



**Tennessee**  
**TECH**

<https://www.tntech.edu>

<https://www.tntech.edu/research/featured-researchers/featured-researcher-archive/featured-researchers-holley>

## Featured Researcher | Adam Holley

### TITLE

---

Investigation of Spin Evolution in Magnetic Ultracold Neutron Bottles Used to Measure the Free Neutron Lifetime

### INVESTIGATOR

---

PI: Adam Holley

### FUNDING

---

National Science Foundation CAREER Award

#### PROJECT SUMMARY

Dr. Adam Holley, Assistant Professor of Physics, recently earned a National Science Foundation CAREER Award for his work titled "Investigation of Spin Evolution in Magnetic Ultracold Neutron Bottles Used to Measure the Free Neutron Lifetime." The NSF CAREER Program supports junior faculty who "exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations." Dr. Holley's award lasts through 2021.

In his work, Dr. Holley uses neutrons to probe the basic rules that govern the subatomic world. Neutrons play a significant role in cosmology, and their study complements current efforts at collider facilities to discover new physics. Two laboratory techniques exist to determine the lifetime of a neutron with high precision, but they disagree significantly in their reported values. This discrepancy must be addressed in order to realize the potential of these techniques to help uncover new physics. The research conducted with this award directly supports that effort by examining the behavior of very low energy (or "ultracold") neutrons which are magnetically confined in order to determine the neutron lifetime. The research involves a broad set of ideas and skills appropriate for undergraduate involvement and will be used to form the kernel for an interdisciplinary undergraduate research training, mentoring, and outreach program at Tennessee Technological University.

*Last edited 2016.06.22 by Hill, Amy.*