

2016 CALL FOR APPLICATIONS: DISTINGUISHED SCIENCE OF LEARNING FELLOWSHIP

SYNOPSIS

The Distinguished Science of Learning Fellowship Program provides fellows the opportunity to gain experience beyond their current training in (a) conducting interdisciplinary research in the science of learning and (b) learning how to effectively communicate and translate scientific findings to practitioners, policymakers, and the general public. The fellowship program is open to pre-doctoral and post-doctoral applicants within and outside of Johns Hopkins University. Applications are due December 14, 2015 at 11:59 p.m. EST.

I. INTRODUCTION

In an effort to prepare the next generation of leaders in the science of learning, the Distinguished Pre-doctoral and Post-doctoral Science of Learning Fellowship Program provides young scientists opportunities to obtain interdisciplinary research and dissemination training beyond the scope of their prior undergraduate and graduate education. The goal of the program is to train scientists to think broadly about learning, yield innovative scientific discoveries about learning, and use these discoveries to drive research, practice, and policy. The fellowship program draws upon the existing expertise of Johns Hopkins faculty to direct innovative research efforts that cross the disciplinary boundaries of basic and applied sciences.

The fellowship program is sponsored by the Science of Learning Institute (SLI) of Johns Hopkins University. The mission of the Institute is to understand and optimize the most essential part of our human capital: the ability to learn. The Institute supports interdisciplinary research that will generate innovative scientific discoveries and build meaningful connections between research, practice, and policy. Through its research and training activities, the SLI seeks to create an integrated understanding of the cellular and molecular mechanisms of learning, how learning varies as a function of basic learner characteristics (e.g. under genetic change, over the life span, across individual differences), how these characteristics interact with different environments to produce variation in learning outcomes, and how interactions with intelligent artificial learning systems can enhance and optimize human learning. Please see [Section VIII of this call](#) to view a full list of funded projects read one-page project descriptions on our [website](#). For more information about the Institute's mission and goals, please see: <http://scienceoflearning.jhu.edu>.

II. FELLOWSHIP PROGRAM DESCRIPTION

The Distinguished Science of Learning Fellowship Program provides fellows the opportunity to gain experience beyond their current training in (a) conducting an interdisciplinary research project in the science of learning and (b) learning how to effectively communicate and translate scientific findings to practitioners, policymakers, and the general public. The fellowship program is open to pre-doctoral and post-doctoral applicants within and outside of Johns Hopkins University.

A. Topical Areas

The Fellowship Program supports research projects that align with the mission of the Science of Learning Institute. We support interdisciplinary research across a variety of disciplines and using a wide

range of approaches to advance our understanding of learning. The research project may represent an original thesis that was generated by the fellowship applicant or a novel extension of a currently existing project. For a full list of funded projects, please see Section VIII. For more information about the Institute's mission and goals, please see: <http://scienceoflearning.jhu.edu>.

B. Research Training

Each fellow's research project must be motivated by a compelling research question that *requires* an interdisciplinary approach for successful investigation. Interdisciplinary research refers to "a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice" (National Academies Report, 2004, p. 2). Successful applications will clearly indicate the need for new skills and expertise that are beyond the scope of the applicant's current or past training to achieve the goals of the proposed research.

Fellows will carry out their interdisciplinary research and training under the direction of two faculty mentors from different disciplines and departments or divisions across Johns Hopkins University. Each mentor should compliment (not merely reinforce) the expertise of the fellow and the co-mentor. Successful applications will clearly demonstrate the role that each mentor will play in advancing the post-doctoral applicant's intellectual growth in the designated area, investigation of the driving research questions, and future career development.

C. Dissemination and Translation Training

Within the 2-year fellowship period, each fellow will be required to develop a dissemination or translation project relevant to his or her particular interdisciplinary area of interest. Examples include, but are not limited to, the creation of scientific materials for professional training of educators; policy briefs or popular press news articles; novel digital applications that disseminate scientific information in meaningful ways; creation of museum exhibit programs or materials, etc. Dissemination projects will clearly build on the fellow's scientific project and novel ideas are welcome. During the first year, fellows will participate in monthly seminars to learn about dissemination science and translational research practices (see below) and develop a dissemination project plan. During the second year, fellows will produce their dissemination project.

