



**FZU**

Institute of Physics  
of the Czech  
Academy of Sciences

## Invitation

to the seminar of Division of Elementary Particle Physics of the  
Institute of Physics of the Czech Academy of Sciences



### Alex Hackett

FZU - Institute of Physics  
of the Czech Academy of Sciences

## Cosmology with Exotic Stars – Across the HR Diagram

**Abstract:** Fred Hoyle once stated that he considered stars to be "basically, simple things". Since the dawn of modern stellar astrophysics however, theoretical and observational work alike have increasingly come to challenge this perspective. In this talk, I will give an overview of the work that I have done over the past few years on the topic of exotic stars – those stellar objects that arise via non-canonical evolutionary pathways or in unusual environments. I will also show the surprising degree to which modern cosmology and Galactic Astrophysics – from large scale simulations to understanding the chemical evolution of the Universe, rely on understanding these objects. This ranges from the very largest stars, that came into existence when the Universe was just a fraction of its current age, to hybrid stars that result from complicated binary evolution processes such as common envelope evolution, to exotic highly magnetised stellar remnants. These stars and star-like objects influenced the wider Universe by impacting reionization, altering the rates of SNeIa that we rely on as a cosmological distance indicator, and a whole host of other unexpected effects. When we give an overview of this work we can increasingly understand the extent of Hoyle's understatement!!

**When:** Thursday, May 22, 2025 at 2PM

**Where:** Dvořák hall, FZU, Pod Vodárenskou věží 1, Prague

For more information, please see <https://indico.fzu.cz/event/299/>