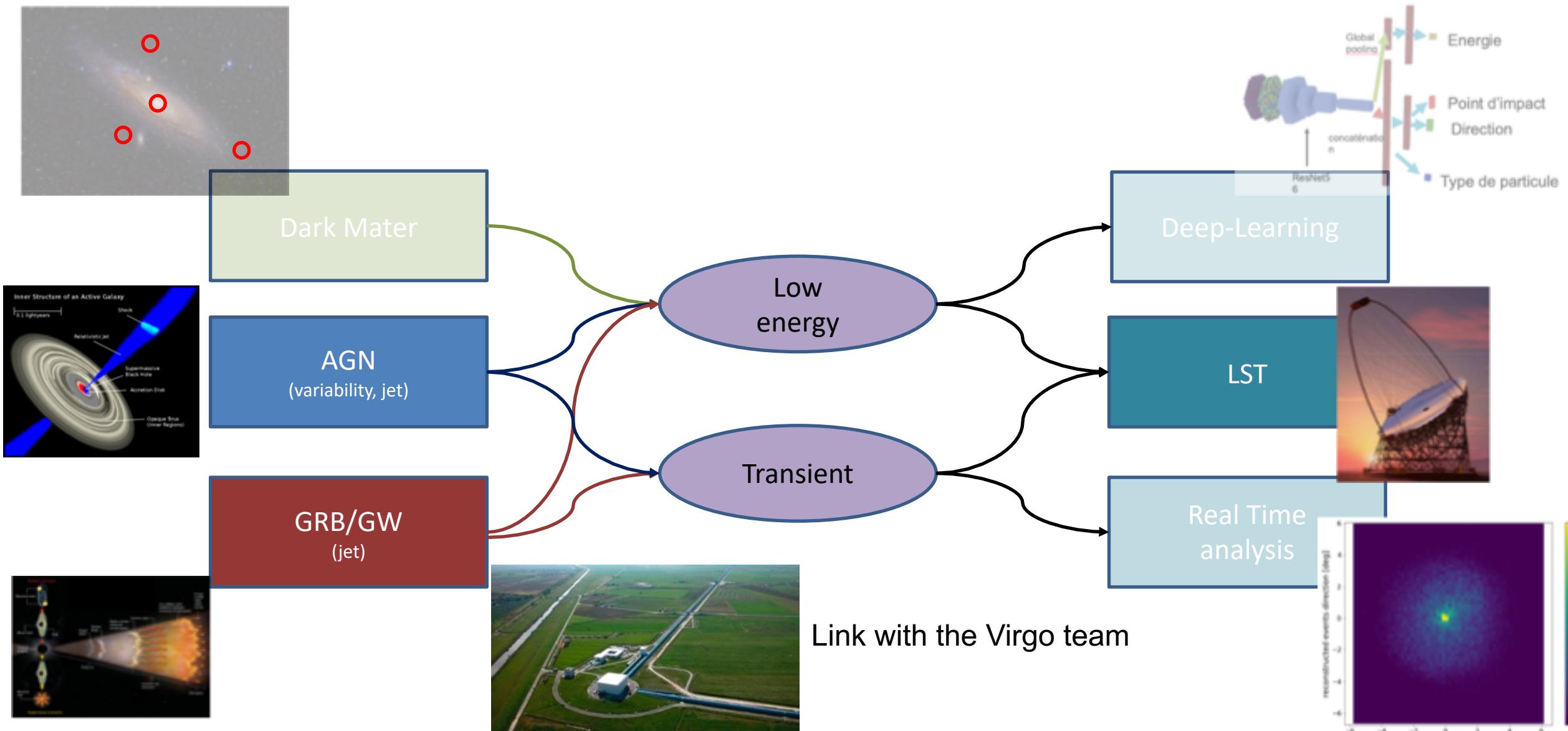


People under the umbrella of Enigmass

Main focus : GRB activity if the group

- A. Carosi 2017-2020: Expert on GRB and work in both HES and CTA collaborations.
- F. Dirisa : Start in October and then decided to resigned and leave.



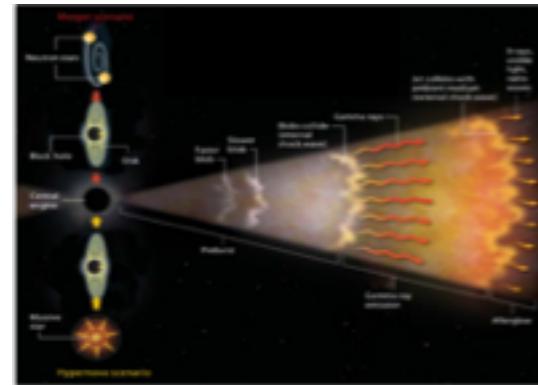


- First detection in 2018 by H.E.S.S.

