



University of Miami, Physics Department Seminar

Date: Thursday, Mar 7, 2024
Time: 3:30 pm – 4:30 pm
Location: Physics Conference Room – Rm 335, Knight Physics Building

Speaker:

Maximilian Bachmaier

PhD student in Gia Dvali's group at LMU and MPP in Munich

Talk Topic:

The Fate of Magnetic Monopoles in the Early Universe

In the first part of my talk, I will present our study on the interactions between 't Hooft-Polyakov magnetic monopoles and the domain walls formed by the same order parameter within an $SU(2)$ gauge theory. We observe that the collision leads to the erasure of the magnetic monopoles, aligning with the predictions by Dvali, Liu and Vachaspati. The erasure phenomenon has profound implications for cosmology, as it sheds a very different light on the monopole abundance in post-inflationary phase transitions and provides potentially observable imprints in the form of electromagnetic and gravitational radiation.

The second part of my talk focuses on the so-called "slingshot effect" that describes magnetic monopoles traversing the boundary between Coulomb and confining phases. This passage causes the gauge field to be confined in a cosmic string connected to the domain wall separating the two phases. Since this phenomenon could be important for first-order phase transitions in the early universe, it could give significant imprints to the gravitational background. Hence, I will also discuss the characteristics of the gravitational radiation emitted during a single slingshot effect.