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Particle Physics in Paris

Mardi 20 Octobre 2020, 16 :00
IHP, Seminar via zoom https ://ijclab.zoom.us/j/94900481972
Domaines : astro-ph—hep-ph—hep-th

Titre : *BSM Interpretations of the 12.5-year NANOGrav Pulsar Timing Data*

Orateur : **Kai Schmitz (CERN)**

Résumé : *The NANOGrav pulsar timing collaboration has recently reported strong evidence for a new stochastic common-spectrum process affecting the pulsar timing residuals in its 12.5-year data set. If confirmed in the future, this signal may turn out to be the first glimpse of a stochastic gravitational-wave background at nanohertz frequencies. In the first half of this talk, I will review the NANOGrav experiment, discuss the properties of the observed signal, and comment on its astrophysical interpretation in terms of inspiraling supermassive black-hole binaries. In the second half of the talk, I will then turn to possible explanations based on physics beyond the standard model, including first-order phase transitions, primordial black holes, and cosmic strings. I will conclude by giving an outlook on the future of gravitational-wave astronomy in general and pulsar timing measurements in particular in view of the NANOGrav result. My own work on the NANOGrav signal is contained in 2009.06607 and 2009.10649, which I will also briefly discuss.*