- Since 2 other GRBs were detected
 - Maybe a 4. by MAGIC

- The future :

- Group is deeply involved in the GRB task force of HESS
 - Implication in LST



TITLE: GCN CIRCULAR

NUMBER: 28659

SUBJECT: MAGIC observations of GRB 201015A: hint of very high energy gamma-ray signal

DATE: 20/10/16 16:48:37 GMT

FROM: Oscar Blanch at MAGIC Collaboration <blanch@ifae.es>

O. Blanch (IFAE-BIST Barcelona), M. Gaug (UAB Barcelona), K. Noda (ICRR University of Tokyo), A. Berti (INFN Torino), E. Moretti (IFAE-BIST Barcelona), D. Miceli (University of Udine and INFN Trieste), P. Gliwiny (University of Lodz) S. Ubach (UAB Barcelona), B. Schleicher (University of Wuerzburg), M. Cerruti (University of Barcelona) and A. Stamerra (INAF Rome) on behalf of the MAGIC collaboration report:

On October 15, 2020, the MAGIC telescopes observed GRB 201015A following the Swift-BAT trigger (DiCarlo et al., GCN 28632). MAGIC started observations under good conditions about 40 seconds after the initial Swift trigger, revealing a hint of signal with significance >3 sigma in the very high energy band. Refined off-line analyses of the data are ongoing.

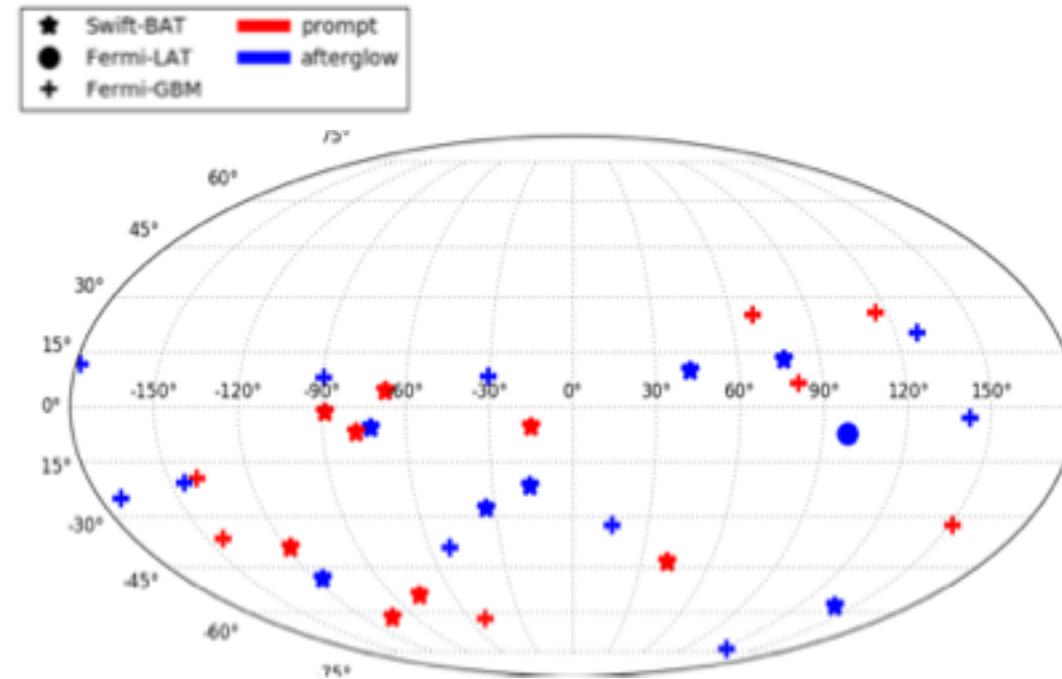
Further MAGIC observations on GRB 201015A are planned in the coming night. We strongly encourage follow-up observations by other instruments at all wavelengths.

