Contact: Rachel Boon

PROFESSIONAL DEVELOPMENT ASSIGNMENT REQUESTS FOR FY24

Action Requested: Recommend approval of the professional development assignment requests submitted by the Regent universities for FY24.

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 2023-24 the University of Iowa, Iowa State University and the University of Northern Iowa request approval of 109 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 2023-24 represent 2.3% 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 tied to supporting innovation, economic development, human capital development and advancing the teaching to support evolving workforce needs. The Board office recommends approval of the professional development assignment requests for FY24.

NUMBER OF PDA RECIPIENTS AND PERCENT OF TOTAL FACULTY
FY 2020 – FY 2024

	FY 2020	FY 2021	FY 2022	FY 2023	FY2024
SUI	71 (3.0%)	72 (2.2%)	43 (1.3%)	52 (2.1%)	59 (2.4%)
ISU	50 (2.7%)	48 (2.6%)	29 (1.6%)	38 (2.2%)	41 (2.3%)
UNI	14 (1.8%)	14 (1.9%)	0 (0.0%)	8 (1.4%)	9 (1.7%)
REGENT TOTAL	135 (2.7%)	134 (2.3%)	72 (1.2%)	98 (2.1%)	109 (2.3%)

Background

Educational excellence can be obtained only with a vital faculty that actively pursues new developments in knowledge and teaching. A period of sustained time for special projects is essential for maintaining faculty vitality. These projects impact the educational mission and involve research in a wide range of fields of value to the university. An assignment of time for such projects enables faculty members to improve individually and to achieve institutional educational objectives. Valuable outcomes of this program continue to be an increased visibility and prominence of our faculty and departments in some of the newest and advanced areas of research and scholarship, and the direct application of expanded knowledge to students and constituents in Iowa, the nation and the world.

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 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.

Faculty replacement costs.

- At SUI, the total projected cost of the program for 2023-24 is $176,071. 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. The total funds allocated for teaching replacement salary costs for FY24 PDAs is estimated to be $217,702. There are no research-related expenses for ISU faculty approved for this program.
- 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 FY24 PDAs is estimated to be $76,881.

BUDGETED REPLACEMENT NET COSTS
FY 2022 – FY 2024

	FY2022	**FY2023**	**FY2024**
SUI	$207,231	*$87,217	*$176,071
ISU	*$166,588	***$0	*$217,702
UNI	**$0	*$45,671	*$76,881
REGENT TOTAL	$373,819	$132,888	$470,654

*Calculation reflects 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.

University of Iowa

ASAY, SCOTT, associate professor, Business-Accounting, 9 years of service, Fall 2023
Title: Investor Decisions and Information Sources
Prof. Asay will examine how individual investors make investment decisions, with an emphasis on understanding the information sources that investors rely upon to inform their decisions. While individual investors have initiated over 20% of trades in recent years, they may often rely on low-quality information sources that lead them to make risky or poor investments. Prof. Asay will collect data on investors' decisions and prepare a working paper reporting the results. Prof. Asay's findings will have implications for individual investors as well as policy makers seeking to protect investor welfare.

BATES, MELISSA, associate professor, CLAS-Health & Human Physiology, 8 years of service, Fall 2023
Title: Developing Pneumero: A Device to Remotely Measure Lung Function
Eleven percent of Americans live with chronic lung diseases like asthma and chronic obstructive pulmonary disease (COPD). Presently, most patients have their lung function assessed in a doctor's office and there are no good tools to measure lung function at home. This means that the overwhelming majority of patients rely on the development of symptoms (e.g., cough, shortness of breath) to know when their disease is worsening. When a patient develops symptoms, the probability that they will be hospitalized increases. Prof. Bates has developed a sensitive method to measure lung function and is requesting this PDA to achieve two goals: 1) to develop a minimal viable prototype that adapts this method for remote monitoring of lung disease at home; and 2) to work with the John Pappajohn Entrepreneurial Center to develop a Small Business Innovation Research grant to support beta testing and refinement of the prototype.

BECKER, NICOLE M, associate professor, CLAS-Chemistry, 8 years of service, Fall 2023
Title: Supporting undergraduate chemistry students' reasoning with graphical representations
Prof. Becker will conduct a study of undergraduate chemistry students' interpretation and use of graphical information to make inferences about chemical processes. The PDA will entail gathering eye tracking data and verbal records of students' reasoning as they solve chemistry problems using graphical representations of data. The expected outcome of this work will be descriptions of themes in students' approaches to analyzing and interpreting graphical information, which will be used to inform curricular and pedagogical best practices. Findings will be used to inform training of graduate teaching assistants, and to improve curricular resources in introductory undergraduate chemistry courses at UI. Improving supports for student learning in introductory chemistry courses in Iowa will ultimately enhance the preparedness of Science Technology Engineering and Mathematics (STEM) graduates in the state of Iowa.

BERG, MARK T, professor, CLAS-Sociology and Criminology, 9 years of service, Spring 2024
Title: Contribution of Firearms to the Lethality of Community-Based Violence in the United States Over Time
After years of declines, homicides have again surged with communities reporting their highest counts of killings in decades. Oddly, rates of nonfatal violence have continued a three-decade decline. The proposed study hypothesizes that firearms -- their proliferation and lethal capabilities -- are responsible for the increasing lethality of violent crime. No single data infrastructure tool is available for researchers to assess lethality patterns. Prof. Berg aims to determine how firearms have contributed to the lethality of violent incidents over the last 30 years and to develop a data infrastructure tool. His project is significant because it will determine if violent incidents have become increasingly deadly because of the growing presence of firearms or their lethal capabilities. Prof. Berg anticipates that the project will lead to applications for federal funding and

produce three manuscripts in reputable academic outlets. Findings will inform the course content of undergraduate and graduate courses on crime control policy. Society will benefit from knowledge of whether the proliferation of firearms has contributed to changes in the nature of American violence.

BERRY, VENISE T, professor, CLAS-Journalism and Mass Communications, 31 years of service, Fall 2023
Title: Samsara, A Novel
For this proposed PDA, Prof. Berry plans to move to her creative side and write Samsara. This novel will examine Black women's struggles with mental health issues in today's society. Samsara is a Buddhist term that means – the cycle of life, death, and rebirth. The story will explore the relationship between a mother and daughter who are both dealing with mental health issues. All of Prof. Berry's novels are well researched. She believes it is important that readers not only enjoy a good story but also learn something. She will interview a number of mental health professionals, research journal articles, examine relevant books, and she will also draw on her own personal experience with her daughter attempting suicide twice during high school. Samsara is an important story that needs to be told.

BUCHHOLZ, JAMES H J, associate professor, Engineering-Mechanical Engineering, 14 years of service, Spring 2024
Title: Data Analysis and Machine Learning for Estimation of Fluid Flows
The interaction of vortices in flowing liquids and gases with immersed solid structures is a ubiquitous phenomenon in a diverse array of applications such as aircraft aerodynamics, biological flight, wind energy and fluid flows in the human body. Prof. Buchholz's project seeks to develop a powerful tool for the estimation of key flow attributes from a limited number of pressure measurements on the immersed solid surface by combining a transport framework developed in his research program with data analysis and machine learning algorithms. The resulting analysis tool will facilitate a deeper understanding of the physics of flow-surface interactions, support the development of novel control strategies for aerodynamic vehicles, and help to provide insight into the nature of pathologies related to flow-structure interactions in the upper respiratory system. Through this project, Prof. Buchholz will involve and train a graduate student, publish the results of his work, submit a proposal for further development of the model, and establish a foundation for several new research projects. The resulting algorithm will also augment student projects in courses taught by Prof. Buchholz.

BUREK PIERCE, JENNIFER, associate professor, Graduate-Library & Information Science, 17 years of service, Spring 2024
Title: More Than Rooms with Books: US Public Libraries in the Atomic Age, 1941-1965
Prof. Burek Pierce's research demonstrates that U.S. public libraries responded to cultural, technological and professional changes in the wake of World War II with new approaches to serving their communities, an essential step toward the ways librarians envision working with young people today. Starting in 1941, the American Library Association (ALA)'s Committee on Post-War Planning (CPWP) urged libraries to provide new information resources to support citizens' learning. Ensuring that libraries would be "more than rooms with books," as one contemporary report put it, was a priority. Because no funding supported libraries' efforts to respond to the CPWP's edicts and other war-time challenges, libraries responded creatively. Prof. Burek Pierce won an ALA award for research showing that librarians brought authors to libraries to meet with teens as part the effort to create these new opportunities. Prof. Burek Pierce will visit several library archives to access records that will enable her to craft the larger story of librarians'

commitment to young people during these years; this research will be the basis for a book and a new UI course for master's students in library science.

CASTELLANOS, HORACIO, associate professor, CLAS-Spanish & Portuguese, 11 years of service, Spring 2024
Title: A Fiction Novel: El Salvador 1972.
Prof. Castellanos' project is writing a fictional novel set in his native El Salvador in 1972. This was a crucial year in political terms for the country: the military regime committed fraud in the presidential elections, large sectors of the population became radicalized, which precipitated the civil war years later. Prof. Castellanos will carry out the research of that period and write the first draft of the text. The novel will recount the last three days of Clemente Aragón's life before he was shot to death in the middle of the turmoil. Members of different generations of the Aragón family have been main characters in the last six novels by Prof. Castellanos. With this new story, he will continue the construction of a fresco of Salvadorean history through a saga of novels. The research and the writing will impact positively on his teaching, both on the undergraduate (Journalistic Writing in Spanish America) and the graduate (fiction workshop) courses. The novel will contribute to a better understanding of El Salvador and Central American history, and to disseminate the Spanish creative work carried out at the University of Iowa.

CHOU, CYNTHIA G, professor, CLAS-Anthropology, 7 years of service, Spring 2024
Title: Fieldwork and Publication of Anthropological Ethnographic Study on Sea Nomads in Southeast Asia
Prof. Chou will conduct anthropological fieldwork and publish an edited volume on sea nomads in Southeast Asia. By investigating why people remain stateless by choice, the project will explain that modern civilization is not an inevitable progression towards statehood. Southeast Asia is an important field site for studying nomadism as long-held adaptions to evade state capture and state formation. Stretches of spaces there constitute some of the largest areas in the world that are not integrated into nation states. The project will be the first comprehensive study of the relationship between sea nomads and states; generate a history of human civilization from stateless people's perspective; and further understanding about how stateless societies impact political spaces and international relations. The project will enhance UI's international profile and Prof. Chou's classes on Anthropology and Contemporary World Problems; Peoples and Cultures of Southeast Asia; Culture, Health and Well-being: Southeast Asia in Focus; and Space, Place and Identity.

COELHO, BENJAMIN A, professor, CLAS-Music, 24 years of service, Spring 2024
Title: Bassoon: Pratica quotidiana: An Introduction to Diversity of Sounds
In the last two to three years, there have been discussions at the School of Music about Equity, Diversity, Inclusion, and Belonging (EDIB) in classical music and ways systemic issues will change in the coming years. These must include diversity of sounds in the educational and pedagogical materials when teaching music by offering sounds from different parts of the world. Prof. Coelho will expand his bassoon method book, Pratica quotidiana (Daily Practice), for undergraduate and graduate music and non-music bassoon majors. The method book will introduce and educate students on the concept of diversity of sounds by including music from classical, popular, indigenous, and folkloric music genres from the six inhabited continents and breaking traditional barriers. The final product will result in a published method book available to teachers and students.

