

**The School of Natural Sciences**  
**Presents**  
**Undergraduate Physics Research Symposium, Session 1**  
**Graduating seniors from the physics program**

**Friday, April 29, 2022**  
**10:30 – 12:00**

**COB1 Room 113 (Classroom Building) and remotely via**

<https://ucmerced.zoom.us/j/82652263820?pwd=RmgYeXh2aFVZTDdkb0Y4d3Q2WEc3QT09&from=addon>

**Talk times are approximate.**

10:30-10:42

*Developing a finite-temperature exchange-correlation approximation via the generalized thermal adiabatic connection*

**Zachary Mauri, Brittany Harding, Aurora Pribram-Jones**

10:43-10:55

*Sensing single charges with quantum dot molecules*

**Zachary von Jena, Michael Scheibner**

10:56-11:08

*Using Monte Carlo simulations to understand cargo transport by multiple kinesins*

**Donovan Bercasio, Jing Xu**

11:09-11:21

*Classification of Discrete Random Walks Utilizing Machine Learning*

**Fernando Espinoza-Ortiz, Chih-Chun Chien**

11:22-11:34

*Towards practical models for correcting artificial symmetry breaking in cases with more than one spin-contaminant*

**Jonathan Loera, Jorge Vasquez, Hrant Hratchian**

11:35-11:47

*Bacterial motility across a gradient of Newtonian and non-Newtonian fluids*

**Radoslav Iliev, Bin Liu**

*Note: Session 2 will take place on Friday, May 6 at 10:30 am. Six more graduating physics majors will present their research: 10:30: Adrian Sanchez Magana; 10:43: Nolan Kelly; 10:56: Demitrius Zulevic; 11:09: Elsa Vazquez; 11:22: Calista Lum; 11:35: Karla Leon-Aguilar*

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