



Einladung zum
Physikalischen Kolloquium
Wintersemester 2022/2023

Physikzentrum der Technischen Universität Braunschweig

Prof. Reinhard Werner

(Leibniz University Hannover)

will give a talk on

November 15th, 16:45, MS 3.1

**The end of the classical world: The 2022
Nobel Prize in Physics**

Abstract: The 2022 Nobel Prize in Physics was awarded to John Clauser, Alain Aspect and Anton Zeilinger "for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science". I will recount the development leading up to Bell's inequalities and derive them from the point of view of what they say about classical descriptions. This will help to explain the flood of misleading "explanations" triggered by the prize: The prize this year is awarded precisely for the proof that simple classical explanations and pictures fail in microphysics. So in their own way the press releases about "spooky action at a distance" and the like illustrate this point. The work of Einstein, Bell, and the prize winners was definitely not in the mainstream at the time. This changed with the beginning of quantum information science in the early 90s, which was, however, mostly driven by advances in theory, like the discoveries of teleportation, quantum key distribution, and the possibility of quantum computing.