COLBERT, AMY E, professor, Business-Management & Entrepreneurship, 15 years of service, Spring 2024
Title: Need Fulfillment across Life Domains: Promoting Physical and Psychological Well-Being

Work helps to fulfill human needs for meaning, relatedness, autonomy and competence, contributing to overall physical and psychological well-being. However, work can also conflict with other life domains (e.g., family, community, religion, leisure), leading people to question how best to integrate work and these other aspects of life. Prof. Colbert is conducting a series of studies to examine how need fulfillment across life domains contributes to overall well-being. Through two quantitative and one qualitative study, Prof. Colbert will investigate whether need fulfillment in each domain contributes independently to well-being or if there are diminishing returns across domains. She will also investigate how people make decisions about relative investments across life domains. Together these studies will provide students with evidence to inform their decisions about integrating work with other life domains and will guide leaders and organizations as they create policies and practices to support the work-life interface and strengthen relationships with employees.

DOWLING, DAVID O, professor, CLAS-Journalism & Mass Communications, 10 years of service, Spring 2024
Title: News, Inc.: Brand Journalism Across Media
In the news industry, commercial interests are traditionally considered anathema to the editorial function of informing the public. Yet journalists and advertisers have always shared the common goal of producing compelling stories with a focus on engagement. The proverbial separation of church and state has blurred dramatically in the digital age, particularly with the rise of native advertising and content marketing. Prof. Dowling will examine the current normalization of such practices in the media industry dedicated to the production of digital longform journalism. Brands have increasingly become publishers and have taken on the role of journalists. News organizations have responded by selling their authority and journalistic storytelling prowess to the advertising industry as producers of sponsored content known as brand journalism. Prof. Dowling argues that brand journalism has provided a much-needed revenue source for the beleaguered news industry, as consumers increasingly seek nuanced longform storytelling in the form of engaging captivating narrative journalism. Lost in the process is the principle of independence, which has been radically reformulated in the digital age.

DUARTE, ARMANDO S, professor, CLAS-Dance, 29 years of service, Fall 2023
Title: O Samba no Corpo de um Brasileiro – Volume 1
O Samba no Corpo de um Brasileiro, volume 1 is a manuscript about iconic performers present in the dance scene of samba during the Schools of Samba carnival parades in Brazil - the Mestre-Sala, and Porta-Bandeira. The project is focused on finishing and publishing various interviews that Prof. Duarte conducted in Brazil with Mestres-Salas, and Porta-Bandeiras. Based on their own narratives, plus their significance for samba and carnival in Brazil, this is a description of their careers and an examination of dance elements related to their performances. The central claim of this manuscript focuses on presenting these interviews in Portuguese and English along with two to three chapters on the history of samba in Brazil. In Brazil, Prof. Duarte plans to meet with publishers, conduct additional interviews, access research documentation, and attend samba activities in Rio de Janeiro and São Paulo. The research outcome provides an original view of a dance considered to be the most important in a Brazilian School of Samba carnival parade. Moreover, it will secure further information to foster his teaching and research at UI.

ESPINOSA, MARIOLA, associate professor, CLAS-History, 9 years of service, Spring 2024
Title: Sensational Cures: Medicine, Politics, and Popular Culture in the Spanish-Speaking World
Prof. Espinosa will complete research on her book on the relationships between medical professionals, populist leaders and popular culture in the early 20th Century. In 1929, Dr. Fernando Asuero captivated Spain and Latin America with the claim that he could relieve pain,

even cure paralysis, just by touching the trigeminal nerve. As thousands flocked to Dr. Asuero for relief, he and his cure became a transnational cultural phenomenon. The populist rulers of Spain, Italy, and Argentina were among Dr. Asuero's admirers, but the medical establishments of those countries reacted harshly, arguing that he was a quack who should be arrested. By documenting how doctors, patients, and politicians were portrayed in transnational popular culture, the resulting book will make important contributions to the medical humanities, to the history of the politicization of medicine, and to the history of medical professionalization in Spain and Latin America. It will also yield new material for integrating multidisciplinarity into undergraduate courses, as well as facilitate new professional networks for graduate students at the University of Iowa.

FARRIN, LAUREL, professor, CLAS-Art & Art History, 24 years of service, Fall 2023
Title: Weird O
Prof. Farrin will work on Weird O, an art project of paintings and videos created from recombining, re-purposing and improvising found materials. Comedy is a social practice helping people cope, heal and work together and is an instrument for change used by artists. Prof. Farrin's innovative research contributes to the field of contemporary painting by inventing new visual comedic forms that cultivate empathy through abstract visual situations, circumventing the language barriers of comedy. During Prof. Farrin's PDA, new links between contemporary ideas in visual art, ecology and physics will be explored through the lens of comedy. Prof. Farrin's 2018 solo exhibit at the Figge Museum, No Particular Order, and her 2020 solo exhibit, Vaudeville, at Devening Projects in Chicago, is the foundation for her next solo show, Weird O, which will be exhibited in State and National venues. Prof. Farrin will teach multidisciplinary and conceptual aspects of the project in School of Art and Art History's undergraduate and graduate programs.

FINE, DANIEL S, associate professor, CLAS-Theatre Arts, 6 years of service, Spring 2024
Title: Projection Mapping and Beyond
Prof. Fine's objective is to extend his research into community engagement through the creation of a new course that culminates in a projection mapping festival in Iowa City. He will create a partnership between the Creative Services department of the Downtown District of Iowa City, Public Space One, and multiple departments within UI. His goals are to: 1) create an annual projection mapping festival in Iowa City; 2) develop a new undergraduate/graduate course in architectural projection mapping that culminates in student participation in the festival; and 3) curate a festival that brings diverse national artists' work to Iowa City. He will continue his ongoing, multi-year research exploring new technologies with live performance. Additionally, he will link these creative research projects directly to the classroom through the initial development of two additional courses based on VR and Motion Capture. These advanced art & technology courses, along with a university/community festival, will expand his existing course offerings and directly impact students by expanding potential employment opportunities and fostering connections to our community.

FRISVOLD, DAVID E, associate professor, Business-Economics, 9 years of service, Spring 2024
Title: Understanding the Influence of Menu Labeling on Restaurant Purchases
Consuming meals in restaurants is linked to the rise in obesity, and consumers have difficulty in accurately determining the nutritional content and number of calories of menu items. As a result, the Affordable Care Act (ACA) requires chain restaurants to post calorie information on menus and menu boards. Prof. Frisvold's project will determine the impact of this information on the amount of calories that consumers purchase in fast-food restaurants. He will incorporate his findings into his undergraduate course, Health Economics. This project will inform policymakers whether the calorie posting mandate in the ACA influences the amount of calories purchased and has the potential to impact obesity rates.

GHOSH, JOYEE, associate professor, CLAS-Statistics & Actuarial Sc, 12 years of service, Spring 2024
Title: Bayesian Variable Selection for Streaming Data
Prof. Ghosh will develop new methods for Bayesian variable selection for streaming datasets. Streaming datasets refer to datasets that arrive sequentially, such as in mobile or web applications. Streaming data can be overwhelmingly large for computer memory, making it difficult or even impossible to implement standard methods meant for traditional static datasets. In many problems, the goal is to predict an outcome variable, which is called a response variable, based on many input variables, which are called predictors. Variable selection refers to the problem of developing methods for identifying the relevant input variables or predictors that are useful for predicting the response variable. Bayesian variable selection for streaming datasets is an active area of research at the intersection of statistics, machine learning, and data science. There are many application areas such as biomedical, environmental and financial applications. The development of these methods could benefit society. This PDA will result in one or more papers and generate cutting edge research topics for undergraduate and graduate courses.

GIDAL, ERIC, professor, CLAS-English, 26 years of service, Spring 2024
Title: Public and Digital Environmental Humanities
Prof. Gidal will work on two collaborative projects in environmental humanities: one related to publicly engaged graduate education at the University of Iowa, the other related to geographical and computational approaches to literary history. In consultation with faculty and staff from the College of Engineering and the Iowa Initiative for Sustainable Communities, he will prepare materials gathered and produced during the previous summer as part of the NSF-funded BlueGreen Action Platform, a cross-disciplinary, multi-institutional collaboration between the University of Iowa and the University of South Florida that connects communities across watersheds to improve nitrogen management. He will also spend time working with Prof. Michael Gavin of the University of South Carolina on an on-going project in environmental geography and corpus analytics. These two projects connect public and digital environmental humanities through collaborative pedagogy and scholarship.

GLASS, LOREN D, professor, CLAS-English, 18 years of service, Spring 2024
Title: Cities of Literature
Prof. Glass will conduct a comparative study of selected UNESCO Cities of Literature in order to understand the contemporary economic and cultural significance of urban literary branding. During his PDA, he will visit selected cities on multiple continents--including Edinburgh (the first city so designated), Melbourne, and Reykjavik--in order to obtain a global perspective on this contemporary development and its significance for world literature. He intends to study each city (including Iowa City) both in its distinct deployment of the UNESCO brand and in its participation in the expanding Creative Cities Network. The result will be a book called Cities of Literature. Prof. Glass is applying for a Fulbright Global Scholar Award to fund his travel.

GOREE, JOHN A, professor, CLAS-Physics & Astronomy, 37 years of service, Fall 2023
Title: Research Collaboration in Physics and Engineering
Prof. Goree will undertake two projects in this PDA. Both projects involve scientific collaboration: one with the UI College of Engineering, the other with Appalachian State University's Physics Department. The Engineering collaboration will lead to the development of a new kind of scientific instrumentation for high-speed imaging of the combustion of fuel drops in the laboratory. This effort will promote a better understanding of combustion, which could contribute to improved energy efficiency and reduced emissions. A graduate student's PhD thesis project will be co-advised in that project. The Physics collaboration at App State will lead to the completion of a

jointly authored paper on shock waves passing through a layer of electrically charged particles. For that effort, experimental data recorded by high-speed imaging will be analyzed and compared to a new theoretical model that Prof. Goree has co-developed. The skills developed with high-speed imaging in both of these research projects, will carry over to instruction in a general education physics course taught by Prof. Goree.

GREWAL, ANDY S, professor, Law-Faculty, 11 years of service, Spring 2024
Title: Political Accountability and EITC Enforcement
Prof. Grewal will research how to improve political accountability in the administration of the Earned Income Tax Credit (EITC) program. He will propose and examine the viability of a targeted budgeting regime for EITC enforcement. This research activity will likely culminate in a traditional law review article. The project will add to UI's reputation for producing research relevant to pressing social problems. Additionally, society may be improved through informed analysis over a massive federal program, which around 25 million taxpayers participate in yearly.

GREYSER, NAOMI, associate professor, CLAS-Gender, Women's and Sexuality Studies, 14 years of service, halftime for calendar year 2024
Title: Blocked and Unblocked: Writing, Research, and the Creative Process
Prof. Greyser is proposing to use this PDA to make substantial progress on two interlinked books, Un/Blocked: Writing, Research & the Creative Process and Blocked: Writing, Race and Gender at the University. These books address a seemingly simple question: What do humans need to explore and express ideas and to solve problems? BOOK 1: Un/Blocked offers tools, ingredients and springboards for researchers to work and play with. Drawing on over a decade of supporting academic writers across disciplines, Prof. Greyser's evidence-based approach complements and augments researchers' expertise in their own fields. Un/Blocked maps many of inquiry's unwritten yet powerful rules--and lays out how researchers can experiment, bend and break them. BOOK 2: Examining writer's block in university design, education policy, and academics' experiences with inquiry, Blocked maps historical and structural conditions that delimit what can be asked and examined, how and by whom. Un/Blocked helps researchers troubleshoot work-in-progress. Blocked reflects on written inquiry's power and limits in academia. Both books strive to cultivate more robust and equitable conditions for creative and scholarly work.

