Exhibit R-2, RDT&E Budget Item Justification							Date: February 2005	
Appropriation/Budget Activity RDT&E/Defense Wide BA#1				R-1 Item Nomenclature: Government/Industry/Co-Sponsorship of University Research PE 0601111D8Z				
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	6.504	6.838	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*

*Program transferred to become part of DARPA's Focus Research Center Program in FY 2006 and outyears.

A. Mission Description and Budget Item Justification:

(U) Program is a shared commitment between industry and Government to sponsor next generation semiconductor electronics research via the Government/Industry Co-sponsorship of University Research (GICUR) program. It capitalizes on university-based research, education and training in technologies of strategic importance to national defense and also to industry. It provides an emphasis on ground-breaking research with a long-term horizon, and education and training in selected research areas which are vital to advancement of technologies. The commitment is a jointly formed pool of funding (requiring an industry match of at least one-to-one) and a shared management structure for sponsoring this sort of long-term basic research at universities. This provides the military with leading-edge technologies as well as reduces vulnerabilities of industries involved, increases long-term technical growth in these areas, infuses new ideas and approaches, all of which are important for national security. Industry and government share responsibility for research focus area selection and overall direction. Mechanisms have been established for personnel exchange and interactions to provide for continuing education of highly qualified researchers already working in leading edge and emerging S&T. One of the areas emphasizes basic concepts for DoD needs in high frequency applications such as radars, millimeter/microwave communications and radiometry, with special attention to devices fabricated from compound semiconductors, such as gallium arsenide. The program supports both graduate and undergraduate research assistants; thereby assisting in the development of the future S&T workforce in these technical areas.

B. Program Change Summary:

	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget:	6.696	0.000	0.000	0.000
Current FY2006 President's Budget Submission	6.504	6.838	0.000	0.000
Adjustments to Appropriated Value:				
Congressional Program Reductions:				
Congressional Rescissions:				
Congressional Increases:	0.000	7.000	0.000	0.000
Reprogrammings:				
SBIR/STTR Transfers:				
Other:	-0.192	-0.162	0.000	0.000

C. Other Program Funding: N/A

D. Acquisition Strategy: N/A

E. Performance Metrics:

Performance in the GICUR Program is monitored at several levels, individual level, focus center level, and overall program level. This research program is jointly funded between the industry and the Government. At the lowest level of the performer, efforts are tracked using project technical milestones that have been appropriately defined and agreed upon. In addition, published papers, conference presentations, and talks at industrial and government organizations are also used to gauge effectiveness of progress of individual efforts. Programmatic and technical milestones are also maintained at the Center level, and the interaction among the current five centers is tracked. Interactions between Centers and DoD labs and industrial organizations are also tracked. In addition, periodic technical and management reviews are conducted with the Centers to gauge progress and provide guidance. Industrial, government, and academic experts are invited to attend these reviews. At the program level, DARPA tracks major deliverables and examines the transition of technologies and ideas from the Center for development in other DARPA programs. DARPA looks at the numbers and impacts of GICUR core technologies that have moved from this program to other programs or to sponsorship by other organizations. Surveys with industry and government experts are used to understand impact and/or potential of individual technologies.

Exhibit R-2a, RDT&E Project Justification							Date: February 2005	
Appropriation/Budget Activity RDT&E/Defense Wide BA 1			Project Name and Number: Government/Industry Co-sponsorship of University Research PE 0601111D8Z					
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GICUR/P111	6.504	6.838	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*

* Program Transferred to DARPA in FY 2006 and outyears.

A. Mission Description and Budget Item Justification:
Program is a shared commitment between industry and Government to sponsor next generation semiconductor electronics research via the Government/Industry Co-sponsorship of University Research (GICUR) program. It capitalizes on university-based research, education and training in technologies of strategic importance to national defense and also to industry. It provides an emphasis on ground-breaking research with a long-term horizon, and education and training in selected research areas which are vital to advancement of technologies.

