SACRAMENTO STATE

Department of Physics and Astronomy

SPRING 2026 Colloquium Series

"Analyzing the GMCs in Different Simulated Spiral Barred Galaxies"

Mauricio Uribe Moreno

Sac State Physics Major Senior Project Talk

Our understanding of giant molecular clouds (GMC) has been growing, with technological advances in observations and simulation data. Looking closer at GMCs within barred spiral galaxies has shown the difficulty of cataloging the GMCs. We will study simulations of two spiral barred galaxies that had different formation process. The first galaxy was formed in isolation, meanwhile the second was formed by a tidal interaction. We analysis GMCs by investigating parameters such as density threshold, virial parameter, and scale length used to define them. We aim to categorize GMCs in the inner arm, arm, and bar regions of the galaxies. To do this we need to look at the GMCs individually to begin to categorize the GMCs into the regions. We can also gain some insight to the total mass of each cloud in a galaxy and how they change over time. By looking at the mass of the GMCs it can help understand if there are heavier GMCs near the bar or at the arm. The difference in galaxy formation could provide insight as to efficiency of star formation in the regions stated.

***Tuesday, May 12, 2026**

4:00 – 5:20PM

MND1015

Open & Free to all students, faculty and public