HARRIS, CHRISTOPHER, associate professor, CLAS-Cinematic Arts, 5 years of service, Spring 2024
Title: Experimental Cinema and Speculative Approaches to the Archive and African American Media Histories
Prof. Harris will research the absence of African Americans from the visual historical record in Chicago-area film archives. The visual history of African Americans is fragmentary due to lost Black films from the first half of the 20th century. Prof. Harris will search archives for traces of missing Black films and use nontraditional film production approaches to make a film that responds to these absent images. Taking archival fragments (a publicity still from a lost film, a title, a release date, a newspaper ad, etc.) as inspiration, Prof. Harris will produce a film from these remaining traces that purposely collapses boundaries between historical research methods and creative methods to allow for a richer, deeper understanding of African American visual history. This project is expected to result in screenings at major film festivals, museums, and cinematheques and is supported by an Andrew Mellon Collaborative Fellowship for Arts Practice and Scholarship at the University of Chicago's Gray Center for the Arts where Prof. Harris will be in residence. It will also provide a methodology Prof. Harris will teach students in CINE 5890 Graduate Colloquium in Film and Video Production.

HAZELTINE, ELIOT E, professor, CLAS-Psychological Brain Sciences, 19 years of service, Spring 2024
Title: How Do Task Representations Guide Cognitive Control
The proposal work focuses on the role that task structure plays in driving and organizing behavior. It examines how to measure task representation, which is critical because task representation drives behavior but there are few established measures of how to measure it. During the PDA period, Prof. Hazeltine will connect psychological and neural mechanisms across a diverse array of controlled behaviors under a unified framework. The research will enhance our understanding of frontal lobe function and suggest ways in which task settings may be reconfigured to assist individuals with frontal lobe damage or executive dysfunction. The outcomes of these experiments may have wide ranging implications for how human-machine interfaces can be designed to improve performance. The research will benefit students at UI because it will allow Prof. Hazeltine to develop curriculum on the cognitive neuroscience of task representation. Task representation integrates findings from the burgeoning research topics of cognitive control, frontal lobe function, and decoding neural signals.

HOOKS, ADAM G, associate professor, CLAS-English, 13 years of service, Spring 2024
Title: Making Shakespeare's Poems
Prof. Hooks will continue work on a new edition of Shakespeare's Poems under contract for the leading textbook publisher in the discipline. It will be the first born-digital edition of Shakespeare's works. This book builds on recent cutting-edge research in Renaissance studies which seeks evidence about the printing, publishing and early reception of Shakespeare by attending to individual original copies. It also explains and interprets all the non-dramatic texts for twenty-first-century readers, including students, scholars and the general public, by providing narrative introductions and comprehensive annotations. Work will also proceed on a companion digital project, shakespearecensus.org, which catalogs and describes every early copy of Shakespeare's works in print. Prof. Hooks will complete the editing of Shakespeare's two long and difficult narrative poems during the PDA, while also writing a research article based on the online census. The PDA will directly impact the Shakespeare and book studies courses taught by Prof. Hooks to both undergraduate and graduate students and will further enhance UI's commitment to public scholarship work.

JAYNES, ALLISON N, associate professor, CLAS-Physics & Astronomy, 5 years of service, Spring 2024
Title: Exploring Earth's Space Environment with a VLF Receiver Network
Space weather is the manifestation of the Sun's effects on Earth and the geospace environment. It affects every aspect of modern human life, from GPS and cellular communications to aircraft flight planning and energy grid considerations. Understanding of the entire Sun-Earth system and the ability to predict and forecast space weather is paramount to the stability of our technologically-based society. Prof. Jaynes will investigate the effects of space weather on Earth's upper atmosphere by immersing in a research group based at the University of Otago, New Zealand. The group holds a unique data set composed of a global network of radio receivers that senses changes in the density of charged particles in the atmosphere. This data set will be used together with space-based observations to gain new and significant insights into the space environment during geospace storms and periods of high solar activity. A graduate student will be invited to join Prof. Jaynes in New Zealand for a shorter period, contributing to the professional and research development of an early career scientist. This project will strengthen ties between UI and the international space physics community.

KOCHANSKA, GRAZYNA, professor, CLAS-Psychological Brain Sciences, 31 years of service, Spring 2024
Title: Understanding Early Origins of Young Children's Diverse Developmental Paths
Prof. Kochanska's studies a question that has profound implications for children, families, and society: Why do some children embark on positive, adaptive paths toward prosocial, rule-abiding conduct, and robust social competence, whereas others enter maladaptive paths toward callousness, disregard for rules of conduct and others' feelings, disruptive, antisocial behavior, and impoverished competence? Prof. Kochanska's work, federally funded for three decades, is informed by her comprehensive theory that emphasizes the role of early warm, secure parent-child relationships in children's development. Her work highlights complex, powerful long-term legacy of early relationships and describes how their impact depends on children's biological characteristics. Currently, Prof. Kochanska leads a large, federally funded study of 200 Iowa children and their parents, followed from infancy to age 5; she plans to obtain new funding to extend the study to age 10. PDA will help Prof. Kochanska and her students launch the follow-up study and maintain high productivity. This work will benefit developmental science and inform intervention and prevention programs for parents.

LANDSMAN, MIRIAM J, associate professor, CLAS-Social Work, 22 years of service, halftime for academic year 2023-2024
Title: Well-Being of the Social Work Workforce Post-Pandemic
Prof. Landsman will conduct a statewide survey of Iowa's social workers to understand factors contributing to workforce well-being in the post-COVID environment. The pandemic has affected the working and personal lives of helping professionals, and research is needed to better understand these impacts and to develop strategies to support workforce well-being and retention. Prof. Landsman's PDA builds on a workforce assessment that she conducted with the Iowa Chapter of the National Association of Social Workers prior to the pandemic, and continues this collaboration with Iowa's professional social work association. Prof. Landsman will write a journal article and prepare a conference abstract based on survey results to inform researchers, educators, and practitioners about factors contributing to workforce well-being. She will also incorporate study findings into two courses: Child Welfare Policy and Practice and Introduction to Trauma and Resilience, providing UI students with research-based strategies to help sustain workforce well-being as future practitioners, supervisors, and leaders in the field.

LEFEVRE, GREGORY, associate professor, Engineering-Civil-Environmental Engineering, 7 years of service, Spring 2024
Title: Probing Complex Chemical Contaminant Exposure Mixtures in Water using Non-Target Analysis High Resolution Mass Spectrometry
Prof. LeFevre will examine how complex chemical mixtures change in the environment using novel analytical techniques. Complex mixtures of chemicals are important environmental and human health concerns because organisms are rarely exposed to contaminants one at a time. Understanding how complex mixtures change in the environment is limited; however, Non-Target Analysis (NTA) is an emerging technology that can illuminate processes. Prof. LeFevre will spend the PDA working with researchers at UC-Davis and the USGS to learn NTA by collecting and analyzing water samples. The expected outcome will generate large NTA data sets that will result in several journal articles and a grant to the NSF. Prof. LeFevre will take this new knowledge and skill back to UI, where it will benefit advising graduate student research and be integrated into multiple courses he teaches (e.g., environmental chemistry based). Results will further benefit the University through increased external funding opportunities. The PDA will benefit the state of Iowa and society generally by improving understanding of complex chemical mixtures through analytical chemistry to protect public health (e.g., drinking water).

LEVINE, MARK A, professor, CLAS-Creative Writing, 23 years of service, Fall 2023
Title: New Book of Poems
Prof. Levine's project is to write a new collection of poems, his sixth, which aims to examine and to complicate questions of constructed identity, historical inheritance, and relationships between language and power, while remaining poetically distinctive and engaging. Levine will employ the traditional English ballad form in interrogating the figure of "the Jew" in a range of texts from medieval passion plays to contemporary social media. Alongside these sources, Levine will draw on letters and writings by his father, who was a Holocaust survivor. In challenging the traditional dynamics between lyric poetic forms and historical fact, Levine seeks to address urgent questions of representation in American poetry, and to develop materials for teaching and mentorship of his graduate students in the Writers' Workshop.

LI, TONG, professor, CLAS-Mathematics, 29 years of service, Fall 2023
Title: Nonlinear Partial Differential Equations and Their Applications
Prof. Li proposes to study the mathematical theory of problems arising from engineering, physical and biological sciences. She will solve fundamental problems in the nonlinear partial differential equations(PDE) models of chemotaxis, traffic flows, blood flow and more. As with previous PDA awards, the current PDA will result in publications in high quality mathematics journals. The PDA will enable more collaborations between Prof. Li and colleagues all over the world and will raise Prof. Li's research to an exciting new level. The PDA will increase the visibility of UI and the state of Iowa. The PDA will also benefit Prof. Li's teaching and training of undergraduate, graduate students and postdocs.

LONGFELLOW, BRENDA, associate professor, CLAS-Art & Art History, 17 years of service, Spring 2024
Title: The Religious Activities and Networks of Women in Ancient Pompeii
Prof. Longfellow will undertake field research at the ancient Roman city of Pompeii in Italy, where she will analyze the remains of altars and sanctuaries funded by women in the city, as well as the religious paintings and offerings associated with Pompeian women. She will then write up her results, which will be published as a chapter in her book titled The Lives and Deaths of Women in Pompeii. Prof. Longfellow teaches courses on ancient Roman art history, including a course specifically on Pompeii. Her research during the award period will directly inform undergraduate and graduate discussions about the religious roles and financial involvement of women in sanctuaries in the Roman world. Because this project analyzes the economic and social implications of religious activities of women in Pompeii, it furthers our understanding of the historical nature of female investment in the larger community and outside of the domestic sphere.

LYNN, FREDA B, associate professor, CLAS-Sociology, 14 years of service, halftime for academic year 2023-2024
Title: A Sociological Study of the Curricular Hierarchy and Math Anxiety
Math anxiety is widespread and a major issue because it hurts academic performance and impedes STEM participation. Prof. Lynn will use her PDA to help find solutions to this complex problem. Study 1 examines the sociological context in which math anxiety thrives. Analyzing U.S. educational initiatives in the postwar era, Prof. Lynn will trace the evolution of the curricular hierarchy before and after WWII and the rise of the now-dominant cultural logic that STEM training is more important to national prosperity than any other kind of know-how. Study 2 uses an experiment to examine if these cultural beliefs about the status value of mathematics and STEM training exacerbate math anxiety. The PDA is expected to result in training opportunities for graduate students, scholarly articles, an external funding proposal on how to combat math anxiety, and new material for Prof. Lynn's graduate seminars on inequality. She will also develop

an in-class activity for her undergraduate and graduate statistics courses; the activity will help students manage their math anxiety and increase their engagement with quantitative material.