The MAGIC point of contact for this burst is O. Blanch (blanch@ifae.es). Burst Advocate for this burst is M. Gaug (Markus.Gaug@uab.cat)

MAGIC is a system of two 17m-diameter Imaging Atmospheric Cherenkov Telescopes located at the Observatory Roque de los Muchachos on the Canary island La Palma, Spain, and designed to perform gamma-ray astronomy in the energy range from 50 GeV to greater than 50 TeV.

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Avés -
Aviso - Legal Notice - (LOPD) - <http://legal.ifae.es>
<<http://legal.ifae.es/>>

For 15 years not electromagnetic emission in the TeV range



H.E.S.S. GRB sample

- Re-analysis of the data since 2008
 - Take profit of the improvement of the analysis
 - Only use 1 type of analysis
- Leader in this task (A. Carosi, LAPP)
 - Coordination
 - LAPP team ran the analysis of 66 GRBs

Article “review” in progress

- 1 member of LAPP will be corresponding author

[Previous | Next | [ADS](#)]

GRB190829A: Detection of VHE gamma-ray emission with H.E.S.S.

ATel #13052; *M. de Naurois (H. E.S. S. Collaboration)*

on 30 Aug 2019; 07:12 UT

Credential Certification: Fabian Schüssler (fabian.schussler@cea.fr)

Subjects: Gamma Ray, >GeV, TeV, VHE, Gamma-Ray Burst

[Tweet](#)

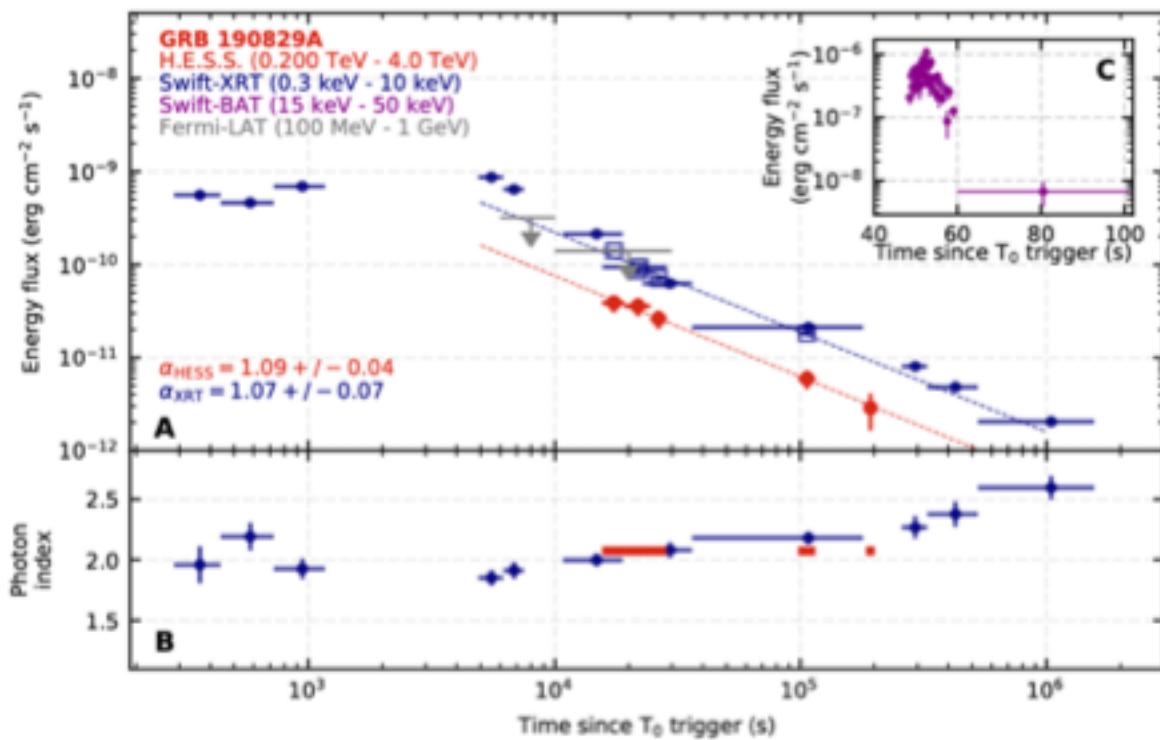
The H.E.S.S. array of imaging atmospheric Cherenkov telescopes was used to carry out follow-up observations of the afterglow of GRB 190829A (Dichiara et al., GCN 25552). At a redshift of $z = 0.0785 \pm 0.005$ (A.F. Valeev et al., GCN 25565) this is one of the nearest GRBs detected to date. H.E.S.S. Observations started July 30 at 00:16 UTC (i.e. T0 + 4h20), lasted until 3h50 UTC and were taken under good conditions. A preliminary onsite analysis of the obtained data shows a $>5\sigma$ gamma-ray excess compatible with the direction of GRB190829A. Further analyses of the data are on-going and further H.E.S.S. observations are planned. We strongly encourage follow-up at all wavelengths. H.E.S.S. is an array of five imaging atmospheric Cherenkov telescopes for the detection of very-high-energy gamma-ray sources and is located in the Khomas Highlands in Namibia. It was constructed and is operated by researchers from Armenia, Australia, Austria, France, Germany, Ireland, Japan, the Netherlands, Poland, South Africa, Sweden, UK, and the host country, Namibia. For more details see <https://www.mpi-hd.mpg.de/hfm/HESS/>

