



PHYSIKALISCHES KOLLOQUIUM

Wintersemester 2021/2022

Montag, 29.11.2021, 12 Uhr c.t. [online](#)

Probing the extremes of the Universe using pulsars, magnetars and fast radio bursts

Prof. Dr. Jason Hessels

ASTRON & University of Amsterdam, Netherlands

Radio astronomy is a powerful probe of the "non-thermal" Universe. Astronomical radio waves point to the sites of relativistic particle acceleration, and they also carry the signatures imparted by intervening plasma and magnetic field. This allows us to study neutron stars and black holes, which are the most extreme macroscopic objects we know of. It also allows us to study the otherwise invisible matter between stars and galaxies.



In this talk, he will focus on neutron stars and explain how we can use the clock-like radio pulses of pulsars to constrain their dense matter equation of state, and to test general relativity. He will also discuss fast radio bursts (FRBs), which are millisecond-duration radio flashes originating from deep in extragalactic space. The physical nature of FRBs remains one of the biggest puzzles in modern astrophysics. FRBs may be produced by magnetars, ultra-magnetised neutron stars that are powered by the decay of their magnetic field. He will present recent observations that in some ways support this interpretation, but also raise new questions. Then he will conclude with a vision for how radio astronomical observations can continue to lead to breakthroughs in our understanding of the extremes of the Universe.

Einführung: Prof. Dr. Ralf-Jürgen Dettmar

Die Fakultät lädt alle Interessierten herzlich ein.