

Contact: Rachel Boon

**PROFESSIONAL DEVELOPMENT ASSIGNMENT REQUESTS FOR 2022-23**

**Action Requested:** Recommend approval of the professional development assignment requests submitted by the Regent universities for 2022-23.

**Executive Summary:** The Board of Regents must annually approve faculty professional development assignments as specified in Iowa Code §262.9(14) and Board Policy §2.2.R. For 2022-23 the University of Iowa, Iowa State University and the University of Northern Iowa request approval of 98 faculty professional development assignments. Guidance to the institutions permits them to request PDAs for a maximum of 3% of eligible faculty in a year. These requests for 2022-23 represent 2.1% of eligible faculty.

A brief description of the work planned for each proposed assignment is available below. This report addresses the Board of Regents Strategic Plan priorities for “promoting and supporting innovation in teaching, research, and economic development and promoting effective use of resources to meet institutional missions.” The Board office recommends approval of the professional development assignment requests for 2022-23.

**NUMBER OF PDA RECIPIENTS AND PERCENT OF TOTAL FACULTY  
FY 2019 – FY 2023**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
SUI	56 (2.4%)	71 (3.0%)	72 (2.2%)	43 (1.3%)	52 (2.1%)
ISU	43 (2.2%)	50 (2.7%)	48 (2.6%)	29 (1.6%)	38 (2.2%)
UNI	12 (1.7%)	14 (1.8%)	14 (1.9%)	0 (0.0%)	8 (1.4%)
<b>REGENT TOTAL</b>	111 (2.2%)	135 (2.7%)	134 (2.3%)	72 (1.2%)	98 (2.1%)

**Background**

**Eligibility.** Each university has academic policies that describe the process and requirements for professional development assignments (PDA) and which guide the selection of faculty.

**University of Iowa.** Full-time faculty members (i.e., tenure or clinical-track) with academic year appointments who have completed a minimum of 10 semesters of full-time academic service are eligible for an initial one-semester PDA. Full-time tenure-track and clinical-track faculty members with fiscal-year appointments are eligible for their first PDA of 4.5 months (i.e., one semester) in length after they have completed a minimum of four years of full-time academic service or the equivalent (i.e., prorated for part-time faculty). Alternatively, fiscal-year faculty members who have completed 8 or 11 years of full-time academic service or the equivalent (i.e., prorated for part-time faculty) are eligible for a PDA of 9 months (i.e., two semesters), or a full 12 months, respectively. To become eligible for a subsequent award following a PDA, faculty members with academic-year appointments must complete 10 semesters of full-time service; faculty members with fiscal-year appointments must complete four years of full-time service.

**Iowa State University.** All members of the faculty employed half time or more are eligible to apply for faculty professional development assignment. There is no restriction on length of service in

order to qualify for a faculty professional development assignment, however priority is given to accomplished senior faculty; to those faculty who are seeking competitive AAU-caliber fellowships (e.g., Fulbright Award); and to faculty who have not received a faculty professional development assignment in the past five years.

**University of Northern Iowa.** Policies and procedures relating to Professional Development Assignments at UNI are defined in the Faculty Handbook. Only tenured faculty members are eligible to apply. A recipient of a PDA is ineligible for a subsequent assignment during the six academic years of active service following an award. Assignments are competitive and a campus-wide committee ensures that only those projects meeting the established criteria (e.g. context, significance and objectives, methods and timetable, and plans for dissemination and long-range importance) in the application are considered and reviewed for overall quality.

Review process. The universities each conduct a rigorous review process for each proposed PDA. Peer review and recommendation are the basis of selection at the department and college levels at each university and final approval by the provost. Criteria considered include ability of the department to continue to offer the courses students need to stay on track for graduation, as well as the impact of the proposed PDA on the institution and the state.

Length of assignments. Professional development assignments are usually for one semester, although they may be up to a year. For PDA that are two semesters in length, compensation is limited to the amount of compensation a faculty member would receive during a semester-long assignment. Salary savings generated from faculty members on assignment for a full year offset the replacement costs for other faculty members.

Obligation to institution. Iowa Code §262.9(14) requires that a faculty member return to the institution for twice the length of time of the professional development assignment or to repay the costs associated with the PDA if the faculty member does not return to the institution. Following a PDA, faculty members are responsible for reporting the results of their assignments as specified by Board Policy 2.1.4.R. and institutional guidelines.

Value of professional development assignments. The PDA provide increased visibility and prominence of faculty and departments in research and scholarship and direct application of expanded knowledge to students, Iowans, the nation and the world. Recipients often compete successfully for external grants and awards that benefit the professors, the programs, the universities and the state by generating revenue for core university activities and research opportunities for undergraduate and graduate students.

Proposed activities. Faculty members engage in a variety of productive activities during their PDA. For example, faculty members perform intensive research, write scholarly books and articles, create new works of art and composition, present papers, work in industry, prepare grant proposals, mentor graduate students, and develop modeling systems, software, course materials and multimedia resources for their discipline. These opportunities enrich the educational environment of the universities and are essential to the academic vitality of the universities.

Faculty replacement costs.

- At SUI, the total projected cost of the program for 2022-23 is \$87,217. For the recommended awards, costs will be reduced, where possible, by having colleagues cover courses or deferring non-required courses to a later time.

- To the extent possible, ISU department chairs and deans provide flexible approaches to managing the workload and associated costs for the assignments, such as in reassignment or alternate scheduling of courses. For example, some PDA requests do not represent new costs but instead are managed by the department through a reassignment of course load among current faculty. Salary savings generated from the faculty members on assignment for a full year are used to offset the replacement costs in other cases. Due to twelve requests for a full year PDA, ISU estimates salary savings of \$471,600, which exceeds the estimated costs of \$464,000.
- UNI department heads and deans assign courses, originally to be taught by faculty members receiving PDAs, by assigning their courses to other faculty members in the department, rescheduling elective courses to subsequent semesters, or assigning adjunct instructors to cover courses. Salary savings are utilized to offset some replacement costs available when a faculty member receives a one-year PDA. The funds allocated for replacement salary costs for FY23 PDAs is estimated to be \$45,671.

**BUDGETED REPLACEMENT NET COSTS  
FY 2020 – FY 2022**

	<b>FY2021</b>	<b>FY2022</b>	<b>FY2023</b>
SUI	\$256,949	\$207,231	*\$87,217
ISU	*\$96,102	*\$166,588	***\$0
UNI	*\$47,887	**\$0	*\$45,671
<b>REGENT TOTAL</b>	<b>\$400,938</b>	<b>\$373,819</b>	<b>\$132,888</b>

\*Change in calculation of costs to reflect net costs (estimated costs minus salary savings)

\*\*UNI did not request any PDAs for FY2022.

\*\*\*All costs for ISU are recovered through salary savings of the 12 faculty who requested a full year PDA, leading to an estimated net cost of \$0.

**Iowa State University**

**ADAMS, DEAN**, Distinguished Professor, Ecology, Evolution and Organismal Biology, 20 years of service, full academic year

*Title:* Deciphering the Repeatability of Evolution in Vertebrates

Professor Adams will explore the repeatability evolution – specifically, whether changes among vertebrates are consistent across diverse environments – during his proposed assignment. The results will be incorporated into Adams’ courses, and result in numerous peer-reviewed publications, new research collaborations and external funding proposals.

**ADELEKE, R TUNDE**, Professor, History/African and African-American Studies, 15 years of service, spring 2023

*Title:* “We Wish to Plead Our Cause”: Moral Suasion, Religion and Black Abolitionism (1830-1850)

Professor Adeleke will analyze the circumstances that compelled leading Blacks in the early 19<sup>th</sup> century to adopt moral suasion (appeals to morality to influence behavior) as a reform strategy, and how this choice created a split between the Black abolitionist movement and the Black Church. The assignment will compel rethinking of the Black Church during this period, and highlight how moral suasion continues to impact Black Americans today.

**ANDREWS, JAMES THOMAS**, University Professor, History, 24 years of service, full academic year

*Title:* Iconic Metropolitan: Mass Mobility, Architectural Visions, and the Politics of Public Space in Modern Russia

Professor Andrews’ assignment will focus on a book project that examines the history of the Moscow Metro, providing insights into the politics of the Stalin era, and how everyday practices, political iconography, and public architecture intersected into late-Soviet and post-Soviet eras. This project has already been awarded a prestigious Woodrow Wilson Center for International Scholars grant.

**ARNDT, GRANT**, Associate Professor, World Languages and Cultures, 13 years of service, full academic year

*Title:* “Anthropologists and Other Friends”: Cosmopolitan Indians, Action Anthropologists, and the Emergence of Indigeneity

Professor Arndt will use the proposed assignment to work on a book manuscript focused on Sol Tax and Nancy Lurie, two anthropologists who undertook collaborative projects with American Indian communities in Chicago and Wisconsin in the mid-20<sup>th</sup> century. The book will be an important contribution to both anthropology and American Indian studies, as well as Arndt’s ongoing scholarship and courses on American Indian Culture and politics.

**ARORA, RAJEEV**, Professor, Horticulture, 20 years of service, spring 2023

*Title:* Understanding the dynamics of formation, localization, and progression of ice in tissues vis-à-vis its consequences for freeze-injury or -tolerance in plants

Professor Arora will use the proposed assignment to with colleagues at the University of Innsbruck, Austria, to understand ice management in plant tissues. This work is expected to produce refereed publications, grant proposals, and graduate student projects, as well as be incorporated into Arora’s research and classroom teaching.

**BHATTACHARYA, JOYDEEP**, Professor, Economics, 22 years of service, October 2022-August 2023

*Title:* Discrimination in Labor Markets

Professor Bhattacharya's assignment is focused in India, examining discrimination by the Hindu majority workforce against minority Muslim employers within the context of rural labor markets. This work is novel since it looks at discrimination from employee toward employer, rather than employer toward employee, and may explain low rates of entrepreneurship in underprivileged groups. Expected outcomes will include journal articles and opportunity for student projects in other countries.

**DOYLE, SHELBY**, Associate Professor, Architecture, 6 years of service, fall 2022

*Title:* Sympoesis (Making With): Architecture & Robotic Construction

Professor Doyle's proposed assignment brings together two funded research projects: a theoretical project supported by the Canadian Centre for Architecture and the Mellon Foundation; and a technical robotics project supported by Autodesk. Outcomes will include original research, new robotic workflows, journal publications, public lectures and exhibitions, and future grant applications. The work will also benefit ISU students through new pedagogies in computation and robotics for the College of Design and the Student Innovation Center.

**EISMAN, APRIL**, Associate Professor, Art and Visual Culture, 14 years of service, full academic year

*Title:* Painting Women in East Germany: Five Artists in a Socialist State

Professor Eisman's project will examine the life and work of five of East Germany's most successful female artists. The primary outcome of this work will be a book manuscript, which will be the first monograph to offer a comparative study of women artists in East Germany. Other outcomes include the development of material for Eisman's courses at Iowa State.

