

# UGent activities in cosmoparticle physics

# IceCube & co I

## Members

- Dirk Ryckbosch
- Stef Verpoest (PhD candidate)
- Bob Oeyen (PhD candidate)

# IceCube & co II

## IceTop data analysis

- Energy spectrum & composition of CR (Stef)
  - ▶ muon content in airshowers

## IceCube data analysis

- Search for fractionally charged particles (Ward, Bob)

## Hardware

- Acoustic detection
  - ▶ attenuation length (much) shorter than expected
- RNO-G
  - ▶ simulation radio signal in ice (Bob)

# Gravitational Waves I

## Members

- Dirk Ryckbosch
- Archisman Ghosh
- Daniela Pascucci (postdoc)
- Gergely Dályá (postdoc)
- Freija Beirnaert (PhD candidate)
- Cezary Turcki (PhD candidate)
- Sibe Bleuzé (masters student)
- Yves Israel (senior technician)

# Gravitational Waves II

## ETpf instrumentation

- Installation of vacuum towers for the ETpf (Yves)
- Fabrication of components of the seismic isolation system (Yves, Daniela)
- Organization of cabling for the ETpf (Daniela)
- Vacuum control system of the ETpf (Dirk, Daniela)
- Development of a quadrant photo diode ( $\lambda = 2\mu\text{m}$ ) for the ETpf (Daniela)

# Gravitational Waves III

## LIGO-Virgo-KAGRA data analysis

- Strong-field gravity: Tests of general relativity and search for exotic behaviour beyond Einstein's theory and standard black holes (Archisman)
- Cosmology: measurement of the Hubble constant and expansion of the universe using GWs (Cezary, Freija, Gergely, Archisman)
- Development of galaxy catalogues for rapid host identification of compact binaries and for providing redshift support for GW cosmography (Gergely)
- Development of an analysis method for extraction of physical parameters from potential supernova signals in LVK data (Sibe, Gergely)

# Gravitational Waves IV

## Science case for Einstein Telescope and the ET detector network

- Cosmography and study of large scale structure using compact binary observations from the ET detector network (Freija, Gergely, Archisman)
- Supernovae and model-independent searches for GWs in the ET era (Gergely)
- Development of a "mock data set" for the ET detector network (Freija, Gergely, Archisman)