

HETH: Gravitational Waves in both Hemispheres

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(Virtual) Iberian Gravitational-Wave Meeting

ZoomSpace

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HETH: High-Energy Transients and their Hosts

Headquartered at the Instituto de Astrofísica de Andalucía – CSIC,
Granada, Spain



PI: Christina C. Thöne

Co-PI: Antonio de Ugarte Postigo

Further members: D. Alexander Kann (Postdoc, Project PI), Martin Blazek (Postdoc, technical), J. Feliciano Agüí (PhD student)

Former during O3: L. Izzo (Postdoc), K. Bensch (PhD student)

Very international: 2 Germans, 2 Spanish, 1 Czech (1 Italian, 1 Polish)

HETH: High-Energy Transients and their Hosts

Research topics:

- Gamma-Ray Bursts (and their supernovae)
- Superluminous and other peculiar Supernovae
- Gravitational-Wave Sources
- Soft Gamma Repeaters
- (Tidal Disruption Events)
- ... and their local and galactic environments!

HETH: High-Energy Transients and their Hosts

Research topics generally:

- Optical and NIR follow-up, photometry and spectroscopy, both 2D and 3D
- Light curve analysis, spectral analysis, star-forming galaxies

HETH has, or has had, and is involved in, proposals at:

Optical/NIR: GTC, CAHA, OSN, OAJ, LT, NOT, WHT, VLT+Vista, CFHT, ANU, HST, Spitzer

Radio/mm/submm: NOEMA, ALMA, GMRT, ATCA, APEX, SMA

GWs @ HETH:

Involvement in **GW170817/GRB 170817A/AT2017gfo**:

- Abbott, B. P., et al. 2017, ApJL, 848, L12: MMA paper with everyone else
- Tanvir, N. R., et al. 2017, ApJL, 848, L27: VINROUGE follow-up
- Levan, A. J., et al. 2017, ApJL, 848, L28: Study of NGC 4993
- Smartt, S. J., et al. 2017, Nature, 551, 75: EPESSTO follow-up
- Abbott, B. P., et al. 2017, Nature, 551, 85: GW standard siren
- Kim, S., et al. 2017, ApJL, 850, L21: ALMA follow-up, modelling
- Cantiello, M., et al. 2018, ApJL, 854, L31: Distance to NGC 4993
- Lyman, J. D., et al. 2018, Nature Astr., 2, 751: Afterglow of GRB 170817A
- Della Valle, M., et al. 2018, MNRAS, 481, 4355: local KN rate

GWs @ HETH:

GTC (PI Kann):

Semester 2018B: Proposal for GTC, accepted along with five other GW proposals, request: merge the groups!

O3 delayed, no triggers

Semester 2019A: Merged 5/6 groups, then proposal rejected, group 6 was accepted.

Semester 2019B: Proposal rejected.

Semester 2020A: Proposal accepted, specific focus on follow-up of classified Kilonovae. Then observatory closed after three weeks because of COVID-19...