**FOEGEN, ANNE**, Professor, School of Education, 26 years of service, full academic year

*Title:* Extending the Potential of Algebra Progress Monitoring

Professor Foegen's assignment is focused on developing expertise in advanced statistical methodologies, and pursuing commercial options for a software program to support students' learning of algebra through frequent screening assessments. This work will result in new publications, and is expected to benefit the School of Education, Iowa State University, and teachers across the state and nation.

**FOX, RODNEY**, Distinguished Professor, Chemical and Biological Engineering, 23 years of service, full academic year

*Title:* Fulbright-Tocqueville Distinguished Scholar Award – Innovative Moment-Based Multiphase Flow Models for Renewable and Clean-Energy Production

Professor Fox's proposed assignment is focused on the global challenge of developing renewable and clean energy sources to maintain quality human life. Fox will expand on his pioneering work in multiphase modeling with collaborators in France; the results will also be shared with industry through Iowa State's Center for Multiphase Flow Research and Education, and be incorporated into current ISU courses.

**GEORGE, JOEY**, Distinguished Professor, Information Systems and Business Analytics, 10 years of service, fall 2022

*Title:* Using Eye Tracking to Discover Why People Believe Disinformation about Healthcare

Professor George will conduct two laboratory experiments in the U.S. and Canada to determine what aspects of multimedia social network posts lead people to believe and potentially act on

health care disinformation. The results are expected to lead to journal articles and conference presentations. George has also applied for a Fulbright Scholarship to support this work.

**GREVSTAD-NORDBROCK, THEODORE ERNST**, Assistant Professor, Community and Regional Planning, 6 years of service, fall 2022

*Title:* The Social Impacts of Heritage Policy: Gentrification and Displacement in Oslo  
Governmental heritage preservation policies impact cities in profound and positive ways, yet their unintended outcomes are rarely studied. Professor Grevstad-Nordbrock's proposed assignment will analyze the integration of heritage within local planning and redevelopment practices. Grevstad-Nordbrock has applied for a Fulbright scholar award to support his assignment, which will support the next generation of preservation practitioners at Iowa State.

**HADDAD, MONICA**, Professor, Community and Regional Planning, 18 years of service, spring 2023

*Title:* Networking for Climate Justice: Collaborations between Iowa State University and the United Kingdom

Professor Haddad will examine how cities in Brazil and South Africa are tackling climate adaptation while furthering justice, and also conduct visits to British institutions to learn about climate pedagogy in her proposed assignment. These parallel activities will generate new knowledge on how these countries prioritize the needs to diverse communities and enrich teaching and research in Iowa State's College of Design.

**HERZOG, DAVID**, Associate Professor, Mathematics, 6 years of service, full academic year

*Title:* Smoothing and Stabilizing Structures in the Stochastic Navier-Stokes Equations and Related Systems

Professor Herzog's work to date has focused on understanding the large-time behavior of solutions of stochastic ordinary differential equations. The proposed assignment will allow him to expand this research to partial differential equations, working with experts from Duke University and the University of Virginia. The results will be shared in scientific meetings and conferences, and incorporated into Herzog's ISU graduate courses.

**KIM, STEPHEN**, Professor, Marketing, 15 years of service, fall 2022

*Title:* Unpacking the Black Box of Franchising Success

Franchising is the most popular retailing format in the U.S., but there are concerns about its sustained growth. Professor Kim will conduct a multi-level, multi-method study of fast food franchising during his proposed assignment, which will provide valuable information for both franchisors and customers. The results will be shared at industry meetings, in publications, and incorporated in Kim's marketing courses.

**LEE, SAM**, Associate Professor, Accounting, 7 years of service, spring 2023

*Title:* Managerial Ability, Corporate Social Responsibility, and Accounting Informativeness

Professor Lee's assignment will explore whether managerial ability drives corporate social performance and enhances its valuation. This work will provide the support needed to produce high-quality publications in premier accounting journals, and enhance accounting courses in the Ivy College of Business.

**MADON, STEPHANIE**, Professor, Psychology, 22 years of service, spring 2023

*Title:* Wrongful Conviction: The Downstream Effects of Inconclusive Forensic Decisions

Invalid or improper forensic evidence is a leading cause of wrongful conviction, including the failure to treat inconclusive decisions as mismatches, and therefore exculpatory. Professor

Madon's assignment will examine the downstream effects of these decisions; encourage forensic science policy reforms; contribute to Iowa State's visibility as a leader in the discipline; and promote the professional advancement of ISU students with interests in law enforcement, psychology and forensic science.

**MARQUART, DEBRA**, Distinguished Professor, English, 26 years of service, fall 2022

*Title:* "Things Go Boom in the Bakken: Dispatches from an Oil Patch" – A Work of Docu-Poetics and Research Nonfiction

Professor Marquart, former Iowa Poet Laureate and Fellow of the Academy of American Poetry, will use the proposed assignment to conduct research in North Dakota for a book-length work that blends docu-poetics and research nonfiction to tell both the human and scientific story of the true cost of oil extraction. Additional outcomes will include conference presentations, and invited lectures to discuss her research and book.

**NORDMAN, DANIEL**, Professor, Statistics, 16 years of service, full academic year

*Title:* Resampling and Empirical Processes for Complex Data

Professor Nordman will conduct research on resampling methods for data "re-use," empirical process theory, and matching records from different databases during his proposed assignment. Outcomes of this work will include teaching materials for new ISU courses in these areas, and external funding proposals on resampling and simulation of large spatial datasets.

**OBERHAUSER, ANN**, Professor, Sociology and Criminal Justice, 6 years of service, fall 2022

*Title:* Advancing Scholarship in Gender and Development

Professor Oberhauser's proposed assignment will involve several ongoing and new research projects in the areas of gender studies and sociology of development. This work will include co-editing a special edition of the journal, *Gender, Place and Culture* with 12 international colleagues; revising a co-authored book on feminist geography; and revising a National Science Foundation funding proposal with ISU colleagues.

**OCKEY, GARY**, Professor, English, 7 years of service, full academic year

*Title:* Second Language Assessment

Professor Ockey will complete a book during his proposed assignment that focuses on current theory and best practice in the field of second language assessment. The book is expected to impact the quality of second language learning throughout the world by providing guidance for those who develop and use assessments, and lead to international conference presentations.

**ORTH, PETER**, Associate Professor, Physics and Astronomy, 5 years of service, spring 2023

*Title:* Theory of Nonlinear Optical Response in Magnetic Moire Quantum Materials

Magnetic topological materials possess unique properties that have tremendous potential for innovative technological applications. Professor Orth's proposed assignment includes conducting research in this area with colleagues at Harvard University. Expected outcomes include two peer-reviewed publications, an open-source software package, and invited lectures and conference presentations.

**PARSHAD, RANA**, Associate Professor, Mathematics, 3 years of service, fall 2022

*Title:* Improving Invasion Control by Competition Manipulation

Professor Parshad will work with colleagues at the Indian Statistical Institute and Indian Institute of Technology, employing differential equation theory and niche theory to devise new control tactics for invasive species. This work is expected to have large-scale application to control invasive soybean aphid in Iowa and other U.S. states.

**PASSE, ULRIKE**, Professor, Architecture, 15 years of service, fall 2022

*Title:* Sustainable Regional Systems Research Network Proposal to the U.S. NSF

Professor Passe will use the proposed assignment to develop a \$15 million National Science Foundation Sustainable Regional Systems Research and Education Network proposal with the Mississippi River Watershed as a system of study. Passe will collaborate with other institutions, city governments and other stakeholder organizations to address the various rural-urban interfaces within the watershed, address chronic challenges, anticipate future risks, and integrate local efforts.

**PREMKUMAR, SHOBA**, Teaching Professor, Finance, 18 years of service, fall 2022

*Title:* Textbook on “Fintech and Crypto Currency”

There are currently no quality textbooks with pedagogical elements and instructor resources in the areas of financial technology and crypto currency; Professor Premkumar’s textbook will help future students acquire knowledge in these emerging fields. Research undertaken during the proposed assignment will also aid the development of high quality undergraduate and graduate courses at Iowa State.

**REBER, JACQUELINE**, Associate Professor, Geological and Atmospheric Science, 6 years of service, fall 2022

*Title:* Extending Scholarship and Grant Funding on Semi-Brittle Deformation Dynamics

Professor Reber, recipient of a 2018 National Science Foundation CAREER award, will work to better understand deformations in the earth’s crust and the generation of earthquakes during the proposed assignment. Outcomes of this work include external funding applications, journal publications, new course materials, and research opportunities for undergraduate, graduate, and high school students.

**ROGERS, HALDRE**, Associate Professor, Ecology, Evolution, and Organismal Biology, 6 years of service, full academic year

*Title:* Linking Pollination, Seed Dispersal, and Food Web Dynamics to Improve Conservation of Tropical Forest Trees

Professor Rogers will travel to Guam, Spain and Switzerland during her proposed assignment to study the cascading and interacting impacts of pollinators, seed dispersers and predators on tropical forest trees. Outcomes include a new research project and high school program in the Mariana Islands, collaborations on network ecology with European colleagues, and advance Iowa State’s reputation in the field.

**ROZIER, KRISTIN YVONNE**, Associate Professor, Aerospace Engineering, 5 years of service, spring 2023

*Title:* Robot Resilience Sparked by Creative Constraint Satisfaction

Professor Rozier’s assignment will focus on making robots more resilient in dynamic, dangerous environments, so they can still accomplish their goals even after suffering handicaps, or as environments change. Outcomes include new material for Iowa State engineering courses, publications and external funding proposals.

**RUTENBERG, AMY**, Associate Professor, History, 6 years of service, fall 2022

*Title:* In the Service of Peace: Peace Activism and Military Service in Post-Vietnam War America  
Professor Rutenberg proposes to spend the fall 2022 semester conducting research in California, Michigan and New Mexico to collect data for her book by the same title, and to prepare two scholarly articles on the relationship between peace activism and foreign and domestic policies

between 1970 and 2008. These works will shed light on the nature of America's civil-military relationship in the era of an all-volunteer military, as well as the impact of activists in policy planning.

**SHANKAR, SUBRAMANIAM**, Professor, Mechanical Engineering, 19 years of service, spring 2023

*Title:* Advanced Multiphase Models for Simulation of Biofuel Production

Professor Shankar will develop advanced models for simulated biofuel production during his proposed assignment, based upon a multiphase turbulence theory recently formulated in his laboratory. This work will have a positive long-term impact on a broad range of applications relevant to the state of Iowa, such as biofuel production, grain and food processing, advanced manufacturing and wastewater treatment.

