

PUBLIC LECTURE

# NEUTRON STARS AND GRAVITATIONAL WAVES

PROBING MATTER UNDER EXTREME CONDITIONS



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA  
DEPARTMENT OF PHYSICS AND ASTRONOMY  
"AUGUSTO RIGHI"

05:30 p.m.  
February 15th  
2023

AULA MAGNA

Via Irnerio, 46  
Bologna

Info e contatti

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FREE ENTRANCE

The lecture will be in English

Neutron stars are the endpoint of the evolution of massive stars. Their properties are so extraordinary that they provide a **testbed of our understanding of gravity and fundamental interactions of matter** under extreme conditions.

The detection of gravitational waves from a neutron star merger by the LIGO-Virgo collaboration has opened a **new era of multimessenger astronomy**. These and other recent observations have shown that neutron stars are not only quite heavy but also very compact having radii of less than 13 km. The matter in the inner part of a neutron star could be so dense that the particles could dissolve into their constituents, quarks, forming quark matter in the core.

Prof. Jürgen Schaffner-Bielich will discuss the exploration of **quark matter** by the observation of **pulsars**, the measurement of gravitational waves from neutron star mergers and from the **Big Bang**, as well as by **experiments with heavy-ion collisions** at particle accelerators such as at the Large Hadron Collider of CERN, Geneva and at the Facility for Antiproton and Ion Research at GSI, Darmstadt.

SPEAKER

**Prof. Jürgen Schaffner-Bielich**

Goethe Universitaet Frankfurt, Germany

Theoretical physicist and lecturer in astrophysics, cosmology and heavy-ion physics. His research focuses on the equation of state for neutron star mergers and the properties of twin stars, compact stars with a phase transition in their core.



SITO DIFA / EVENTI