* Program was transferred in FY 2006 and outyears to become part of DARPA's Focus Research Center Program.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
GICUR/P111	6.504	6.838	0.000	0.000

(U) FY 2004 Accomplishments: (U) The Focus Center Program has demonstrated new technologies that will provide new capabilities in the design and fabrication of semiconductor devices and integrated circuits. In the Gigascale Design Center, a design methodology for obtaining low power but high performance processors was developed using a robust checking circuit that corrects errors in a very low voltage core processor. A design roadmap was implemented to guide future technologies by enabling the accurate modeling and simulation of "what-if" experiments and scenarios on the complex semiconductor technology process. The concepts of platform-centric design were translated from the digital domain to the analog/mixed signal regime and work to formalize the approach was initiated. In the Interconnect Focus Center, the integration of optical materials with silicon were demonstrated. Optical links were developed and measurements of power consumption and bit-error rate were collected. Experiments with nanotubes were conducted, leading to the development and refinement of accurate models of transient performance, including parasitic reactances. In the Center for Circuits Solutions, robust design methodologies for enabling computation with unreliable or faulty components were investigated and interfaces were defined. In addition, applications of fin field effect transistors (finFETs) were investigated, including dynamic and dc properties. Under the Materials, Structures, and Devices Center, experiments with carbon nanotubes and the integration of nanotubes with silicon circuits were conducted. Measurements of mobility were performed and methods to form good contacts using metallics were developed. In addition, experiments were conducted to quantify how film strains and new materials will provide carrier mobility enhancements for very short channel transistors. In the Functional Electronic Nano-Architectures Center, advances in understanding the chemistry of certain polymeric materials enabled development of a process for creating a novel polymeric memory cell that would have significant low power and low fabrication cost and could be scaled to nano-scale dimensions.

(U) FY 2005 Accomplishment: (U) The Focus Center Program has demonstrated new technologies that will provide new capabilities in the design and fabrication of semiconductor devices and integrated circuits. In the Gigascale Design Center, a design methodology for obtaining low power but high performance processors was developed using a robust checking circuit that corrects errors in a very low voltage core processor. A design roadmap was implemented to guide future technologies by enabling the accurate modeling and simulation of "what-if" experiments and scenarios on the complex semiconductor technology process. The concepts of platform-centric design were translated from the digital domain to the analog/mixed signal regime and work to formalize the approach was initiated. In the Interconnect Focus Center, the integration of optical materials with silicon were demonstrated. Optical links were developed and measurements of power consumption and bit-error rate were collected. Experiments with nanotubes were conducted, leading to the development and refinement of accurate models of transient performance, including parasitic reactances. In the Center for Circuits Solutions, robust design methodologies for enabling computation with unreliable or faulty components were investigated and interfaces were defined. In addition, applications of fin field effect transistors (finFETs) were investigated, including dynamic and dc properties. Under the Materials, Structures, and Devices Center, experiments with carbon nanotubes and the integration of nanotubes with silicon circuits were conducted. Measurements of mobility were performed and methods to form good contacts using metallics were developed. In addition, experiments were conducted to quantify how film strains and new materials will provide carrier mobility enhancements for very short channel transistors. In the Functional Electronic Nano-Architectures Center, advances in understanding the chemistry of certain polymeric materials enabled development of a process for creating a novel polymeric memory cell that would have significant low power and low fabrication cost and could be scaled to nano-scale dimensions.

Program ends in FY 2005. The program has been transferred to become part of DARPA's Focus Research Center Program.

C. Other Program Funding: N/A

D. Acquisition Strategy: N/A

E. Major Performers

Georgia Institute of Technology, Interconnect Focus Center, Atlanta, GA
Massachusetts Institute of Technology, Materials/Structures/Devices Center, Boston, MA
University of CA at LA, Functional Engineering Nano-Architectonics Center, Los Angeles, CA
University of CA at Berkeley, Gigascale Design Center, Berkeley, CA
Carnegie Mellon University in Pittsburgh, PA N/A

RDT&E Budget Item Justification Sheet (R-2 Exhibit)							Date: February 2005	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1					R-1 ITEM NOMENCLATURE Defense Experimental Program to Stimulate Competition PE 0601114D8Z			
COST (*In Millions)*	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	10.951	13.132	9.164	9.384	9.676	9.701	10.027	10.150

(U) A. Mission Description and Budget Item Justification

(U) Defense Experimental Program to Stimulate Competitive Research (DEPSCoR). The DEPSCoR is a legislated program that helps build national infrastructure for research and education by funding research activities in science and engineering fields important to national defense. Participation in this program is limited to states that meet eligibility criteria as set forth in the authorizing language. The program is intended to improve the capabilities of institutions of higher education (IHE) to develop, plan and execute science and engineering research that is competitive under the peer-review system. IHEs in eligible states are invited, through their National Science Foundation (NSF) State EPSCoR Committee, to compete for research/infrastructure awards in areas identified by the department in broad agency announcements regularly published by the Services.

