



**NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230**

NSF 17-146

Dear Colleague Letter: Announcing Creation of the Engineering Design and Systems Engineering (EDSE) Program which Merges and Replaces the Engineering and Systems Design (ESD), System Science (SYS), and Design of Engineering Material Systems (DEMS) Programs

September 26, 2017

Dear Colleagues:

The [Engineering Design and Systems Engineering \(EDSE\)](#) program of the Division of Civil, Mechanical and Manufacturing Innovation (CMMI) within the National Science Foundation's Directorate for Engineering accepts proposals for fundamental research on theory and methodology of engineering design and systems engineering. This program merges and replaces the Engineering and Systems Design (ESD), System Science (SYS), and Design of Engineering Material Systems (DEMS) programs. The ESD, SYS and DEMS programs will no longer accept proposals; active awards in ESD, SYS, and DEMS will be managed by the EDSE Program Director and will remain eligible for supplements and extensions.

The goal of this merger is to simplify proposal submission for investigators and to provide a larger combined program budget that will allow more flexibility in award amounts and duration. The EDSE program will seek to advance frontiers of knowledge broadly across the disciplines of engineering design and systems engineering so as to promote more effective design and systems engineering practices, and to enable the development of increasingly complex, integrated, and interactive engineered systems demanded by advanced technologies and emerging societal imperatives.

The EDSE program will continue to emphasize the major research thrusts of the constituent programs, namely to foster the emergence of a rigorous theory of engineering design and systems engineering, including both normative and descriptive aspects. In pursuit of this emphasis, EDSE will support fundamental research in the applications of probability theory, decision theory, game theory, optimization, organizational theory, behavioral science and other relevant disciplines to engineering design and systems engineering practices and processes. Support will be provided both for studies of a purely theoretical nature and studies of an observational or experimental nature.

Like the programs it replaces, EDSE does not support the development of ad-hoc methods or the

application of known techniques to new problems. Furthermore, proposals should pursue contributions that are either independent of engineering domain or consistent with the disciplinary thrusts of the CMMI division.

The program especially encourages proposals consistent with the following three themes:

Understanding the Development of Systems at Scale. Research investigating challenges of designing and validating extremely large scale or complex technical and socio-technical platforms and systems.

Cognitive Support for Design and Systems Engineering. Research advancing fundamental understanding about how advanced computing technologies firmly grounded in cognitive science/engineering can best be utilized to support human cognition, decision making, and effective collaboration during design and systems engineering.

Design of Engineering Material Systems. Research advancing methodology specific to the design of engineering material systems. Successful proposals will identify a specific material system and leverage the unique aspects of that system to realize novel design methods that are driven by performance metrics and incorporate processing/manufacturing considerations. Advances in materials modeling and processing are welcome to the extent they support advances in design methodology.

The EDSE program encourages proposals from multidisciplinary teams that synergistically combine expertise in design or systems engineering research with expertise from other scientific and engineering domains.

Prospective investigators are encouraged to discuss topic suitability and project scope with the Program Director prior to proposal preparation.

Full program details are available at: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505478.

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