**SUN, HUA**, Associate Professor, Finance, 7 years of service, spring 2023

*Title:* A Machine-Learning Approach to Examining Coopetition among Corporate Scientists and Firm Innovation Outcomes

Professor Sun plans to develop a model to examine how simultaneous competition and collaboration – “coopetition” – among research and development employees impacts innovation at each firm. The model will form the basis for additional research and be incorporated into Sun's undergraduate and graduate courses.

**TYE-WILLIAMS, STACY**, Associate Professor, English/Communication Studies, 7 years of service, spring 2023

*Title:* Workplace Bullying: An Investigation of Intervention Strategies and Conflict Communication Book Proposal

Professor Tye-Williams will complete in-depth data collection on workplace bullying intervention strategies during the proposed assignment, resulting in a book proposal on conflict communication. The book will collect personal stories about heated communications exchanges online, in personal relationships and at work to better understand why we engage in seemingly petty conflicts, and what we can do avoid them.

**VALENZUELA, NICOLE**, Professor, Ecology, Evolution and Organismal Biology, 17 years of service, full academic year

*Title:* Co-evolution of Recombination Rates and Repetitive DNA in Turtles

Professor Valenzuela will work with colleagues in Spain during her proposed assignment, where she will employ state-of-the-art methods to analyze turtle genome sequencing data to estimate the co-evolution of repetitive DNA and recombination rates. This work will result in technology transfer to Iowa State, provide proof of concept for grant proposals, and enhance Valenzuela's ISU courses. Valenzuela has received \$15,000 in National Science Foundation funding to support her travel.

**WANAMAKER, ALAN**, Professor, Geological and Atmospheric Sciences, 12 years of service, fall 2022

*Title:* Developing Isotope Baselines in the Gulf of Maine in the Context of Environmental Change

Professor Wanamaker will collect and measure the isotopic composition of phytoplankton, zooplankton, and mollusk shells to develop a baseline of isotopic variability across the Gulf of Maine coastal system, which is undergoing rapid environmental change. The proposed assignment will advance the fields of geochemistry and ecochemistry, and benefit ISU students through teaching, mentoring, and research efforts.

**WEINSTEIN, AMANDA**, Associate Professor, Physics and Astronomy, 11 years of service, fall 2022

*Title:* Augmenting Studies of Cosmic-Ray Acceleration and Diffusion with Novel Optical Polarimetry

Scientists have long sought to identify and understand the cosmic phenomena that bombard our atmosphere with charged particle radiation. Professor Weinstein will use the proposed assignment to maximize the use of gamma rays in studying cosmic accelerators, working with colleagues from the University of Crete. This work will enhance Weinstein's current research and develop new opportunities for students and faculty at Iowa State.

**WELK, GREGORY**, Professor, Kinesiology, 21 years of service, spring 2023

*Title:* International Applications and Surveillance with the Youth Activity Profile

Professor Welk, whose research focuses on the assessment and promotion of physical activity – including the Youth Activity Profile self-reporting tool – will use the proposed assignment to formalize partnerships and in the United Kingdom, Spain and Czech Republic, and secure funding to enable the coordinated international application of the tool.

**WU, ZHIJUN**, Professor, Mathematics, 21 years of service, fall 2022

*Title:* Modeling Evolution of Social Cooperation in Biological Populations

Professor Wu's assignment will investigate the evolutionary dynamics of social cooperation in biological populations, including human populations, using evolutionary game theory. The project will build a theoretical basis for understanding social cooperation in social foraging, animal grouping, in multilingual populations and social distancing, which are of importance to Iowa's cultural and economic development. Support for Wu's travel has been provided by the Simons Foundation.

**ZHU, ZHENGYUAN**, Professor, Statistics, 12 years of service, fall 2022

*Title:* All Data Approach for Official Statistics and Environmental Statistics

Technology enhancements have had a fundamental impact on how we collect and use data for official and environmental statistics. Professor Zhu's proposed assignment will develop statistical and machine learning methods for non-survey data that drastically reduce data collection cost and enhance their usage. The findings will enrich Zhu's teaching of survey courses, as well as lead to publications and external funding proposals

### **University of Northern Iowa**

**ARSIWALLA, DILBUR**, Associate Professor, Psychology, 9 Years of Service, AY 2022-2023

*Title:* Connections of Health-Related Perceptions and Behaviors with Sleep Patterns and Mental Health During the COVID-19 Pandemic

The COVID-19 pandemic has posed an enormous burden on public healthcare, economic systems and mental health around the world (Khan et al., 2021; Partinen et al., 2021). According to the WHO, as of 7th September 2021, there have been over 221 million COVID-19 cases and 4 million deaths globally (WHO, 2021). Given these alarming statistics, research on the psychological toll of the pandemic is needed to understand how COVID-19 is impacting people in their daily lives. Data will be collected from a community sample of adults (18-80 years) from UNI and Amazon Mechanical Turk. The first goal of the proposed study is to empirically examine associations of COVID-19-related knowledge, risk perceptions and health behaviors with disrupted sleep patterns during the pandemic. A second goal is to examine whether less health knowledge, lower risk perceptions and health behaviors predict poorer mental health as indicated

by COVID-19 related stress, anxiety and PTSD. The third goal of the study is to examine whether the connections of risk perceptions and health behaviors with sleep patterns vary based on mental health. The fourth goal of the study is to examine whether associations between COVID-19-related risk perceptions and health behaviors vary based on optimism bias and conscientiousness. The fifth goal is to examine connections of COVID-19 related stress with sleep disruptions and disorders. The sixth goal is to examine the indirect association between health knowledge and health behaviors via health risk perceptions during the COVID-19 pandemic. The seventh goal is to examine differences in COVID-19-related knowledge, risk perceptions and health behaviors across older versus younger participants. The eighth goal is to examine differences in sleep patterns by age. The ninth goal is to examine differences in COVID-19 related stress, anxiety, and PTSD by age. The proposed study will engage undergraduate and graduate UNI students and serve as a pilot study for an NIH R15 grant application that serves to create a mobile app on health related cognitions, behaviors, and sleep and mental health outcomes.

**BETRABET GULWADI, GOWRI**, Professor, School of Applied Human Sciences, 18 Years of Service, Spring Semester

*Title:* A Biophilic Pattern Recognition Audit for Understanding Health-Promoting Potential on College Campuses

Biophilia refers to an innate human need to connect with nature. Viewing or being in nature - e.g., places with trees, green vegetation, bodies of water, flowers, small animals - have been associated with deeply healing outcomes, including improved mental health. Nature experiences on college campuses have the biophilic potential to provide short- and long-term benefits to students during a crucial phase in their learning and development. At this point, it is known what the biophilic patterns (natural spaces and their configurations) and attributes are, but what is lacking is a good systematic and comprehensive way to observe and document them on a college campus. Drawing on a theoretical, campus-relevant framework created with my research collaborators from an existing list of general biophilic attributes, a pilot-test will be developed, and a Biophilic Pattern Recognition Audit tool for documenting the presence of campus-specific biophilic attributes will be refined. The pilot test will be conducted through walkthroughs and observations at UNI, ISU and the University of Iowa. With the refined final version of the audit tool created here in Iowa, universities in Iowa and across the world will be able to recognize biophilic patterns and attributes on their own campus and decide if, and what, needs to be changed to make the campus more health promoting for the many students they serve. Students at UNI will benefit from the place-based studio pedagogy when sharing the journey and its results in classes. It will also help them understand the hidden healing potential of our campus landscapes in addition to their aesthetic value.

**BURNIDGE, CARA L.**, Associate Professor, Philosophy and World Religions, 7 Years of Service, Spring Semester

*Title:* Religious Biography of Elizabeth Cady Stanton

This proposed PDA project is to complete the writing phase of the first full-length religious biography of Elizabeth Cady Stanton [ECS], a book project under contract with Eerdmans Publishing. Presently, there are five biographies of this suffrage and women's rights leader. Each of these works—as well as numerous monographs historicizing ECS's political thought—continue to depict her only as a critic of religion rebelling against her parents' Calvinism. Such a view reflects the public persona ECS intentionally crafted through her autobiographical works. This project, however, takes a different approach. Rather than merely amplifying Stanton's curated self-presentation, this project synthesizes nineteenth-century American religious life for a general audience. It presents ECS's complicated relationship with religion as more reflective of her specific historical time and place, and the implications of such a religious life for Americans today.

This work provides three contributions to the public understanding of religious identity, political activism and religion in American life. First, the proposed work approaches Stanton's theological doubt, skepticism and metaphysical experimentation as legitimate participation in—rather than a rejection of—religion. Second, the proposed work presents Stanton's spiritual experimentation as an authentic American religious life. Finally, while this biography gives special attention to religion, it will also weave race, gender, class and politics together to provide new insight into the role of religion in her life and, by extension, the women's movement. Upon completion of the award period and submission of the manuscript to the press, the project will produce the first full-length religious biography of Elizabeth Cady Stanton.

**ELGERSMA, KENNETH J.**, Associate Professor, Biology, 8 Years of Service, Fall Semester  
*Title: Improving Soil Health of Iowa's Agroecosystems Through Improved Vegetation Quality in USDA Conservation Reserve Program Grasslands*

The US Department of Agriculture's Conservation Reserve Program (CRP) improves ecosystem services in agricultural landscapes by temporarily and strategically converting agricultural land to perennial grassland vegetation. The program provides large environmental benefits and ecosystem services to the people of Iowa. One benefit provided by high-quality vegetation is carbon sequestration, because plant growth removes carbon dioxide from the atmosphere and transforms it into carbon-rich soil organic matter. This transformation not only mitigates climate effects of carbon dioxide, it also improves soil fertility and prevents soil erosion. However, maintaining high-quality vegetation in CRP land can be challenging for many reasons, including invasion pressure from non-native weedy or noxious plant species. The focus of this PDA is on uncovering patterns in existing data about CRP vegetation quality and the ecosystem services provided by that vegetation. This work will contribute to understanding of the conditions that promote high quality vegetation, which provides valuable ecosystem services to landowners and to all residents of Iowa. Because of the comprehensive region-wide approach, this work has the potential to directly improve the Conservation Reserve Program, while providing training opportunities to UNI students and strong national-level visibility to UNI-based research.

**GOONESEKERE, NALIN**, Professor, Biochemistry, 16 Years of Service, Fall Semester  
*Title: Development of an AI-Based Application for the Early Detection of Pancreatic Cancer*  
Pancreatic cancer (PC) is a highly lethal disease with poor diagnosis and dismal prognosis, with a 5-year survival rate of only 10%. It is the third highest cause of deaths by cancer in Iowa. There are no effective screening tests for the early detection of PC, when the disease can be effectively treated by surgery. Several people have identified biological molecules or biomarkers that could potentially be used in the early detection of PC. Unfortunately, no single biomarker has displayed the necessary sensitivity and specificity required for screening. Thus, it is becoming clear that multiple biomarkers need to be employed in the early detection of PC. There are over 60 FDA-approved applications of Artificial Intelligence (AI) in disease diagnosis. Both AI systems and physicians use features from a patient (*biomarkers, in this context*) and information gleaned from past patients to make a diagnosis or prediction. Both need to assess the relative importance of each feature when making a prediction. As the number of features increase, it becomes increasingly challenging for clinicians to integrate information in making a prediction, whereas for AI-based systems, there is a natural mechanism for 'scaling up'. In this proposal, the development of an AI-based application for the detection of early-stage PC is sought. PC patient data will be obtained from The Cancer Genome Atlas database and the Cancer Cell Line Encyclopedia database. *Artificial Neural Networks (ANNs)* will be used to construct an AI based diagnosis tool for PC.