B. Program Change Summary:

	FY 2004	FY 2005	FY 2006	FY2007
Previous President's Budget Submission:	9.578	9.590	9.738	9.933
Current FY 2006 President's Budget Submission:	10.951	13.132	9.164	9.384
Adjustments to Appropriated Value:	+1.373	+3.542	-0.574	-0.549
Congressional Program Reductions:	-0.042	-0.258		
Congressional Rescissions:				
Congressional Increases:		+3.800		
Reprogrammings:	+1.687			
SBIR/STTR Transfers:	-0.272			
Other:			-0.574	-0.549

C. Other Program Funding Summary: NA

D. Acquisition Strategy: NA

E. Performance Metrics: 1. Data will be gathered and analyzed annually to determine program eligibility in accordance with authorization language. 2. 100% of program awards will be to states with an NSF recognized EPSCoR State Committee and meet the eligibility requirement under the DEPSCoR program authority at the time of the award announcement.

Exhibit R-2a, RDT&E Project Justification								Date: February 2005
Appropriation/Budget Activity RDT&E, DW BA1				Project Name and Number Defense Experimental Program to Stimulate Competitive Research (DEPSCOR) PE 0601114D8Z				
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
DEPSCOR/ P 114	10.951	13.132	9.164	9.384	9.676	9.701	10.027	10.150

A. Mission Description and Budget Item Justification:

(U) Defense Experimental Program to Stimulate Competitive Research (DEPSCoR). The DEPSCoR is a legislated program that helps build national infrastructure for research and education by funding research activities in science and engineering fields important to national defense.

B. Accomplishments/Planned Program:

	FY 2004	FY 2005	FY 2006	FY 2007
Research	10.951	13.132	9.164	9.384

FY 2004 Accomplishments:
(U) Research. The Department of Defense (DoD) awarded 20 separate grants for research/infrastructure support to 15 academic institutions in 12 States to perform research in science and engineering fields important to national defense. Proposals were competitively selected by the Air Force Office of Scientific Research, the Army Research Office and the Office of Naval Research to receive an average of $420,000 each over the three year grant period. The DEPSCoR is designed to expand research opportunities in States that have traditionally received the least funding in federal support for university research. ($ 10.951 million)

FY 2007 Plans*:*
(U) Research. This is a congressionally mandated program that will continue to be conducted in a manner that is consistent with the goals established in the authorizing legislation and at a level of performance directly proportional to the funding that is annually appropriated by Congress. Research proposals from eligible states will be competitively selected for funding.($ 13.132 million)

C. Other Program Funding Summary: None

RDT&E Budget Item Justification Sheet (R-2 Exhibit)							Date: February 2005	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1					R-1 ITEM NOMENCLATURE National Defense Education Act (NDEA) PE 0601120D8Z			
COST (*In Millions)*	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	0.000	2.500	10.282	10.270	15.907	20.694	41.272	61.975

(U) A. Mission Description and Budget Item Justification

(U) The Department of Defense is confronted with a continuing challenge in educating, training, recruiting, and retaining individuals in certain science, mathematics, engineering, and language disciplines that are critical to the national security functions of the Department. The Science, Mathematics and Research for Transformation (SMART) Defense Scholarship Pilot Program is a program mandated by Congress in Section 1101 of the National Defense Authorization Act (NDAA) for Fiscal Year 2005 that intends to address these needs. SMART will permit current and future scientists, mathematicians, engineers, and technicians to receive scholarships at the undergraduate and graduate levels and gain experience that will develop well rounded individuals that are exceptionally trained and equipped with skills and talents relevant to specific needs identified within the department. Recipients will be required to enter into civilian service for a period of time commensurate with the support they have received.

