



NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH CENTERS

FINAL Report

2009-2010 STRUCTURAL INFORMATION¹

- **TABLE 1:** GENERAL CENTER INFORMATION
- **TABLE 2:** OPERATING BUDGET: TOTAL FUNDING
- **TABLE 3:** CAPITAL AND IN-KIND SUPPORT
- **TABLE 4:** INDUSTRY MEMBERSHIP DESCRIPTORS
- **TABLE 5:** HUMAN RESOURCES
- **TABLE 6:** CENTER DIRECTOR DESCRIPTORS
- **TABLE 7:** CENTER OUTCOMES
- **TABLE 8:** INTELLECTUAL PROPERTY EVENTS
- **APPENDIX:** FOOTNOTES: SPECIAL CONSIDERATIONS
(Footnotes appear on top of columns and/or at end of rows for each table and are described in the appendix on the last page).

D.O. Gray, L. McGowen, & S.E. DeYoung-Winstead
DEPARTMENT OF PSYCHOLOGY
NORTH CAROLINA STATE UNIVERSITY

January, 2011

¹**NOTE:** 2009-2010 data collected from 42/42 Center Director Surveys (100% response rate).

*IUCRC Evaluation Project
North Carolina State University
Psychology Department, Box 7650
Raleigh, NC 27695-7650*

Phone: 919.515.3237
Fax: 919.515.1716
E-mail iucrc@ncsu.edu
Webpage <http://www.ncsu.edu/iucrc>

Table 1: 2009-2010 GENERAL CENTER INFORMATION* (Sorted Chronologically)

Yr Funded:	Center Name	University Name: Director	Partner University 1 Director	Partner University 2 Director	Partner University 3 Director	Partner University 4 Director
1999	Advanced Vehicle & Extreme Environment Electronics	Auburn Univ. Lall				
2000*	Biocatalysis & Bioprocessing of Macromolecules	Polytechnic Institute of New York Univ. Gross				
2001	Biomolecular Interaction Technologies	Univ. of New Hampshire Laue				
2001	Dielectric Studies	Pennsylvania State Univ. Randall	Missouri Univ. of Science & Tech. Dogan			
2001	Intelligent Maintenance Systems	Univ. of Cincinnati Lee	Univ. of Michigan Ni	Missouri Univ. of Science & Tech. Sarangapani		
2001*	Membrane Applied Science & Technology	Univ. of Colorado at Boulder Greenberg				
2002	Center for Excellence in Logistics and Distribution ^a	Univ. of Arkansas Meller	Univ. of Oklahoma Pulat	Oklahoma State Univ. Ingalls	Clemson Univ. Ferrell	Lehigh Univ. Zimmers
2002	Compact High-Performance Cooling Technologies	Purdue Univ. Garimella				
2002	Identification Technology Research	West Virginia Univ. Cukic / Ross	Univ. of Arizona Burgoon / Nunamaker	Clarkson Univ. Schuckers		
2002	Plasmas & Lasers in Advanced Manufacturing	Univ. of Virginia Gupta	Univ. of Michigan - Ann Arbor Mazumder	Southern Methodist Univ. Kovacevic	Univ. of Illinois, Urbana Champagne Ruzic	
2003	Communications Circuits & Systems	Arizona State Univ. Kiaei	Rensselaer Polytechnic Institute Shur	Ohio State Univ. Volakis	Univ. of Arizona Krunz	Univ. of Hawaii Iskander
2003	E-Design ^b	Virginia Tech Goff	Univ. of Massachusetts Krishnamurty	Univ. of Central Florida Geiger		
2003	Experimental Research in Computer Systems	Georgia Institute of Tech. Schwan	Ohio State Univ. Ramanathan			
2003	Fuel Cell Center	Univ. of South Carolina Van Zee	Univ. of Connecticut Anwar			
2004	Friction Stir Processing	South Dakota School of Mines and Tech Sorenson	Missouri Univ. of Science & Tech. Mishra	Brigham Young Univ. Nelson	Univ. of South Carolina Reynolds	Wichita State Univ. Burford
2004	Safety, Security, Rescue Research Center	Univ. of Minnesota Papanikolopoulos	Univ. of Pennsylvania Kumar	Univ. of Denver Andrews		
2004	Wireless Internet Center for Advanced Technology	Polytechnic Institute of New York Univ. Panwar	Univ. of Virginia Horowitz	Auburn Univ. Agrawal	Virginia Tech Bose	
2005	Child Injury Prevention Studies	Children's Hospital of Philadelphia Winston				
2005	Computational Materials Design	Pennsylvania State Univ. Liu	Georgia Institute of Tech. McDowell			
2005	Information Protection	Iowa State Univ. Jacobson				
2006	Center for High-Performance Reconfigurable Computing	Univ. of Florida George	Brigham Young Univ. Nelson	George Washington Univ. El-Ghazawi	Virginia Tech Athanas	

* Report sorted by Status, Organized by Year Funded; * = Last year funded by NSF

IUCRC Structure Database, FY 2009-2010

^a Centers are Phase III grant recipients that have had a break in their NSF IUCRC funding. They are formerly funded centers that recompeted for a third five year award.

^a: Additional Universities and Directors for the Center for Excellence in Logistics and Distribution are: Virginia Tech. (Ellis), Univ. of Missouri (Noble), Texas Tech. Univ. (Matis), and Arizona State Univ. (Villalobos)

^b: Dr. Goff is the acting Center Director for E-Design at the time of this report's publication. However, Dr. Terpenney was the Center Director for the reporting period.

