

- ET is the project aiming to realise the **European 3rd Generation Gravitational Wave observatory**
- ET defined the concept of 3rd generation GW observatory:
 - A sensitivity at least 10 times better than the (nominal) advanced detectors on a large fraction of the detection frequency band
 - Wideband (possibly wider than the current detectors) accessing the frequency band below 10Hz
 - High reliability and improved observation capability
- Included in the EU ESFRI Roadmap in June 2021
- The ET Collaboration was formally created on June 7, 2022

The ET Collaboration



XII ET Symposium, Budapest, June 7, 2022

ASTROPHYSICS

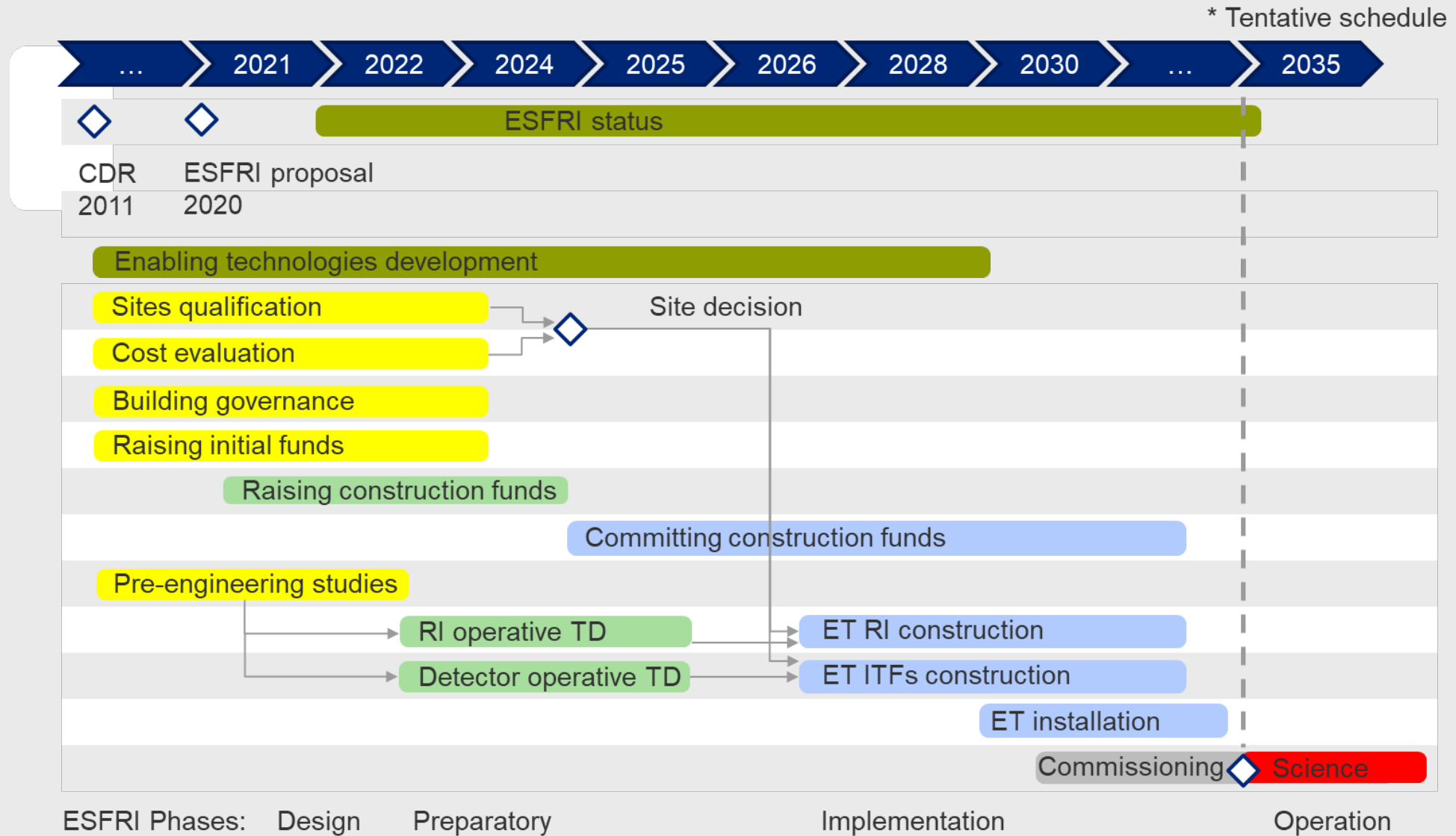
- Black hole properties
 - origin (stellar vs. primordial)
 - evolution, demography
- Neutron star properties
 - interior structure (QCD at ultra-high densities, exotic states of matter)
 - demography
- Multi-band and -messenger astronomy
 - joint GW/EM observations (GRB, kilonova,...)
 - multiband GW detection (LISA)
 - neutrinos
- Detection of new astrophysical sources
 - core collapse supernovae
 - isolated neutron stars
 - stochastic background of astrophysical origin

FUNDAMENTAL PHYSICS & COSMOLOGY

- The nature of compact objects
 - near-horizon physics
 - tests of no-hair theorem
 - exotic compact objects
- Tests of General Relativity
 - post-Newtonian expansion
 - strong field regime
- Dark matter
 - primordial BHs
 - axion clouds, dark matter accreting on compact objects
- Dark energy and modifications of gravity on cosmological scales
 - dark energy equation of state
 - modified GW propagation
- Stochastic backgrounds of cosmological origin
 - inflation, phase transitions, cosmic strings



- Currently there are two candidate sites being characterized to host ET:
 - The Sardinia site, close to the Sos Enattos mine
 - The Euregio Meuse-Rhine site, close to the NL-B-D border
 - A third option in Saxony (Germany) was recently proposed and is under discussion



- Three detectors in a **triangular** structure
 - Closed geometry allows the use of the null data stream
 - The third detector makes up for 60° angle
- Each detector (red, green and blue) consists of **two** Michelson interferometers
 - “Xylophone” configuration
 - High-frequency and (more challenging) Low-frequency

