



**The Association for Women in Mathematics**  
**University of Kansas Student Chapter**

**Everyone is Invited!**

**Tuesday, April 14, 2015**

**4:15 PM**

**306 Snow Hall**

*A Mathematical Physics Approaching to Understanding  
DNA and Proteins*

**Sarah LeGresley, PhD Candidate**  
**Department of Physics and Astronomy**

Abstract: Contained in our deoxyribonucleic acid (DNA) are instructions for how our cells develop and function. DNA damage that is not repaired leads to health related issues such as developmental disorders, premature aging, and cancer. DNA damage occurs at a rate of ~10,000 per cell per day and we have ~100 trillion cells. Various diffusion models have been explored but none explain the observed repair rates. We have modeled the damaged DNA and our results suggest that damage prefers to be located at sites that may be more easily found by repair proteins. If the damage is located at specific locations, that could significantly decrease the time needed for the repair proteins to locate the damage.

Short Bio: Sarah completed her master's degree in mathematics from KU under the guidance of Bozenna Pasik-Duncan (2008). Currently she is working on her PhD in physics with a concentration on Biophysics. Her interests include mathematical modeling, probability, statistics, and Monte Carlo simulations.

**Pizza will be served!**