D. Monthly Seminar Requirements

To facilitate training and interaction among the fellows, all fellows will participate in a monthly seminar over the course of the two-year fellowship. The seminars will represent a mix of topical discussions, invited presentations, and workshops. They will be designed to (1) expose fellows to an array of science of learning research and its applications, (2) foster new knowledge and skills in translation and dissemination practices, and (3) assist fellows in meeting their professional development goals. Fellows will present their research and dissemination projects in a small symposium at the end of their fellowship tenure.

III. ELIGIBILITY

A. Fellowship Applicant

1. For pre-doctoral fellowships, the applicant must meet the following criteria:
 - a. Currently enrolled in a doctoral program at Johns Hopkins University.

- b. In his or her 3rd or 4th year of their graduate program.
2. For post-doctoral fellowships, the applicant must meet the following criteria:
 - a. Be a U.S. citizen, national, or legally admitted permanent resident alien of the United States. International applicants are welcome to apply, but the costs of work/education visas will need to be covered by the hosting departments/ divisions.
 - b. Candidates within 3 years of earning their Ph.D. or M.D. will be preferred. The relevant doctoral degree must have been earned by May 2016.

B. Mentors

The mentors must be full-time tenure stream faculty at JHU who are eligible to serve as PIs in their division. The mentors must be from (a) at least *two* different disciplines and (b) two departments or divisions from Johns Hopkins University. Faculty from *any* division within the University are eligible to serve as mentors. Divisions include Krieger School of Arts and Sciences, Whiting School of Engineering, Carey Business School, School of Education, School of Medicine, School of Nursing, Peabody Institute, Bloomberg School of Public Health, and School of Advanced International Studies (for more information about JHU schools, see <https://www.jhu.edu/academics/>).

C. Other Criteria

Applications will be returned without review if:

1. The research project does not align with the mission of the Science of Learning Institute.
2. The application does not adhere to the formatting guidelines or include *all* relevant application materials listed in the “*Application Preparation and Submission*” section.
3. The fellowship applicant and/or the mentor(s) do not meet the stated eligibility requirements.

IV. AWARD INFORMATION

We anticipate funding two (2) pre-doctoral fellowships and three (3) post-doctoral fellowships in 2016.

A. Duration and Tenure

Fellowships are awarded for up to two years. Tenure will begin on July 1, 2016 and conclude on June 30, 2018. The second year of funding will be contingent upon acceptable progress as described in the end-of-year progress report.

B. Award Amount and Budget Allowances

Awards will not exceed \$65,000 for postdoctoral fellows and \$35,000 for predoctoral fellows per year. The fellowship budget and budget justification must include the following allowances:

1. **Salary:** Fellows will be paid a 12-month salary commensurate with distinguished federal fellowship scales and the fellow’s qualifications and experience. JHU departments and divisions typically require fellows’ salaries to adhere to a particular federal fellowship scale. Relevant fellowship salary scales include the [NIH NRSA Fellowship](#) (predoctoral and postdoctoral salaries), [the NSF Graduate Research Fellowship \(predoctoral salary\)](#), and [discipline-specific NSF Postdoctoral Fellowships](#). Fellowship applicants should verify salary requirements with both of their mentors. Please note that salaries for mentors are not allowed in the budget.

2. **Research and Travel Expenses:** Up to \$10,000 may be budgeted per year for research-related equipment, supplies, and travel expenses (e.g., data collection travel, conference travel).
3. **Training and Professional Development:** It is expected that fellows will need additional formal training to compliment their project-based training. Up to \$2,500 may be budgeted per year for training and professional development to foster the fellow's intellectual growth and methodological expertise in new areas. This may include graduate courses, workshops, training programs, and corresponding expenses (e.g., texts, software, etc.).
4. **Fringe Benefits:** Fringe benefits will be paid by SLI and will **not count** toward the project budget total. Fellows will still need to report the fringe benefit dollar amount on the online application form. Fellows must submit their budgets to the department's financial administrator to obtain appropriate fringe benefit information.

