

Spring 2023 Colloquium

Department of Physics & Astronomy

Texas A&M University-Commerce

April 20, Thursday, 4-5 PM in Science Building 127

(coffee and cookies will be served at 3:50 PM)

Nuclear Physics

Silent events at the Large Hadron Collider

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Full Professor of the Physics and Mathematics Institute at the Federal University of Pelotas (UFPel), Pelotas, Brazil, where he has been working since 2002. He holds a PhD in Physics from the Federal University of Rio Grande do Sul (2000). He was coordinator of the Degree in Physics from 2004 to 2008, coordinator of the Master's in Physics from 2008 to 2011 and director of the Physics and Mathematics Institute from 2010 to 2014. He worked at Lund University as a guest researcher from August 2015 to July 2016. Chair of the SBF/APS program at the University of Kansas in September and October 2018. Associate Researcher at the Institute of Modern Physics of the Chinese Academy of Sciences, Lanzhou, China, since March 2021. Currently, is a visiting researcher at the University of Muenster, Germany. He has experience in

Physics, with emphasis on Specific Reactions and Particle Phenomenology, working mainly on the following topics: quantum chromodynamics, high energy dynamics and dense systems, neutrino and cosmic ray physics, and scenarios for the physics beyond the standard model.

Abstract

A broad class of processes at high energies has properties analogous to the classical pattern of the diffraction of light and are characterized by a small number of particles in the final state, in contrast to the typical events present in proton - proton, proton - nucleus and nucleus - nucleus collisions. In recent years, several authors have demonstrated that these "silent" events provide new possibilities for the investigation of the Quantum Electrodynamics and Quantum Chromodynamics at high energies as well as to search for Beyond the Standard Model (BSM) Physics. In this talk I will review the basic concepts needed to describe the hadronic collisions at the Large Hadron Collider (LHC) and how the "silent" events can be generated. Moreover, I will present the recent results for the Light - by - Light scattering and for the production of Axionlike particles at the LHC, which indicate that "silent" events can be used to probe the presence and to constrain possible scenarios for BSM physics.