OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDT&E/ Defense Wide BA# 1	**0601111D8Z - Government/Industry Co-sponsorship of University Research**

Cost ($ in Millions)		FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost		9.552	9.147	0.000	0.000	0.000	0.000	0.000	0.000
P111	Government/Industry Co-sponsorship of University Research	9.552	9.147	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Budget Item Justification: (U) GICUR provides early access to leading-edge military technologies and reduces vulnerabilities for the electronics manufacturing industries involved. Industry and government co-sponsor (required one-for-one dollar match) next generation semiconductor electronics research at five university-based Focus Research Centers.

(U) FY 2007 Estimate reflects Congressional add for the Focus Center Research Program (8000) and a Bio/Nano Electronic Defense Devices and Sensors program (1200).

Focus Research Centers:
1. Interconnect Focus Ce
nter, Georgia Institute of Technology, Atlanta, GA
2. Materials/Structures/Devices Center, Massachusetts Institute of Technology, Cambridge, MA
3. Functional Engineering Nano-Architectonics Center, University of California at Los Angeles, Los Angeles, CA
4. Gigascale Design Center, University of California at Berkeley, Berkeley, CA
5. Circuits, Systems, and Software Focus Center, Carnegie Mellon University, Pittsburgh, PA
Through the Defense Advanced Research Projects Agency, the Focus Center Research program is administered by the Microelectronics Advanced Research Corporation (MARCO).

Bio/Nano Electronic Defense Devices and Sensors:
FY2007 Congressional initiative

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	10.038	0.000	0.000	0.000
Current BES/President's Budget (FY 2008/2009)	9.552	9.147	0.000	0.000
Total Adjustments	-0.486	9.147	0.000	0.000
Congressional Program Reductions		-0.053		
Congressional Rescissions				
Congressional Increases		9.200		

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Reprogrammings	-0.200			
SBIR/STTR Transfer	-0.286			
Other				

Two FY07 Congressional Initiatives were added to this PE:

- Bio/Nano Electronic Defense Devices and Sensors - 1,200
- Focus Center Defense Research Program (Transferred from RDT&E, DW Line2) - 8,000

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 1	**0601111D8Z - Government/Industry Co-sponsorship of University Research**	**P111**

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P111	Government/Industry Co-sponsorship of University Research	9.552	9.147	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Project Justification: (U) GICUR provides early access to leading-edge military technologies, reduces vulnerabilities for the electronics manufacturing industries involved. Industry and government co-sponsor (required one-for-one dollar match) next generation semiconductor electronics research at five university-based Focus Research Centers.

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Bio/Nano Electronic Defense Devices and Sensors:
FY2007 Congressional initiative

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Interconnect Focus Center, Georgia Institute of Technology, Atlanta, GA	2.100	7.947	0.000	0.000

FY 2006 Accomplishments:

- The integration of optical materials with silicon was 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.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

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RDT&E/ Defense Wide BA# 1	**0601111D8Z - Government/Industry Co-sponsorship of University Research**	**P111**

FY 2007 Plan

- To continue from FY 2006 with the integration of optical materials with silicon will be explored and demonstrated.
- Optical links will continue to be developed and measurements of power consumption and bit-error rate will continue to be collected.
- Experiments with nanotubes will continue to be conducted, leading to the development and refinement of accurate models of transient performance, including parasitic reactances.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Materials/Structures/Devices Center, Massachusetts Institute of Technology, Cambridge, MA	1.570	0.000	0.000	0.000

FY 2006 Accomplishments
- 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.
- Experiments were conducted to quantify how film strains and new materials will provide carrier mobility enhancements for very short channel transistors.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Functional Engineering Nano-Architectonics Center, University of California at Los Angeles, Los Angeles, CA	1.220	0.000	0.000	0.000

FY 2006 Accomplishments
- 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.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Gigascale Design Center, University of California at Berkeley, Berkeley, CA	2.017	0.000	0.000	0.000

FY 2006 Accomplishments
- 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.
- Concepts of platform-centric design were translated from the digital domain to the analog/mixed signal regime and work started to formalize the approach.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
rcuits, Systems, and Software Focus Center, Carnegie Mellon University, Pittsburgh, PA	2.645	0.000	0.000	0.000

FY 2006 Accomplishments
- Robust design methodologies for enabling computation with unreliable or faulty components were investigated and interfaces defined.
- Applications of fin field effect transistors (FinFETs) were investigated, including dynamic and dc properties.

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Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Bio/Nano Electric Defense Devices and Sensors Program	0.000	1.200	0.000	0.000

FY 2007 Plan

- DARPA has not provided identification of performer has not been provided. No proposal has been received.

C. Other Program Funding Summary	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
0601101E Defense Research Sciences	127.893	145.239	152.622	156.242	0.000	0.000	0.000	0.000	0.000	581.996

Comment:

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.