MACGILLIVRAY, LEONARD R, professor, CLAS-Chemistry, 22 years of service, Spring 2024
Title: Molecular Solar-Thermal Energy Storage Materials
The development of new materials and technologies for solar-thermal energy storage and management is crucial to support a national and global move toward renewable energy sources. Solar energy is a virtually infinite resource of carbon-neutral energy. In this application, emerging new forms of solar-thermal energy storage systems that are based on molecules will be studied. Molecular solar-thermal energy storage (MOST) exploit various energy-storing photochemical reactions. Heat is then released into the environment when the photochemical reaction is reversed and can be used for technological applications including those where the heat is converted to electricity. A major need to be considered when developing MOST systems is operation under real conditions and, more specifically, in highly concentrated media such the solid state (e.g. devices). Very little is known how promising MOST systems operate in the solid state and that important perspective will begin to be addressed.

*** MAGSAMEN-CONRAD, KATE C**, associate professor, CLAS-Communication Studies, 4 years of service, Spring 2024
Title: Evaluating the Intergroup Communication Intervention: A Decade with Community
Prof. Magsamen-Conrad studies inequities and disparities related to technology, health and interpersonal communication, and how they contribute to barriers experienced by marginalized groups. She also reduces these barriers using an evidence-based intervention model that explicitly addresses ongoing systemic disparities in access/use of technologies through engagement (the Intergroup Communication Intervention, ICI). Prof. Magsamen-Conrad will assess the ICI across the last decade, systematically evaluating 16 waves of data. Prof. Magsamen-Conrad 's previous work was limited to one to five waves of data. The results will help better understand how the ICI enhances student learning experiences, knowledge acquisition, exposure to new perspectives on cultures, beliefs and practices, provides an opportunity to recognize and address individual biases and privilege, and increases civic engagement intention in the future. After analyzing the data, Prof. Magsamen-Conrad can help students help Iowans develop the skills they need to get jobs, education and healthcare. Prof. Magsamen-Conrad will include graduate students, who will learn about community-engaged research and teaching.

MANAK, JOHN R, professor, CLAS-Biology, 15 years of service, Fall 2023
Title: Exploring the Genetic Basis of Mendelian Disorders: Connecting DNA Alterations with Congenital Malformations (Birth Defects).
The purpose of this PDA is to give Prof. Manak the opportunity to expand his expertise in understanding how DNA alterations cause birth defects. His teaching assignments include two courses that emphasize human genetic disorders, which also is the primary focus of Prof. Manak's research. However, given the breadth of disorders that exist (>7,000), he recognizes a need to expand his knowledge of them, as well as to become proficient in navigating the latest databases cataloging DNA alterations in individuals with genetic disorders. Such expertise will allow Prof. Manak to apply for funding opportunities that require this skillset. To accomplish these goals, he will visit both the laboratory of Dr. Nara Sobreira (an expert in rare genetic disorders) as well as the center that catalogs genetic disorders (Online Mendelian Inheritance in Man; both at Johns Hopkins University). Dr. Sobreira specializes in navigating the numerous databases cataloging genetic alterations and congenital malformations, a skill she will teach Prof. Manak. This PDA will provide Prof. Manak with a critical skillset needed for his intended research to understand and treat birth defects in addition to informing his teaching.

MARGULIS, CLAUDIO J, professor, CLAS-Chemistry, 19 years of service, Spring 2024
Title: Physical Chemistry of Ionic Systems
Prof. Margulis will use this PDA to further his research on high-temperature molten salts and room-temperature ionic liquids. Prof. Margulis is a world recognized leader that garners significant and sustained funding from federal agencies and has a large body of published work. Since 2016, a total of 27 articles including multiple with special mentions such as selected as ACS Editor's Choice, most read, being highlighted in Chemical & Engineering News, as ChemSci Pick of the Week, and as cover articles have appeared. Benefits to Iowa or the society in general: Molten salts are particularly important for next generation molten salt nuclear reactors to produce electricity; ionic liquids are novel materials with a variety of exciting applications in industry and academic research settings including for biomass processing, lubrication and space exploration. Benefit to teaching/students and the UI: The work will directly benefit students in the Margulis group (their work will get published faster). It will also help the larger student body when concepts trickle into course curricula.

MATTES, TIMOTHY E, professor, Engineering-Civil-Environmental Engineering, 18 years of service, Spring 2024
Title: Investigating Nitrogen Cycling in Marine Oxygen Minimum Zones by Sulfur-oxidizing Bacteria and Associated Viruses
Prof. Mattes will investigate the impact of dissolved oxygen and marine viruses on the assimilation and recycling of nitrogen in ocean oxygen minimum zones (OMZs) by marine microbial communities. This project has considerable environmental importance as global climate change could expand OMZs and lead to increased nutrient loss from the oceans. Prof. Mattes will first analyze an existing dataset to determine the effect of dissolved oxygen on marine microbes in OMZs. He will then conduct laboratory experiments to understand the frequency of virus infection in marine bacteria and factors that lead to virus activation. He will also investigate these microbes and viruses in seawater by obtaining samples on an OMZ research cruise off the coast of Namibia in 2024. This project will be conducted at the University of Washington, School of Oceanography. It is expected to yield at least one journal article and one external grant application. The exposure to new topics and lab techniques will enhance collaborations both at UI and abroad, benefit Prof. Mattes' current PhD students, and students that take his developing graduate level environmental biotechnology and bioremediation course.

MCKERNAN, SUSAN C, associate professor, Dentistry-Preventive & Community Dentistry, 7 years of service, Spring 2024
Title: Dental Workforce Research to Address Oral Health Inequities
This PDA provides Prof. McKernan with career mentoring for her goal of establishing a successful research lab, time to write and/or conduct oral health disparities research, and an opportunity to acquire new research skills in a successful lab at the University of Washington (UW, Seattle). Activities are associated with Prof. McKernan's recent application to the U.S. Health Resources and Services Administration (HRSA). If that grant is awarded, she will be co-director of a proposed Oral Health Workforce Research Center, working at UW to set up the Center. Onsite collaboration will support a more effective start-up. If not awarded, Prof. McKernan will work onsite to revise the HRSA proposal into 2 applications to submit to the NIH in mid-2023. In either scenario, she will benefit from career and research mentoring. The skills and research collaborations that she develops will allow her to compete for grants more successfully. As a research mentor, Prof. McKernan supports the pipeline of oral health researchers and future faculty. UI students will benefit directly from the competitive advantages conferred by this PDA.

MENNINGA, ELIZABETH J, associate professor, CLAS-Political Science, 7 years of service, Spring 2024
Title: Cooperation in Civil Wars
Prof. Menninga will explore how and when combatants fighting one another in a civil war cooperate with each other. Her project will provide unique and novel insights into conflict dynamics by shifting the focus away from the battlefield. By specifically considering civil wars with multiple active rebel groups, Prof. Menninga will be able to map the evolution of cooperation within and across conflict dyads. Understanding how cooperation evolves will shed light on civil conflict management, resolution and termination. The results will be of interest to both scholars and conflict management practitioners. This project is expected to result in several journal articles, a book proposal and research opportunities for both undergraduate and graduate students. Prof. Menninga's UI undergraduate and graduate seminars will also be reinvigorated with new material.

MUBEEN, SYED, associate professor, Engineering-Chemical & Biochemistry Engineering, 8 years of service, Fall 2023
Title: Towards a Renewable Hydrogen Ecosystem for Iowa
Prof. Mubeen's research interests focus on sustainable energy production and conversion systems. For this PDA, Prof. Mubeen will work with experts at University of California-Santa Barbara, University of California-Irvine, National Renewable Energy Lab, and SunHydrogen Inc., to develop fundamental science and engineering to decarbonize production of hydrogen - an energy carrier and an alternative fuel. Specifically, Prof. Mubeen aims to develop and demonstrate a reactor that can generate 1 kg-hydrogen production per day at UI that utilizes sunlight as the only energy input. This experience will help Prof. Mubeen better understand how fundamental discoveries in his laboratory can be translated to engineering technologies with commercial relevance that benefits Iowa and the United States. Upon completion, Prof. Mubeen will use his PDA to enable future research, teaching and service efforts at UI to support the innovation, implementation and adoption of a burgeoning hydrogen economy. Prof. Mubeen's 5-year goal after his PDA experience is to catalyze a Center-level proposal aimed at reshaping U.S. hydrogen ecosystem to enable net-zero carbon emissions.

OATES, THOMAS P, associate professor, CLAS-American Studies, 10 years of service, Spring 2024
Title: Crossover: How Playground Basketball Became Mainstream Entertainment
This PDA will support the completion of writing for a book project on the history of playground basketball. The book details how this distinctive subvariant of the game moved from a marginal and demonized subculture to a highly profitable and mainstream form. It reveals the complex and sometimes contradictory ways that media representations of black urban life have circulated, creating moral panics and opportunities for profit. While scholars have examined how the musical genre of hip-hop and cinematic narratives have shaped dominant ideas about urban black space, they have not directed the same attention to the role of sport. This project addresses that gap by tracing the emergence and commercialization of playground basketball from the 1950s through the present, focusing on how media narratives confirm, contest and complicate dominant understandings of the black urban space. The book will deepen understanding of how sport media influences culture and politics, especially in relation to race and urban life. Prof. Oates will incorporate the findings into his undergraduate and graduate courses in sport and media.

PETTYS, TODD E, professor, Law-Faculty, 23 years of service, Spring 2024
Title: "Obscene" Books in the Hands of Children
Controversy has erupted across the country concerning sexually explicit books that are available to children in bookstores, public schools and libraries. Many critics have called for tough

enforcement of obscenity laws, with some saying librarians and schoolteachers who distribute certain books to children should face jail time. Building on the work he began with an article produced in Summer 2022, Prof. Pettys will use his PDA to work on a short book that focuses on questions concerning First Amendment obscenity law in general and the placement of sexually explicit publications in the hands of children in particular. The U.S. Supreme Court has said that the First Amendment protects those who write and distribute sexually explicit expressive works if a reasonable person would say those works possess "serious literary, artistic, political, or scientific value." But when one begins to press into the details of that formulation--particularly, though not exclusively, in instances involving children--complications arise. Prof. Pettys intends to address and resolve those complications here.

PRIEST, RICHARD T, associate professor, CLAS-History, 10 years of service, Spring 2024
Title: Oceans of Oil: The Epic Struggles Over Offshore Drilling in the United States
Prof. Priest will finish writing a book on the history of the politics and policy of offshore oil and gas in the United States, entitled "Oceans of Oil: The Epic Struggles Over Offshore Drilling in the United States," and submit it to a university press. In the last two years, Prof. Priest and co-author have drafted 10 of the 12 chapters plus the introduction. The remaining two chapters are partially drafted. By Spring 2023, they will have a complete draft of the manuscript, which they will send to several readers in addition to the readers for the university press. Prof. Priest requests a PDA for Spring 2024 to enable him to revise the manuscript, based on reader reports that should arrive by Fall 2023, and prepare it in other ways for publication (e.g., selecting images and obtaining copyright permissions). Completion of the research and writing for this book project will enhance Prof. Priest's teaching of American Environmental History and U.S. Energy Policy. As the definitive study of offshore oil development, "Oceans of Oil" will invite students, professional historians and lay readers to rethink the connections between energy, environment and society.