V. APPLICATION REVIEW CRITERIA

Priority will be given to proposals that are strongest in meeting the following criteria, which will be explicitly evaluated in the review process:

A. Project Merit Criteria

1. *Innovation:* The project seeks to discover principles about learning that break traditional barriers and generate truly new insights within its own field and across different fields.
2. *Strength and Interdisciplinarity of Approach:* The project's design, methods, and analytic plan are well-developed, integrated, and appropriate to the aims of the proposed project and the research environment. The project uses two or more empirical approaches to address the same learning problem, and clearly draws on expertise spanning more than one discipline, department, and/or school in the university.

B. Future Impact Criteria:

1. *Project Impact:* The project will benefit society and contribute to the achievement of specific, desired societal outcomes. Such outcomes include, but are not limited to: increased public scientific literacy and public engagement; improved learning outcomes in society; increased partnerships between academia, industry, and others; inclusion of women, underrepresented minorities, or persons with disabilities.
2. *Educational Impact:* The applicant demonstrates a clear interest in interdisciplinary science of learning research, its dissemination to nonscientific audiences, and its practical applications. The applicant identifies how the fellowship will broaden his or her knowledge and skills in each of these areas and how it will help prepare him or her for a research career in academia, industry, or government.

C. Fellow-Mentor Team Merit Criteria:

1. *Strength and Interdisciplinarity of the Fellow-Mentor Team:* The fellow and the mentors are uniquely qualified with appropriate content knowledge and methodological expertise to carry out all elements of the proposed project. Each mentor compliments the expertise of the fellow and the co-mentor.

2. *Co-mentoring Plan:* The co-mentoring plan is well-developed with clear indications of how each mentor will advance the fellow's intellectual growth and career development (e.g., meeting schedule, readings, training procedures, etc.). The plan also includes joint-mentoring activities designed to foster cross-disciplinary conversations and develop synergies between the fellowship and mentors.

VI. APPLICATION PREPARATION AND SUBMISSION

A. Formatting Requirements

All application materials must be formatted to fit on 8.5 x 11" paper with 1-inch margins, single line spacing, 12-point Times New Roman font, and consistent with the professional style guidelines of the applicant's field. **Applications will be returned without review if these formatting requirements are not followed.**

B. Application Materials (Page limits in Parentheses)

Each application should consist of the following items:

1. *Project Abstract:* A short description of the project in 300 words or less.
2. *Project Description (9 pages maximum; Evaluated on the Project Merit criteria):* The description should include the following sections:
 - a. *Background & Specific Aims (2 pages):* This section should clearly describe the background, the objectives of the project, and the hypotheses or questions addressed. This section should end with a numbered list of the Aims.
 - b. *Significance (1 page):* This section should include 2 clearly-labeled subsections that briefly describe how the project addresses the "Innovation" and "strength and interdisciplinarity of approach" criteria. This section should clearly demonstrate the importance of the project and how the project will improve scientific knowledge, technical capability, and/or practice if the aims are achieved.
 - c. *Approach (3 pages):* This section should outline the research design, measures, data analysis plan, and any preliminary data.
 - d. *Budget and Budget Justification for Year 1 and Year 2 (1 page):* This section must include the fellow's salary, any research and travel expenses requested, any training and professional development requested, and other expense categories, as needed. Awards may not exceed \$65,000 for postdoctoral fellows and \$35,000 for predoctoral fellows per year. Refer to Section IV-B for budget allowances.
 - e. *References (2 pages)*
3. *Future Impact Summary (1 page; Evaluated on the Future Impact criteria):* This section should provide a clear, succinct statement of the fellow's career goals and an explanation of how the fellowship will help achieve the goals. It should include two specific sections entitled "Why this project requires interdisciplinary training beyond my core graduate training" and "How dissemination and translation training will be used in my future career."
4. *Fellow-Mentor Team Description ([Download template](#); Evaluated on Fellow-Mentor Team Merit criteria):* This is a brief, four-page form that has two sections. The first section is a justification of the applicant's choice of mentors, written by the applicant (1 page maximum). The second is a co-mentoring plan, written and signed by the mentors (1 page maximum for the co-mentoring plan; 2 signature pages).