^c: Additional Universities and Directors for the Center for Advanced Forestry Systems are: Univ. of Georgia (Kane), Univ. of Washington (Briggs), Univ. of Florida (Jokela), and Univ. of Idaho (Coleman)

^d: Additional Universities and Directors for the Power Systems Engineering Research Center are: Iowa State Univ. (McCalley), Wichita State Univ. (Jewell), Georgia Institute of Tech (Meliopoulos), Howard Univ. (Momoh), Univ. of Illinois Urbana-Champaign (Sauer), and Univ. of California Berkeley (Oren)

<i>Yr Funded:</i>	<i>Center Name</i>	<i>University Name: Director</i>	<i>Partner University 1 Director</i>	<i>Partner University 2 Director</i>	<i>Partner University 3 Director</i>	<i>Partner University 4 Director</i>
2006	Center for Minimally Invasive Diagnostics	Univ. of Minnesota Erdman	Univ. of Cincinnati Nistor / Doam			
2006	Precision Forming	Ohio State Univ. Altan	The Virginia Commonwealth Univ. Koc			
2007	Smart Vehicle Concepts	Ohio State Univ. Singh	Texas A&M Lagoudas			
2008	Advanced Forestry Systems ^C	North Carolina State Univ. Goldfarb	Oregon State Univ. Howe	Purdue Univ. Michler	Virginia Tech Fox	Univ. of Maine Wagner
2008	Autonomic Computing	Univ. of Florida Fortes	Rutgers Univ. Pompili	Univ. of Arizona Hariri	Mississippi State Univ Banicescu	
2009	Advanced Cutting Tools	Michigan State Univ. Kwon				
2009	Advanced Knowledge Enablement	Florida International Univ. Rishe	Florida Atlantic Univ. Furht			
2009	Advanced Space Technologies Research and Engineeri	Univ. of Florida Fitz-Coy	North Carolina A&T Edmonson			
2009	Advanced Sustainable Iron and Steel	Michigan Tech. Univ. Kawatra				
2009	Bioenergy Research and Development	South Dakota School of Mines and Tech Abata	Univ. of Hawaii Turn	State Univ. of New York; Stony Brook Mahajan	North Carolina State Univ. Peretti	
2009	Health Organization Transformation	Texas A&M Health Science Center Gamm	Georgia Institute of Tech. Lee	Northeastern Univ. Bennevan		
2009	Particulate and Surfactant Systems	Univ. of Florida Moudgil	Columbia Univ. Somasundaran			
2009	Silicon Solar Consortium	North Carolina State Univ. Rozgonyi	Georgia Institute of Tech. Rohatgi			
2010	Center for Hybrid Multicore Productivity Research	Univ. Maryland Baltimore County Halem	Georgia Institute of Tech. Bader	Univ. of California, San Diego Brown		
2010	Center for Research in Intelligent Storage	Univ. of Minnesota Du	Univ. of California, Santa Cruz Miller			
2010	Electromagnetic Compatibility	Missouri Univ. of Science & Tech. DuBroof	Univ. of Houston Chen	Clemson Univ. Hubing	Univ. Of Oklahoma Grant	
2010	Embedded Systems	Arizona State Univ. Vrudhula	Southern Illinois Univ. Carbondale Trağoudas			
2010	Grid-Connected Advanced Power Electronic Systems	Univ. of Arkansas Mantooth	Univ. of South Carolina Dougal			
2010	Integration of Composites into Infrastructure	West Virginia Univ. GangaRao	Rutgers Univ. Balaguru	Univ. of Miami Nanni	North Carolina State Univ. Rizkalla	
2010	Net-Centrics Systems	Univ. of North Texas Kavi	Univ. of Texas, Dallas Bastani	Arizona State Univ. Spanias		
2010	Water and Environmental Technology	Temple Univ. Suri	Univ. of Arizona Pepper	Arizona State Univ. Abbaszadegan		

* Report sorted by Status, Organized by Year Funded; * = Last year funded by NSF

IUCRC Structure Database, FY 2009-2010

^A Centers are Phase III grant recipients that have had a break in their NSF IUCRC funding. They are formerly funded centers that recompeted for a third five year award.

^a: Additional Universities and Directors for the Center for Excellence in Logistics and Distribution are: Virginia Tech. (Ellis), Univ. of Missouri (Noble), Texas Tech. Univ. (Matis), and Arizona State Univ. (Villalobos)

^b: Dr. Goff is the acting Center Director for E-Design at the time of this report's publication. However, Dr. Terpeny was the Center Director for the reporting period.

