National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230

NSF 13-093

Dear Colleague Letter:

Date: May 14, 2013

The Directorate for Computer and Information Science and Engineering (CISE) of the National Science Foundation (NSF) and the Office of Financial Research (OFR) of the Department of Treasury share an interest in advancing basic and applied research centered on Computational and Information Processing Approaches to and Infrastructure in support of, Financial Research and Analysis and Management (CIFRAM).

The complexity of modern financial instruments presents many challenges in recognizing and regulating Systemic Risk. The topic has been the subject of a recent National Academy of Science Report titled "Technical Capabilities Necessary for Systemic Risk Regulation: Summary of a Workshop." The CISE directorate and the Computing Community Consortium have sponsored workshops on Knowledge Representation and Information Management for Financial Risk Management and on Next-Generation Financial Cyberinfrastructure aimed at identifying research opportunities and challenges in CIFRAM.

NSF and OFR have established a collaboration (hereafter referred to as CIFRAM) to identify and fund a small number of exploratory but potentially transformative CIFRAM research proposals. The collaboration enables OFR to support a broad range of financial research related to OFR's mission, including research on potential threats to financial stability. It also assists OFR with the goal of promoting and encouraging collaboration between the government, the private sector, and academic institutions interested in furthering financial research and analysis. The collaboration enables the NSF to nurture fundamental CISE research on a variety of topics including algorithms, informatics, knowledge representation, and data analytics needed to advance the current state of the art in financial research and analysis. Proposals that involve collaborations between Computer Scientists, Mathematicians, Statisticians, and experts in Financial Risk Analysis and Management are especially welcome.

Topics of interest in CIFRAM include, but are not limited to: Analysis of financial networks; algorithms and methods for measuring threats to financial stability; Representation and standardization of financial data and information; Formal methods for representation and analysis of financial contracts and regulations, e.g., logics, ontologies, and rule-based approaches; Complexity of financial systems and relationships; Technologies for modeling and monitoring financial systems and infrastructure; Visualizations of the financial system and its attendant risks; Financial risk management techniques for the quantification of uncertainty and risk, including stress testing, risk and volatility forecasting, and the modeling of statistical distributions, processes, and dependence structures; Representation and querying of uncertain financial data, such as marks to model for infrequently traded instruments; Storage and query tools and techniques applicable to financial data; Assembly, integration, and analysis of new datasets for financial research; Techniques for ensuring the security and confidentiality of sensitive financial data, including approaches for selective sharing; Technologies and methodologies to support investigations of failures and disruptions in financial markets, such as those that might arise from (or be exacerbated by) automated high frequency trading systems; Simulation of financial systems, for example using Monte Carlo and agent-based methods; and Tools to support financial policymaking and decision-

making.

Principal Investigators (PIs) interested in seeking research support through the program should submit 2-page white papers to nsfofr@nsf.gov. The white paper should briefly outline (i) the research objectives (iii) the new financial research and management capabilities that the research aims to advance, (iii) the innovations in one or more of the CISE research areas that the research aims to accomplish; (iv) the scientific rationale and motivation for the research, (v) the expertise that the team members bring to the project. If OFR and NSF agree that the research idea falls within the scope of CIFRAM, the PI will be invited to submit an EAGER proposal on the topic prepared in accordance with the instructions for EAGER proposals contained in the NSF Grant Proposal Guide and submitted electronically via the NSF FastLane or Grants.gov. Proposals, any review materials, and reports submitted under awards may be shared between NSF and OFR for purposes of administering this collaboration.

For further information, please contact the cognizant NSF program directors Dr. Vasant Honavar (vhonavar@nsf.gov) or Dr. Frank Olken (folken@nsf.gov) or the OFR liaison Dr. Mark Flood (Mark.Flood@treasury.gov).