PRUSSING, ERICA, associate professor, CLAS-Anthropology, 18 years of service, Fall 2023
Title: Storytelling with Numbers: Humanizing Statistics Through Pro-Equity Data Science
Prof. Prussing's project examines how pro-equity data science initiatives, which aim to better convey the human stories that statistics contain, integrate concerns with justice into scientific methodologies. By combining moral considerations from humanistic approaches with the empirical focus of scientific approaches, these initiatives chart new possibilities for combining valuable insights from both ways of knowing. Building on and expanding from her earlier study with Indigenous epidemiologists, Prof. Prussing will complete initial fieldwork with staff at additional organizations and projects that use statistical data to support racial justice. Using this pilot data, she will prepare grant proposals to the National Science Foundation and the National Endowment for the Humanities, to conduct a fuller ethnographic study that will help to support more nuanced scholarly and public discussions about why changes in science are needed and how to make them. Prof. Prussing will involve graduate students in the project and incorporate insights from it into her interdisciplinary courses in cultural anthropology, medical anthropology and global public health.

REINHARDT, JOSEPH M, professor, Engineering-Biomedical Engineering, 25 years of service, Spring 2024
Title: Synthesizing Lung Functional Images Using Generative Adversarial Networks
Prof. Reinhardt teaches and performs research in the area of medical image processing, with a focus on pulmonary imaging. In this PDA, he will investigate the use of artificial intelligence methods to analyze computed tomography (CT) images of the lungs. Using a powerful artificial intelligence approach known as generative adversarial networks, Prof. Reinhardt will design, train and test systems that can convert a single lung CT into a synthetic image depicting regional lung

ventilation. These synthetic ventilation images can then be analyzed to detect abnormalities and to better understand the relationships between anatomic structure and regional lung function. Prof. Reinhardt will bring the new methods and results from this PDA into his medical image processing classes and into his graduate student mentoring. The results from this PDA will serve as preliminary data to apply for external research funding to continue developing these methods to study the normal and diseased lung.

RODGERS, VINCENT G, professor, CLAS-Physics & Astronomy, 33 years of service, Spring 2024
Title: Thomas-Whitehead Gravitation
Theoretical physics searches for the mathematical underpinnings, based on the principle of mathematical consistency and symmetries, as to what makes up the physical world. This may be thought of as mathematical detective work where mathematics dictates where new physics might reside. During this PDA, the research focus will be on Thomas-Whitehead Gravitation. The investigations are based on the relationship of the mathematical area of projective differential geometry and experimental observations. Consistency of gravitational theories with quantum mechanics has been long-sought for more than one-hundred years. Thomas-Whitehead theory provides an explanation through a correspondence with string theory but far more tractable than string theory. This work will improve the understanding of particles with gravitation, gravitational radiation the early universe, and the essence of the mysterious dark matter observed. Thomas-Whitehead gravity was conceived and developed here at UI and has led to several undergraduate and PhD dissertation topics. One of the dissertations won the D.C. Spriestersbach award.

SCHLÜTTER, MORTEN, associate professor, CLAS-Religious Studies, 19 years of service, Spring 2024
Title: The Platform Sūtra and the Evolution of Chinese Zen Buddhism
Prof. Schlütter will use this PDA to complete a book project that will be based on several rare book manuscripts of a key Chinese Chan (Jpn.: Zen) Buddhist text known as the "Platform Sutra of the Sixth Patriarch." This text is extant in a number of different versions, the oldest from about 780CE and the latest from 1291CE. By examining changes that took place over time in the Platform Sutra, the project seeks to trace crucial changes in Chinese Chan-Buddhist doctrinal thought and meditation practices over more than 500 years. Prof. Schlütter will submit the book manuscript to his publisher for outside reviews at the end of the PDA period. The book will address a wide audience, including members of the public interested in Buddhism, college students, and academics within and outside of Buddhist studies. The book is designed to be useable in upper-level college courses. The research and writing for the book will enhance Prof. Schlütter's teaching, at both the graduate and the undergraduate levels. The publication of his book will enhance his academic standing and the status of Religious Studies and Asian Studies at the UI.

SCHNIEDERS, MICHAEL J, associate professor, Engineering-Biomedical Engineering, 10 years of service, Fall 2023
Title: Chemical Theory to Understand Non-Coding Genetic Variants and Formulate Therapeutics
Discovery and development of new orally bioavailable therapeutics to treat disease (e.g., antibiotics, antivirals, cholesterol lowering statins, antidepressants, etc.) depends on formulation of the active pharmaceutical ingredient (API) into a crystalline tablet that can be manufactured, is stable (i.e., does not melt or change forms prior to use), is soluble (i.e., dissolves within the gastrointestinal tract) and can cross cellular membranes. This PDA will enable Prof. Schnieders to develop next-generation computational tools for drug formulation at the Tokyo Institute of Technology (TIT) in Japan (Fall ’23) within the lab of Prof. Akio Kitao and in collaboration with

Mitsubishi Tanabe Pharmaceuticals. The outcome of the research will be novel computational algorithms for drug formulation within the open-source software Force Field X (https://ffx.biochem.uiowa.edu), which is disseminated from UI. These advances will be conveyed to UI students in Prof. Schnieders course “Computational Biochemistry” and will benefit the state of Iowa by contributing to UI remaining at the forefront of pioneering new treatments for disease.

SHILL, GREGORY, professor, Law-Faculty, 5 years of service, Fall 2023
Title: Unpacking the Car
Prof. Shill will complete research for his book on transportation law, safety and policy, "Unpacking the Car." The car generates many well-known benefits, but also many costs. U.S. policy is behind that of our peers in mitigating these costs, having neither reduced the centrality of the car in daily life (like in Europe) nor retained its central position while curbing its risks and other costs (like Canada and Australia). There are many reasons for this; one is the influence of law. The book will explain how law operates as a one-way ratchet favoring one transportation objective--speed of movement--over another, arguably more important one - access to destinations. The finite nature of physical space inevitably brings these concepts into conflict in transportation. Consider a commuter's desire to travel quickly on a country road versus that of a farmer who must operate implements on the same road. A variety of laws and legal institutions make balancing these demands difficult. The project builds on Prof. Shill's prior work in transportation safety and is expected to assist policymakers in understanding the processes in which they operate.

STIPP, CHRISTOPHER, associate professor, CLAS-Biology, 19 years of service, Spring 2024
Title: Establishing a Genome-Wide Method to Identify Protein-Protein Interactions in Living Cells
The goal of this PDA is to establish a new method to search the entire human genome for genes that encode proteins that engage in clinically relevant protein-protein interactions. To accomplish this goal, Prof. Stipp will collaborate with his UI colleague, Prof. Adam Dupuy. Prof. Dupuy has developed a method of inserting defined genetic elements randomly throughout the entire human genome. In this application, Prof. Stipp will work to adapt Prof. Dupuy's method to identify genes that encode proteins that interact with a clinically relevant protein involved in tumor cell survival and metastasis. The expected outcomes of this work include (i) data for publication of a proof-of-concept method with the potential to advance research with broad potential across a spectrum of human diseases, and (ii) establishing a workflow that can be adapted to Prof. Stipp's Cell Biology lab course that involves students in discovery science and helps to prepare them for a career in biomedical research.

THOMAS, GEB W, professor, Engineering-Industrial Engineering, 25 years of service, Fall 2023
Title: Advancing Inventions to Commercialization in Medicine and Occupational Health
Prof. Thomas and his team have invented a surgical simulator for training orthopaedic surgical residents, and a wireless air quality and sound monitor. Iowa's Research Foundation owns a patent for the simulator. This year the American Board of Orthopaedic Surgeons will vote on making simulation required for board certification. Prof. Thomas will help in final design refinements and work with international partners on global distribution. Likewise, the wireless devices developed at Iowa for monitoring air quality are the core of a large Air Force contract. Prof. Thomas will oversee engineers refining the design. The outcomes of this award will be: 1) international dissemination of an Iowa-developed simulator for training surgeons; 2) refinement of wireless sensor systems into a product for the Department of Defense, among other markets; and 3) conference papers and journal articles on development and testing of the technologies. Students will benefit by seeing examples of innovative thinking, practical design and entrepreneurship. It will benefit Iowa by high profile technology being produced here and benefit society by improving patient safety and worker health.

TOLBERT, CAROLINE J, professor, CLAS-Political Science, 16 years of service, Spring 2024
Title: Building a Resilient Democracy: Modernizing and Updating U.S. Elections
Election rules often fly under the radar--out of sight of the general public. But reform of America's election rules is long overdue. The 2020 presidential election placed a spotlight on how changing the rules can shape outcomes and who wins and loses. This study empirically evaluates the effects of state and local government experiments in modernizing U.S. election laws and practices to boost participation in politics and make American democracy more resilient. Research for this award expands upon our previous work when in-person early voting and absentee mail voting was not as widespread. There is a critical need to update the data analysis reported in our previous book, Accessible Elections: How State Governments Can Help Americans Vote (Oxford University Press. 2020), to understand turnout in the 2018, 2020 and 2022 elections relative to prior years. The proposed research develops new metrics of local government performance in administering elections for all 3000+ U.S. counties. Prof. Tolbert will complete a book and journal articles. Her research is driven by an interest in strengthening American democracy and fostering inclusive economic and political participation.

VOYCE, STEPHEN C, associate professor, CLAS-English, 11 years of service, Spring 2024
Title: Dark Worlds: Culture, War, & the National Security State
Prof. Voyce has made significant progress on a book entitled Dark Worlds: Culture, War, & The National Security State. Dark Worlds addresses the following questions: how do artists, writers and filmmakers engage in the clandestine activities of National Security? How do they help us to see, read and hear anew a highly mediated form of warfare that paradoxically conceals the black ops, redacted docs, dark money and classified landscapes comprising the secretive theaters of 21st-century warfare? Imagine, for example, Mona Hatoum's encaged neon globes of real-time border conflicts, Laura Poitras's pictures of intercepted drone feeds, or Harun Farocki's films set inside military training simulation programs. The project draws upon an international group of makers from North America and the Greater Middle East to understand the changing nature of war and global security today. Prof. Voyce has completed the Foreword, the Introduction, and Chapter 2, and is currently finishing a draft of Chapter 5 based on an article that appeared in the Routledge Companion to 21st-Century Poetry. He will use the present academic year to plan Chapters 3 and 4, which he will complete during the term of the award.

WALKER, ELIZABETH A, associate professor, CLAS-Communication Sciences & Disorders, 7 years of service, Spring 2024
Title: Ecological Momentary Assessments for Adolescents with Hearing Loss
Childhood hearing loss (HL) is associated with communication delays. Previous research suggests that hearing devices can ameliorate the negative effects of reduced hearing. However, these studies evaluate hearing deficits and the benefits of hearing devices in controlled lab settings; thus they lack ecological validity. The current proposal seeks to determine the feasibility of using ecological momentary assessments (EMA) with adolescents with HL. EMA uses repeated assessments of individual listening situations in real-world environments via smartphone technology. The expected outcome is that this pilot study will fill a knowledge gap about the benefit of hearing devices in managing listening demands in the real world for children with HL. These data will provide evidence to support science-based (re)habilitation approaches and education planning decisions to improve long-term outcomes for adolescents with HL. This project is anticipated to result in 3 manuscripts, 2 grant applications, evidence-based data for dissemination in Prof. Walker’s undergraduate and graduate courses, and research opportunities for undergraduates and graduates in Prof. Walker’s department.