**MATLOOB HAGHANIKAR, TARANEH**, Associate Professor, Curriculum and Instruction, 5 Years of Service, AY 2022-2023

*Title:* How do African American Characters Feel a Sentiment Analysis of Characters Emotional Status in YA novels

Historically, while African Americans have been depicted in young adult novels, their frequently victimized image perpetuated misguided messages about Black culture. The widespread stereotypes imposed on African Americans can be viewed by others as facts and it is likely for adolescents of color to internalize these persistent assumptions when they read the biased stories. Despite substantial research on the content of current young adult literature, no synthesis of scholarship has been produced to delineate what patterns contemporary YA literature reproduce and perpetuate. This study focuses on African American protagonists of contemporary young adult novels and examines their emotional status; do they become happier, sadder, or do not change throughout the story? This study aims to extend the idea developed by the rejected master thesis of Vonnegut in 1981. The rejected research later became a fundamental study on storytelling. According to Vonnegut (2011) “stories have shapes which can be drawn on graph paper, and that the shape of a given society’s stories is at least as interesting as the shape of its pots or spearheads” (p. 285). Similarly, the present study recognizes the experience of African American protagonists, examining how their emotional arcs might reveal a recurring pattern. Preparing teachers to be culturally competent to serve all K-12 students has never been more urgent. The findings of this study will be shared with UNI pre-service teachers enrolled in multicultural children’s literature courses to inform them about the patterns of stereotypes in YA novels about African American experiences.

**TAMPLIN, JEFFREY**, Professor, Biology, 20 Years of Service, Fall Semester

*Title:* Conservation of the Wood Turtle in Northeastern Iowa and Southeastern Minnesota  
The Wood Turtle (*Glyptemys insculpta*) is an endangered species in Iowa, a threatened species in Minnesota, and is one of the most “at risk” North American turtles. The species is currently being evaluated by the US Fish & Wildlife Service for federal listing under the Endangered Species Act. These data are used by county conservation boards and the Iowa Department of Natural Resources to better develop species management policy and to implement effective habitat restoration actions. In addition, these data have been utilized to generate funding for several multi-state State Wildlife Grants awarded by the US Department of the Interior (US Fish & Wildlife Service) to Iowa and its midwestern state partners (Phase 1, 2014-2016: Upper Midwestern Riverine Turtle Habitat Improvement, \$493,903; Phase 2, 2017-2019: Midwestern Turtle Conservation, \$462,407). This proposal is supported by a joint Iowa and Minnesota DNR State Wildlife Grant (“Upper Midwestern Turtle Conservation,” Phase 3) and seeks to generate data to achieve the goals and objectives of this grant contract and to inform the USFWS as they evaluate the species across its range. The Phase 3 grant objectives require on-site monitoring up to 4 days a week, plus data entry and analysis, and thus require extended time away from campus that will be facilitated by a one-semester PDA and a subsequent semester of teaching “buy-out.” Funding (\$997,925 total; \$221,607 UNI subaward) for Phase 3 was awarded by the US Department of the Interior in January 2021.

**WALTER, MICHAEL H.**, Associate Professor, Biology, 24 Years of Service, Spring Semester

*Title:* Structural and Genome-Linked Proteins of Stability-Selected Anti Anthrax Bacteriophages (‘phages’) are viruses that bind, infect, replicate in, and burst specific host bacteria, including *Bacillus anthracis*, the spore-forming agent anthrax disease. Unlike animal viruses (the spherical SARS2-COVID19 for example), phage particles have a ‘head and tail’ configuration often compared in shape to the Lunar Lander of the Apollo Program. The applied

field of 'phage therapy' seeks to control bacterial infection by use of these natural phage anti-bacterial agents and is limited in application due to instability of phages exposed to heat, aerosolization, blood, perspiration, UV, sunlight or other conditions encountered during application against topical and other bacterial infections. In this study a selected set of *B. anthracis* phages in 'prairie soil' that are stable under the above conditions will be utilized. An investigation will occur of structural protein composition of abundant (head & tail) proteins of these selected *B. anthracis* phages. It will be determined if any particular protein structures or amino-acid compositions are more abundant in 'durability selected' phages, relative to unselected phages. There is an opportunity to use a newly acquired *Agilent 6546 Q-TOF LC/MS* mass spectrometer that allows particularly high-resolution analysis of proteins isolated and purified by standard methods. The study will similarly investigate bonding and composition of a genome-linked protein suspected to occur in *B. anthracis* phage QCM11.

### **University of Iowa**

**ANDERSON, BJORN P**, associate professor, Art & Art History, 9 years of service, Fall 2022

*Title:* The Hoover Fakes: How Defrauding a Presidential Library Exposed the Brazen Sale of Forged Antiquities

This project will allow Professor Anderson to complete a book about the defrauding of the Herbert Hoover Presidential Library and Museum in April 2019, when it cancelled a planned exhibition because the loaned objects were demonstrated to be forgeries. It will document how the investigation of these forgeries contributed to the indictment of the owner of an antiquities gallery in New York City, who was arrested following a dramatic raid in August 2021. The project will result in a book, titled "The Hoover Fakes: How Defrauding a Presidential Library Exposed the Brazen Sale of Forged Antiquities." Anderson worked with a graduate student to lead the initial investigation and the book's account of their work will benefit the school, the university, and the State of Iowa as it shows how careful art-historical research at a Regents' institution helped the Hoover avoid a major embarrassment and also provided important evidence that helped law enforcement shut down a large-scale forgery operation. The subject matter will be included in the curriculum of at least two Art History courses.

**ANKRUM, JAMES A**, associate professor, Biomedical Engineering, 7 years of service, Spring 2023

*Title:* Scaffold Design for Translational Regenerative Medicine Applications

Regenerative medicine is a rapidly developing field that lies at the intersection of biology and engineering by often combining biomaterials with progenitor cells to grow functional tissues. The underlying premise of regenerative medicine is that diseased tissues can be replaced or coaxed to heal. In addition to replacing damaged tissues, these same techniques are used to develop models of human tissues in the lab that can be used to study the toxic effects of chemicals. This nascent field has tremendous commercial potential and has spawned a number of major funding initiatives. Ankrum seeks a PDA so that he can acquire training in techniques to design, manufacture and analyze cell scaffolds tailored to support specific cell types that will be used to grow his research and teaching portfolio in regenerative medicine. Ankrum's training will benefit society as he applies the techniques to develop regenerative medicine solutions for wound healing and toxicology. This will also result in the development of new teaching modules on scaffolds to be taught to Biomedical Engineering students at the University of Iowa.

**ARNOLD, MARK A**, professor, Chemistry, 39 years of service, Spring 2023

*Title:* Advanced Spectroscopic Sensors for the Next Generation Artificial Pancreas

During this PDA, Professor Arnold will explore ways to enable creation of a next generation artificial pancreas for the treatment of type 1 diabetes. An implantable device is envisioned that operates autonomously for a period of one year. His research plan focuses only on the sensing element of the artificial pancreas and his plan is designed to enhance clinical measurements for a group of metabolic biomarkers using a novel solid-state photonic (LED) platform. Specific efforts will include developing analytical methods for biomarker measurements inside the body, establishing a collaboration with a researcher at the University of Connecticut to enable measurements in an innovative clinical fluid, and evaluating the utility of a state-of-the-art photonic platform designed for the wavelengths of light needed for this application. The findings will be included as real-world examples in selected chemistry courses, disseminated in the peer-reviewed literature, and serve as the basis for an R01 grant application for the National Institute for Diabetes and Digestive and Kidney Diseases (NIDDK).

**BARBUZZA, ISABEL**, professor, Art & Art History, 24 years of service, Spring 2023

*Title:* The Power Lies in Data - Visualizing Lithium

Professor Barbuza will use data visualization techniques to create six sculptures using diverse materials, colors and intricate surface treatments. Barbuza will add new data to her previous research on lithium production, mining and the impact on the environment in Chile, Argentina and Bolivia. She will translate information into visuals to tell a story about lithium and the green dilemma: electric vehicles and other clean energy innovations are the way of the future; however, lithium extraction is not sustainable in these three countries. Barbuza will write proposals to exhibit her research at the Santa Barbara Museum of Art, where her work is part of their art collection. At the same time, she will submit her proposal to the Figgie Museum in Davenport, IA. Her research has added important visuals and environmental readings to her class, "Art at the Edge of the Landfill," designed for students concerned with environmental issues. The class is also a collaboration with the Iowa City Landfill and Recycling Center.

**BARNHARDT, CASSIE L**, associate professor, Educational Policy and Leadership, 9 years of service, Fall 2022

*Title:* The Educational Climate for Civic Empowerment: Projects to Advance a Theory and Support Organizational Reform

Given the global need for renewing the civic and public purposes of education, the PDA will use multiple forms of data to assess the capacities of the education sector to actively and intentionally contribute to the democratic and civic needs of a state or nation. Professor Barnhardt will conduct research and engage in translational activities for the purpose of substantially advancing theory about how culture and climate shape organizational outcomes related to civics and democracy in education. Her work will build on three separate, but conceptually aligned research projects. The first initiative focuses on civic learning in the state of Iowa (with an emphasis on K-12 schools), the second initiative addresses the influence of state-level policies regarding expression and dissent on college campus activism, and the third initiative is international and assesses the extent to which higher education promotes civic learning in North Macedonia. Together these projects will advance theory and contribute to organizational reform in education.

**BORRECA, ARTHUR R**, associate professor, Theatre Arts, 32 years of service, Fall 2022

*Title:* Working the Action: Dramaturgy in Theatre, Politics, and Life

For his PDA, Professor Borreca will research and write four interrelated essays which, together with an introduction and annotated bibliography, will form a collection, "Working the Action: Dramaturgy in Theatre, Politics, and Life." The essays will include: "Rethinking New Play Dramaturgy," "Screenwriting: The Dramaturgy of Playwrights as Screenwriters," "Revisiting Political Dramaturgy," and "Life Dramas: The Dramaturgy of Adoption and Recovery." Dramaturgy

involves the analysis of plays for production and the analysis of society from a theatrical perspective. Borreca's essays will build on his work in both areas. The work to be completed will include a book proposal to be submitted to publishers by December 2022, and drafts of two of the essays. All four essays will be completed by the end of summer, 2023. The proposed project will contribute new material and new theoretical perspectives to the teaching of such courses as Playwrights Workshop, New Play Dramaturgy, Special Topics in Playwriting, Script Analysis and History of Theatre and Drama.