- afterglow d'un GRB par H.E.S.S. (Août 2019)
- Atel sent the day after (2019/08/30 #13052)
- **Afterglow détecté 4h après le burst et suivi 2 jours plus tard par HESS**
- **Major contribution from the LAPP**
 - **A. Carosi** ran the analysis

Important implications for the GRB physic

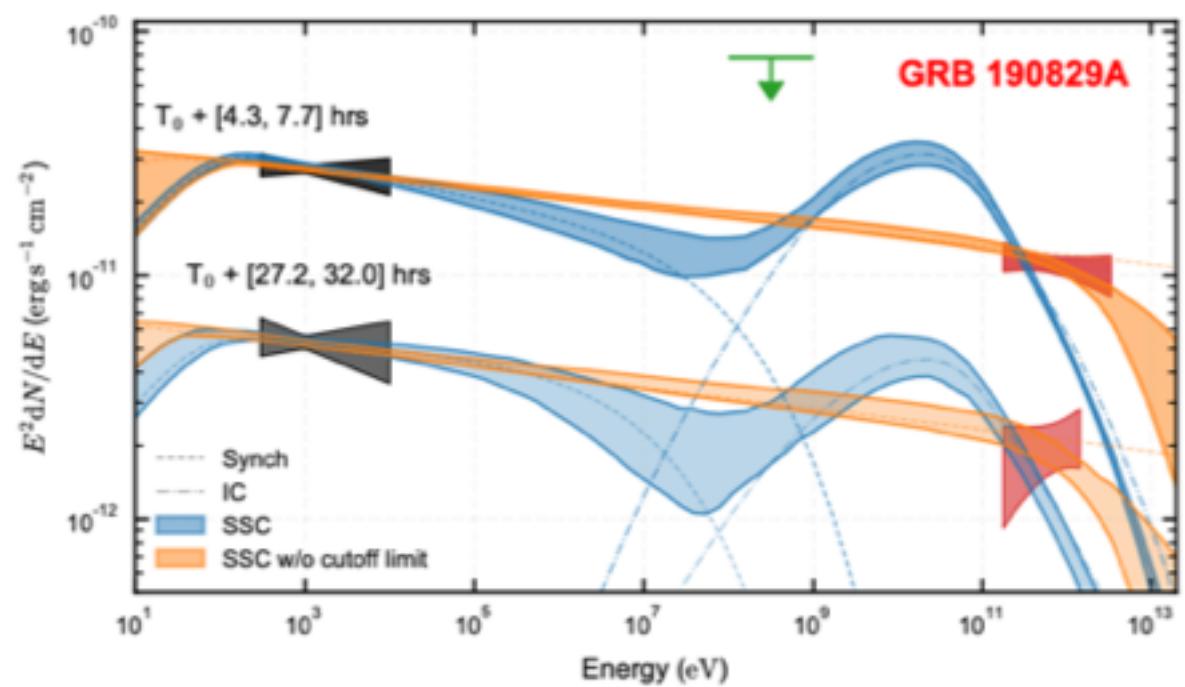
4 nights of observations

X-ray et TeV bandes follow a similar trend -> link between the 2 bands

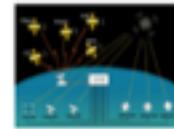


Synchrotron + IC ruled out

Synchrotron only preferred



TH design

**LSST****LOFAR**

Code and interface donne at LAPP

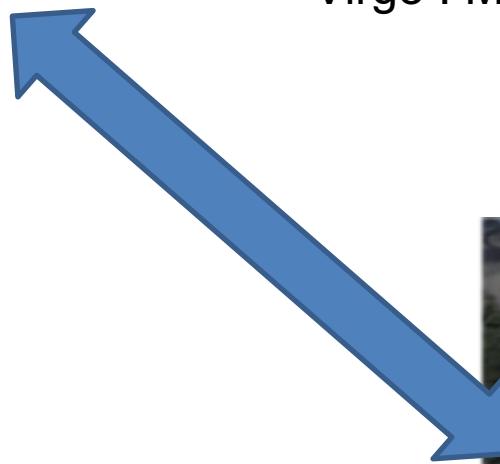
Feedback with the RTA

Crédit : A. Carosi



Work on the transient alerter :
réception/reaction and feedback loop

Simulations and prediction of alerts/follow up



Virgo – CTA (LST) : reflection for possible collaboration

