



Instituto de Estructura de la Materia

IEM

Gravitation and Cosmology group

Faculty members

- Guillermo A. Mena Marugán
- Fernando Barbero
- Gianluca Calcagni

Postdoc

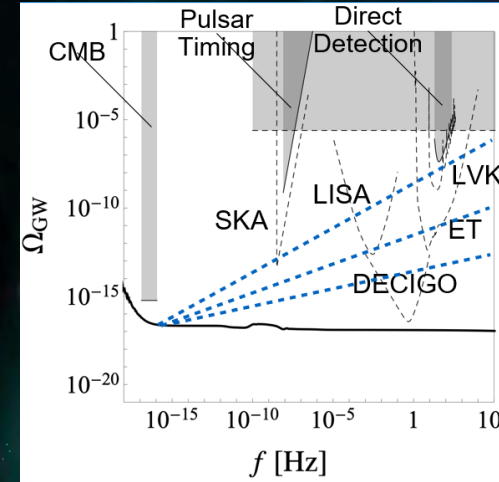
- Beatriz Elizaga Navascués

Students

- Alejandro García-Quismondo Martín
- Santiago Prado Loy

What we do at **IEM**

- **Theoretical cosmology** (inflation, CMB, **SGWB**, dark matter, dark energy, **late-time GWs**)
- **Quantum gravity and modified-gravity models**: theory and cosmological predictions
- **Classical gravity**: theory
- Active participation in **LISA** Consortium science and management activities (LISA Science Group, Cosmology WG, Fundamental Physics WG)
- Contacts with groups of future missions TianQin and Taijin
- GW-related collaborations with other groups (e.g., IFT, Swansea U.)



What we plan to do for and with ET

- OSB: Div1: Fundamental Physics. Div2: Cosmology. Div5: Synergies with other GW observatories
- Develop classical and quantum models of gravity (loop quantum gravity, nonlocal gravity, ...) and of dark energy with implications for the physics of GWs in the frequency range covered by ET. Modification of
 - production: black-hole solutions, merger and ringdown phases, waveform, polarization, SGWB
 - propagation: dispersion relation, luminosity distance of standard sirens, SGWB
- Extraction of physical observables from theoretical models, using numerical simulations to be integrated in ET pipelines. Verify predictions with data.
- Collaboration with other CSIC and international groups
- Mission management and organizational duties: blue book / WPs writing, participation in internal committees (D.E.I., structuring, membership management, ...)