

Women Lecture Series (WLS)

The Kansas State University Department of Mathematics is hosting a Women Lecture Series in celebration of the 50th anniversary of the [Association for Women in Mathematics](#). The WLS includes Distinguished Lectures and colloquium talks by women mathematicians planned throughout 2021. The talks will be streamed live during Spring 2021 and may be streamed live and/or in person during Fall 2021, depending on the circumstances of the pandemic. The talks will be held at 2:30pm-3:20pm Central Time on a Tuesday or a Thursday; there will be time for Q&A at the end of each talk.

COLLOQUIUM TALK

JUANITA PINZÓN CAICEDO (University of Notre Dame)

Thursday, October 14th, 2021, 2:30pm (Central Time)

Cardwell 122 and Streamed live at <https://youtu.be/RWFFORUQkJM>

(For those attending online, no registration or sign in needed, unless you would like to ask questions through the chat; in that case, you must login with a gmail account.)

Title: Instantons and knot concordance

Abstract: Knot concordance can be regarded as the study of knots as boundaries of surfaces embedded in spaces of dimension 4. Specifically, two knots K_0 and K_1 are said to be smoothly concordant if there is a smooth embedding of the annulus $S^1 \times [0,1] \times S^1 \times [0,1]$ into the "cylinder" $S^3 \times [0,1]$ that restricts to the given knots at each end. Smooth concordance is an equivalence relation, and the set C of smooth concordance classes of knots is an abelian group with connected sum as the binary operation. The algebraic structure of C , the concordance class of the unknot, and the set of knots that are topologically slice but not smoothly slice are much studied objects in low-dimensional topology. Gauge theoretical results on the nonexistence of certain definite smooth 4-manifolds can be used to better understand these objects. In particular, the study of anti-self dual connections on 4-manifolds can be used to show that the group of topologically slice knots up to smooth concordance contains a subgroup isomorphic to \mathbb{Z}^∞ .



Juanita Pinzón Caicedo was born and raised in Bogotá, Colombia and lived there until she moved to the US to pursue a PhD in Mathematics at Indiana University. She is now an Assistant Professor at the University of Notre Dame. The mathematical questions that Juanita aims to answer belong to low-dimensional topology. More specifically, she studies knots from the perspective of the surfaces they bound in the 4-ball, and relies mostly on tools from gauge theory and Floer homologies.