Contribution ID: **98** Type: **not specified**

BSM physics explanations of a_μ in light of the FNAL muon $g-2$ measurement

Tuesday, 24 August 2021 10:55 (20 minutes)

The first results of the Fermilab Muon $g-2$ experiment are in full agreement with the previous BNL measurement and push the world average deviation in Δa_μ from the Standard Model to 4.2 σ. In this talk I will present an extensive survey of its impact on beyond the Standard Model physics, focusing on simple extensions of the standard model, based on arXiv:2104.03691. In this work we used state-of-the-art calculations and a sophisticated set of tools to make predictions for a_μ, dark matter and LHC searches. We examined a wide range of simple models with up to three new fields which represent some of the few ways that large Δa_μ can be explained. The results show that the new measurement excludes a large number of models and provides crucial constraints on others. Generally, these models provide viable explanations of the a_μ result only by using rather small masses and/or large couplings with chirality flip enhancements, which can lead to conflicts with limits from LHC and dark matter experiments. I will present results for a range of models extending the standard model by one, two and three new fields including scalar leptoquarks and simple models constructed to explain dark matter and $g-2$ simultaneously.

Primary authors: JACOB, Douglas (Monash University); ATHRON, Peter; BALAZS, Csaba (Monash University); KOTLARSKI, Wojciech (TU - Dresden); STOECKINGER, Dominik (TU Dresden); STOECKINGER-KIM, Hyejung (TU Dresden)

Presenter: JACOB, Douglas (Monash University)

Session Classification: Dark Matter and Astroparticle Physics

Track Classification: Dark Matter and Astroparticle Physics