(U) The DoD will seek to amend the current SMART authorization to enable the DoD to execute a more comprehensive approach to development of a workforce capable of dealing with demands and challenges in skills and disciplines that, as determined by the Secretary, are critical to the national security functions of the Department of Defense. The follow-on program, to be known as Science, Mathematics and Research for Transformation (SMART)/National Defense Education Act (NDEA), Phase I, will establish a permanent program, rather than a pilot, to increase the development, recruitment, and retention of individuals with knowledge, skills, and abilities in disciplines critical to the Department of Defense; expand the educational disciplines for which financial assistance may be awarded specifically to include foreign languages; expand the degrees covered by the program to include assistance for study toward an associate's degree; authorize the Department of Defense to employ recipients of scholarships and fellowships in over-strength positions both while pursuing their studies and for up to two years after completion of their studies; increase the range of allowable expenses for which financial assistance may be provided; and contain flexibilities such that internship opportunities may be incorporated into recipients' programs.

B. Program Change Summary:

	FY 2004	FY 2005	FY 2006	FY2007
Previous President's Budget:	0.000	0.000	0.000	0.000
Current FY 2006 President's Budget Submission	0.000	2.500	10.282	10.270
Adjustments to Appropriated Value:	0.000	+2.500	+10.282	+10.270
Congressional Program Reductions:				
Congressional Rescissions:				
Congressional Increases:				
Reprogrammings:				
SBIR/STTR Transfers:				
Other:				
Program Increase:		+2.500	+10.282	+10.270

C. Other Program Funding Summary:

D. Performance Metrics: 1. Data will be gathered and analyzed annually to assess program exection including level of interest in the program, level of satisfaction and ability of graduates to meet the expectations of sponsoring services and agencies. Performance of scholars and fellows and placement will be tracked, services and agencies will be queried in order to identify any need for programmatic adjustments in order to maximize program benefits to DoD.

Exhibit R-2a, RDT&E Project Justification								Date: February 2005
Appropriation/Budget Activity RDT&E, D BA1				R-1 ITEM NOMENCLATURE National Defense Education Act (NDEA) PE 0601120D8Z				
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
NDEA	0	2.500	10.282	10.270	15.907	20.694	41.272	61.975

A. Mission Description and Budget Item Justification:

(U) The Science, Mathematics and Research for Transformation (SMART) Defense Scholarship Pilot Program will help the Department of Defense address a continuing challenge in educating, training, recruiting, and retaining individuals in certain science, mathematics, engineering, and language disciplines that are critical to the national security functions of the Department.

B. Accomplishments/Planned Program:

	FY 2004	FY 2005	FY 2006	FY 2007
Scholarships/Fellowships	0	2.500	10.282	10.270

FY 2004 Accomplishments:
(U) N/A New program to begin execution in FY 2005

FY 2005 Plans*:*
(U) Scholarships/Fellowships. Services and Agencies will develop and execute the SMART Pilot Program inviting applications from the public and defense employees for not more than the last two years of educational support in disciplines deemed critical to national defense at the undergraduate and graduate degree levels. Recipients will be required to enter into an agreement for civil service that is commensurate with the support received. ($ 2.500 million)

FY 2006 Plans*:*
(U) Scholarships/Fellowships. Services and Agencies will develop and execute the SMART/NDEA permanent program inviting applications from the public and defense employees for educational support in skills and disciplines deemed critical to national defense at the associate, undergraduate and graduate degree levels. Recipients will receive a higher level of integration into and familiarity with the DoD S&T community and its needs and will be required to enter into an agreement for civil service that is commensurate with the support received. Assessment of the utility of the SMART program will begin. ($ 10.282 million)

FY 2007 Plans:
(U) Scholarships/Fellowships. Services and Agencies will refine and execute the SMART/NDEA program inviting applications from the public and defense employees for educational support in skills and disciplines deemed critical to national defense at the associate, undergraduate and graduate degree levels. The program will be modified as needed based upon input from the previous year execution lessons learned. Recipients will receive a high level of integration into and familiarity with the DoD S&T community and its needs and will be required to enter into an agreement for civil service that is commensurate with the support received. Assessment of the utility of the SMART program will continue. ($ 10.270 million)

C. Other Program Funding Summary: None