

**Topic:** “A Cyber-Physical Systems Perspective on Smart Grid Security”

**Date:** Thursday, October 19, 2017

**Location:** Lehigh University, STEPS 101 Building

**Time:** 6:00 PM to 7:30 PM, includes light refreshments for those pre-registered.

**RESERVATIONS ARE REQUIRED BY OCTOBER 19<sup>th</sup> 11 AM USING THE FOLLOWING LINK:**

<https://events.vtools.ieee.org/m/46617>

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**Speaker:** Aaron St. Leger, Phd

**Agenda:** Smart grid technologies are providing a tremendous opportunity to improve operation, reliability, and resiliency of electric power systems. The technologies also enable enhanced customer participation in the power grid to include renewable energy system integration and demand response programs. As the power grid is evolving into a “smarter grid”, system operators and customers are implementing advanced measurement and metering, two-way communication, and distributed computing and control technologies.

At a high level, this can be viewed as smart grid applications serving specific roles within the power grid and a supporting infrastructure to enable these applications. A Cyber-Physical Systems (CPS) perspective allows for modeling these applications and infrastructure in a cohesive manner. Identifying and studying cyber-physical interactions provides a valuable tool for the design of smart grid applications and analyzing smart grid security.

This talk provides a high level overview of CPS and on applying CPS concepts to describe and analyze security of smart grids. A number of specific power system applications will be discussed within this framework. Vulnerabilities of these applications, both cyber and physical, will be discussed along with risk assessment and mitigation strategies. Lastly, the cyber induced blackout of Ukraine in 2015 will be used as practical example for examining risks, threat vectors, and methods of security.

**Biography:** Aaron St. Leger is an Associate Professor at the United States Military Academy (USMA). He received his BSEE, MSEE and PhD degrees at Drexel University. His research and teaching interests include alternative energy, electric power systems, modeling and controls. He has over 50 papers published on these

subjects. His recent work has focused on integrating alternative energy and demand response controllers to improve electric power systems for military forward operating bases, and anomaly detection in smart grids.

He is the director of the Electrical Power Systems, Alternative Energy, and Operational Energy laboratories at USMA. He is an active senior member of the IEEE. He founded and served as chair in the IEEE Power & Energy Society (PES) Young Professionals Committee, and currently serves in the IEEE PES Power and Energy Education Committee, IEEE PES Long Range Planning Committee, IEEE Young Professionals Committee, and as the faculty advisor to the USMA IEEE student branch.