^c: Additional Universities and Directors for the Center for Advanced Forestry Systems are: Univ. of Georgia (Kane), Univ. of Washington (Briggs), Univ. of Florida (Jokela), and Univ. of Idaho (Coleman)

^d: Additional Universities and Directors for the Power Systems Engineering Research Center are: Iowa State Univ. (McCalley), Wichita State Univ. (Jewell), Georgia Institute of Tech (Meliopoulos), Howard Univ. (Momoh), Univ. of Illinois Urbana-Champaign (Sauer), and Univ. of California Berkeley (Oren)

<i>Yr Funded:</i>	<i>Center Name</i>	<i>University Name: Director</i>	<i>Partner University 1 Director</i>	<i>Partner University 2 Director</i>	<i>Partner University 3 Director</i>	<i>Partner University 4 Director</i>
New						
2011	Center for Surveillance Research	Ohio State Univ. Potter	Wright State Univ. Rigling			
2011	Ceramics Composites and Optical Materials Center	Clemson Univ. Smith	Rutgers Univ. Haber			
2011	Energy Harvesting Materials and Systems	Virginia Tech	Univ. of Texas - Dallas			
2011	Integrative Joining of Materials for Energy Applications	Ohio State Univ. Babu	Univ. of Wisconsin - Madison Kou	Lehigh Univ. DuPont	Colorado School of Mines Liu	
2011	Membrane Science, Engineering & Technology Center	New Jersey Institute of Technology Sirkar	Univ. of Colorado at Boulder Greenberg			
2011	Next Generation Photovoltaics	Colorado State Univ. Sampath				
2011	Pharmaceutical Development	Georgia Institute of Tech. Bommarius	Univ. of Kentucky Munson			
2011	Plug-In Hybrid Electric Vehicles	Univ. of Texas at Austin Waller	Texas A&M Kezunovic			
2011	Resource Recovery and Recycling	Worcester Polytechnic Institute Apelian	Colorado School of Mines Mishra			
2011	Security and Software Engineering Research Center	Ball State Univ. Zage	Iowa State Univ. Jacobson			
2011	Water Equipment and Policy	Univ. Wisconsin-Milwaukee Christensen	Marquette Univ. Switzenbaum			
2011	Wood-Based Composites	Virginia Tech. Frazier	Oregon State Univ. Kamke			
Recompeted						
2011 ^a	Advanced Processing and Packaging Studies	Ohio State Univ. Schwartz	North Carolina State Univ. Sandeep			
2011 ^a	Design of Analog/Digital Integrated Circuits	Washington State Univ. Ringo	Univ. of Washington Darling	Oregon State Univ. Hanumolu		
2011 ^a	Nondestructive Evaluation	Iowa State Univ. Thompson				
2011 ^a	Power Systems Engineering Research Center ^d	Arizona State Univ. Vittal	Cornell Univ. Mount	Texas A&M Kezunovic	Washington State Univ. Bose	Univ. Wisconsin-Madison DeMarco

* Report sorted by Status, Organized by Year Funded; * = Last year funded by NSF

IUCRC Structure Database, FY 2009-2010

^a Centers are Phase III grant recipients that have had a break in their NSF IUCRC funding. They are formerly funded centers that recompeted for a third five year award.

^a: Additional Universities and Directors for the Center for Excellence in Logistics and Distribution are: Virginia Tech. (Ellis), Univ. of Missouri (Noble), Texas Tech. Univ. (Matis), and Arizona State Univ. (Villalobos)

^b: Dr. Goff is the acting Center Director for E-Design at the time of this report's publication. However, Dr. Terpeny was the Center Director for the reporting period.

^c: Additional Universities and Directors for the Center for Advanced Forestry Systems are: Univ. of Georgia (Kane), Univ. of Washington (Briggs), Univ. of Florida (Jokela), and Univ. of Idaho (Coleman)

^d: Additional Universities and Directors for the Power Systems Engineering Research Center are: Iowa State Univ. (McCalley), Wichita State Univ. (Jewell), Georgia Institute of Tech (Meliopoulos), Howard Univ. (Momoh), Univ. of Illinois Urbana-Champaign (Sauer), and Univ. of California Berkeley (Oren)

