Name and brief description of initiative:
Dynamic Data Driven Applications Systems (DDDAS)

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The DDDAS concept entails the ability to dynamically incorporate additional data into an executing application, and in reverse, the ability of an application to dynamically steer the measurement process. Fostering and nurturing research and technical communities to develop DDDAS capabilities has began a few years ago and nurtured though workshops and seeding efforts, and this endeavor is continuing presently and more systematically through the multi-agency DDDAS Program Solicitation launched in FY05. Information on such DDDAS related activities and funded projects can be found in: www.cise.nsf.gov/dddas and www.dddas.org. Through these efforts, a wealth of new multidisciplinary research advances, and novel approaches and methods have begun to emerge, pushing the current boundaries to enable DDDAS capabilities. Through the solicitation and other DDDAS-related activities have articulated the DDDAS concept, its beneficial impact to many research and technology areas, the research and technology advances that can be enabled by DDDAS and those that are needed to enable DDDAS, the need for synergistic multidisciplinary work among several research and technology communities, and the opportunities of collaboration among multiple sectors: academia, industry, national laboratories, US government agencies, and international partners. The DDDAS program provides the venue for systematic support of research and technology development driven by and aimed at enabling and applying the DDDAS concept. The projects that have been sponsored include many areas of National and International priority, and span synergistic advances in new methods in modeling and analysis, research in measurement, data collection and management, mathematical and statistical algorithms, and research on new systems software methods and software infrastructure frameworks, and the enablement of individual research advances in collaboration with other strategic investigators and organizations.

The funded projects under the DDDAS rubric, with the multidisciplinary emphasis of the program, bridge the different research areas pursued in both the traditional disciplinary lines and across different academic units, different institutional organizations, and different organizations within funding agencies. The projects funded illustrate that there can be synergistic research endeavors established, and provide opportunity of vertical (multidisciplinary within the group) and horizontal (across groups) cross fertilization of ideas and advances.. Such endeavors not only have the potential to make major breakthroughs and advances in the challenges addressed within these projects, but a) they also demonstrate that they can advance and expand the frontiers within the scope of individual disciplines and organizations, and b) there exist several unique aspects of the DDDAS efforts, *not* present in specialized domains, which can expose and fertilize new research and technology directions and enable new capabilities of broad impact. Recognizing that multi-disciplinary research under DDDAS is attracting interest from multiple sectors: academe, industry, and federal agencies.