**Project Title:** Function Theory on Polydiscs  
**Principle Investigator:** Dr. Kelly Bickel, Assistant Professor of Mathematics  
**Funding Agency:** National Science Foundation (NSF)  
**Award Amount:** $95,000.00  
**Award Period:** 2014-2017

This project concerns the study of complex functions of two or more variables with sufficiently nice structure. Such functions can be used to encode information about simple physical systems that accept input data and release output data, such as signal processors. They are also closely related to problems in robust control theory; here, the driving question is how to design systems that perform desired tasks while maintaining internal stability. The motivation for Dr. Kelly Bickel in this NSF funded project are the classic results by mathematicians such as Beurling and Herglotz that show that nice functions of one variable can be represented using different and enlightening formulas. Different formulas are useful in different situations, and the collection serves as a robust toolbox for studying properties of complex functions and related objects.

The specific focus of this project is the study of holomorphic functions on the polydisc and multivariate analogues of classic representation formulas for such functions. Within this context, Dr. Bickel plans a further study of functions on polydiscs, with an emphasis on boundary behavior. Broader impacts of this study include the mentoring of students interested in science and mathematics by Dr. Bickel through her teaching and outreach activities.

**Contact:** Carol A. Burdsal, Assistant Provost for Research, 570-577-3855, cab066@bucknell.edu

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