Table 2: 2009-2010 OPERATING BUDGET AND TOTAL FUNDING

Center Name	Total ⁴ Funding	NSF ⁵		INDUSTRY		State ⁸	University ⁹	OTHER ¹⁰		
		NSF/ IUCRC	Other NSF	Member ⁶ Fees	Addl ⁷ Industry			Other ¹¹ Federal	Non- ¹² Federal	Other Cash
Advanced Cutting Tools	\$160,000	\$70,000	\$0	\$90,000	\$0	\$0	\$0	\$0	\$0	\$0
Advanced Forestry Systems	\$7,195,640	\$947,600	\$67,350	\$3,078,047	\$70,000	\$290,000	\$1,255,143	\$1,110,000	\$377,500	\$0
Advanced Knowledge Enablement	\$605,850	\$233,000	\$0	\$322,850	\$0	\$0	\$0	\$0	\$0	\$50,000
Advanced Space Technologies Research and	\$535,000	\$125,000	\$0	\$330,000	\$0	\$0	\$80,000	\$0	\$0	\$0
Advanced Sustainable Iron and Steel	\$851,367	\$145,969	\$99,950	\$60,000	\$0	\$99,441	\$0	\$436,007	\$10,000	\$0
Advanced Vehicle & Extreme Environment Ele	\$2,144,104	\$29,000	\$0	\$2,115,104	\$0	\$0	\$0	\$0	\$0	\$0
Autonomic Computing	\$3,273,463	\$877,944	\$720,000	\$507,525	\$70,000	\$0	\$257,994	\$840,000	\$0	\$0
Biocatalysis & Bioprocessing of Macromolecul	\$237,500	\$37,500	\$0	\$200,000	\$0	\$0	\$0	\$0	\$0	\$0
Bioenergy Research and Development	\$1,584,000	\$391,000	\$10,000	\$583,000	\$80,000	\$100,000	\$20,000	\$50,000	\$50,000	\$300,000
Biomolecular Interaction Technologies	\$143,000	\$43,000	\$0	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0
Center for Excellence in Logistics and Distribut	\$2,710,659	\$452,999	\$0	\$1,486,581	\$7,000	\$10,000	\$224,600	\$454,479	\$10,000	\$65,000
Center for High-Performance Reconfigurable C	\$4,129,925	\$314,000	\$872,696	\$1,454,407	\$50,000	\$0	\$1,258,822	\$180,000	\$0	\$0
Center for Hybrid Multicore Productivity Resea	\$1,152,033	\$228,033	\$0	\$384,000	\$360,000	\$0	\$0	\$180,000	\$0	\$0
Center for Minimally Invasive Diagnostics	\$360,000	\$110,000	\$0	\$200,000	\$0	\$0	\$50,000	\$0	\$0	\$0
Center for Research in Intelligent Storage	\$1,899,000	\$135,000	\$1,064,000	\$400,000	\$0	\$0	\$0	\$300,000	\$0	\$0
Child Injury Prevention Studies	\$682,076	\$152,076	\$0	\$530,000	\$0	\$0	\$0	\$0	\$0	\$0
Communications Circuits & Systems	\$1,940,367	\$358,000	\$0	\$1,347,367	\$50,000	\$40,000	\$45,000	\$100,000	\$0	\$0
Compact High-Performance Cooling Technolo	\$3,362,250	\$176,000	\$200,000	\$450,000	\$500,000	\$900,000	\$236,250	\$900,000	\$0	\$0
Computational Materials Design	\$497,500	\$110,000	\$0	\$355,500	\$0	\$0	\$32,000	\$0	\$0	\$0
Dielectric Studies	\$1,182,000	\$308,000	\$88,000	\$645,000	\$50,000	\$0	\$91,000	\$0	\$0	\$0
E-Design	\$1,066,406	\$367,500	\$230,000	\$324,100	\$0	\$0	\$144,806	\$0	\$0	\$0
Electromagnetic Compatibility	\$2,202,991	\$240,771	\$414,890	\$960,000	\$299,830	\$0	\$37,500	\$250,000	\$0	\$0
Embedded Systems	\$491,101	\$110,000	\$0	\$320,000	\$0	\$0	\$61,101	\$0	\$0	\$0
Experimental Research in Computer Systems	\$670,084	\$300,122	\$0	\$165,000	\$204,962	\$0	\$0	\$0	\$0	\$0
Friction Stir Processing	\$1,847,838	\$290,500	\$80,000	\$805,000	\$0	\$259,323	\$348,015	\$35,000	\$0	\$30,000
Fuel Cell Center	\$435,500	\$103,000	\$0	\$332,500	\$0	\$0	\$0	\$0	\$0	\$0
Grid-Connected Advanced Power Electronic S	\$815,667	\$229,000	\$0	\$566,667	\$0	\$0	\$20,000	\$0	\$0	\$0
Health Organization Transformation	\$820,000	\$84,000	\$0	\$550,000	\$0	\$0	\$186,000	\$0	\$0	\$0
Identification Technology Research	\$5,082,644	\$113,000	\$512,017	\$1,160,874	\$0	\$250,000	\$68,446	\$2,708,307	\$270,000	\$0
Information Protection	\$120,000	\$60,000	\$0	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0
Integration of Composites into Infrastructure	\$1,052,000	\$547,000	\$0	\$482,500	\$0	\$0	\$22,500	\$0	\$0	\$0
Intelligent Maintenance Systems	\$1,997,880	\$162,000	\$500,000	\$628,000	\$372,080	\$0	\$25,500	\$117,000	\$0	\$193,300
Membrane Applied Science & Technology	\$750,471	\$43,000	\$65,214	\$592,257	\$0	\$0	\$50,000	\$0	\$0	\$0
Net-Centrics Systems	\$486,793	\$141,793	\$0	\$310,000	\$0	\$0	\$35,000	\$0	\$0	\$0
Particulate and Surfactant Systems	\$1,018,540	\$260,000	\$0	\$379,500	\$213,000	\$0	\$96,040	\$60,000	\$0	\$10,000
Plasmas & Lasers in Advanced Manufacturing	\$1,356,413	\$225,500	\$0	\$530,320	\$0	\$0	\$176,385	\$424,208	\$0	\$0
Precision Forming	\$805,000	\$135,000	\$0	\$325,000	\$80,000	\$100,000	\$160,000	\$0	\$0	\$5,000
Safety, Security, Rescue Research Center	\$692,000	\$261,000	\$0	\$281,000	\$150,000	\$0	\$0	\$0	\$0	\$0
Silicon Solar Consortium	\$709,000	\$139,000	\$0	\$570,000	\$0	\$0	\$0	\$0	\$0	\$0
Smart Vehicle Concepts	\$1,153,000	\$130,000	\$150,000	\$555,000	\$0	\$50,000	\$258,000	\$10,000	\$0	\$0
Water and Environmental Technology	\$2,443,000	\$256,000	\$0	\$492,000	\$7,000	\$1,488,000	\$60,000	\$0	\$0	\$140,000
Wireless Internet Center for Advanced Technol	\$11,915,138	\$463,000	\$3,006,853	\$1,271,000	\$290,490	\$0	\$314,000	\$6,569,795	\$0	\$0
Grand Mean	\$1,728,029	\$235,841	\$192,404	\$626,193	\$67,961	\$85,399	\$133,669	\$350,590	\$17,083	\$18,888
Grand Sum	\$72,577,200	\$9,905,307	\$8,080,970	\$26,300,099	\$2,854,362	\$3,586,764	\$5,614,102	\$14,724,796	\$717,500	\$793,300

