

# Reconstructing the Neutron Star Equation of State with Bayesian Deep Learning

Giulia Ventagli

CEICO, Institute of Physics of the Czech Academy of Sciences

# From observations to nuclear matter properties

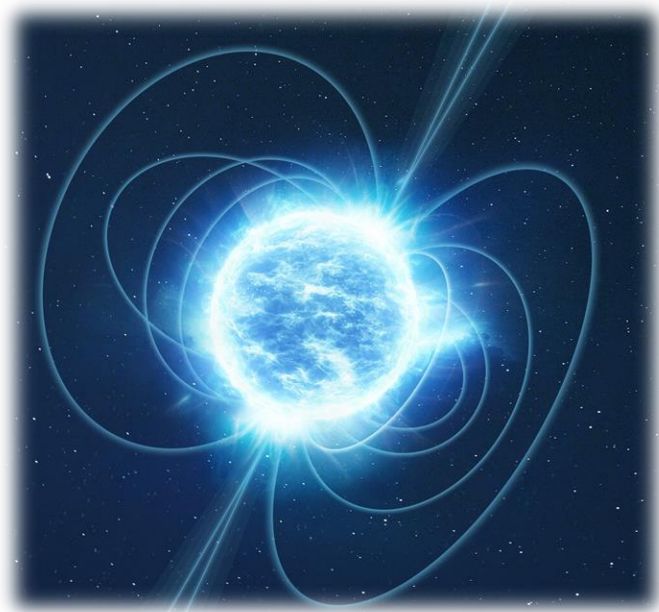
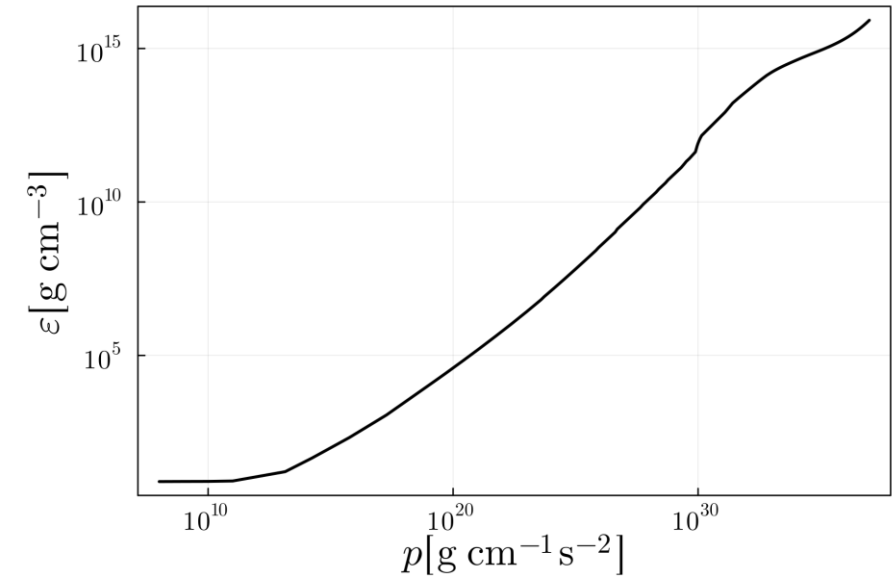