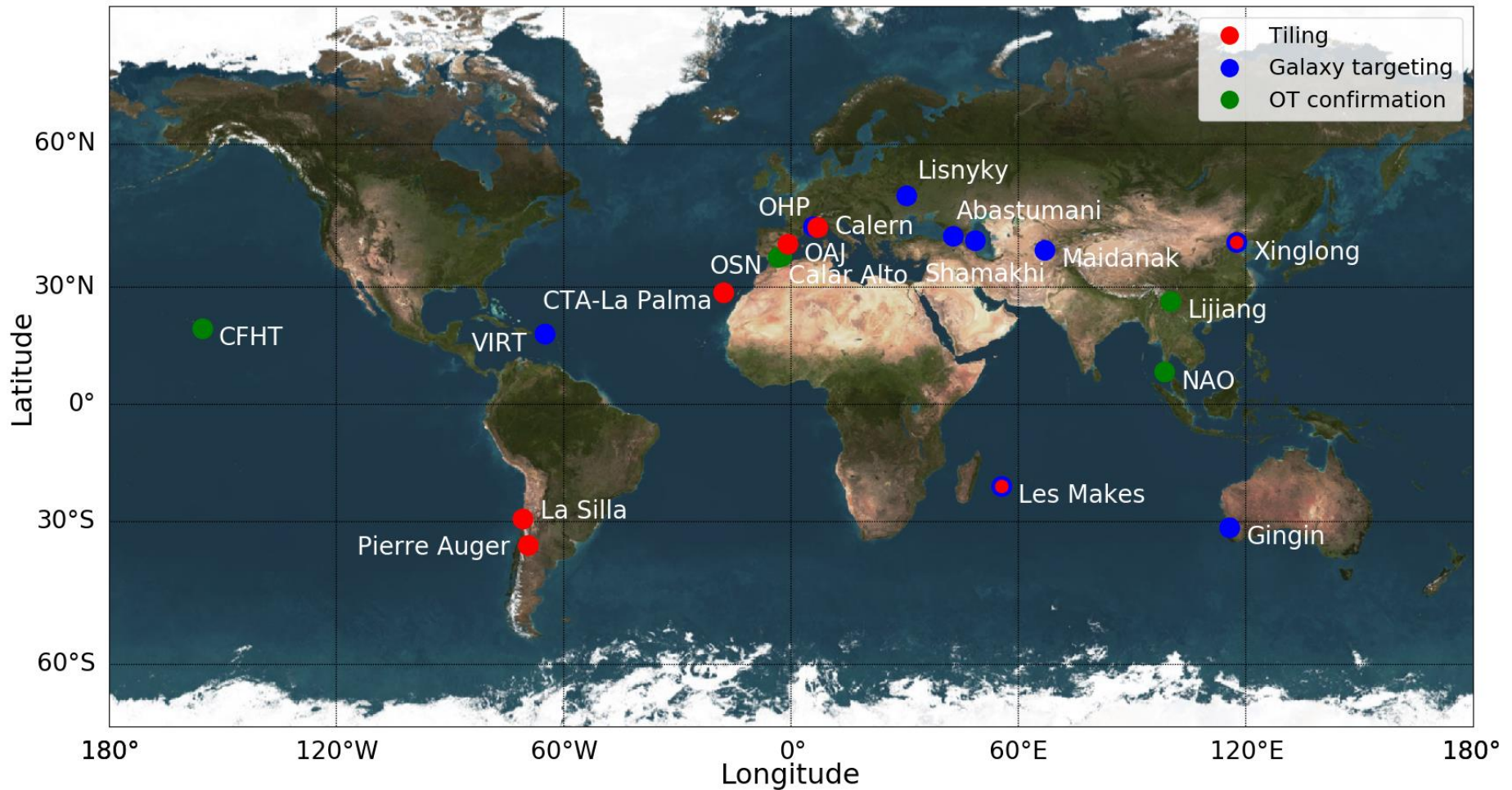
GRANDMA: Global Rapid Advanced Network Devoted to the Multi-messenger Addicts

PI: Sarah Antier (Université de Paris, CNRS, Astroparticule et Cosmologie)

