



Department of Physics and Astronomy  
SPRING 2022 Colloquium Series

# “Quantifying the Intestinal Tissue Mechanics in Drosophila Fruit Flies Carrying Genetic Mutations”

Prince Yadav

*Sac State Physics Major  
Senior Project Research*

Previous research has shown that changes in the gut of Drosophila fruit fly properties can change its neurological properties; however, no such relation is quantified yet. Our research is a small part of a bigger research that would quantify the relation between Drosophila Fruit Fly gut and its neurological properties. The purpose of my research is to understand the Force and Strain relation of Drosophila fruit fly gut. Specifically, the research focuses on quantifying the deforming elasticity of the two types of fruit fly gut samples by analyzing the effect of external force applied on it. One of the fruit fly samples is of mutated fruit flies and the other is of unmutated wild type Drosophila fly. When the external force is applied to the samples and the strain percentage is calculated from the raw data, a different response from each sample is observed. The unmutated gut samples could only withstand a maximum force of about 10  $\mu\text{N}$  to 30  $\mu\text{N}$  without breaking, whereas the mutated gut samples could withstand 30  $\mu\text{N}$  to 75  $\mu\text{N}$  without breaking. We also observed that the maximum stiffness observed ranges from 20  $\mu\text{N}$  to 40  $\mu\text{N}$  for unmutated gut samples and from 20  $\mu\text{N}$  to 40  $\mu\text{N}$  for mutated gut samples. Therefore, it is observed that the gut samples of mutated fruit fly were softer initially and became stiffer when strained. Furthermore, it is observed that the mutated gut samples could withstand more strain percentage before breaking than the unmutated gut samples.

**\*Tuesday, May 10, 2022**

**4:00 - 5:20PM**

**Talk will be via Zoom and recorded**

*Open & Free to all students, faculty and public*