

Approved by the Board of Trustees,
March 10, 2005

Board Meeting
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APPOINT FELLOWS AND ASSOCIATES TO THE CENTER FOR ADVANCED
STUDY, URBANA

Action: Approve Appointments of Fellows and Associates to the Center for Advanced Study for the Academic Year 2005-06, Urbana

Funding: Private Gift Funds from the Beckman Endowment and State Appropriated Funds

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

The Chancellor at Urbana recommends the following list of Fellows and Associates selected for the 2005-06 academic year, and offers a brief description of their projects:

Fellows

Isaac Cann, Assistant Professor, Animal Sciences, *Evolution of clamp loaders in DNA replication*

Clamp loaders are protein complexes that switch DNA synthesis from slow to very rapid processes in all forms of life. This research aims at analyzing *Methanosarcina acetivorans* clamp loader, a potential "missing link" in the evolution of complex clamp loaders.

Sahraoui Chaieb, Professor, Theoretical and Applied Mechanics, *Liposomes wrinkling by adiabatic cooling of magnetic nanocrystals*

A new class of liposomes wrinkles upon cooling and releases its content. For deep tissue delivery, an investigation of the occurrence of adiabatic cooling in magnetic nanocrystals as a trigger for the delivery.

Rachael DeLue, Assistant Professor, Art and Design, *Diagnosing Pictures: The Science of Looking in Turn-of-the-Century America*

This study examines how American art critics around 1900, borrowing from the claims and methods of scientific inquiry, transformed their practice into a diagnostic science. By characterizing how art and science thus intersected, DeLue illuminates how art-writing articulated and explored new ways of perceiving the world made possible by scientific advances. In addition, how the very act of looking underwent re-conceptualization at a moment when preoccupation with the capacity of perception and concern about verity and deception underpinned conversations in multiple social spheres.

Atul Jain, Assistant Professor, Atmospheric Sciences, *Exploring the implication for oceanic carbon uptake of the marine ecosystem response*

This proposed research will be the first attempt to conduct a comprehensive investigation of the sensitivity of carbon uptake to changes in marine productivity, phytoplankton dynamics, and marine ecology associated with climate change.

****Zachary Lesser, Assistant Professor, English, *The birth of tragicomedy: Mixed form, mixed politics in Renaissance drama***

This book examines the politics of the most popular dramatic genre of seventeenth-century England. Tragicomedy's emphasis on mixture--and its figural analogue, paradox--encodes the pressing political questions of early Stuart society, which, in a period of historic transition, relied on the same kind of paradoxical mixture to prevent political, religious, and economic debates from becoming unbridgeable divides.

****Chad Michael Rienstra, Assistant Professor, Chemistry, *Protein structure determination by solid-state nuclear magnetic resonance (NMR)***

Many proteins relevant to human disease, including membrane proteins and fibrous aggregates, cannot be examined by the traditional methods of structure determination (X-ray crystallography and solution NMR). This study proposes to leverage newly acquired state-of-the-art magic-angle spinning experiment capabilities to solve the structure of proteins associated with Parkinson's disease. The long-term objective of our research is to develop a detailed atomic-resolution structural and mechanistic understanding of protein aggregation and fibril formation. If successful, these studies will have a major impact on our understanding of protein aggregation, improving both diagnostic and therapeutic tools for neurodegenerative diseases.

****Glenn I. Roisman, Assistant Professor, Psychology, *The legacy of early experience as reflected in adult relationships***

The proposed research will examine genetic, non-shared environmental, and shared environmental contributions to continuity and change in the quality of parent-child attachments from infancy to adulthood, study how adults' childhood experiences lay a foundation for interpersonal relationships in adulthood, and examine the significance of romantic, sibling, and friend relationships in terms of their impact on the individual development of adults.

****Valeria Sobol, Assistant Professor, Slavic Languages and Literatures, *Febris erotica: A cultural history of lovesickness in Russia***

This project attempts to account for the strikingly frequent appearance of the ancient notion of lovesickness in Russian literary, philosophical, and medical texts. This study argues that lovesickness (a borderline concept that highlights the link between the emotional and the physical) plays such an important role in Russian culture due to its intense preoccupation with the nature of the mind-body interaction.

****Huimin Zhao, Assistant Professor, Chemical and Biomolecular Engineering, *Directed evolution of human class II MHC DR1 molecules***

This project uses directed evolution and yeast surface display to engineer and characterize human class II MHC DR1 variants with increased antigenic peptide substrate specificity and affinity. This work may not only provide new insights into the molecular basis of peptide-MHC interaction, but also may lead to the development of novel MHC-based diagnostic and therapeutic agents for cancer and autoimmune diseases.

