

Board Meeting
January 15, 2015

APPOINT ASSOCIATES TO THE CENTER FOR ADVANCED STUDY, URBANA

Action: Appoint Associates to the Center for Advanced Study for the Academic Year 2015-16

Funding: State Appropriated Funds

Each year the Center for Advanced Study awards appointments as Associates in the Center, providing one semester of release time for creative work. Associates are selected in an annual competition from the tenured faculty of all departments and colleges to carry out self-initiated programs of scholarly research or professional activity.

The Chancellor, University of Illinois at Urbana-Champaign, and Vice President, University of Illinois recommends the following list of Associates selected for the 2015-16 academic year, and offers a brief description of their projects:

Yuliy Baryshnikov, Professor, Mathematics and Electrical and Computer Engineering, *Applied Configuration Spaces*

A book on applied configuration spaces will be finalized during the semester. It will cover several novel areas in applied topology, addressing engineering and scientific problems ranging from protein folding to motion planning and exploring tools from algebraic topology.

Howard Berenbaum, Professor, Psychology, *This I Believe*

The proposed project will explore the nature of beliefs – what they are, how they develop, and how they change. The goal is to develop a new unified model of belief formation and change that can explain the development of beliefs considered psychotic (e.g., I am visited

by Martians every evening), those considered (by most scientists at least) to be peculiar, but not psychotic (e.g., carrying around a rabbit's foot will bring good luck), those that are central to our views of ourselves (e.g., I am brave, good looking, and above average), those that are central to our views of our place in the universe (e.g., a benevolent G-d watches over me), and those that are relevant to public policy (e.g., there is no such thing as global warming).

Weng Chew, Professor, Electrical and Computer Engineering, *Computational Electromagnetics for Quantum Optics and Casimir Force Study*

Even in the quantum regime, the solutions of Maxwell's equations are indispensable in the understanding of quantum optics systems, which are important for quantum information and Casimir force. This project will study the use of computational electromagnetics methods (CEM) to better understand highly complex quantum optics systems.

Cara Finnegan, Associate Professor, Communication, *The Camera Politic: American Presidents and the History of Photography from the Daguerreotype to the Digital Revolution*

The Camera Politic uses archival research and analysis of published texts and images to study how U.S. presidents have shaped our experiences of photography in the public sphere. The project investigates how presidents participated in four moments of dramatic change in the history of photography and provides critical insight into how generations of Americans were taught by those in political power to understand photography's role in public life.

Eyamba Bokamba, Professor, *Multilingualism in Africa: Sociolinguistic and Cognitive Dimensions*

This project will pursue and complete the author's on-going research on multilingualism — the existence of three or more languages as media of daily (oral) communication for a given society or speaker — with an emphasis on Africa as an illustrative study of this largely understudied and misunderstood worldwide phenomenon. The study is part of an envisaged book publication titled, *Multilingualism in Africa: Sociolinguistic and Cognitive Dimensions*, that will characterize and elucidate empirically the phenomenon's social and cognitive dimensions at the societal and individual levels, including its legal implications in the use of language as a critical criterion in the adjudication of the ever-increase asylum seekers' applications.

Farzad Kamalabadi, Professor, Electrical and Computer Engineering, *Computational Spectral Imaging: Theory, Algorithms, and Fundamental Performance Limits*

Spectral imaging, the simultaneous imaging and spectroscopy of a radiating scene, while ubiquitous in virtually all branches of physical sciences as a fundamental diagnostic technique, suffers from intrinsic temporal, spectral, and spatial resolution limitations of the physical systems that rely on inevitable two-dimensional detectors. The proposed research plan aims to overcome these limitations of conventional spectral imaging systems by distributing the task of image formation and spectroscopy between a physical and a computational system, hence digitally forming spectral images by obtaining efficient computational solutions and statistical performance bounds of the resultant inverse problems.

Jean-Pierre Leburton, Professor, Electrical and Computer Engineering,
Genomics with Semiconductor Nanotechnology

This research project investigates the operation of graphene-based nanoscale devices in performing biological functions with the nanopore of an artificial multi-layer membrane energized by voltage and current sources. For this purpose, we will use a multi-scale computational approach coupling molecular dynamics with advanced device modeling to explore the possibility of sequencing DNA molecules in the nanopore of stacks of mono-atomic layers of graphene embedded in a field-effect transistor structure.

Hedda Meadan-Kaplansky, Associate Professor, Special Education, *Capitalizing on Internet Technology to Support Families with Young Children with Autism and Other Developmental Disabilities*

The main thrust of this project is to further develop and test an innovative Internet-based model in which partnerships with families are nurtured and parents are taught to use evidence-based communication strategies with their young children with autism and other developmental disabilities. This study aims to demonstrate that by adopting evidence-based, naturalistic intervention strategies and targeting social-communication skills of young nonverbal children with autism and other developmental disabilities, the quality of life of both the children and their families will be enriched.

Harriet Murav, Professor, Slavic Languages and Literatures and Comparative and World Literatures, *A Strange New World: Untimeliness, Futurity, and David Bergelson*

A Strange New World: Untimeliness, Futurity, and David Bergelson focuses on the experience of anachronism and distorted temporality as an emotional, sensory, and existential condition in both the world and the work of the Yiddish author David Bergelson (1884-1952). By situating Bergelson in the philosophical and artistic experimentation and the political and technological change of his era, this study adds a new comparative and interdisciplinary dimension to the study of Yiddish, and a new ethnic dimension to the study of modernism.

Philip Phillips, Professor, Physics, *Strongly Coupled Electron Matter*

Strongly coupled systems pose a distinct problem for theoretical physics. If a fixed point at strong coupling exists, then definitive progress can be made, including in the classic problem of high-temperature superconductivity. This research project will devise a method for constructing a fixed point at strong coupling for strongly correlated electron matter.

Renée Trilling, Associate Professor, English, *Ecce Corpus: Beholding the Body in Anglo-Saxon England*

Recent trends in critical theory have drawn from scholarship in neuroscience and related fields to rethink the definitions of materiality and subjectivity, and this project uses those insights to uncover the role of the body in Anglo-Saxon England. Its goals are simultaneously to

better understand ideas of the self in the early Middle Ages and to challenge modern assumptions about the nature of subjectivity.

Ted Underwood, Professor, English, *The Social Differentiation of Literary Genres, 1800-1950.*

This project applies statistical modeling to a collection of a million English-language volumes in order to understand the emergence of broad distinctions that organize the modern literary world — for instance, the notion that literature is set apart from nonfiction by a special vividness of language, and divided internally into genres that are “serious” or “popular.” These distinctions haven’t always seemed obvious; nor were they invented by a particular school of writers; they emerged quite gradually, and tracing that process of emergence can illuminate their social significance.

The Board action recommended in this item complies in all material respects with applicable State and federal laws, University of Illinois *Statutes, The General Rules Concerning University Organization and Procedure*, and Board of Trustees policies and directives.

The Vice President for Academic Affairs concurs.

The President of the University recommends approval.