

Seminar: "Geometry&Physics@DFT" (IFIN-HH)
([Geometry&Physics Homepage](#)) ([DFT Seminars webpage](#))

Date: June 27th, 2024, 12:00 noon EET

Location: DFT seminar room & Zoom

Speaker: **Prof. Krzysztof Turzynski** (Univ. Warsaw, Dept. Physics)

Title: **Tachyons - enfants terribles of contemporary physics?**

Abstract: Tachyons do not exist in quantum theory. There are three reasons: their energy spectrum is unbounded from below, the vacuum state is unstable and not Lorentz-covariant, and the commutation rules are wrong. We critically examine the reasoning behind those arguments and find that the apparent obstacles for a quantum theory of tachyons are neatly removed if we extend the Hilbert space of tachyonic states in a two-state interpretation of quantum mechanics put forth by Aharonov et al. sixty years ago. Physical consequences of this new scheme include description of phase transitions in the early Universe.

Based on: J. Paczos, K. Debski, S. Cedrowski, S. Charzyński, KT, A. Ekert, A. Dragan 'Covariant quantum field theory of tachyons', e-Print: 2308.00450 [quant-ph], Phys. Rev. D (in press)