Associates

John P. D'Angelo, Professor, Mathematics, *Research and scholarly writing in CR geometry*

The project continues work in the developing branch of mathematics called CR geometry. Research continues in CR geometry, to synthesize and organize recent results in the subject, and to write a monograph based on these developments.

Peter Fritzsche, Professor, History, *The Nazi Revolution: Nation, Race, Empire*

The project culminates in a seventh book, *The Nazi Revolution*, a compact interpretation of National Socialism, the Holocaust, and race war through three interrelated concepts: nation, race, and empire. A final chapter, "After Words," will examine the nature of knowledge in the wake of the Nazi catastrophe.

Steve Granick, Professor, Materials Science and Engineering, *Macromolecular diffusion at hard and soft surfaces*

The project addresses one of the most fundamental unsolved problems in the study of macromolecular liquids, namely the translational mobility of these molecules at surfaces. Fluorescence spectroscopy using single-molecule and few-molecule methods will be employed to make the first systematic direct measurements of the surface diffusion of synthetic polymers at surfaces and in confined spaces.

Ioan-Sherban Lupu, Professor, Music, *The violin works of George Enescu*

The project results in a book about the performance of the violin works of George Enescu (1881-1955) who, together with Bela Bartok, Igor Stravinsky, and Karol Szymanowsky, is one of the giants of musical composition of the twentieth century representing East European musical tradition and folklore. In addition to his compositional and conducting activities, Enescu was also one of the great violinists of his time and his creative output for his instrument is an innovative and invaluable testimonial of both his artistry and compositional skills.

Nancy Makri, Professor, Chemistry, *Simulation methods for quantum many-body systems*

This work will pursue the development of novel methods for simulating the dynamics of processes in condensed phase systems dominated by quantum mechanical effects. Such simulations will lead to a better understanding of energy transfer in organic materials, intriguing processes in quantum fluids, and the possibility of realizing quantum computing.

Rajeshwari Vijay Pandharipande, Professor, Religious Studies and Linguistics, *Transformation and authentication of Hinduism: Language of religion in U.S. diaspora*

This project examines the transformation of the linguistic form, religious content, and the function of the language of Hinduism in the U.S., analyzes the role of the Hindu mystics and saints in authenticating the change, and presents a cohesive interdisciplinary framework for analyzing religious language in diaspora.

Henry Plummer, Professor, Architecture, *Completion of a forthcoming book: Masters of Light. Second Volume: Contemporary Experiments*

This project continues the research and writing of a new book entitled, *Masters of Light. Second Volume: Contemporary Experiments*. A twofold work of theory and photography, this book explores how natural light is currently being used as a creative medium in architecture, and manifests new ideas on the art and science of light that define our modern world.

Andrea L. Press, Professor, Communications Research and Speech Communication, *Faith, politics, and information: religious and secular beliefs in the new media*

This project analyzes the relationship between media use and beliefs about religious and civic life in two groups of citizens (a white fundamentalist group, and an African-American woman's group), media diaries, and a family study of media use. The study focuses on the relationship between the new media environment and U.S. citizens' varying practices *vis-a-vis* their civic and religious lives.

Nikolaos Sahinidis, Professor, Chemical and Biomolecular Engineering, *Novel algorithms for crystallographic computing*

This project will develop novel algorithms and software for crystallographic computing. The work will advance the frontiers of macromolecular crystallography and structural biology by developing fast and accurate imaging

techniques capable of unraveling the structures of biomolecules important in the understanding of life, materials science, and drug design.

Mahir Saul, Professor, Anthropology, *The Bobo village from heterarchy to modern state politics*

This project analyzes the long-term fieldwork and archival research in West Africa. Its subject is the political organization of the farming population in the Volta region, the influence of the colonial period, and the contribution of this knowledge to understanding political participation in the nation state.

Jon J. Thaler, Professor, Physics, *Astrophysics: DES and LSST*

It has become increasingly clear that particle physics and astrophysics have much in common. In particular, the evolution of the universe since the big bang depends crucially on the properties of the elementary particles that it contains. Several interesting puzzles have attracted attention--the contribution of neutrinos to the formation of cosmological structure (stars and galaxies) and the nature of the dark matter and the dark energy are of particular interest. These materials together make up 96 percent of the total energy in the universe, but their other properties are almost completely unknown.

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 President of the University concurs.

**These faculty members have been recommended for appointment as Beckman Fellows in the Center for Advanced Study named for the donor of a gift that permits additional recognition for outstanding younger fellow candidates who have already made distinctive scholarly contributions.