* Report sorted Alphabetically by Center

IUCRC Structure Database, FY 2009-2010

Table 3: 2009-2010 CAPITAL AND IN-KIND SUPPORT

CenterName	Capital and In-Kind Support ¹³						Overhead		Budget	
	Total Funding	Total Cap In-Kind	Equipment	Facilities	Personnel	Software	Other Support	% to Mem ¹⁴	Typical ¹⁵	Admin ¹⁶
Advanced Cutting Tools	\$160,000	\$6,000	\$1,000	\$3,000	\$2,000	\$0	\$0	0	52	0
Advanced Forestry Systems	\$7,195,640	\$1,527,021	\$510,000	\$565,000	\$318,021	\$14,000	\$120,000	0	49	3
Advanced Knowledge Enablement	\$605,850	\$490,000	\$300,000	\$50,000	\$0	\$140,000	\$0	0	44	20
Advanced Space Technologies Research and E	\$535,000	\$0	\$0	\$0	\$0	\$0	\$0	0	48	30
Advanced Sustainable Iron and Steel	\$851,367	\$0	\$0	\$0	\$0	\$0	\$0	0	52	5
Advanced Vehicle & Extreme Environment Elec	\$2,144,104	\$0	\$0	\$0	\$0	\$0	\$0	10	46	1.3991859
Autonomic Computing	\$3,273,463	\$112,500	\$25,000	\$10,000	\$10,000	\$10,000	\$57,500	0	46.5	25
Biocatalysis & Bioprocessing of Macromolecul	\$237,500	\$225,000	\$0	\$100,000	\$125,000	\$0	\$0	10	37	5
Bioenergy Research and Development	\$1,584,000	\$325,000	\$15,000	\$105,000	\$200,000	\$0	\$5,000	0	47	2.5
Biomolecular Interaction Technologies	\$143,000	\$500,000	\$500,000	\$0	\$0	\$0	\$0	11	45	20
Center for Excellence in Logistics and Distributi	\$2,710,659	\$40,000	\$0	\$0	\$40,000	\$0	\$0	16	46	10
Center for High-Performance Reconfigurable Co	\$4,129,925	\$2,131,280	\$931,280	\$0	\$0	\$1,200,000	\$0	0	46.5	10
Center for Hybrid Multicore Productivity Resear	\$1,152,033	\$389,000	\$260,000	\$24,000	\$60,000	\$5,000	\$40,000	10	48	10
Center for Minimally Invasive Diagnostics ^a	\$360,000	\$0	\$0	\$0	\$0	\$0	\$0	49.5	49.5	20
Center for Research in Intelligent Storage	\$1,899,000	\$5,000	\$5,000	\$0	\$0	\$0	\$0	10	51	10
Child Injury Prevention Studies	\$682,076	\$0	\$0	\$0	\$0	\$0	\$0	0	65	10
Communications Circuits & Systems	\$1,940,367	\$9,108,300	\$5,000,000	\$4,000,000	\$108,300	\$0	\$0	10	52.5	25
Compact High-Performance Cooling Technologi	\$3,362,250	\$0	\$0	\$0	\$0	\$0	\$0	0	54	5
Computational Materials Design	\$497,500	\$0	\$0	\$0	\$0	\$0	\$0	0	48	17
Dielectric Studies	\$1,182,000	\$0	\$0	\$0	\$0	\$0	\$0	0	51	10
E-Design	\$1,066,406	\$829,300	\$305,000	\$6,000	\$20,000	\$167,250	\$331,050	0	58.5	6
Electromagnetic Compatibility	\$2,202,991	\$204,000	\$200,000	\$0	\$0	\$4,000	\$0	0	51	10
Embedded Systems	\$491,101	\$0	\$0	\$0	\$0	\$0	\$0	10	52.5	34
Experimental Research in Computer Systems	\$670,084	\$0	\$0	\$0	\$0	\$0	\$0	0	50.5	5
Friction Stir Processing	\$1,847,838	\$85,000	\$0	\$0	\$0	\$0	\$85,000	0	47	10
Fuel Cell Center	\$435,500	\$0	\$0	\$0	\$0	\$0	\$0	0	45	25
Grid-Connected Advanced Power Electronic Sy	\$815,667	\$20,100	\$20,100	\$0	\$0	\$0	\$0	10	42	20
Health Organization Transformation	\$820,000	\$426,000	\$0	\$12,000	\$310,000	\$0	\$104,000	10	47	2
Identification Technology Research	\$5,082,644	\$39,260	\$9,130	\$0	\$16,000	\$9,130	\$5,000	0	46.5	1.7
Information Protection	\$120,000	\$0	\$0	\$0	\$0	\$0	\$0	8	48	40
Integration of Composites into Infrastructure	\$1,052,000	\$0	\$0	\$0	\$0	\$0	\$0	0	46.5	25
Intelligent Maintenance Systems	\$1,997,880	\$42,000	\$12,000	\$0	\$30,000	\$0	\$0	0	57	10
Membrane Applied Science & Technology	\$750,471	\$0	\$0	\$0	\$0	\$0	\$0	6	51.5	18
Net-Centrics Systems	\$486,793	\$78,053	\$0	\$0	\$78,053	\$0	\$0	0	47	10
Particulate and Surfactant Systems	\$1,018,540	\$69,507	\$66,263	\$0	\$0	\$3,244	\$0	0	47	33
Plasmas & Lasers in Advanced Manufacturing	\$1,356,413	\$100,000	\$100,000	\$0	\$0	\$0	\$0	0	54	18
Precision Forming	\$805,000	\$270,000	\$50,000	\$20,000	\$0	\$200,000	\$0	10	50	5
Safety, Security, Rescue Research Center	\$692,000	\$1,375,000	\$485,000	\$145,000	\$110,000	\$110,000	\$525,000	25	51	5
Silicon Solar Consortium	\$709,000	\$0	\$0	\$0	\$0	\$0	\$0	9.5	50	25
Smart Vehicle Concepts	\$1,153,000	\$45,000	\$0	\$0	\$45,000	\$0	\$0	11	52	13
Water and Environmental Technology	\$2,443,000	\$0	\$0	\$0	\$0	\$0	\$0	10	52	7
Wireless Internet Center for Advanced Technolo	\$11,915,138	\$60,000	\$0	\$0	\$60,000	\$0	\$0	10	37	20
Grand Mean	\$1,728,029	\$440,531	\$209,399	\$120,000	\$36,485	\$44,348	\$30,299	5.86	49.07	13.85
Grand Sum	\$72,577,200	\$18,502,321	\$8,794,773	\$5,040,000	\$1,532,374	\$1,862,624	\$1,272,550	N/A	N/A	N/A