5. *Brief Biographical Sketches* ([Download template](#) and [instructions](#); Evaluated on Fellow-Mentor Team Merit criteria): Brief, 2-page statements for the applicant and each mentor.

C. Application Deadline and Timeline for Review

Applications are due December 14, 2015 at 11:59 p.m. EST, and should be submitted via the Science of Learning Institute's grant application system (a link to the grant application site will be listed on the SLI's [website](#)). The site will open for submissions starting October 15, 2015. Evaluation of proposals will be carried out by a team of internal evaluators who are experts in the science of learning. Applicants will be notified of funding decisions by May 2, 2016.

We strongly recommend that fellowship applicants contact potential mentors *at least* one month prior to the application deadline to allow adequate time to discuss project ideas, review drafts of the research project, and develop the co-mentoring plan.

VII. QUESTIONS

Applicants who wish to discuss their project before applying or need assistance in identifying potential mentors are encouraged to contact SLI personnel or steering committee members with the most relevant expertise. Questions about the application process or review timeline should be directed to Mike Alexander, SLI Program Coordinator, malexander@jhu.edu.

Personnel

- Barbara Landau, Director, Science of Learning Institute; Professor, Cognitive Science, landau@jhu.edu
- Kelly Fisher, Associate Director, Science of Learning Institute; Assistant Professor, School of Education, kelly.fisher@jhu.edu
- Kristin Gagnier, Outreach and Evaluation Specialist, Science of Learning Institute; Assistant Research Scientist, Cognitive Science, kristin.gagnier@jhu.edu

Steering Committee

- Randal Burns, Professor, Computer Science, randal@cs.jhu.edu
- Mark Chevillet, Program Manager, JHU Applied Physics Laboratory, mark.chevillet@jhuapl.edu
- Charles E. Connor, Professor, Neuroscience, connor@jhu.edu
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- Tim Moran, Professor, Psychiatry and Behavioral Sciences - School of Medicine, tmoran@jhmi.edu
- Amy Shelton, Professor and Associate Dean for Research, School of Education, ashelton@jhu.edu

VIII. PREVIOUSLY FUNDED FELLOWSHIP PROJECTS

Previously Funded Fellowships Include Fellows and Mentors From:

- Krieger School of Arts and Sciences (e.g., Cognitive Science, Psychological and Brain Sciences)
- School of Education (e.g., Center for Research and Reform in Education, Special Education)
- School of Medicine (e.g., Cognitive Neurology)
- Whiting School of Engineering (e.g., Electrical and Computer Engineering)
- Human Language Technology Center of Excellence
- Kennedy Krieger Institute (Neurology, Developmental Medicine)

Previously Awarded Grant Project Titles (Fellows, Mentors):

- Modality Effects in Letter Learning: Developing Foundations for Educational Interventions (Robert Wiley, Brenda Rapp, Karin Sandmel)
- Jointly Modeling Syntax and Semantics in Verb-Learning (Aaron Steven White, Kyle Rawlins, Benjamin Van Durme)
- An Interdisciplinary Approach to Improving Reading Comprehension in High-Functioning Individuals with Autism (Emily Coderre, Barry Gordon, Nancy Madden)
- Large Scale Learning of Speaker Variation (Eleanor Chodroff, Sanjeev Khudanpur, Colin Wilson)
- Behavioral and Neural Mechanisms of Effective Working Memory Training (Kara Blacker, Susan Courtney, Joshua Ewen)