**BURER, SAMUEL**, professor, Management Sciences, 20 years of service, Spring 2023

*Title:* Improving the Entire Optimization Process

Professor Burer's project will investigate improvements to the entire optimization process, which businesses and non-profit organizations undertake when attempting to make optimal decisions that further the goals of their organizations. The planned work will span real-world applications, data collection, theoretical algorithms and practical software. Burer will collaborate with a financial-services company in the private sector as well as a public university, whose research interests align well with the project. Scholarly outputs will include journal articles, data sets, software packages and conference presentations. Burer will incorporate lessons learned from his research into four courses at the University of Iowa at the undergraduate, master's, and doctoral levels. The outcomes of this PDA will also benefit the people of Iowa and beyond by improving industry-standard best practices for optimally making critical decisions.

**CANAHUATE, GUADALUPE M**, associate professor, Electrical-Computer Engineering, 10 years of service, Fall 2022

*Title:* Interpreting Patient Reported Outcomes Through Machine Learning and Data Visualization  
Professor Canahuate's recent work applying association rule mining to symptom inventory questionnaire responses from head and neck cancer patients has generated enthusiasm from clinicians and other researchers. This PDA will provide time to extend the results to longitudinal data (responses over time) and other healthcare domains. Canahuate was recently invited by the University of Illinois in Chicago to apply this research to COVID questionnaires. Last year, the NIH released a call for "Research to Improve the Interpretation of Patient-Reported Outcomes at the Individual Patient Level for Use in Clinical Practice", making this research both timely and relevant. Canahuate will further advance her already-established presence in artificial intelligence and machine learning for healthcare. She will investigate algorithms and visualizations for Patient Reported Outcomes (PRO) data to further advance our ability to identify clusters of symptoms leading to improved diagnoses and treatment of disease. The project is expected to result in journal publications, a competitive grant funding submission and new material for undergraduate and graduate courses.

**CARMICHAEL, GREGORY R**, professor, Chemical & Biochemical Engineering, 43 years of service, Spring 2023

*Title:* Using Digital Twins to Make Cities More Sustainable and Resilient

The overarching question of Professor Carmichael's PDA project is how do we increase resiliency and responsiveness of cities to disruptions such as natural disasters, air pollution, climate change and pandemics? The project addresses this question through the novel use of digital twins. The digital twins developed will be virtual representations of urban systems, designed to mirror complex interactions between multiple hazards such as air pollution, climate change and disease exposure, in actual urban environments. The project will combine physical based models of air quality, weather and climate, with modern spatial/temporal machine learning, and use multiple sources of data, including new satellite capabilities that can detect air pollutants, low-cost sensors, urban mobility data, traffic patterns and socio-economic information. The digital twins will be used

to evaluate various interventions in terms of sustainability and resilience, consistent with the United Nations sustainable development goals. This project is expected to result in several journal publications, new grants from NSF and NASA, and new materials for use in his graduate and undergraduate courses.

**CATES, DIANA F**, professor, Religious Studies, 31 years of service, Fall 2022

*Title:* The Concept and the Morality of Hatred

During her PDA, Professor Cates will complete a full draft of her book manuscript "The Concept and the Morality of Hatred." She will draw on, extend and integrate several published articles and book chapters, as well as scholarly lectures, in which she has advanced a theory of hatred as it relates to several other states of mind, including love, anger and compassion. Publishing this book will enhance her international scholarly profile. Prof. Cates's research and publication will also benefit her teaching. All her ethics classes foster students' abilities to understand their own and other people's responses to events whose moral salience most of them perceive under the influence of religion. Benefits to students will extend to the state and beyond by means of students' educated interactions with others. Cates's work will raise the level of public discourse about the relationship between religion and morality, ideally leading to fewer serious conflicts concerning what people regard as most important in life.

**CHENG, CHI-LIEN**, professor, Biology, 31 years of service, Fall 2022

*Title:* Evolution of Reproductive Development in Land Plants

In the past six years, Professor Cheng's laboratory has been working on two important aspects of plant life: stem cell maintenance and reproduction. During the PDA, she will concentrate on the reproduction aspect. The model plant the lab uses is a fern. Ferns do not flower but do produce spores and gametes like flowering plants. The gene network of the flowering process has been evolved from ferns to flowering plants. Cheng's lab has been actively investigating how key genes in the network function in the fern. Complementarily, Dr. Ambrose at The New York Botanical Garden is working on a family of genes involved in the structural change during the transition to reproduction. During the PDA, Cheng will collaborate with Ambrose through Zoom and a short visit on the investigation of this network in this and other ferns and the evolutionary implication. The goal is to write a collaborative proposal to be funded by NSF. The research results will be incorporated into two courses Cheng currently teaches.

**CHOI, INYONG**, associate professor, Communication Sciences & Disorders, 6 years of service, Spring 2023

*Title:* Treating Hearing-in-noise Difficulties

Professor Choi will develop perceptual training paradigms for hearing-in-noise difficulties. Accurate and rapid understanding of speech in noise (SiN) is essential for everyday communications. However, persistent variability in SiN perception exists even in young listeners with normal hearing (NH) thresholds. Yet no therapeutic method has been established for NH listeners who struggle with SiN understanding. Perceptual training is one of the very few options currently available for such SiN problems in NH listeners, although a dearth of information exists regarding its efficacy and mediating biological mechanisms. Choi aims to validate the feasibility and efficacy of novel, evidence-based auditory training protocols to improve SiN performance in NH listeners. The project may provide clinically applicable, immersive and evidence-based rehabilitation paradigms that show efficacy in specific auditory cognitive processes for everyday speech communications. This project is also expected to result in journal articles, grants from the National Institute of Health and the Department of Defense, and new chapters for Choi's courses.

**COMERON, JOSEP M**, professor, Biology, 19 years of service, Fall 2022

*Title: Causes and Consequences of Recombination*

Recombination is a fundamental biological process that generates genetic variation and allows species to adapt to ever changing environments. Yet, little is known about the possibility that species may increase recombination when it is most needed. Equally poorly understood is the link between recombination and diseases. Professor Comeron's research focuses on recombination with a multidisciplinary approach that includes genomics, theoretical population genetics, bioinformatics and big-data analyses. Building on earlier studies, Comeron proposes two interrelated projects. First, the study of 3D genome structures linking stress conditions and recombination rates. Second, how recombination influences telomere length and cellular senescence, which can provide insights into aging and cancers. The results will be published in peer-reviewed journals and be crucial components of grant proposals to NIH and NSF. The new knowledge will be seamlessly incorporated into the courses that Comeron currently teaches. These courses, together with training of undergraduate students and public lectures will provide a direct benefit to the citizens of state of Iowa.

**COOHEY, CAROL A**, professor, Social Work, 25 years of service, Spring 2023

*Title: Preparing Counselors and Others to Respond to People with Suicidal Thoughts*

This award will produce knowledge that Iowa agencies, practitioners and students will use to intervene more skillfully with Iowans in crisis. Iowans will report they are more able to regulate their thoughts of suicide and be less likely to attempt suicide after chatting with an Iowa Crisis Chat counselor. In collaboration with community partners and others, Professor Coohy anticipates writing brief reports, including making graphs that Iowa agencies can include in grant proposals and share with their constituencies; consulting with Iowa agencies on how to improve workers' crisis intervention skills; developing teaching/training modules and training/teaching Iowa practitioners/UI students; providing other consultation and support to agencies at the local and national levels. Coohy will also share research results in journals and conferences.

**COOPER, BENJAMIN J**, associate professor, Mathematics, 7 years of service, Fall 2022

*Title: A Project on the Structure of Skein Algebras*

Professor Cooper will introduce new techniques into the study of three- and four-dimensional spaces. His project will investigate the space of paths inside of a space and the manner in which they knot or tangle together. He will study a collection of knots from which any knot can be written as a combination and explore in greater detail relations among the objects in this collection. Cooper will introduce new relations between different ideas of mathematics and physics. These results will support and extend Cooper's work and connect it to the frameworks being developed by other mathematicians at institutions such as University of Virginia, Oxford, Stony Brook and Johns Hopkins. This will facilitate a bridge between several distinct areas of topology and geometry creating research interactions, topics for seminars and work for graduate students.

**CUNNING, DAVID**, professor, Philosophy, 18 years of service, Fall 2022

*Title: Spinoza on the Obstacle That is Language*

Professor Cunning would use a PDA to do new research on the philosopher Benedict Spinoza. The research focuses on the ways in which commentators have misconstrued some of the most important views and arguments in Spinoza's system. In a way this is his own fault – he sometimes uses the language of the tradition in order to secure buy-in among contemporaries; in other instances, he employs common-sense language so that his reluctant audience might give his views a better hearing. Cunning will generate an interpretation of Spinoza's system that is consistent and compelling. For example, Spinoza argues that each of the entities in the universe has a causal impact on the beings that surround it and that if creatures want to be maximally authoritative, they need to know more about all that is impacting them, and how and why. Iowa

students find the study of Spinoza to be illuminating insofar as it exposes the unnoticed causes that are present in the situations that surround them. Students have returned after graduation to report that their newfound acuity has helped them in business, medicine, law and other fields.

**DIAMANTIS, MIHAILIS E**, professor, Law, 5 years of service, Fall 2022

*Title:* People Are Corporations, Too

The U.S. is in the midst of a powerful movement to end decades of abusive policing and harsh punishment. Progress must rest on a solid theoretical foundation and concrete policy proposals. Rather than build these from the ground up, Professor Diamantis' project would draw insights from a pre-existing theoretical and legal template: corporate criminal law. Though technically "people" under criminal law, corporations are convicted at lower rates and receive more lenient, rehabilitative sanctions. Most commentators call for punishing corporations more severely. Diamantis would reverse the analysis, asking what lessons corporate criminal law holds for why and how to treat individuals more leniently. This research would benefit Diamantis in teaching his two core courses, Criminal Law and Corporate Crimes, by uncovering novel themes that unite them. Because he will publish his research in law journals, the award would benefit the University of Iowa by helping to solidify its reputation as a center for innovative legal research. The state of Iowa and society generally will benefit from concrete proposals for making criminal punishment more just and effective.

**DING, HONGTAO**, associate professor, Mechanical Engineering, 9 years of service, Spring 2023

*Title:* Laser-based Fabrication of Tunable Terahertz Metamaterials

The goal of this PDA is to support Professor Ding to adapt to the fast-moving pace of research in Terahertz (THz) metamaterials and develop new research proposals by infusing his expertise in high-throughput laser processing. The existing THz imaging techniques lack the capability to pinpoint the materials' fingerprint within a narrow frequency band. It is therefore of vital importance to develop novel optoelectronic lenses that can be actively tuned to acquire the spectral THz features rapidly, and thus enable fast and accurate detection. During the award period, Ding plans to perform hypothesis-driven research tasks in the design of dynamically tunable THz metasurfaces and develop a novel high-throughput laser fabrication process for THz lenses. This project is also expected to result in several grant proposals for NSF and AFOSR, a journal article, and new material for undergraduate and graduate courses in advanced manufacturing.

