PHAROS: The multi-messenger physics and astrophysics of neutron stars

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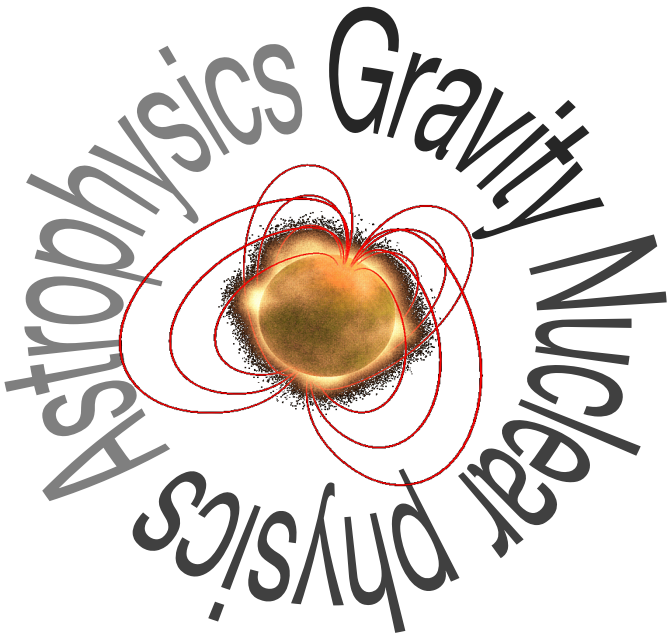
The COST Action PHAROS (CA16214) has the ambitious goal of attacking key challenges in the physics involved in neutron stars by facing them via an innovative, problem based approach, focusing on current, and new, data and experiments, and that hinges on interdisciplinary Working Groups….



PHAROS
THE MULTI-MESSENGER PHYSICS AND ASTROPHYSICS OF NEUTRON STARS

http://www.pharos.ice.csic.es/

Associated Countries : 29

Proposer: ES

AT, BE, BG, CH, CZ, DE, DK,FI, FR, GR, HR, HU, IE, IL, IT, MK, MT, NL, NO, PL, PT, RO, RS, SK, SI, SE, TR, UK

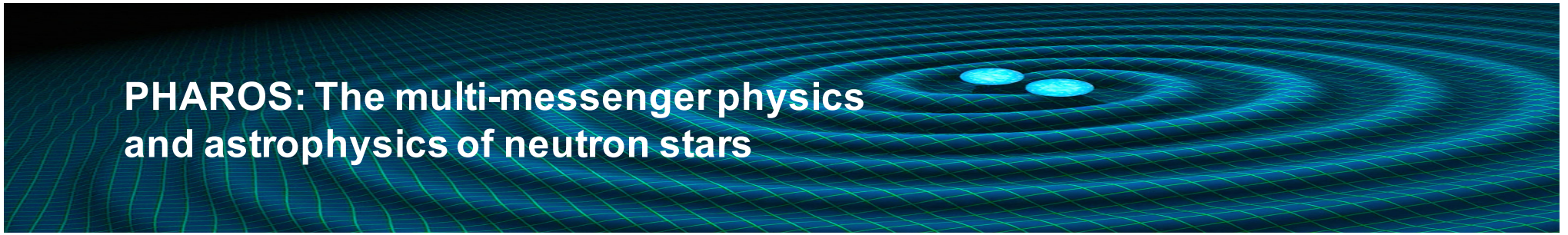
Near Neighbour Countries : EG, RU, UA

Cost International Partners: AU, CA, CL, MX, IN, JP, USA

Specific organizations: ESA

Working groups

WG1	**Equation of State of dense matter**
WG2	**Superfluidity/Superconductivity in dense matter and transport coefficients**
WG3	Gravitational wave signals from neutron stars
WG4	Magnetic field formation, evolution, (in)stability and neutron star population study
WG5	Neutron star magnetospheres, acceleration mechanisms, environment and jets



Working Group 1: Equation of State of dense matter

WG Leader and Task Leaders: Enrico Bozzo, Ian Jones and Laura Tolos

PHAROS will aim at answering **how can the neutron star Equation of State (EoS) be investigated with different astrophysical and gravitational observations**. Answering this question requires the communities to interact with nuclear physicists to set standard parameters for different EoS species to be implemented in astrophysical and gravitational simulations

Main objective: an online equation of state catalogue, that builds on existing online repositories in an innovative manner, upgrading them in such a way as to provide data in a form that can easily be used in numerical simulations and for direct comparison with astrophysical observables

Objectives:

- Collaboration between communities to determine standards
- Provide benchmarks to test the correct implementation/functioning
- Provide unified and consistent EoSs.
- Collaboration with WG2 to determine consistent transport parameters

Tasks:

- Set up specific task forces to tackle individual aspects of the objectives.
- Manage and edit an online repository of EoS, together with WG2 (transport)
- Report WG activities to the MC

Deliverables:

- Web-based repository of several EoS in easy readable formats standardized over different communities
- White paper describing the theoretical and observational state of the art and the methods and procedures used in the website. Update of General website.