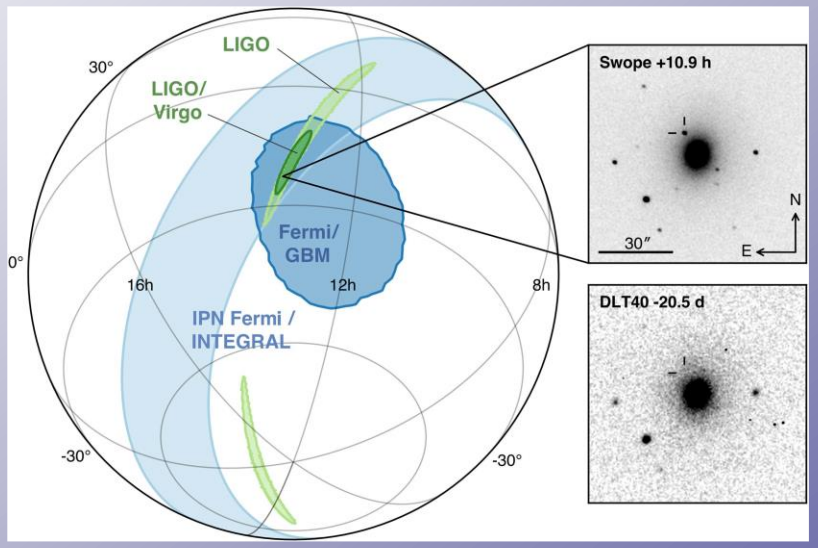
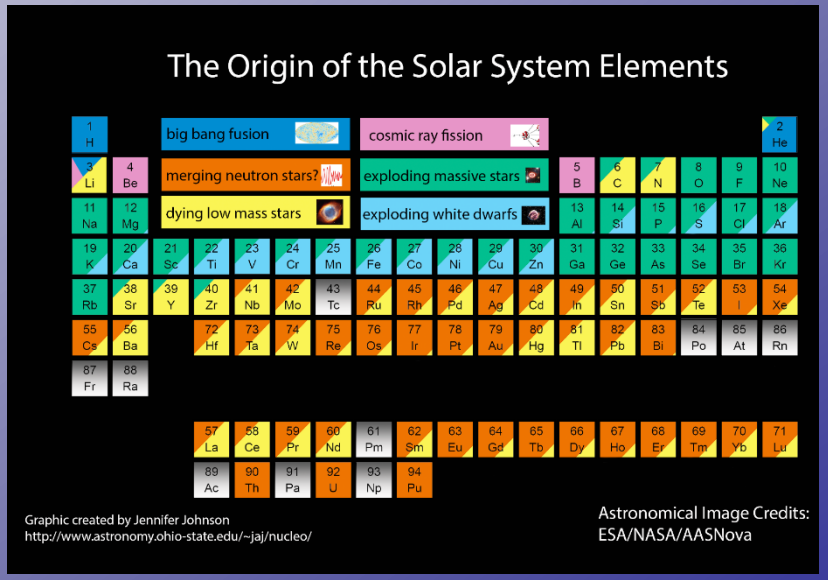
FRONTIERS Online Winter School 2021

Gravitational Wave Astronomy Module

Frontiers has been funded within the framework of the European Union Erasmus+ programme

GW Astronomy





Virgo and LIGO sensitivity

Imagine to drop a glass of wine (or water) in the ocean…….

Ocean Surface (S):
70% x 4π x R_terra^2 =
0.7 x 4 x 3.14 x (6.37e6 m)^2
~ 3.6e14 m^2

Volume of the glass (V):
~ 0.25e-3 m^3

Increase of the global sea level:
h ~ V / S ~ 1e-18 m

This is the level of sensitivity we need to reach with GW detectors !!

GW Module
The program

Saturday, 30 January **10:00** → 12:30

Module 1 - Gravitational Wave Astronomy **2h 30m**

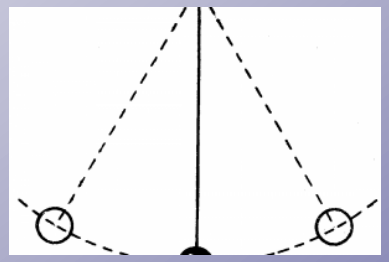
Moderator: Valerio Boschi (European Gravitational Observatory)

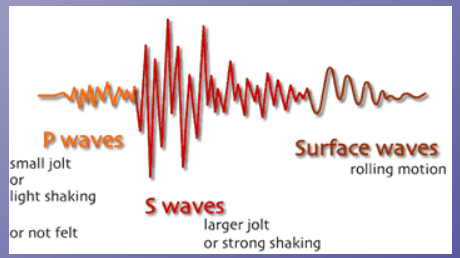
- An introduction to gravitational waves
  Speaker: Matteo Barsuglia (Paris Centre for Cosmological Physics, Université de Paris)
- Inquiry Based Learning in action
  Speaker: Isabella Marini (MIUR)
- FRONTIERS demonstrators on gravitational waves
  - Discovering and building a Michelson interferometer (M. Barsuglia)
  - Finding black holes in a chirp (S. Mastrogiovanni)
  - The Pendulum and the Earthquake Interferometer (V. Boschi)
  - Gravitational waves noise hunting (E.Chaniotakis)
  - Gravity Spy (E.Chaniotakis)
- Organization of Working Group

17:30 → 18:30 **Virgo Virtual Visit**

GW Module
The demonstrators

- ***Discovering and building a Michelson interferometer***
- ***The pendulum***
- ***Earthquake Interferometer***
- ***Finding Black Holes in a Chirp***
- **Gravitational Wave Noise Hunting**
- Control (Class)room
- VIRGO Virtual Visits





SPACE-TIME QUEST