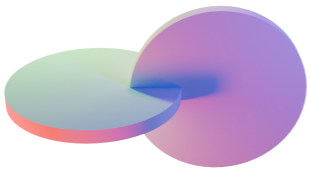

GIREP-EPEC
Transforming physics learning via Research & Practice
LEIDEN, 2025

Contribution ID: **70** Type: **Invited keynote**

Navigating the Cosmos: Cognitive Challenges in Astronomy Education

Tuesday 1 July 2025 11:00 (1 hour)

Astronomy is not only one of the oldest sciences, it also fascinates a broad public. For this reason, it plays a special role within public science communication. However, because of its appeal, astronomy can also play a crucial role in science education, by acting as a "gateway science"which can open doors for many STEM fields.
To establish this, we need dedicated research on the teaching and learning of astronomy related concepts: a growing body of research shows that these concepts are often extremely difficult to grasp and understand deeply. Although over the last decades a wide range of aspects of astronomy education has been studied, including both cognitive and affective dimensions of learning, this talk will specifically focus on the cognitive aspects.
We will explore how students construct mental models of astronomical phenomena examining the challenges they face in grasping abstract concepts such as celestial motion, scale, and three-dimensional spatial relationships. The presentation will discuss findings on conceptual change in astronomy education, focusing on how learners overcome common misconceptions and develop scientifically accurate understanding. We will also discuss the role of visual-spatial abilities in astronomy learning.
By synthesizing research from cognitive psychology, astronomy education, and physics learning, we aim to offer both researchers and teachers a deeper insight in student learning and evidence-based approaches to improve astronomy instruction across various educational levels.

Education level

All ages

Physics topic

Astronomy and Astrophysics

Research focus

Other

Research method

Other

Organizing preference criteria

Physics topic

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Session Classification: Keynote speaker

Track Classification: Astronomy and Astrophysics education (ASTRO)