* Report sorted Alphabetically by Center
a: University does not reduce overhead, but matches 25% of membership fees

Table 4: 2009-2010 INDUSTRY MEMBERSHIP DESCRIPTORS

<i>CenterName</i>	<i>2009-2010 MEMBERS</i>			<i>LIFETIME MEMBERS</i>			<i>ANNUAL FEES</i>			
	<i>Current Members</i>	<i>Starting</i>	<i>New</i>	<i>Left</i>	<i>Starting</i>	<i>New</i>	<i>Left</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
Advanced Cutting Tools	3	6	0	3	6	6	3	\$30,000	\$15,000	
Advanced Forestry Systems	99	89	18	8	68	119	20	\$25,000	\$5,000	
Advanced Knowledge Enablement	18	13	8	3	10	18	3	\$24,000		
Advanced Space Technologies Research and E	8	11	0	3	11	11	3	\$35,000	\$15,000	
Advanced Sustainable Iron and Steel	7	7	2	2	7	9	2	\$50,000	\$25,000	
Advanced Vehicle & Extreme Environment Elec	17	24	3	10	11	39	33	\$75,000	\$37,500	
Autonomic Computing	10	13	18	6	13	33	8	\$35,000		
Biocatalysis & Bioprocessing of Macromolecul	4	4	0	0	7	9	10	\$50,000	\$25,000	
Bioenergy Research and Development	23	16	9	2	16	25	2	\$50,000	\$20,000	
Biomolecular Interaction Technologies	11	11	0	0	8	15	12	\$30,000	\$20,000	\$10,000
Center for Excellence in Logistics and Distributi	24	28	8	12	29	73	83	\$50,000	\$25,000	\$5,000
Center for High-Performance Reconfigurable Co	33	27	12	6	21	62	19	\$35,000		
Center for Hybrid Multicore Productivity Resear	14	0	0	0	14	14	0	\$40,000	\$20,000	
Center for Minimally Invasive Diagnostics	1	4	0	3	7	8	7	\$50,000		
Center for Research in Intelligent Storage	8	0	0	0	8	8	0	\$50,000		
Child Injury Prevention Studies	12	9	3	0	6	7	1	\$50,000	\$25,000	\$15,000
Communications Circuits & Systems	24	26	9	11	9	38	23	\$50,000		
Compact High-Performance Cooling Technologi	18	19	2	3	14	21	20	\$30,000		
Computational Materials Design	10	11	1	2	10	15	5	\$39,000	\$15,000	
Dielectric Studies	19	23	2	6	18	29	24	\$35,000	\$10,000	
E-Design	19	20	1	2	9	38	26	\$30,000		
Electromagnetic Compatibility	15	0	0	0	15	15	0	\$60,000		
Embedded Systems	7	0	0	0	7	7	0	\$50,000		
Experimental Research in Computer Systems	19	14	10	5	8	25	10	\$45,000	\$5,000	
Friction Stir Processing	25	25	3	3	20	28	18	\$35,000	\$30,000	
Fuel Cell Center	11	8	5	2	14	15	18	\$35,000		
Grid-Connected Advanced Power Electronic Sy	17	0	0	0	17	17	0	\$40,000	\$5,000	
Health Organization Transformation	12	10	3	1	10	13	1	\$50,000		
Identification Technology Research	27	26	5	4	8	38	18	\$40,000	\$30,000	
Information Protection	3	4	0	1	11	14	11	\$30,000	\$15,000	
Integration of Composites into Infrastructure	15	0	0	0	15	15	0	\$50,000	\$40,000	\$15,000
Intelligent Maintenance Systems	31	33	4	6	25	58	54	\$40,000	\$12,000	
Membrane Applied Science & Technology	12	8	4	0	36	36	32	\$50,000		
Net-Centrics Systems	12	0	0	0	12	12	0	\$30,000	\$10,000	
Particulate and Surfactant Systems	27	42	2	17	43	45	17	\$25,000	\$15,000	\$5,000
Plasmas & Lasers in Advanced Manufacturing	22	21	3	2	9	33	15	\$30,000	\$10,000	
Precision Forming	15	14	2	1	18	27	12	\$30,000	\$15,000	\$10,000
Safety, Security, Rescue Research Center	10	10	3	3	7	22	21	\$35,000	\$10,000	
Silicon Solar Consortium	18	15	7	4	15	22	4	\$50,000	\$25,000	\$10,000
Smart Vehicle Concepts	18	14	5	1	14	22	4	\$40,000	\$10,000	
Water and Environmental Technology	33	0	0	0	33	33	0	\$30,000	\$10,000	\$3,000
Wireless Internet Center for Advanced Technolo	35	33	8	6	7	49	15	\$40,000		
Grand Mean	18.24	15.19	3.81	3.29	15.38	27.21	13.19	\$40,429	\$17,839	\$9,125
Grand Sum	766	638	160	138	646	1143	554			