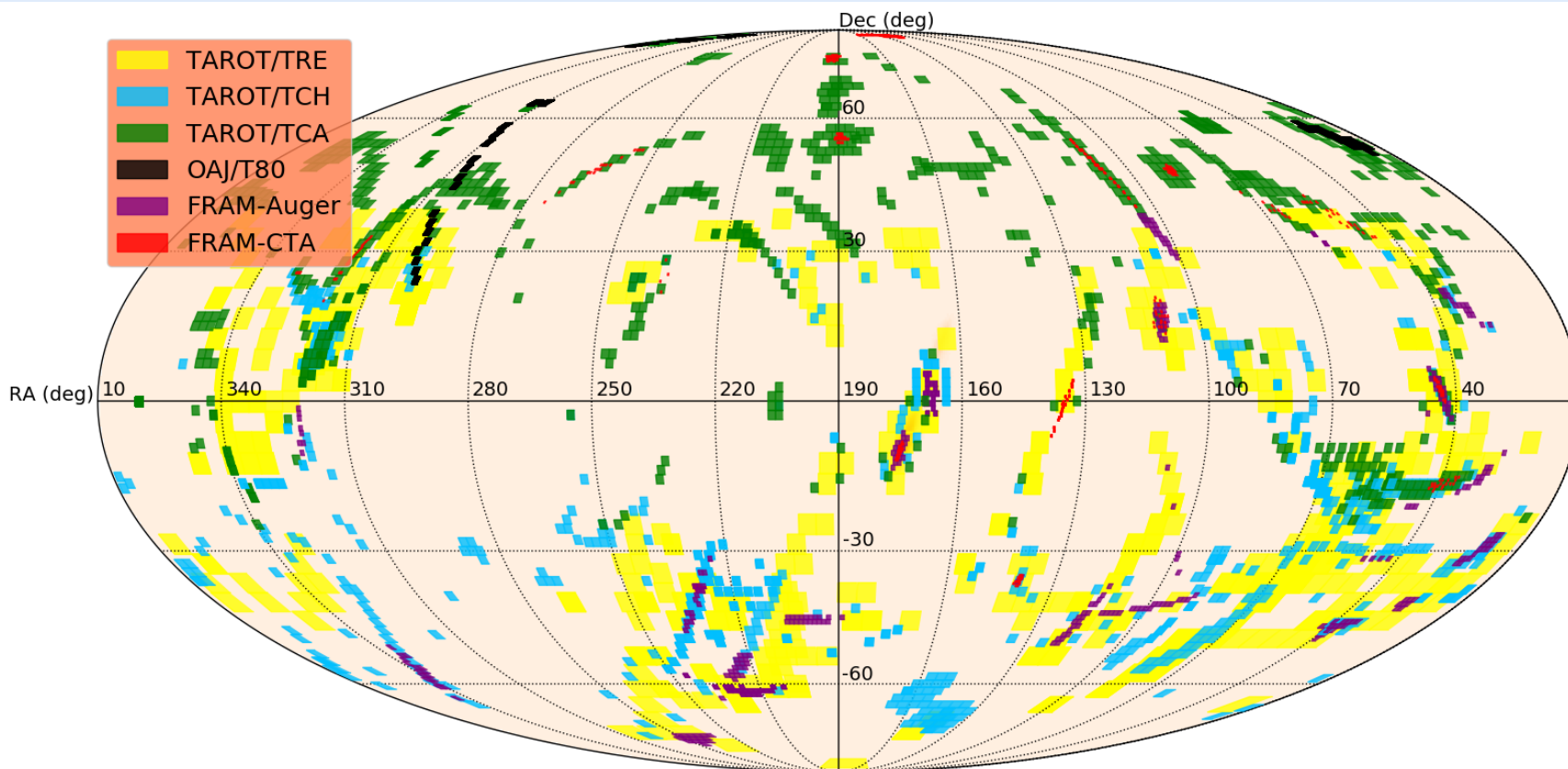
Very international (mostly European/Asian) group dedicated to GW transient follow-up and engineering telescope follow-up networks

- Antier, S., et al: 2020a: The first six months of the Advanced LIGO's and Advanced Virgo's third observing run with GRANDMA, MNRAS, 492, 3904
- Antier, S., et al: 2020b: GRANDMA observations of advanced LIGO's and advanced Virgo's third observational campaign, MNRAS, 497, 5518

GRANDMA:



GRANDMA:



GRANDMA:

HETH joined in Spring 2019. Contributions to GRANDMA:

- OAJ T80 proposal for tiling observations of GW error fields (PI Kann)
- CAHA proposal for galaxy targeting and transient photometric (spectroscopic) follow-up (PI Kann)
- OSN proposal for galaxy targeting with photometry (PI Blazek)
- NOEMA proposal for mm/submm follow-up (PI Kann)
- GTC proposal for especially spectroscopic follow-up of secure candidates (PI Kann)

Post-O3:

- OAJ tiling of neutrino error circles (IceCube) (PI Kann)
- GTC and CAHA follow-up of KNe from wide-field surveys (PI Kann)

GRANDMA:

HETH observational contributions to GRANDMA:

- GW190425: CAHA deep photometric follow-up of UVOT transient: Likely flare star (Kann et al., GCN 24459)
- OAJ tiling follow-up for S190426 and S200213t (Blazek et al., GCNs 24327; 27116)

Problems: few viable candidates, and huge error regions

Preparations for **O4** are ongoing, in the meanwhile, we hope for some interesting transients from wide-field surveys, and some „Gold“ neutrinos.

HETH hosted the 2nd GRANDMA meeting in Granada@IAA, August 2019



ENGRAVE: (ElectromagNetic counterparts of **GRA**vitational wave sources at the **VE**ry Large Telescope)

Very large collaboration @ESO VLT, HETH people are part of several working groups (photometry, spectroscopy, radio/mm, writing)

Ackley, K. , et al. 2020, Observational constraints on the optical and near-infrared emission from the neutron star–black hole binary merger candidate S190814bv, A&A, in press (arXiv:2002.01950v2)

ENGRAVE now has a KN follow-up program



Muchas gracias!