**DURNEV, ARTEM A**, professor, Finance, 10 years of service, Fall 2022

*Title:* Disaster Risk and Corporate Policies

The increasing population growth and urban expansion in hazard-prone regions in the U.S. rapidly increase disaster risk (e.g., floods and earthquakes). While major companies, state and local governments are aware of these risks, they lack the understanding on its economic and financial consequences, as well as possible strategies to mitigate them. Professor Durnev's projects will explore by what means disaster risk and specific disasters affect how firms build on capital stock, how firms raise external financing to fund their growth, and what state and local governments can do to react to the risks (e.g., improving infrastructure). The project will build new economic theories and test those theories using novel data. These projects will advance our understanding on the role of increasing disaster risks on economic growth and public wealth generation, thus benefiting publicly listed companies, including companies residing in the State of Iowa. Being multidisciplinary in nature, these projects are expected to result in multiple top academic journal publications in the fields of Finance, Accounting and Economics, as well as new business cases that can be used in Durnev's teaching.

**EBERL, DANIEL F**, professor, Biology, 23 years of service, Fall 2022

*Title:* Genetics of Mosquito Hearing

Mosquito-borne diseases directly impact one third of the human population. Insecticides, though important tools in mosquito control, cause unintended damage to many other species and the environment, and mosquitoes can develop resistance. Thus, novel tools for mosquito control are critical. Mosquito genetic techniques continue to advance, offering a novel approach to controlling mosquito populations. Professor Eberl will generate new mosquito mutants that disrupt their ability to hear, and characterize their effects on the mosquito's Johnston's organ, a large auditory organ in the antenna. Male mosquitoes use their hearing to detect female flight sounds, and both male and female rely on hearing for swarming, another important courtship behavior. Eberl will test effects of targeting specific mosquito genes, using electrodes inserted into the antenna, as well as microscopy to determine developmental effects on Johnston's organ. These studies will advance the field of genetic mosquito control. Eberl will incorporate his findings into his Animal Behavior course and enhance training for undergraduate students conducting research in his lab.

**FILIOS, DENISE K**, associate professor, Spanish & Portuguese, 22 years of service, halftime for academic year 2022-2023

*Title:* Stories of the Conquest: Landscapes of Identity in Medieval Iberia

Professor Filios will complete a book about landscapes of identity as depicted in stories about the 711 conquest of Iberia in ninth-century Arabic and Hispano-Latin historical writing. The shared scriptural roots of Christianity and Islam infused medieval Iberian historical writing with materials recycled from Jewish tradition which were deployed to construct new oppositional identities within contested Iberian spaces, resulting in mythologized landscapes of identity that continue to inform Spanish political discourses to this day. Drawing on ecocriticism, phenomenology and religious studies, this project explores the construction of identity embedded in mythic narratives of belonging. Through this work Filios will shed new light on medieval Iberian identities and bring to Iowa expertise in the complexities of Christian and Islamic contact which she will share in her scholarship and teaching.

**FREEMAN, JOHN H**, professor, Psychological Brain Sciences, 23 years of service, Fall 2022

*Title:* Cognitive Functions of the Posterior Cerebellum

Professor Freeman's project will be to identify cognitive functions of the posterior cerebellum. People with cerebellar pathology have deficits in various cognitive functions. Freeman and his students will use an animal model to discover the specific cognitive functions of different parts of the posterior cerebellum to gain a more mechanistic understanding of how cerebellar pathology leads to cognitive deficits in humans. Freeman can then develop treatments for cognitive deficits in people with cerebellar damage. The proposed project will help to elucidate cognitive functions of the posterior cerebellum and provide preliminary data for new funding opportunities. Graduate and undergraduate students will participate in this project and receive valuable research training. The results of this project will also add to the content of several of Freeman's courses.

**GLANVILLE, JENNIFER**, professor, Sociology, 20 years of service, halftime for academic year 2022-2023

*Title:* Uncovering the True Relationship between Diversity and Generalized Trust

As contemporary societies grow increasingly diverse, the implications of ethnoracial diversity for generalized trust, or trust in strangers, are the subject of extensive debate. A recent systematic analysis of prior empirical research in this area concluded that residential diversity and trust are negatively related. Professor Glanville's research will assess the degree to which a flaw in the way that most previous research measures trust in surveys—"Do you think most people can be trusted?"—has distorted its conclusions. Residential diversity likely shapes how "most people" is interpreted, and thus, previous results are inconclusive. Glanville will collect original survey data

that will include improved alternative measures of trust, allowing her to assess the true relationship between diversity and generalized trust. Her research is expected to result in several academic articles and to contribute to public policy discussions about how to enhance trust in society. Undergraduate and graduate students will be involved in the research process, and the project will provide new material for Glanville's undergraduate and graduate courses.

**GOLLNICK, BRIAN**, associate professor, Spanish & Portuguese, 22 years of service, Fall 2022  
*Title:* Mexico in the Imagination of Dr. Atl

Professor Gollnick will complete two chapters in a book project related to the major Mexican intellectual known as Dr. Atl. Dr. Atl is the most important landscape painter in modern Mexico. He was also a prolific author and an ardent fascist. Because Dr. Atl's politics are far more evident in his writings than in his paintings, Gollnick's study of Dr. Atl's literary output will significantly reframe Dr. Atl's position in Mexican cultural history. Gollnick will also focus on Dr. Atl's reliance on State patronage to engage the Mexican context with the study of fascism as a global ideology. With regard to Latin America, studies on the global nature of fascism have tended to overlook Mexico in favor of Brazil and Argentina, countries with greater demographic ties to Germany and Italy. Gollnick will emphasize Dr. Atl's ideological debts to far-right groups in the US, suggesting a new area in the hemispheric study of fascism in the Americas. Completion of the two chapters will advance the book to a stage where it can be readily evaluated for publication.

**GRETEMAN, BLAINE**, associate professor, English, 12 years of service, Spring 2023

*Title:* "Earth's vast bulk within one sheet": Colonialism, Cosmography, and the English Book Trade  
Professor Greteman will conduct research for a new book project, prospectively titled "Earth's vast bulk within one sheet: Colonialism, Cosmography, and the English Book Trade." During the PDA he will research and complete the book's initial two chapters and complete research and begin drafting the third and fourth. He intends to submit versions of one or two of these chapters for publication as journal articles before the end of the PDA period. This research and book project will inform and invigorate Greteman's teaching of early-modern race and colonial exploration, an area of growing interest for Iowa undergraduates and graduate students. Greteman intends to develop a graduate seminar that will draw directly from and continue to inform his research, and ultimately to adapt that class for the undergraduate curriculum.

**\*GUERNSEY, ALISON K**, clinical associate professor, Law, 3 years of service, Fall 2022

*Title:* Compassionate Release and the Need for Federal Bureau of Prisons Transparency  
The number of people who have sought compassionate release in federal court has skyrocketed, and students in the College of Law Federal Criminal Defense Clinic have spent the past 18 months representing people seeking early release. One of the factors that the Court considers in evaluating a motion is the infection and death rate in the federal Bureau of Prisons (BOP). Professor Guernsey has monitored the BOP's reported data and identified serious deficiencies. Guernsey's project will build on the data her clinic has amassed, as she evaluates the cases of 65 people who died in custody after or while seeking compassionate release. Guernsey hopes to shed light on what prosecutors and the BOP were arguing in legal filings before the federal courts; whether their statements were accurate when referenced against better data; and what, if any, legal reforms are necessary to ensure our prisons are safer and compassionate-release adjudication is more just. The PDA will benefit UI College of Law students in the clinic by providing them with insight that could support future litigation, and will benefit the citizens of this State and the nation by identifying areas of legal reform.

**HAYES, JOY**, associate professor, Communication Studies, 27 years of service, Fall 2022

*Title:* Rethinking the Politics and Aesthetics of Contemporary Media from the Perspective of Radio History

As the first electronic mass medium of communication, radio produced many innovations that are relevant for understanding contemporary media. This proposal argues that a study of conservative broadcasting during the 1930s offers insight into today's conservative media ecosystem by highlighting the use of populist language focused on defining the "un-American." Professor Hayes will analyze the media activities of Representative Martin Dies, Jr. (Texas) who chaired the House Special Committee on Un-American Activities from 1938-1944. Dies' radio speeches reveal the role that national elected officials can play in legitimating extreme right-wing views through the use of populist language and themes. She will incorporate her findings into undergraduate courses on radio and electronic media. Hayes will also examine the history and theory of dramatized documentary programs (docudramas) as they emerged in network radio broadcasting in the 1930s. Docudrama continues to be a vital program genre in the streaming age and this study will make an important addition to media studies and contribute to a new undergraduate course on the history, theory and production of docudramas.

**HILL, MATTHEW E JR**, associate professor, Anthropology, 14 years of service, Spring 2023

*Title:* Becoming Plains Apache (Ndee): Athapaskan Exploration, Ethnogenesis, and Settlement on the Great Plains of North America

About 1000 years ago, Ancestral Plains Apache peoples began a series of migrations south from the northern Yukon and Eastern Alaska to their modern homeland in the Great Plains of North America. During their migrations they entered new lands, intermarried with other Native peoples, and adopted new technologies and subsistence practices. Professor Hill's research addresses how social, economic, and technological changes during movement were critical in shaping the culture and identity of modern Plains Apache people, using data from Native American archaeological sites dating to between AD 1400 and 1750. His work will result in two journal articles; at least one conference presentation; a grant proposal to either National Geographic or the NSF; and new material for his courses, public outreach efforts and undergraduate student research projects. Finally, Hill will also work on establishing partnerships with tribal representatives of modern descendant communities.

**JOHNSON, DOROTHY**, professor, Art & Art History, 34 years of service, Fall 2022

*Title:* The Imaginary of the Boudoir in Eighteenth-Century French Art

Professor Johnson will use the PDA to advance her book project on "The Imaginary of the Boudoir in Eighteenth-Century French Art". During this period the boudoir developed as a separate room in domestic architecture dedicated to the privacy and pleasures of the woman of the household. The vast number and types of depictions of women in the boudoir in the visual arts of the period will be investigated in a multiplicity of contexts, including treatises in medicine, anatomy and the natural sciences that explored the cultural, psychological, biological and physiological nature of women. Johnson will conduct research in France in libraries, archives and museums. Her study will result in several articles and a book. Material will be incorporated into her undergraduate courses and graduate seminars. The new role of women in the private sphere as seen in art will further understanding of the historical development and contributions of women to society overall.