* Report sorted Alphabetically by Center

IUCRC Structure Database, FY 2009-2010

Table 5: 2009-2010 HUMAN RESOURCES

Center Name	RESEARCHERS				STUDENTS		
	Faculty ¹⁸ Scientists	Administrative	Post Docs	Research Staff	PhD	Masters	Undergraduate
Advanced Cutting Tools	2	0	0	0	3	0	2
Advanced Forestry Systems	37	5	7	18	26	17	19
Advanced Knowledge Enablement	15	1	0	7	10	3	2
Advanced Space Technologies Research and Engineering Cent 10		1	0	0	8	3	0
Advanced Sustainable Iron and Steel	5	1	0	1	8	0	3
Advanced Vehicle & Extreme Environment Electronics	18	3	2	0	14	22	6
Autonomic Computing	9	2	2	3	16	15	3
Biocatalysis & Bioprocessing of Macromolecules	3	1	4	0	10	0	0
Bioenergy Research and Development	34	0	2	3	13	5	12
Biomolecular Interaction Technologies	3	1	1	1	3	0	5
Center for Excellence in Logistics and Distribution	44	1	3	1	25	27	12
Center for High-Performance Reconfigurable Computing	15	3	1	2	38	16	11
Center for Hybrid Multicore Productivity Research	17	0	1	5	5	4	3
Center for Minimally Invasive Diagnostics	8	2	1	0	3	3	11
Center for Research in Intelligent Storage	10	2	2	1	16	8	6
Child Injury Prevention Studies	21	1	0	4	2	5	1
Communications Circuits & Systems	28	2	3	6	42	11	3
Compact High-Performance Cooling Technologies	14	1	5	2	20	5	1
Computational Materials Design	13	3	1	0	13	1	0
Dielectric Studies	17	2	6	4	8	2	4
E-Design	14	0	2	1	7	3	1
Electromagnetic Compatibility	14	1	8	2	20	22	2
Embedded Systems	10	1	0	0	13	6	1
Experimental Research in Computer Systems	24	1	0	3	62	56	1
Friction Stir Processing	17	3	4	6	10	19	31
Fuel Cell Center	10	2	2	0	10	1	3
Grid-Connected Advanced Power Electronic Systems	8	4	2	3	7	4	2
Health Organization Transformation	18	4	0	0	24	22	15
Identification Technology Research	20	3	3	8	25	9	21
Information Protection	4	2	0	0	0	2	0
Integration of Composites into Infrastructure	18	4	3	4	13	15	5
Intelligent Maintenance Systems	5	3	5	3	25	6	0
Membrane Applied Science & Technology	12	1	1	0	12	3	0
Net-Centrics Systems	22	1	1	0	14	9	7
Particulate and Surfactant Systems	18	5	8	7	13	2	4
Plasmas & Lasers in Advanced Manufacturing	5	2	4	3	15	4	6
Precision Forming	2	1	4	0	11	9	0
Safety, Security, Rescue Research Center	16	0	2	3	13	9	2
Silicon Solar Consortium	5	2	3	3	11	0	0
Smart Vehicle Concepts	6	2	1	2	11	6	13
Water and Environmental Technology	16	2	7	4	12	8	8
Wireless Internet Center for Advanced Technology	32	5	4	3	64	31	17
Grand Mean	14.74	1.93	2.50	2.69	16.07	9.36	5.79
Grand Sum	619	81	105	113	675	393	243

