

Einstein Telescope

Enzo Brocato

INAF – Osservatorio Astronomico d'Abruzzo

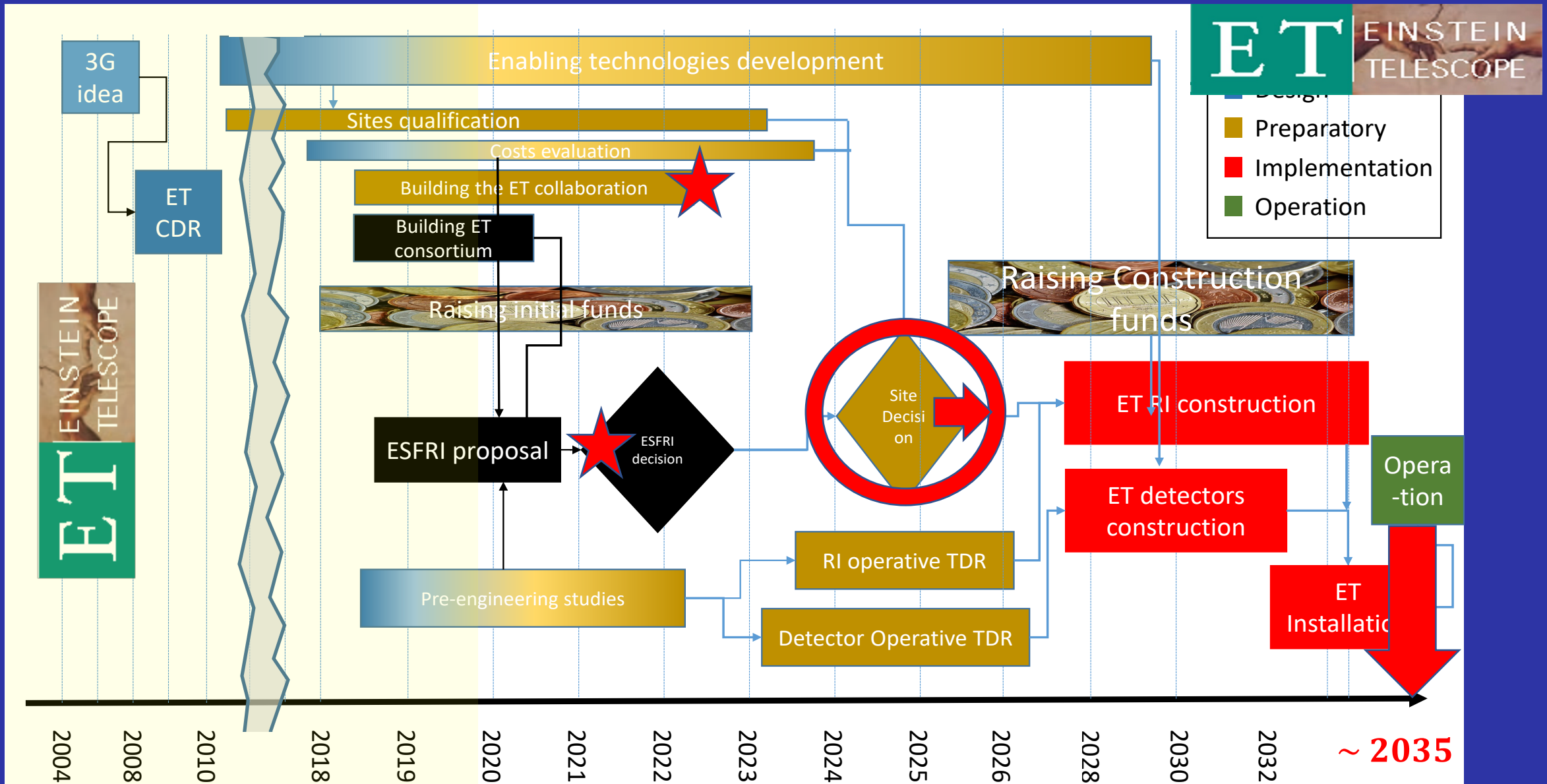
Giornate INAF RSN 4

Napoli 22-24 novembre 2022

ET science case:



- 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-messenger astronomy: nucleosynthesis, physics of jets, role of neutrinos.
- Detection of new astrophysical sources of GWs: core collapse supernovae, isolated neutron stars, stochastic background of astrophysical origin.
- The nature of compact objects: near-horizon physics, exotic compact objects.
- Dark matter: primordial BHs, axion clouds, dark matter accreting on compact objects.
- Dark energy and modifications of gravity on cosmological scales.
- Stochastic backgrounds of cosmological origin and connections with high-energy physics (inflation, phase transitions, cosmic strings, ...)