**KALINA, PAUL R**, associate professor, Theatre Arts, 12 years of service, Fall 2022

*Title:* Media Clown / Motion Capture / Alexander Technique

The power of theatre depends on the live relationship between performer and audience. However, advances in digital technology, such as virtual reality, threaten to change the dynamics of that relationship. For example, cell phones impact performances with patrons texting and posting on social media platforms their experience in real time. The audience member simultaneously exists

in two communities at once, the live community in the theatre and the virtual community on the internet. Furthermore, due to the pandemic, theatres find themselves hastening to find ways to utilize digital technology in an attempt to stay relevant. Professor Kalina's project seeks to complete a full-length theatre piece that merges the analog and digital worlds to create a new live theatrical experience, which advances the relationship between performance and audience. The production is the culmination of two years of research and development with Professor Dan Fine from the Digital Arts Cluster. The production will be submitted to various regional theatres and international theatre festivals. The findings will be incorporated into his acting classes and submitted to professional journals.

**KAWAMURO, KEIKO**, professor, Mathematics, 12 years of service, Spring 2023

*Title:* Knots and Contact Structures

Professor Kawamuro will study functions between surfaces and find a nice region with  $2n$  sides. The expected outcome will be a new tightness criterion of contact structures, which will advance the study of both contact and symplectic topology. The project will generate sub-projects for Kawamuro's students toward their PhD and undergraduate theses. She will also design a new undergraduate course on intuitive and visual introduction to topology. Kawamuro will continue to lead the Geometry & Topology Group at Iowa as the PI of the NSF RTG grant. Kawamuro will organize a Kids Topology Club to serve the Iowa City Community and make trips to recruit under-represented minorities in STEM to the Math Department.

**KAY, ALAN R**, professor, Biology, 31 years of service, Spring 2023

*Title:* Measuring the Mechanical Properties of Cells using Brillouin Microscopy

The mechanical properties of the components of a cell play an important role in determining the cell's function. It has however been very difficult to measure the properties of these elements because they are located within cells and are very small. Professor Kay will use a Brillouin Microscopy and Atomic Force Microscopy to measure the mechanical properties of cells in the fruit fly, *Drosophila melanogaster*. He will learn how to construct a Brillouin Microscope, in the laboratory of Dr. Robert Prevedel (European Molecular Biology Laboratory, Heidelberg, Germany) and collect data from mechanically sensitive cells in flies. The PDA will allow Kay to bring this unique form of microscopy to Iowa as well as allowing students and colleagues to benefit from this cutting-edge technology.

**KHANDELWAL, MEENA R**, associate professor, Anthropology, 18 years of service, Fall 2022

*Title:* Demons of the Hearth: Feminist Fieldnotes on India's Cookstove Campaigns

Demons of the Hearth reaches across the divide between STEM and humanities in order to address pressing world problems, that are of great interest to students and broader society. Professor Khandelwal will edit chapters of her book, using interpretive tools of the humanities and empirical social science to examine failures in the search for technological solutions. Her starting point is a seemingly simple problem: Women in rural India trek long distances to collect wood for daily cooking, a task made difficult by loss and degradation of nearby forests. Their mud stoves are blamed for the drudgery of women's lives, sickness caused by indoor smoke and loss of carbon-sequestering forests. A third of the world cooks on stoves fueled by wood and other biomass. Experts have long promoted 'efficient' or 'clean' stoves, but with little success. Bringing together multiple kinds of data (historical, ethnographic, environmental, technical) and the views of diverse actors, including village women and engineers, shows how life in a seemingly remote place speaks to global processes and how a hand-crafted mud stove is embedded in culture, social arrangements, material and ecological processes.

**KIVLIGHAN, MARTIN**, associate professor, Psychological & Quantitative Foundations, 6 years of service, Fall 2022

*Title:* Developing a Web-based Machine Learning System to Augment and Enhance Group Therapy Preparation

Professor Kivlighan will address the need for high-quality preparation for group therapy through the development of a web-based product that will allow for timely, efficient and high-quality preparation of group members for participation in group therapy. Prior research has demonstrated that preparing clients for group therapy reduces dropout rates, enhances prosocial group behavior and increases treatment outcomes. However, providing high-quality group preparation to patients is difficult in a climate of increasing service demand and limited resources. This project seeks to develop a web-based product to provide group preparation to group members and enhance members' group skills/behaviors prior to the onset of group treatment. This project will result in a prototype product and a submitted federal grant proposal. It is the hope that this project will result in future empirical studies and an evidence-based online product that can be disseminated for clinical use in a variety of clinical settings that utilize group psychotherapy services. This project will similarly enhance Kivlighan's teaching and training of doctoral students in group therapy practice and research.

**KRISHNAMURTHY, MUTHU**, associate professor, Mathematics, 15 years of service, Fall 2022

*Title:* L-functions, P-adic Representations and Applications to Problems in Applied Sciences.

Professor Krishnamurthy's research is mainly centered around the study of certain symmetries that appear naturally in number theory and representation theory. In addition, the proposal explores possible applications of number theory to problems in engineering. The proposal concerns L-functions which are technical tools used in encoding these symmetries. This will build on Krishnamurthy's earlier work on converse theorems; study special values of L-functions; pursue a recent discovery of Krishnamurthy that relates number theory and material science; and build on his recent work on the smart electric grid. The PDA will result in multiple publications, attract national and international students, and help advance his doctoral student's research. Krishnamurthy plans to visit Bristol University in the UK and IISER, Pune, in India to work with his collaborators on some of the proposed problems.

**LIM, TAE-HONG**, professor, Biomedical Engineering, 18 years of service, Fall 2022

*Title:* Collaborative Research Machine Learning based Computational Analysis of the Spine Biomechanics

Abnormal forces in the spine are believed to cause low back pain, but normal forces remain unknown. Professor Lim has been studying to identify the normal forces in the spine and made some progress in identifying the optimal muscle force combinations that can maintain the lumbar spine various postures in a stable manner but with less loads in the spine. However, the progression of his research has been limited by extreme complexities resulting from too many possible combinations of back muscle forces (244 muscle forces). He thinks that the incorporation of the artificial intelligence and machine learning technologies into his current computational analyses may be a viable option to resolve the current issue, the management of extremely complex data. Lim identified that the collaboration with Professor Junghwa Hong at Korea University in Korea and Professor Stephen Baek at University of Virginia would be the best option to incorporate the AI and machine learning technologies into his research on the spine biomechanics. The initiation and buildup of such collaboration require Lim's time commitment beyond that involved in the normal faculty activities.

**\*MIKUCKI-ENYART, SYLVIA**, associate professor, Communication Studies, 4 years of service, Spring 2023

*Title:* "Monsters-in-Law?": Shattering Gendered Ideologies to Understand and Improve the Mother-in-Law and Daughter-in-Law Relationship

Professor Mikucki-Enyart will use the PDA to write a solo-authored book project, "Monsters-in-Law?": Shattering Gendered Ideologies to Understand and Improve the Mother-in-Law and Daughter-in-Law Relationship. This book integrates feminist and communication scholarship to examine the historical and cultural roots of difficulty within the mother-in-law and daughter-in-law relationship, which often color expectations for and behaviors within the in-law dyad. With an understanding of how gendered ideologies shape in-law relationships, the book will outline the most common challenges facing the mother-in-law and daughter-in-law relationship and offer evidence-based communication tools to address them. The project will also result in several journal articles and conference presentations. This project will provide new material for their graduate and undergraduate courses on Family Communication. Results from this project will help mothers-in-law and daughters-in-law in Iowa and across the country utilize communication to establish and maintain healthy and satisfying relationships.

**MITCHELL, SARA B**, professor, Political Science, 17 years of service, Spring 2023

*Title:* How Government Policies Reduce Security Threats from Environmental Shocks

Natural disasters like earthquakes, floods, and droughts have become more frequent and threaten to displace as many as one billion people by 2050. Professor Mitchell examines government policy responses to natural disasters to better understand which types of policies increase political violence risks. Her research team identifies several disaster policy responses, including relocation of affected individuals, restrictions on movement, reconstruction of damaged areas and regulations of third-party disaster relief. She expects political violence to occur more often when governments restrict movements of disaster affected populations, restrict third party actor aid efforts, give aid unequally to politically favored areas and rely on decentralized disaster management strategies. Her project involves collection of government disaster responses for all countries from 1900-2020, building on pilot data compiled for 26 countries. She will also conduct detailed case studies of disaster responses in Haiti, Indonesia, Sudan and Turkey. The project will result in several journal articles, external grant funding and new material for Mitchell's environmental and conflict classes.

**NOONAN, MARY C**, associate professor, Sociology, 20 years of service, halftime for academic year 2022-2023

*Title:* The Impact of Infertility on Women's Careers

Professor Noonan will examine the association between women's fertility status (fertile/infertile) and work outcomes (e.g., promotion, income, etc.) during the period women try to become pregnant. Infertility affects nearly 10 percent of women in the U.S. and is on the rise as more women delay childbirth. It seems likely that infertile working women are more likely to dial back from their paid work in order to accommodate the physically and emotionally demanding "fertility work" (i.e., receiving fertility treatments, recovering from miscarriage/stillbirth) they must undertake to achieve a viable pregnancy. Although women and men are equally likely to be diagnosed as infertile, women are more affected by infertility, in general, because parenthood is more central to their identities and because of their unique biological position in reproduction. As such, the "infertility penalty" may be an under-explored explanation for gender inequality in pay. Noonan will incorporate study findings and techniques into her courses on gender, work and the family and involve students in all aspects of the project (e.g., survey design, data collection, data analysis and presentation of findings).

**PACHECO, JULIANNA**, associate professor, Political Science, 9 years of service, Spring 2023

*Title:* The Effect of Restrictive Electoral Laws on Minority Youth Voting

The number of restrictive voting bills introduced across the states increased by a staggering 900% from February 2020-March 2021. Restrictive electoral laws have historically disenfranchised

minorities raising concerns that these new laws inhibit minority voice and exacerbate political inequality. The evidence that restrictive laws disproportionately affect minorities is mixed; some studies find that voter ID requirements decrease minority turnout, while others fail to find a suppressive effect. Professor Pacheco will use a developmental approach to study the effects of restrictive laws on minority turnout. This project will merge state laws with three longitudinal datasets and explore heterogeneous effects across race/ethnicity on youth voter development. The results of this project have significant implications. If restrictive laws contribute to a delay in first time voting among minority youth, then the suppressive effects of these laws are much more expansive than suggested by previous research. This project is expected to result in several journal articles, grant proposals and new material for Pacheco's undergraduate course on political behavior.