WANG, LIHE, professor, CLAS-Mathematics, 29 years of service, Fall 2023
Title: Theory and Applications of Partial Differential Equations
Several problems from mathematical finance and from geometry are proposed for this study. A problem of mathematical finance that models stochastic volatility is proposed to study using partial differential equations. Existence, uniqueness and numerical methods are developed. The numerical method has shown to converge to the true solution with error estimates. Moreover, a problem from geometry is also proposed using a local capacity property. The main result is that if a geometric object with local capacity equal to that of a plane, then it has to be a hyperplane. Research articles and research grants are projected results of this proposal. The research in mathematical finance has grown explosively in the recent decades and requires efforts of people from different disciplines. This award enhances directly Prof. Wang's teaching and research. Prof. Wang is directing graduate students and the result will increases his students' competitiveness in their careers. The proposed results contribute directly to the university and the state.

WINDSCHITL, PAUL D, professor, CLAS-Psychological Brain Sciences, 25 years of service, Fall 2023
Title: Minimizing Bias in How People Interpret Risk Information
Public health communications and patient decision aids provide people with critically important risk information. The provision of the information allows for informed decision making, but only if it is understood and interpreted in an unbiased way. Prof. Windschitl will conduct studies on the extent to which various risk-communication tools reduce the degree to which people's risk-related beliefs are biased by motivated concerns (e.g., a preference for feeling safe). Improvements to best practices for communicating risk information will also be developed and tested. Scholarly papers describing this research will be submitted to top professional journals. Graduate and undergraduate students will have unique training experiences in designing, testing and implementing key elements of the research.

ZHU, XUEYU, associate professor, CLAS-Mathematics, 6 years of service, Fall 2023
Title: Towards Robust and Reliable Scientific Machine Learning Algorithms
Prof. Zhu's project concerns developing robust and reliable machine algorithms for scientific problems by combining data with mathematical physics models. Despite the recent success of machine learning algorithms in many problems, poor results with existing mathematical formulations and training strategies are common if care is not taken. In this context, the project aims to develop new physics-informed formulations with stable optimization strategies to increase the reliability and robustness of the machine learning models in high-stakes applications for human society, such as self-driving cars and clinical diagnosis, where reliable predictions are critical. Besides, this project will also apply newly developed scientific machine learning algorithms to mitigate the noise effects in quantum computers, thus enabling robust quantum computing. The research findings will be expected to result in several journal articles and used to prepare proposals for National Science Foundation. Moreover, the findings will be incorporated into educational materials for a new graduate course, providing our Ph.D. students at UI a competitive advantage when seeking employment.

* 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.

Iowa State University

AL SHIHABI, DIANE, Associate Professor, Interior Design, 10 years of service, fall 2023
Title: The Pedagogy of Cultural Diplomacy: Interdisciplinary Design Studios as Sites for Innovative Experimentation in Preservation and Cultural Heritage.
Professor Al Shihabi and colleagues are developing a book based on a novel College of Design program that provides students with studio experiences in historic international sites owned by the U.S. State Department. The book will expand students' perspectives about preservation and cultural heritage as well as enhance their use of research technologies and documentation.

BARAN, EVRIM, Associate Professor, School of Education, 5 years of service, spring 2024
Title: Human-Centered Design as a Frame for Teachers' Digital Transformation
Professor Baran, an educational technology expert, will enhance K-12 teacher education during their proposed assignment by developing digital competencies for creative problem solving and human-centered design. This work is expected to be incorporated into Iowa State's teacher education and educational technology programs, and lead to publications, conference presentations, and external funding proposals.

BEST, JEREMY, Associate Professor, History, 7 years of service, 2023-2024 academic year
Title: Recovering Holocaust Memory in Popular Culture: Military Boardgames and the Final Solution, 1945-1975
Professor Best will use the proposed assignment to conduct research in Germany and the U.S. for a book on the history of World War II military themed war games and their role in creating Holocaust ignorance in both countries. Best has applied for a Fulbright U.S. Scholar Award to support this assignment, as well as an invitation from the University of Freiburg in Germany.

BIX, AMY, Professor, History, 29 years of service, 2023-2024 academic year
Title: Women and Gender in Science, Technology, and Medicine from Classical History to the Twenty-first Century
Professor Bix has been invited to write a book on the history of women in science, technology, and medicine, based on an Iowa State class they have taught since 1995. Research for the book will be used to deepen her history courses, which attract majors from across the sciences, engineering, humanities and social sciences.

CAI, YING, Professor, Computer Science, 19 years of service, fall 2023
Title: Authentication of Rank-aware Query Results
Professor Cai will work with a colleague at Princeton University to develop authentication data structures for rank-aware queries, which are used in a wide range of applications, including third-party cloud systems. The proposed research will benefit data owners and improve data security. Results will be shared in journal articles and conferences and incorporated into Iowa State database and networking courses.

COTOS, ELENA, Associate Professor, English, 7 years of service, fall 2023
Title: Genre Studies and Technology: Expanding the Territory for Move Analysis of Research Articles
Professor Cotos will use the proposed assignment to launch a book project demonstrating how linguistic analysis in research articles can be enhanced through technology, which in turn may improve the teaching of scientific writing. The book resulting from this research will benefit scholars investigating scientific writing and will be shared with Iowa State graduate students.

ERDIM, FIRAT, Associate Professor, Architecture, 6 years of service, 2023-2024 academic year
Title: Making Together: Architectural Instruments and their Social Assemblies
Professor Erdim's project will foster cross-cultural engagement and collaborations with students and faculty in Turkey through the fabrication of a series of sonic architectural instruments. The work will enrich Erdim's Iowa State courses and build a framework for future collaborations and exchanges with Turkey.

I, JI YEONG, Associate Professor, School of Education, 7 years of service, fall 2023
Title: Extending the Potential of Effective Mathematical Pedagogy for Emergent Bilinguals
Professor I's proposed assignment is focused on math education for English learners, including data collection for her active National Science Foundation CAREER award, collaboration with researchers in South Korea, and the submissions of manuscripts for publication in mathematics education and teacher education journals.

JEONG, EUNHA, Associate Professor, Apparel, Events, and Hospitality Management, 7 years of service, fall 2023
Title: The Impact of Transformative Green Marketing on Restaurant Customers' Plate Waste Reduction Intention
Food waste is a great concern in the U.S. – nearly 80 billion pounds of food are discarded each year – and 40% of the waste is generated by the food service industry. Professor Jeong will explore how restaurants can communicate food waste reduction practices directly to consumers. The work will expand scholarly teaching and research development in this area and be incorporated into Iowa State's restaurant management education and research programs.

JIANG, SHAN, Associate Professor, Materials Science and Engineering, 6 years of service, fall 2023
Title: Develop Janus nanoparticles for next generation coating materials and additive manufacturing
Janus nanoparticles are new materials that produce high-quality coatings and inks without using organic solvents. Professor Jiang will build upon his technology for producing these nanoparticles in large quantities, which has been commercialized by two Iowa manufacturers, to further develop the technology and benefit Iowa's economy.

KAISER, MARK, Professor, Statistics, 31 years of service, fall 2023
Title: Completion of Textbooks for Intermediate and Advanced Methods in Statistics
Since joining Iowa State in 1991, Professor Kaiser has introduced or redesigned several graduate courses, two of which are now part of the required graduate coursework. The proposed assignment will allow Kaiser to convert his notes into formal textbooks for these courses, which can be used both at Iowa State and in other graduate statistics programs.

KIM, JAE-KWANG, Professor, Statistics, 14 years of service, fall 2023
Title: Innovative applications of data integration
Data integration – combining data from different sources with few or no overlapping records, is an emerging area of research due to the vast volumes of data now available. Professor Kim, an expert in missing data analysis and survey sampling, will use the proposed assignment to develop innovative methods and applications for data integration, which are expected to have broad impact in areas such as epidemiology or marketing.

KULIC, VLADIMIR, Professor, Architecture, 4 years of service, 2023-2024 academic year
Title: Architecture and Geopolitics: The Cold War and Beyond
Professor Kulic will use the proposed assignment to develop a theoretical framework for understanding the relationship between architecture and geopolitics by studying the Cold War as a period of heightened geopolitical tension. The book resulting from this work will enhance Iowa State architecture courses and make architectural history courses more relevant to students from other disciplines.

LAMM, MONICA, Associate Professor, Chemical and Biological Engineering, 19 years of service, fall 2023
Title: Thermo: A new textbook for teaching chemical engineering thermodynamics
Professor Lamm will use her assignment to complete a new textbook on chemical engineering thermodynamics, co-authored by a National Academy of Engineering member. Lamm will also expand her scholarship in modeling nucleic acids for medical diagnostics and environmental sensing applications, leading to new funding proposals.

LAMSAL, BUDDHI, Professor, Food Science and Human Nutrition, 14 years of service, fall 2023
Title: Appropriate Technologies for Processing of Some Non-Timber Forest Products into Value-Added Ingredients/Products
Professor Lamsal will collaborate with colleagues in Nepal to develop low-cost processing technologies that harness the nutritional and economic potential for non-forest timber products, such as air yam, lichen, and wild foxtail millets. The results of this work will be shared in Iowa State food processing courses and will be useful in creating similar opportunities in Iowa.

LENCE, SERGIO HORACIO, Professor, Economics, 29 years of service, spring 2024
Title: Predicting Market Stress and Modeling Productivity for Agricultural Commodities
Professor Lence will study whether recently developed financial models were able to accurately predict profits in equity and commodity markets during periods of extreme volatility. Lence will also explore the individual components of agricultural productivity growth and identify ways to efficiently improve productivity.

LI, TONGLU, Associate Professor, World Languages and Cultures, 13 years of service, 2023-2024 academic year
Title: Beyond the Secular Imagination of Modernity: Religion and Literature in Post-socialist China
Professor Li's proposed assignment will examine how the various literary interpretations of religion allow people in post-socialist China to construct their cultural identity and imagine their spiritual life. This first-of-its-kind research will help students and scientists better understand the sociopolitical tensions, cultural transitions, and construction of spiritual life in modern China.

LIU, PENG, Professor, Statistics, 16 years of service, fall 2023
Title: Development of Statistical Methods for Integrative Analysis of Biological Omics Data
Technological advancements have made it possible to better understand biological systems by exploring the relationships between different types of omics features (such as transcripts, proteins, metabolites, etc.). Professor Liu, an expert in statistical genetics and genomics, will develop new statistical methods for analyzing this data, leading to publications and funding proposals, and contributing to our understanding of precision medicine and agriculture.

LU, CHAOQUN, Associate Professor, Ecology, Evolution, and Organismal Biology, 7 years of service, fall 2023
Title: Quantifying the role of nitrogen enrichment in the basin-scale Food-Energy-Water nexus
Professor Lu's assignment will address the fundamental challenge of balancing food, energy and water production with limited resources, and amid a changing environment. The results will support decision making by Iowa leaders and will be incorporated into Lu's courses on geographic information systems and ecosystem modeling.

MACKIEWICZ, JO, Professor, English, 8 years of service, fall 2023
Title: Shop Floor Smarts: Communication as Knowledge Production in Welding and Metal Fabrication
Professor Mackiewicz will use the proposed assignment to write a book based on her experience as a novice welder, exploring how spoken and written communication is used to produce knowledge in skilled trades work. The project contributes to Iowa State's relationships with fabrication businesses and manufacturers and will enhance Mackiewicz's teaching.

MARTIN, STEVE, Professor, Materials Science and Engineering, 36 years of service, spring 2024
Title: Investigation of Lithium Metal Interfaces with Li^+ Ion Conducting Glassy Solid Electrolytes: A Collaboration with Oak Ridge National Laboratory
Martin, Anson Marston Distinguished Professor of Engineering, will use the proposed assignment to work with colleagues at Oak Ridge National Laboratory on using glassy solid electrolytes to increase the energy density of lithium ion batteries, which ultimately could allow electric vehicles to receive a full charge in only five minutes.

