

CDS&E Program



MPS, ENG, and OCI have recently established a new cross-directorate program in Computational and Data-Enabled Science and Engineering (CDS&E: PD 12-8084).

“The goal of the CDS&E program is to identify and capitalize on opportunities for major scientific and engineering breakthroughs through new computational and data analysis approaches. The intellectual drivers may be in an individual discipline or they may cut across more than one discipline in various Directorates. The key identifying factor is that the outcome relies on the development, adaptation, and utilization of one or more of the capabilities offered by advancement of both research and infrastructure in computation and data. The CDS&E program welcomes proposals in any area of research supported through the participating divisions that:

- Promote the creation, development, and application of the **next generation of mathematical, computational and statistical theories and tools** that are essential for addressing the challenges presented to the scientific and engineering communities by the ever-expanding role of computational modeling and simulation and the explosion and production of digital experimental and observational data.*
- Promote and encourage **integrated research projects that create, develop and apply novel computational, mathematical and statistical methods, algorithms, software, data curation, analysis, visualization and mining tools** to address major, heretofore intractable questions in core science and engineering disciplines...*
- Encourage adventurous ideas that generate **new paradigms and that create and apply novel techniques**, generating and utilizing digital data in innovative ways to complement or dramatically enhance traditional computational, experimental, observational, and theoretical tools for scientific discovery and application.*
- Encourage ideas at the interface between scientific frameworks, computing capability, measurements and physical systems that enable advances well beyond the expected natural progression of individual activities...”*



CDS&E Program Organization

The CDS&E program was created as a “meta-program.” Individual programs that reside in the divisions and directorates are integrated through a single funding announcement (PD 12-8084) and organized with a CDS&E Coordination Group.

Mathematical and Physical Sciences:

- Division Mathematical Sciences: Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences
- Physics Division: Physics at the Information Frontier
- Division Materials Research: Computational and Data Driven Materials Research
- Astronomy Division: Theoretical and Computational Networks
Astronomy and Astrophysics Research Grants
Advanced Technologies and Instrumentation
- Chemistry Division: Chemical Theory, Models and Computational Methods,
Chemical Measurement and Imaging

Engineering Directorate:

- Civil, Mechanical and Manufacturing Innovation (CMMI)
- Chemical, Bioengineering, Environmental, and Transport Systems (CBET)

Office of Cyber Infrastructure



CDS&E Program Started in FY13

This is the first year of the integrated CDS&E program:

- The deadlines for proposal submission began in September.
- The response from the community has been very good.
- The Coordination Group is meeting regularly and has identified proposals for co-review between the divisions and directorates

→ Everything is proceeding smoothly!