Post doc ENIGMASS : Feraol Fana Diarisa but left

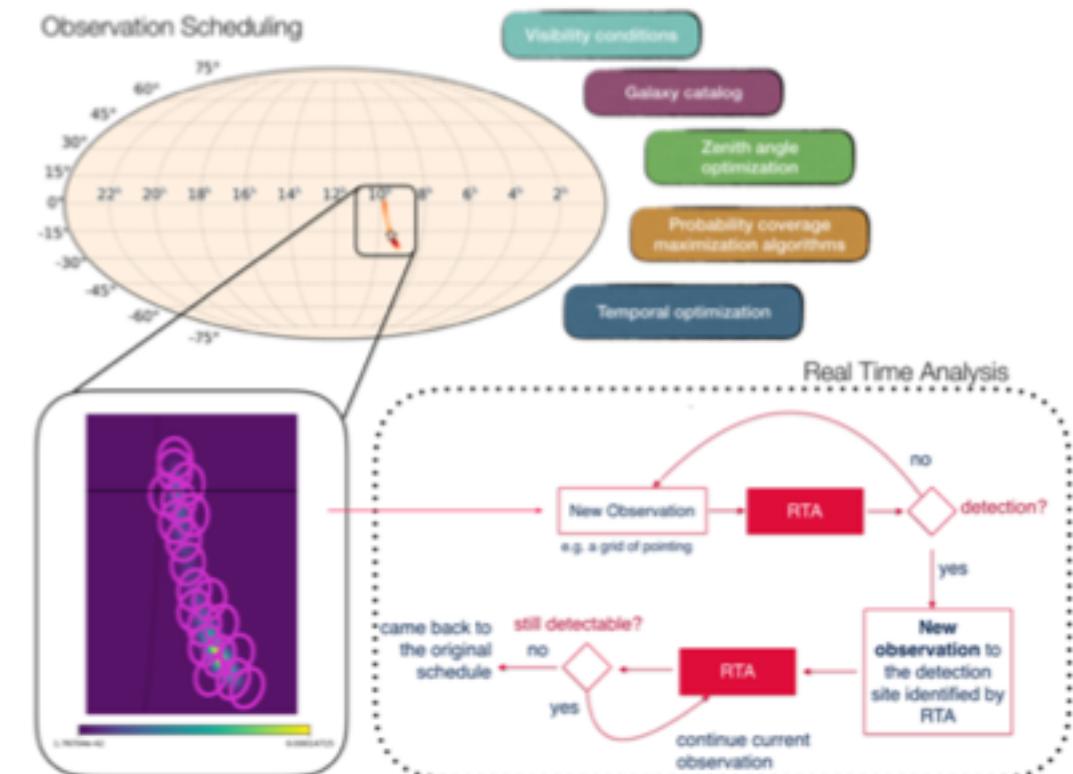
Virgo : Monica Seglar Arroyo + Matteo PRACCHIA



- CTA consortium paper on the GW follow-up
- Study follow-up observation strategies and detectability of the GRB-GW events
 - Feedback for LST:
 - Observation strategies : how to map the large FoV
 - Optimum time
 - Feedback to RTA
 - Future :
 - Interaction between the 2 sites
 - Reaction to pre-alerts (*Early warning*)

Corresponding authors : A. Carosi, M. Seglar Arroyo.

Was planed to increase this collaboration with our new post-doc



HESS

Observations continue

- Follow GRB until Sept 2022 (end of the HESS experiment)
- Finish current studies

Time



2020

CTA

LST1 still in commissioning phase

- Follow-up of GRB will start in 2021 and the LAPP is deeply involved
- RTA, Off-line analysis -> we will be ready
- Virgo-CTA collaboration at LAPP