

**Name and brief description of initiative:**  
**NSF Simulation-Based Engineering Science (SBES)**

**Brief description of goals of initiative:**

SBES is a prospective new initiative at NSF that is based on a study that was conducted by and report that was published by a Blue Ribbon Panel in February of 2006. With a probable home in the Engineering Directorate, it currently has the interest and support of approximately half of the NSF Directorates, and plans include discussions with the remaining Directorates to solicit interest and support. In addition, discussions have been held with NIH NIBIB and NASA and are planned with other federal agencies. The goals of this initiative are to develop modeling and simulation tools that are based on first principles and to apply such tools pervasively throughout engineering and scientific disciplines to enable high fidelity and reliable predictions of system responses in a multi-scale, multi-phenomenon framework. This initiative is expected to capitalize on significant recent developments in computational and computer sciences and rapid advances in computing equipment and systems.

**Principal investigator:**

None to date

**Program contact information:**

Clark Cooper, Ph.D.; (703) 292-7899; [ccooper@nsf.gov](mailto:ccooper@nsf.gov)

Ken Chong, Ph.D.; (703) 292-7008; [kchong@nsf.gov](mailto:kchong@nsf.gov)

Phillip Westmoreland, Ph.D.; (703) 292-8695; [pwestmor@nsf.gov](mailto:pwestmor@nsf.gov)

**Website address of initiative:**

[http://www.nsf.gov/pubs/reports/sbes\\_final\\_report.pdf](http://www.nsf.gov/pubs/reports/sbes_final_report.pdf)

**Brief description of resources and tools available for sharing:**

Sharing of data, algorithms, and other resources is an issue of critical importance to the scientific community, which depends on collaboration and exchange of data and methods to develop accurate functional models and to empirically validate new theories. It is the hope and plan of this prospective new NSF initiative that all information, data, algorithms, *etc.* of a fundamental nature be shared without encumbrance and disseminated widely and publicly for maximum benefit.

**Brief description of integrative efforts:**

**Standard ontologies/terminologies:**

SBES Simulation-based engineering science

**Interactions with other initiatives:**

The NSF SBES initiative is related to other modeling and simulation initiatives within NSF, including but not limited to “Dynamic Data Driven Applications Systems”

([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13511&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13511&from=fund)) and “Interagency Opportunities in Multi-Scale Modeling in Biomedical, Biological, and Behavioral Systems”

([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12763](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12763)) and is underpinned by various supporting initiatives within the Office of Cyberinfrastructure (<http://www.nsf.gov/dir/index.jsp?org=OCI>).

Prepared by C. V. Cooper, 07/07/2006