MCCULLOUGH, JASON, Associate Professor, Mathematics, 5 years of service, spring 2024
Title: Koszul Algebras at MSRI
Professor McCullough's proposed assignment includes participating in the semester-long Simons Laufer Mathematical Research Institute special program on Commutative Algebra. The program, which attracts global experts, will advance McCullough's research program; he will also begin working on a textbook on computational commutative algebra, to be used in Iowa State graduate courses.

MEILLEUR, MAURICE, Assistant Professor, Graphic Design, 3 years of service, fall 2023
Title: Constructing Letters
Professor Meilleur will use the proposed assignment to work on two books about constructed scripts, a specialized genre of lettering and type design. In addition to the two books, expected outcomes include national and international lectures, and enhancements to Meilleur's Iowa State course in advanced typography.

MUECKE, MIKESCH, Associate Professor, Architecture, 27 years of service, fall 2023
Title: The Pedagogy of Cultural Diplomacy: Interdisciplinary Design Studios as Sites for Innovative Experimentation in Preservation and Cultural Heritage
Professor Muecke and colleagues are developing a book based on a novel College of Design program that provides student with studio experiences in historic international sites owned by the U.S. State Department. The book will expand students' perspectives about preservation and cultural heritage as well as enhance their use of research technologies and documentation.

MEYERS, RACHEL, Associate Professor, World Languages and Cultures, 8 years of service, spring 2024
Title: Display and Dedication in Roman Hispania
Professor Meyers proposes a book project focused on marble statues in the ancient Roman world; specifically, how the statues were visual cues that informed citizens about interpersonal relationships and power dynamics between them and their rulers. The work will reinforce Meyers' international reputation as an expert in roman statuary, and the construction of public space in Roman cities.

POPLIN, ALENKA, Associate Professor, Community and Regional Planning, 7 years of service, fall 2023
Title: Authoritative book project: Serious Geogames and their Applications for Urban Planning
Professor Poplin's research concentrates on strategies, methods, and technologies for engaging residents in urban planning, including the development of games that specifically aim to attract residents of marginalized and underrepresented communities. Poplin's proposed assignment will benefit Iowa State students studying community engagement, as well as increase trust between local governments and residents.

REDDY-BEST, KELLY, Associate Professor, Apparel, Events, and Hospitality Management, 6 years of service, fall 2023
Title: 21st Century Queer and Trans Fashion Brands
Numerous fashion brands began catering to queer and trans people following legislation around same-sex marriage. Professor Reddy-Best will examine these emerging brands' histories and product offerings, which can assist in developing cultural competence and reducing future discrimination. This work is expected to result in a book prospectus and will be incorporated into Iowa State courses on fashion history and culture.

REUEL, NIGEL, Associate Professor, Chemical and Biological Engineering, 6 years of service, spring 2024
Title: Prospecting Thermophilic and Biofilm Enzymes for Conventional Plastic Degradation
Enzymes show promise in addressing the growing problem of plastic waste by degrading these otherwise tough materials for reuse or safe disposal. Professor Reuel will use the proposed assignment to identify new enzymes for this purpose using nanosensors developed by his research group, ultimately generating a novel biocatalyst for Iowa biomanufacturing.

SCHALINSKE, KEVIN LEE, Professor, Food Science and Human Nutrition, 23 years of service, spring 2024
Title: Role of B-Vitamins in the Prevention and Treatment of Chronic Disease
Many Iowans have sub-optimal B-vitamin status, owing both to dietary habits and genetics, and are more susceptible to chronic disease. Professor Schalinske will use the proposed assignment to conduct clinical nutrition studies on human subjects that influence public policy recommendations to optimize human health, and secure federal research funding.

SPENCER, DOUGLAS, Associate Professor, Architecture, 4 years of service, spring 2024
Title: Book manuscript: Architecture and the Ends of Capitalism
Professor Spencer's book project, the third in sequence of critically acclaimed publications, will analyze how architecture is employed in responding to contemporary environmental, economic and political crises. The proposed assignment also supports curricular development and scholarship in the Department of Architecture and will enhance its international reputation.

STINGA, PALBO RAUL, Associate Professor, Mathematics, 7 years of service, fall 2023
Title: Analysis of nonlocal models: viscoelastic materials and boundary conditions
In many situations, objects, people and local communities are affected by the direct influence of others that are physically far away. These include situations from the interaction of atoms and globalization to pandemics and social media posts. Professor Stinga's proposed assignment includes developing a new class of mathematical tools, called nonlocal models, to help describe these behaviors.

VALENTINE, OLIVIA, Associate Professor, Art and Visual Culture, 6 years of service, 2023-2024 academic year
Title: Groundwork: Izmir after the 2020 Earthquake
Professor Valentine will document and respond to recent ruptures in the urban fabric of Izmir, Turkey, due to a 2020 earthquake, through the creation of new works in the areas of textiles, sculpture and drawings. The research will also provide new content and methods for Valentine's Iowa State courses in textiles.

VELA-BECERRA, JAVIER, Professor, Chemistry, 13 years of service, spring 2024
Title: Advancing Next Generation Nanotechnologies for Clean Energy and Sustainability
Professor Vela-Becerra will work to develop lead-free semiconductors made of earth-abundant and biocompatible elements for use in energy conversion, such as photovoltaic solar cells, which may enable widespread use in underserved agricultural settings. Results will also be incorporated into Vela-Becerra's Iowa State nanochemistry, inorganic and general chemistry courses.

VOGEL, DAVID, Professor, Psychology, 22 years of service, fall 2023
Title: Increasing Acceptance of Mental Health Services for Rural Cancer Survivors
Professor Vogel's research focuses on reducing mental health stigma and increasing the use of mental health services. In the proposed assignment, Vogel will collaborate with colleagues and medical professionals in Virginia, Pennsylvania and South Dakota to test the effectiveness of a telemedicine-delivered screening and referral program for rural cancer survivors. The results, including publications and grants, will be shared in Iowa State psychology courses.

WANG, YU, Associate Professor, Political Science, 8 years of service, spring 2024
Title: Clean Energy Technology Adoption in Rural Communities to Enhance Energy Justice and Climate Resilience
Rural communities are more likely to be adversely affected by energy insecurity during extreme events. Professor Wang's proposed assignment will analyze the social, community and behavior factors affecting adoption of clean energy technologies to help boost their use in rural areas. Results from this work will be incorporated as case studies to education students on energy policy and climate change.

WEBER, MICHAEL, Associate Professor, Natural Resource Ecology and Management, 10 years of service, fall 2023
Title: Tapping into technology: Using big data from acoustic telemetry to unravel the mysteries of fish movements and population dynamics
Acoustic telemetry is a rapidly growing facet of fisheries ecology that results in large datasets that are challenging to manage and analyze. Professor Weber, who has approximately 100 million telemetry detections, will spend the proposed assignment organizing and analyzing his datasets. Weber will also conduct additional field research, chair a symposium on the subject, mentor students, and pursue external funding opportunities.

WENINGER, QUINN, Professor, Economics, 22 years of service, spring 2024
Title: Empirical measurement in coupled-human-natural systems
Managing coupled natural human systems – how humans interact with the environment, for example – requires calibration of both biological and human (economic) elements. Professor Weninger will seek to overcome this obstacle during his proposed assignment, developing models and applications that better support natural resource management.

WESTORT, CAROLINE, Associate Professor, Landscape Architecture, 10 years of service, spring 2024
Title: Designing a Demonstration Farm for Climate-Positive Best Management Practices in Limpopo Province, South Africa
Professor Westort will use the proposed assignment to study the design and adoption of agricultural best management practices to mitigate the effects of climate change, including design and implementation of a data-driven demonstration farm, and analysis of a large watershed used by farmers and livestock. Westort has applied for a Fulbright Fellowship for her project, which is expected to result in a book proposal.

WOLTERS, TIMOTHY, Associate Professor, History, 12 years of service, 2023-2024 academic year
Title: Tragedy at Sea: Marine Navigation, Radio Technology, and the Point Honda Disaster
Professor Wolters will examine the 1923 Point Honda Disaster, during which a squadron of U.S. Navy destroyers ran aground, leading to the death of 23 sailors and the loss of seven ships. The work will address issues surrounding the adoption of new technologies, which contributed to the disaster, and will be incorporated into Wolter's history courses.

XIANG, CHUNHUI, Associate Professor, Apparel, Events, and Hospitality Management, 10 years of service, spring 2024
Title: Development of Novel Nylon Fibers from Renewable Lysine for Antimicrobial Applications
Professor Xiang will use the proposed assignment to develop new antimicrobial nylon fibers, taking advantage of the inherently antimicrobial properties of renewable amino acids, which can be used in personal protective equipment, underclothes, and other applications. Results will be shared through peer-reviewed publications and conferences and incorporated into Iowa State textile science courses.

ZHANG, SUNING, Associate Professor, Accounting, 5 years of service, fall 2023
Title: The Wisdom of Retail Investors
Professor Zhang will examine retail investors' trading patterns during the proposed assignment, including how advances in technology have changed the way these investors participate in capital markets. The results of this work will be shared in journal articles and conference presentations and incorporated into Zhang's classes in the Ivy College of Business.

University of Northern Iowa

ABEBE, TILAHUN, Professor, Biology, 18 Years of Service, Spring Semester
Title: Improving the Response of Cereal Crops to Environmental Stress
The products of this research are to: (1) to publish 1-2 manuscripts and (2) to evaluate a new crop, known as "tef", in Iowa. The research lab investigates the response of cereal crops to stress tolerance using barley as a model. With support from the Department of Biology; the College of Humanities, Arts and Sciences, and the Office of Research and Sponsored Programs, the lab previously identified several genes that are induced in barley during drought (Abebe *et al*., 2010). Gene expression at the RNA-level is not enough in response to changes in the environment. The messenger RNAs (mRNAs) must be translated to proteins that are needed for stress tolerance. Recently, the lab has been investigating expression of proteins during drought in barley using liquid chromatography-mass spectrometry (LC-MS). The goal of this PDA is to publish the LC-MS data in peer-reviewed scientific journals. A secondary outcome will evaluate tef [(Eragrostis tef Zucc.) Trotter] potential adaptation in Iowa. Tef is a grain crop that is widely cultivated in Ethiopia for food. Tef is slowly taking root in the U.S. because of its nutritional value as well as for hay to feed animals. The lab has been working on tef since 2020 and has identified about 70 strains that mature during the short Iowa summer. This was based on a June 1 planting date. In spring 2024, the lab will test these strains further using different planting dates (May 1, May 15, June 1, June 15, and July 1) to determine the date that is more suitable for growing tef in Iowa. The USDA has many tef strains, of which 50 will be included in this research.