Collaborazione ET: Organizzazione

Spokeperson: M. Punturo
Deputy: H. Luck



Collaboration Board (CB)

- E. Coccia (Chair)
- Leaders of the 79 Research Units

Executive Board (EB):

- Spokeperson (Co-Chair)
- Deputy (Co-Chair)
- Chairs of Specific Boards

Specific BOARDS

- **Observational Science Board (OSB)**
- **Instrument Science Board (ISB)**
- **Site Characterization Board (SCB)**
- **Electronics/Computational Infrastructure Board (EIB)**

- **79 Research Units**
- **1312 membri**
- **200 Istituzioni
in 23 paesi**
- **Member Database
quasi pronto**



Observational Science Board (OSB)

Chairs: M. Maggiore M. Branchesi E. Porter

Fundamental physics	Cosmology	Population Studies	MM observations	Synergies w. other GW observ.	Nuclear physics	Stellar collapse and isolated neutron stars	Waveforms	Science Potential	DA platform
Chris v.d. Broeck Paolo Pani Raphael Porto	Archisman Ghosh Angelo Ricciardone Mairi Sakellariadou	Giulia Cusin Michela Mapelli Antonio Riotto	Giancarlo Ghirlanda Stephen Smartt Susanna Vergani	Nelson Christensen Samaya Nissanke B. Sathyaprakash	Tim Dietrich Tanja Hinderer Michaela Oertel	Marie-Anne Bizouard Enrico Cappellaro Pablo Cerda-Duran	Laura Bernard Harald Pfeiffer Patricia Schmidt	Michal Bejger Ik Siong Heng Andrea Maselli	Chris v.d. Broeck Elena Cuoco Tania Regimbau John Veitch
<div data-bbox="30 829 262 939">Physics near BH horizons</div> <div data-bbox="30 946 262 1011">Tests of GR</div> <div data-bbox="30 1018 262 1096">Exotic compact objects</div>	<div data-bbox="290 829 522 893">Dark Energy</div> <div data-bbox="290 901 522 965">Dark matter</div> <div data-bbox="290 972 522 1096">Estimation of cosmological parameters</div> <div data-bbox="290 1103 522 1228">Modifications of gravity at cosmological scales</div> <div data-bbox="290 1235 522 1402">Stochastic background of cosmological origin</div>	<div data-bbox="550 829 782 996">Predictions of population of astrophysical origin</div> <div data-bbox="550 1003 782 1082">Predictions of primordial BHs</div> <div data-bbox="550 1089 782 1228">Stochastic backgrounds of astrophysical origin</div>	<div data-bbox="810 829 1042 939">ET / high-energy</div> <div data-bbox="810 946 1042 1011">ET / optical</div> <div data-bbox="810 1018 1042 1082">ET / radio</div> <div data-bbox="810 1089 1042 1153">ET / neutrinos</div>	<div data-bbox="1070 829 1302 953">Synergies with 2G+ detector</div> <div data-bbox="1070 961 1302 1068">Synergies with CE, 3G</div> <div data-bbox="1070 1075 1302 1182">Synergies with LISA</div>	<div data-bbox="1330 829 1561 953">EoS of NSs in isolated systems</div> <div data-bbox="1330 961 1561 1082">EoS in NSs in binary systems</div> <div data-bbox="1330 1089 1561 1182">Nucleo-synthesis in BNS mergers</div>	<div data-bbox="1589 829 1821 953">Predictions for Supernovae</div> <div data-bbox="1589 961 1821 1082">Predictions for magnetars</div> <div data-bbox="1589 1089 1821 1182">Predictions for cosmic string bursts</div>	<div data-bbox="1849 829 2081 953">Waveforms relevant for ET</div> <div data-bbox="1849 961 2081 1082">Improvement of waveforms for BBH</div> <div data-bbox="1849 1089 2081 1210">Improvement of waveforms for NSBH</div> <div data-bbox="1849 1218 2081 1296">Improvement of waveforms for BNS</div>	<div data-bbox="2109 829 2341 1096">Science potential for various detector configurations</div> <div data-bbox="2109 1103 2341 1139">Common tools</div>	<div data-bbox="2369 829 2507 953">DA platform</div>