Image source: ESA

Masses, radii, tidal deformabilities

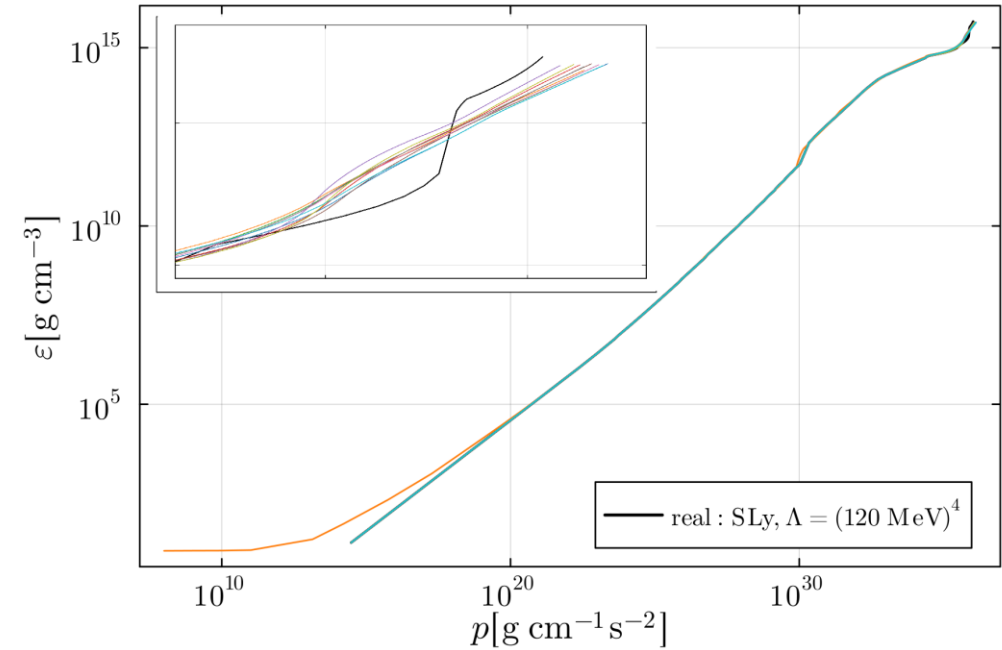
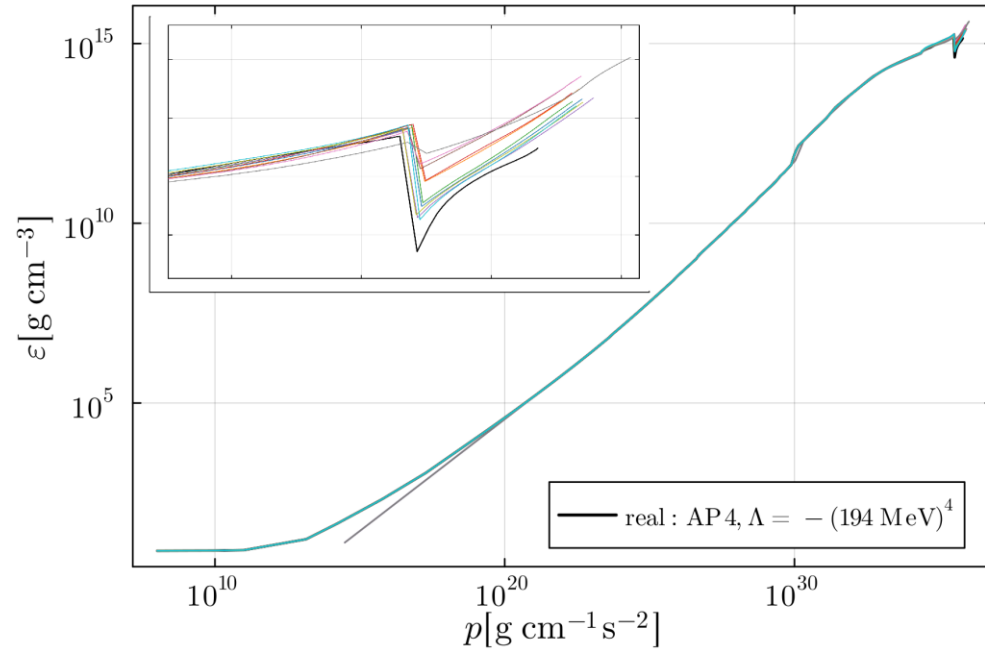
Deterministic deep network

Bayesian deep network



Reconstruct  
 $\varepsilon = \varepsilon(p)$

# Our predictions



**We also include and predict a *vacuum energy phase transition*!**