

**Prize Talk**

PV VII Tue 15:00 AudiMax

**Between fascination and abstraction. Is it possible to teach modern physics at high-schools?** — ●MATTHIAS BARTELMANN — Institute for Theoretical Physics, Heidelberg University — Laureate of the Robert-Wichard-Pohl-Prize 2026

Since this talk is related to the Robert Wichard Pohl Prize, which is awarded also for the conveyance of physics, let me take the opportunity to speak about some sore points in physics education and a possible approach to a solution. Undeniably, high-school teachers are decisive for instilling fascination for, or raising disgust against physics in formative years. If we want to pass our fascination for physics on to further generations, teaching teachers must be among our most important objectives. But modern physics is necessarily developing to-

wards higher degrees of abstraction whose mathematical expression is more and more remote from the mathematics available at high-schools. Consequently, the fascination for modern physics is often lost at high-schools, physics is mistaken for an application of formulae appearing out of the blue, and essential ideas characteristic for physics do not appear. But is it possible to teach the most fascinating aspects of modern physics without having its mathematical foundation available? In this talk, I intend to argue that this is indeed possible. For this purpose, I will describe and discuss a lecture series recently introduced and tested at Heidelberg University. The lecture consists of three parts, one experimental, one theoretical, and one on timely applications. I will focus on the theoretical part, which is arguably the most difficult, and describe its motivation, ideas, structure, and summarize part of its contents.