CASTILLO, JUAN CARLOS, Associate Professor, Languages & Literatures, 22 Years of Service, Spring Semester
Title: The Quixotic Heroes of Spanish Sport
One of the controversies in the study of the Franco era (1939-1975) and beyond has been whether the attempts by the dictatorial regime to establish a solid Spanish national identity were successful or not. This project aims to write and publish a book, English and Spanish editions, that explores the ways in which the Spanish press of the time presented these athletes as perfect examples of the quixotic hero, presenting the values of the Spanish nation through a collective narrative. The media's portrayal of the careers of cyclist Federico Martín Bahamontes, tennis player Manuel Sanna, motorcyclist Ángel Nieto and skier Francisco Fernández Ochoa are analyzed through a typology of fiveta characteristics that define the perfect quixotic hero: idealism and redemptive heroism; example of moral conduct; survival in the face of adversity; taste for irrational and impractical decisions; and heroism for the Spanish nation. The claim that this aspect of Spanish national identity was successful is justified by numerous examples in which, decades later, the names and exploits of these athletes are invoked in the media every time an athlete achieves a new milestone for Spanish sport or, more sadly, following the recent deaths of some of the athletes studied here, as in the case of Manuel Santana's passing in December of 2021.

CUTTER, BARBARA, Professor, History, 22 Years of Service, Fall Semester
Title: Socialites, Sherpas and Mountaineers: Gender, Race, Nature and Citizenship in American Mountain Climbing, 1860-1996
This project suggests that mountain climbing, which has long stressed values of autonomy, individuality and self-reliance, can be a key site to understanding past and present debates in the United States over who is and is not considered a fully autonomous and independent person, one who is capable of being a full member of society. This project approaches the history of mountain climbing through an exploration of those debates and what they reveal about American ideas about citizenship, national identity, race, gender, class and nature. This book-length project will have three sections: the first traces the origins and rise of mountain clubs and climbing in the

United States in the nineteenth century and early twentieth century, as climbing and what is now called hiking (a term that came into use in the 1900s) became increasingly seen as separate activities. The second follows climbing and hiking on two separate but related trajectories through the 1930s. The third follows these trajectories from World War II to the 1990s, exploring how ideas about climbing and hiking changed, as ideas about gender, race, class, nature, national identity and citizenship shifted in U.S. society. It concludes with an exploration of how these ideas played out in popular media portrayals of climbers in the famous May 1996 Mount Everest disaster in which eight mountaineers died. This project makes several key contributions to the discipline of history. First, it integrates political history with cultural and environmental history to shed new light on the history of ideas about citizenship in the United States. Second, it focuses on environmental history and transnational history, two of the fastest growing fields in history, positioning this project at the forefront of the latest trends in historical research. Third, it has great potential to add to understandings of the current U.S. culture wars, by locating their origins much further back in time than scholars have suggested and exploring their development over the course of the twentieth century.

HURLEY, KIMBERLY, Associate Professor, Kinesiology, 5 Years of Service, Spring Semester
Title: Efficacy of Tai Chi for Rural Seniors' Balance Concerns
Approximately 1/3 of seniors 65+ fall each year and the trend for fatal falls among older adults has not decreased despite national efforts to improve balance and falls' risk (National Coalition on Aging, 2015). Falls represent the leading cause of serious injuries and accidental deaths among older Americans (Centers for Disease Control [CDC], 2018). Iowa seniors' fall-related deaths have increased 28% in the last 10 years (CDC WISQARS Index, 2019). Specific to Iowa seniors, 77% of falls result in hospitalizations (Iowa Department of Public Health [IDPH], 2019) and more than 62% of unintentional injury-related deaths (CDC, 2019). Rural seniors experience higher prevalence of falling and greater fear of falling than urban seniors (Arnadottir et al., 2022), however, IDPH reports difficulty collecting robust data regarding falls from seniors in rural Iowa communities (2020). This PDA will support efforts in researching the efficacy of the balance-promotion programming, Tai Chi (https://taichiforhealthinstitute.org/), on physical and psychological balance indices among rural Northeast Iowa seniors. Reviews of Tai Chi for fall prevention among older adults have consistently supported the effectiveness of this mind-body activity that integrates moving meditation with gentle muscular strengthening and balance control for reducing falls' risk. Prof. Hurley will use the PDA to examine the impact of a multi-week Tai Chi intervention on physical and psychological balance indices (pre-/post) with 30-50 rural Iowa seniors (60+ yrs) across three Northeast Iowa communities. Since Tai Chi requires no specific equipment and participants can practice in small or large group settings as well as individually in a variety of environments, this mind-body activity has potential for higher adherence rates among seniors compared with other strength/balance exercise programs. Consistent practice of Tai Chi movements can enhance seniors' mobility, confidence and competence while reducing fears of fall-related restrictions in daily activities and independent functioning. The product of this PDA is to prepare 1 to 2 manuscripts for submission in peer-reviewed journals that focus on older adults and challenges/process of aging.

LOU, SHANGZHEN, Professor, Mathematics, 18 Years of Service, Fall Semester
Title: Game Values and Equilibriums on Linear Diffusion Processes
Game theory has been a powerful mathematical tool to model and analyze interactive situations. This research project studies two-player competitive stochastic games that are built on linear diffusion processes (an important class of random processes in advanced probability theory). The research falls in the field of game theory and probability. One objective is to find the game values (optimal performance measures) and optimal plays (including equilibriums and non-equilibriums).

Game theory methods will be applied including: stochastic calculus, differential equations and probability to find solutions of the games. Also, a new analytical method will be developed to solve the differential equations for game values. Fundamental questions involving the existence of equilibrium, impact of game order, and solvability of the games will be addressed. This team also wants to investigate any practical implications of the game results, and understand the competitive behaviors of the players in an uncertain environment. Many companies nowadays use utility and game related theory in planning and decision-making for asset allocation, insurance premium calculation, inventory management, reliability analysis and quality control. The state of Iowa is home to a great number of leading financial and insurance firms, and the practitioners in these companies (including data scientists, actuaries, asset managers etc.) will benefit from the research results that provide innovative solutions and analytical tools to their daily work on decision-making and problem-solving. The project will also enrich teaching content and open new research opportunities for students at UNI.

PETROV, ANDREY, Professor, Geography, 14 Years of Service, Fall Semester
Title: Towards Sustainable Arctic Cities: Understanding Urban Transitions and Sustainability in a Rapidly Changing Arctic
The goal of this PDA is to advance understanding of sustainability and its policy options in remote urban communities, in particular in the Arctic, amid rapid environmental and socioeconomic change. Although most of Arctic residents live in cities and towns, from large to very small, there is a lack of comprehensive understanding of what sustainability characteristics and pathways exist to support sustainable development of these communities in the coming decades. Specifically, through a synthesis of existing knowledge, including Prof. Petrov's own works, and new field research, this project will produce two peer-reviewed articles and an edited volume/special issue proposal that will have both conceptual and methodological contributions in the body of knowledge about urban and remote-place sustainably in the Arctic and beyond. The PDA will contribute to the broader objectives of the Petrov's research agenda and strengthen interdisciplinary collaborations. The PDA work will capitalize on past and existing externally funded projects and support future grant submissions. The PI's specific tasks will be to work on the novel conceptual interpretation of urban sustainability and transitions in the Arctic, in particular in respect to social, economic and governance systems and (2) conduct case studies in Yellowknife, Canada (fieldwork) and Yakutsk, Russia (online only).

RUMSEY, CHEPINA, Associate Professor, Mathematics, 6 Years of Service, Fall Semester
Title: Let's Grow Math Wonder in Young Mathematicians: A Playful Approach to Mathematical Argumentation
It is important for K-2 students to have opportunities to playfully and curiously explore mathematical ideas as they build both a conceptual understanding and procedural fluency. Prof. Rumsey's research agenda has centered on how elementary students notice and wonder, make conjectures, justify their ideas, share with peers, and modify based on feedback, which are part of what she considers to be important layers of mathematical argumentation. She also strives to make mathematical argumentation accessible to teachers and to support them as they integrate mathematical argumentation into their classrooms. Based on her research, publications and professional development sessions, she and a colleague proposed a book that was recently accepted by the publisher, W. W. Norton. This PDA will allow Prof. Rumsey the opportunity to revise the book chapters, collect additional video of K-2 classroom lessons for the book, transcribe and organize the video onto a website, and analyze the video data to launch the next phase of research. This research and the publication of the book will support teachers in Iowa, and beyond, along with future educators at UNI as they integrate mathematical argumentation in their classrooms. Prof. Rumsey shares her research with students in UNI courses, and having the book

and additional videos collected as part of this project will enhance her teaching and the support for teachers. The book, videos, website, and additional research will also facilitate opportunities to lead and provide more professional development for teachers in Iowa.

SHEN, XINHUA, Associate Professor, Earth & Environmental Sciences, 8 Years of Service, AY 2023-2024
Title: Environmental Impacts and Lifecycle Cost of Hybrid, Electric and Hydrogen Fuel Cell Vehicles in Iowa
To reduce vehicle greenhouse gas (GHG) and pollutant emissions, the transit of transportation in a green manner is needed. More and more people accept and purchase hybrid vehicles, and some people love to own electric cars. Battery electric vehicles (BEVs), which consume electricity, and hydrogen fuel cell vehicles (HFCVs), which use hydrogen as fuel, are two types of zero-emission vehicles. There is a gap in how BEVs and HFCVs can reduce GHG emissions compared to hybrid gasoline/diesel vehicles in Iowa in the future. The proposed project will address the gap and evaluate environmental impacts and cost assessments for hybrid vehicles, BEVs, and HFCVs, in Iowa under several possible energy scenarios from now to 2050 using Lifecycle Assessment (LCA) and Lifecycle Cost Analysis (LCCA). Lifecycle inventories for BEVs and HFCVs will be established according to the recent development of electricity/hydrogen production in Iowa, car fabrication, hydrogen transportation, hydrogen refueling stations, hydrogen storage tanks, etc. The LCA and LCCA models of electricity and hydrogen production for vehicle use from solar energy, wind power and biomass in Iowa will be developed, including uncertainty analyses with the consideration of the impacts caused by the long-term impacts of different energy strategies. The net change in environmental impacts due to the partial use of battery electric cars (BECs) and hydrogen fuel cell cars (HFCCs) in Iowa's transportation will be determined by comparing them with conventional and hybrid cars. A Total Cost of Ownership (TCO) model will be used to localize the prices of electricity and hydrogen in Iowa. Electricity generated from solar and wind farms will play more critical roles in the LCCA of BEVs and HFFVs. Through the research project, the Prof. Shen will strengthen and extend the research abilities in LCA and LCCA of renewable energies and various future vehicles. These results will be provided to stakeholders and community leaders in Iowa to increase technical awareness and promote sustainable growth.

YOON, GUNWOO, Marketing & Entrepreneurship, Associate Professor, 5 Years of Service, Spring Semester
Title: Promoting Conservation Behavior through AI-generated Images of the Future Self
Climate has changed throughout history. Currently many attempts (or strategies) at mitigating climate change are not sufficient in promoting "constructive changes" in behavior. Previous literature suggests that people tend to see climate change as a distant threat; climate change risks are not directly relevant to themselves, and thus, there is no need for immediate action. The proposed research aims to develop an intuitive conservation strategy that can help combat climate change. The assumption is that thinking about the future with AI-generated images of the future self can produce positive effects on individual support for addressing climate change. The proposed research aims to demonstrate whether exposure to age-progressed images of the future self can make future climate change seem more connected or close to the present. The research further explores whether reducing such a psychological/temporal distance with AI-generated images of the future self is an effective strategy to engage and mobilize people around this climate issue. The proposed research will provide theoretical insights into how we can foster a greater understanding of environmental issues and behavior toward them. On a practical side, the expected results will make a substantive contribution for practitioners and policy-makers who seek to find some useful and easy-to-use applications that can motivate people to deeply engage with the issue of climate change.