# IESVic Seminar

**DATE:** Monday, April 30th, 2018

**TIME:** 2:00 – 3:00 pm

**LOCATION:** Engineering Computer Science Bldg. (ECS) Room 660

**SPEAKER:** **Matt Hall**
Assistant Professor, School of Sustainable Design Engineering
University of Prince Edward Island

**TITLE:** ***A Hybrid Model Perspective on Basin Testing Offshore Energy Devices***

**Abstract:** Wave basin testing is a key research tool and validation step in the design process for floating offshore renewable energy converters. Whether the device is an offshore wind turbine, a floating tidal turbine, or a wave energy converter, testing a scaled prototype in a wave basin helps reduce risk before investing in a large-scale prototype. Laboratory wave basin tests often struggle to realize true-to-scale behaviour, particularly at key power conversion steps such as a turbine rotor or a wave energy power take-off. The state-of-the-art solution is a hybrid approach where an actuation system is used to mimic the difficult-to-scale phenomenon by relaying the results of a numerical simulation which runs in real time in parallel with the experiment.

This talk will survey the state of the art in hybrid models and share research on developing and validating a hybrid model approach for use in testing floating wind turbines. The approach uses a cable system to dynamically couple the physical floating structure experiment with a numerical wind turbine model. Tests have shown it to perform well, offering new capabilities to wave basin testing of floating wind turbines. Comparing to tests with a wind tunnel also shows that it can match existing physical tests. The talk will conclude with thoughts on where hybrid model technology is going and its applicability across a range of offshore renewable energy applications.

**Biography:** Matt Hall does research on wind and marine renewable energy and how these clean resources can be better integrated into the energy system. His training is in mechanical engineering, with time spent at the universities of PEI, New Brunswick, Victoria, and Maine. He publishes regularly on floating offshore wind turbine technology and is working with collaborators on ways to make PEI's energy system more self-sufficient and sustainable.

*For further information, please contact the IESVic office (250) 721-6295.*