**PLUMERT, JODIE M**, professor, Psychological Brain Sciences, 31 years of service, Fall 2022

*Title: A Parent-Based Intervention for Enhancing Children's Road-Crossing Safety*

Child pedestrian injuries and fatalities have risen in recent years, leading to calls for increased efforts to prevent collisions with vehicles. This PDA project will use novel virtual environment technology to deliver and test a parent-based intervention program for training children to cross roads safely. Parents will either receive training or no training about how to teach their child to anticipate the arrival of a crossable traffic gap and plan their movements accordingly while crossing roads in an immersive pedestrian simulator. Professor Plumert will team with her colleagues and students (undergraduate and graduate) to carry out this interdisciplinary project and will use the project results as the basis for writing an external grant proposal. This research will provide new information about the critical role that parents play in teaching children how to anticipate whether and when to act in the context of crossing roads and will provide the basis for intervention efforts designed to increase children's road-crossing safety.

**RAMADAN, YASMINE A**, associate professor, French & Italian, 7 years of service, Fall 2022

*Title: Desert Divides*

Professor Ramadan's research project examines the representation of the Sinai Peninsula in Egyptian literary and cultural production. It focuses specifically upon the relationship between artistic production and activism, and the ways in which artists unsettle official state discourse, in this case as it relates to the geopolitical significance of the Sinai, and the experience of the Bedouin communities in the region. The interdisciplinary research conducted with this PDA will contribute to Ramadan's next book *Desert Divides*, a work that draws upon studies of nationalism, postcolonial ecocriticism, and the environmental humanities, bringing them into conversation with Arabic literature. It will also contribute to Ramadan's undergraduate and graduate courses and expand the Arabic Program's interdisciplinary course offerings on the MENA region.

**\*SECCHI, SILVIA**, professor, Geographical & Sustainability Sciences, 4 years of service, Spring 2023

*Title: The Role of Federal and State Policies in Racializing Iowa Agriculture in the 20th and 21st Century*

Professor Secchi will analyze the role that racialized agricultural policies have played in the 20th and early 21st century to continue to exclude people of color from the agricultural sector. The analysis will be based on the agricultural census and other USDA and agricultural data, Iowa and federal statutes and regulations, lawsuits, and other contemporaneous sources such as newspaper articles and documents from agricultural organizations such as farm bill policy statements. The PDA will result in a manuscript, a case study to be used in the classroom and a policy-focused white paper providing ideas to promote a more diverse and equitable agriculture that is focused on federal and state policies that would address systemic racism and

discrimination of farmers of color. The award will benefit the state of Iowa by deepening our understanding of how Iowa's agriculture is impacted by systemic and institutional racism and the policies that perpetuate it.

**SMALL, GARY W**, professor, Chemistry, 17 years of service, Fall 2022

*Title:* Deep Learning Methods for Passive Infrared Chemical Imaging

The U.S. EPA's ASPECT program provides the country's only airborne emergency response capability for detecting the release of hazardous chemicals from disasters such as industrial accidents or hurricanes. The ASPECT aircraft employs an infrared (IR) imager to identify plumes of volatile chemicals. As the aircraft flies, the sensor sweeps across a 60° arc to build the IR image of the ground scene. For the data to be useful to first responders, the interpretation must be rapid and automated. To address this problem, Professor Small will explore the use of deep learning methods for automating the identification of specific chemicals in the collected IR images. Deep learning techniques are a new category of artificial neural networks that are gaining popularity in many imaging applications but have not been widely applied in chemistry. Through this work, Small will expand his research capabilities into an emerging area of data science. These newly acquired skills will enhance the competitiveness of his research proposals and also contribute to his laboratory teaching efforts by allowing the incorporation of this state-of-the-art methodology into the chemistry curriculum.

**SPAK, SCOTT N**, associate professor, Urban & Regional Planning, 10 years of service, Spring 2023

*Title:* Estimating and Accelerating Global Capacity for Integrated Urban Environmental Systems and Services

Professor Spak will conduct mixed-methods research to characterize and inform the global emergence of integrated urban environmental systems and services (UIS) from a patchwork of separate weather, air quality and hydrological forecasting and policy analysis models and decision support tools. He will analyze public data on current and proposed UIS and conduct a global Delphi technology forecasting study of UIS development and operations costs and benefits to estimate resource requirements, benefit:cost ratios and path dependence for deploying state-of-the-science UIS for all 34 world megacities. This PDA will contribute modules for three courses to learn best practices in UIS development and application through group simulations and community-engaged scholarship, and to teach the Delphi method as a qualitative planning technique. The project will benefit the State of Iowa by informing development in forecasting and decision support (e.g., Iowa Flood Center, NOAA National Weather Service) and UIS scholarship across nine UI programs and seven research centers.

**STONE, ELIZABETH A**, professor, Chemistry, 11 years of service, Spring 2023

*Title:* Sources and Transformations of Atmospheric Particulate Matter

Through this award, Professor Stone will conduct research on atmospheric particulate matter as part of three projects funded by the NSF. The first aims to establish the vertical fluxes of pollen, fungal spores and bacteria in the atmosphere. The second focuses on how sea spray aerosol transforms when aged in the atmosphere. The third focuses on volatile compounds that react in the atmosphere to form particles. These projects will improve our understanding of the natural and anthropogenic processes that affect air quality and health. Research will be conducted with an emphasis on collaborative team science among UI researchers in chemistry and engineering as well as collaborators at other universities. Stone will mentor undergraduate and graduate students in research and integrate findings into curriculum for chemistry courses. These research and academic endeavors are directly applicable to improving air quality and the health of Iowans.

**STORRS, LANDON R Y**, professor, History, 9 years of service, Fall 2022

*Title:* Feminist Internationalism During the Cold War: Caroline Ware in Latin America

Professor Storrs will begin writing her book on the career of American social scientist Caroline Ware, with particular attention to her community organizing work in Latin America (1945-1975). Ware is well-known to U.S. women's historians, but the Latin American phase of her career has never been studied. Storrs uses Ware's hitherto unexamined private papers to expand our knowledge of women's international activism and also of American-led programs in international development during the Cold War. This knowledge will enrich Professor Storrs's teaching and advising of undergraduate and graduate students with regard to women's activism, social policy and the Cold War. The PDA will result in chapter drafts, dissemination of findings at international conferences and a subsequent external grant proposal.

**\*SU, RONG**, associate professor, Management & Organization, 4 years of service, Spring 2023

*Title:* Understanding the Long-Term Psychological and Economic Impact of Underemployment: A Multi-Country Study

Compared with unemployment, chronic underemployment—where individuals' employment mismatches their education, training or skill level—is more prevalent, and its effects are potentially more detrimental. However, the long-term psychological and economic impact of underemployment for individuals remain to be understood. This understudied topic is a research frontline at the intersection of management, economics, psychology and sociology with many funding opportunities. With the support of the PDA, Professor Su will address three sets of research questions on the topic by analyzing large-scale data from several national longitudinal population surveys. Knowledge gained from the proposed study has key implications for understanding the rippling effects of underemployment on the labor force and the economy, will provide insights for organizations and leaders managing a shifting work force, and can help inform public policy. The project is expected to produce top-tier journal publications, benefit student learning at undergraduate, MBA and PhD levels, and lay the crucial groundwork for the justification and feasibility of Professor Su's future grant activities.

**TREAT, TERESA A**, professor, Psychological Brain Sciences, 11 years of service, Spring 2023

*Title:* Understanding and Modifying the Role of Cognitive Processing in Alcohol-Related Sexual Assault

Professor Treat proposes to advance her NIH-funded work on male-initiated sexual aggression toward female acquaintances, a major problem on college campuses necessitating improved prevention approaches. Her research focuses on the role of men's misperception of women's sexual interest in sexual aggression. She currently is developing and preliminarily evaluating a novel prevention approach for sexual aggression, risky sexual behavior and heavy drinking among young male college students. During the PDA, she will write an R01 application to support a large randomized controlled trial of the program, and she will conduct an empirical study to examine how sexual arousal influences men's processing of women's sexual interest, which will further inform prevention efforts. Her efforts will be incorporated into two undergraduate courses. The PDA will minimally result in an R01 application, an empirical paper, and two course revisions.

**TSE, KENNETH T**, professor, Music, 19 years of service, Spring 2023

*Title:* Resuming Creativities

Over the past couple of years, due to the pandemic, creative activities have been placed on hold the world over. The primary goals for this PDA period are threefold: Professor Tse will resume a performance tour with the goal of reconnecting with international colleagues and potential recruits. He will record new recordings with piano as well as orchestra. A recording with orchestra is often considered the pinnacle of a soloist's career. Finally, he will begin researching and writing a

pedagogical book. Tse plans to write down the experiences and knowledge he has gathered during his teaching and performing career and methods he has developed on pedagogy. Although it will take more time to finish the book, this PDA would allow Professor Tse to begin and focus on his research and writing.

**WILSON KIMBER, MARIAN**, professor, Music, 17 years of service, Fall 2022

*Title:* Women's Work: Clubwomen Activists and American Music

Professor Wilson Kimber will undertake research for and begin writing a book, "Women's Work: Clubwomen Activists and American Music," exploring the roles of leading figures in the women's club movement whose activism shaped American musical life before World War II. Her book will be first full-length study of the club activities of eight women's leaders—Eva Perry Moore, Grace Porterfield Polk, Eleanor Everest Freer, Anne Shaw Faulkner Oberndorfer, Alice Warder Garrett, Roberta Campbell Lawson, and Phyllis Fergus, as well as Perle Schmidt, whose promotion of Iowa composers is an important part of the state's cultural history. Wilson Kimber will visit archival collections that hold rare research materials, including the General Federation of Women's Clubs archives in Washington, DC; the archives of the National Federation of Music Clubs and the Indiana Historical Society in Indianapolis; the John Hopkins University Library in Baltimore; and the Newberry Library in Chicago. Her research will provide a new understanding of women's roles in shaping American music, informing her seminars on music historiography, American music, and women and gender in music.

**WITTENBERG, DAVID H**, associate professor, English, 23 years of service, Spring 2023

*Title:* Against Dialectic: A Theory of Opposition

Professor Wittenberg will complete a substantial portion of a book entitled "Against Dialectic: A Theory of Opposition". The book reinterprets the concept of "dialectic" in Western philosophy alongside an interpretation of binary habits of thinking in contemporary politics, journalism, and social media. Mainstream political discourse, in part because it inherits styles of dialectical thinking from philosophy, tends to fall into a dualistic mode, exemplified by the "point/counterpoint" or "two sides" model of journalistic debate. Such a mode has the unfortunate effect of equalizing viewpoints regardless of their relative veracity, and therefore may legitimize inaccurate or outright false claims, an urgent problem in the era of viral media and "fake news." By reconsidering the effects of philosophical dialectic on mainstream culture, "Against Dialectic" benefits society by proposing new methods for understanding and analyzing mainstream politics. In addition to its interest for culture and media theorists, the book provides groundwork for several courses on the intersections of philosophy and popular culture that Wittenberg plans to develop.

\* Will have met the 10-semester (academic-year appointment) or 4 years (fiscal year appointment) service requirement prior to taking the assignment approved, per SUI policy.