**Instrument Science Board (ISB)
DIVISIONS**



**ISB Chairs:
G. Gemme & S. Hild**

Suspensions

*Vacuum and
Cryogenics*

Optics

*Active Noise
Mitigation*

Interferometer

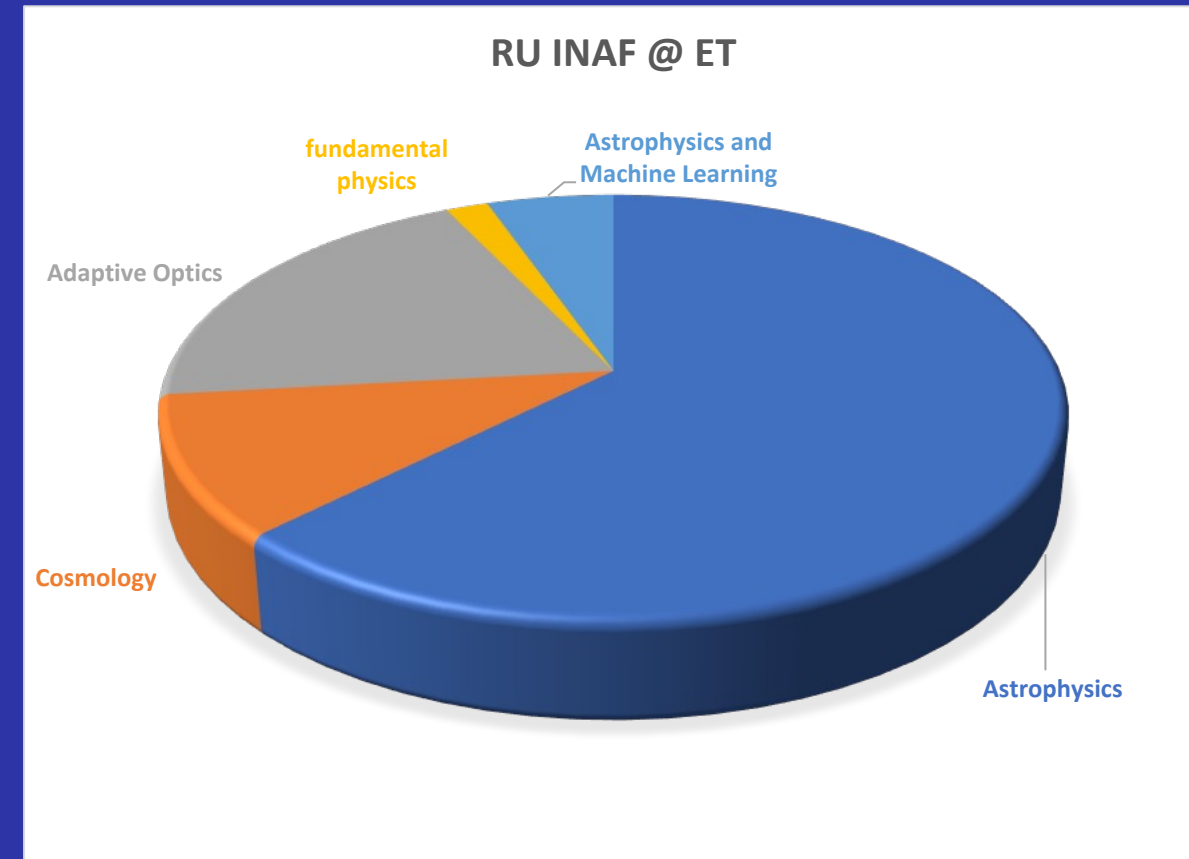
*Civil
Infrastructures*

Strutture INAF e Università coinvolte:

1. INAF Osservatorio Astronomico d'Abruzzo
2. INAF Osservatorio Astronomico di Padova
3. INAF Osservatorio di Astrofisica e Scienza dello Spazio Bologna
4. INAF Istituto di Radioastronomia
5. INAF Osservatorio Astronomico di Roma
6. INAF Istituto di Astrofisica Spaziale e Fisica cosmica Milano
7. INAF Osservatorio Astronomico di Brera
8. INAF Osservatorio Astronomico di Capodimonte
9. INAF Osservatorio Astronomico di Cagliari
10. INAF Osservatorio Astronomico di Catania
11. INAF Osservatorio Astrofisico di Arcetri
12. Università degli Studi di Torino
13. Università degli Studi di Napoli Federico II
14. Università degli Studi di Padova
15. Università degli Studi di Torino



RU INAF @ ET : 57 researchers





Punto di accesso: pagine wiki <https://wiki.et-gw.eu>

Necessario avere un **EGO Active Directory account**

1. **Mailing list** per iscriversi a Boards e Divisions

2. **ET Member Database (ETMD)**

verificare/aggiornare il proprio profile e (<https://apps.et-gw.eu/etmd/>)
inserire FRTE per attività ET (<https://apps.et-gw.eu/etmd/?c=5>)

3. **Nuove richieste di membership alla RU INAF**

- inviare una email a RU leader (es.: enzo.brocato@inaf.it)

includendo: Nome Cognome - Indirizzo email - Board e Division di interesse -

- Expertise - Expected activities - Milestone - FRTE (> 0,1).

4. **Documentazione ET** è disponibile al link <https://apps.et-gw.eu/tds/>

RSN 4

ET Collaboration – INAF Research Unit