* Report sorted Alphabetically by Center

Table 6: 2009-2010 CENTER DIRECTOR DESCRIPTORS

*Includes only primary center director				TIME ALLOCATION				
CenterName	Rank	Tenur	Reports To	Center Admin	Other Admin	Research	Teaching	Other
Advanced Cutting Tools	Full Professor	Tenured	Dean	20	10	35	25	10
Advanced Forestry Systems	Full Professor	Tenured	Dean	10	75	5	5	5
Advanced Knowledge Enablement	Full Professor	Tenured	Interim Director	10	10	40	20	20
Advanced Space Technologies Research and En	Associate Professor	Tenured	College of Engineering Dean	35	25	10	25	5
Advanced Sustainable Iron and Steel	Full Professor	Tenured	Vice President for Research, MTU	10	50	15	20	5
Advanced Vehicle & Extreme Environment Electr	Full Professor	Tenured	Dean	15	0	50	30	5
Autonomic Computing	Full Professor	Tenured	Department Chair	5	5	75	10	5
Biocatalysis & Bioprocessing of Macromolecules	Full Professor	Tenured	Provost	25	20	40	10	5
Bioenergy Research and Development	Full Professor	Tenured	Vice President for Academic Affairs	5	5	10	70	10
Biomolecular Interaction Technologies	Full Professor	Tenured	Dean	20	10	40	30	0
Center for Excellence in Logistics and Distributio	Full Professor	Tenured	Department Head	25	10	30	35	0
Center for High-Performance Reconfigurable Co	Full Professor	Tenured	Department Chair	15	5	50	25	5
Center for Hybrid Multicore Productivity Researc	Full Professor	Non-tenure Track	Chair of Computer Science and Electrical E	25	10	40	15	10
Center for Minimally Invasive Diagnostics	Full Professor	Tenured	Department of Mechanical Engineering	4	16	50	20	10
Center for Research in Intelligent Storage	Full Professor	Tenured	Department Head	15	5	45	30	5
Child Injury Prevention Studies	Full Professor	Tenured	Chief Scientific Officer	5	15	60	0	20
Communications Circuits & Systems	Full Professor	Tenured	Department Chair	15	15	30	20	20
Compact High-Performance Cooling Technolog	Full Professor	Tenured	Department Head	15	5	55	20	5
Computational Materials Design	Full Professor	Tenured	Department Head	20	0	70	10	0
Dielectric Studies	Full Professor	Tenured	Director of Materials Research Institute	10	1	40	40	9
E-Design	Full Professor	Tenured	Dean for College of Engineering	25	5	35	30	5
Electromagnetic Compatibility	Full Professor	Tenured	Chairman of Electrical and Computer Engin	45	5	5	40	5
Embedded Systems	Full Professor	Tenured	Director	15	15	40	15	15
Experimental Research in Computer Systems	Full Professor	Tenured	Vice President for Research	10	10	40	30	10
Friction Stir Processing	Full Professor	Tenured	Chair, Department of Mechanical Engineeri	15	15	35	35	0
Fuel Cell Center	Full Professor	Tenured	Chair, Department of Chemical Engineerin	15	0	60	25	0
Grid-Connected Advanced Power Electronic Syst	Full Professor	Tenured	Electrical Engineering Department Head	15	15	30	25	15
Health Organization Transformation	Full Professor	Tenured	Dean	15	25	35	25	0
Identification Technology Research	Full Professor	Tenured	VP for Rsrch & Econ. Dev.	20	0	40	30	10
Information Protection	Full Professor	Tenured	Vice Provost for Rsrch & Econ. Dev.	15	30	25	25	5
Integration of Composites into Infrastructure	Full Professor	Tenured	Dean	4	6	60	20	10
Intelligent Maintenance Systems	Full Professor	Tenured	Department Head	50	0	20	20	10
Membrane Applied Science & Technology	Full Professor	Tenured	Department Chair	20	25	35	15	5
Net-Centrics Systems	Full Professor	Tenured	Dean, College of Engineering	15	10	40	30	5
Particulate and Surfactant Systems	Full Professor	Tenured	Dean of College of Engineering	1	9	35	50	5
Plasmas & Lasers in Advanced Manufacturing	Full Professor	Tenured	Department Chair and to Dean of Engineeri	12	5	50	30	3
Precision Forming	Full Professor	Tenured	Dept. Chair	20	10	30	30	10
Safety, Security, Rescue Research Center	Full Professor	Tenured	Department Head	5	10	60	15	10
Silicon Solar Consortium	Full Professor	Tenured	Department Head	8	16	33	33	10
Smart Vehicle Concepts	Full Professor	Tenured	MAE Dept. Chair and College Dean	22	0	38	30	10
Water and Environmental Technology	Associate Professor	Tenured	Dean of College of Engineering	30	5	35	25	5
Wireless Internet Center for Advanced Technolog	Full Professor	Tenured	Assoc. Provost, Research & Technology In	10	20	50	15	5
Grand Mean				16.45	12.57	38.60	25.07	7.31

* Report sorted Alphabetically by Center

Table 7: 2009-2010 CENTER OUTCOMES

Center Name:	STUDENTS RECEIVING DEGREE ²⁰			STUDENTS HIRED BY INDUSTRY ²¹			PUBLICATIONS ²²		
	BS Grad	MS Grad	PhD Grad	BS Hired	MS Hired	PhD Hired	w/ Ctr Research	w/ IAB Members	Presentations
	Advanced Cutting Tools	0	0	1	0	0	0	0	0
Advanced Forestry Systems	11	3	11	1	2	1	49	4	116
Advanced Knowledge Enablement	1	2	1	0	1	0	6	3	11
Advanced Space Technologies Research and Engineering Ce	1	5	1	0	0	1	3	5	9
Advanced Sustainable Iron and Steel	0	0	0	0	0	0	9	0	14
Advanced Vehicle & Extreme Environment Electronics	0	6	2	0	0	0	42	6	22
Autonomic Computing	2	8	6	0	0	3	23	5	19
Biocatalysis & Bioprocessing of Macromolecules	3	6	2	0	0	0	14	0	12
Bioenergy Research and Development	0	0	1	0	0	0	0	0	20
Biomolecular Interaction Technologies	1	0	0	0	0	0	2	0	2
Center for Excellence in Logistics and Distribution	19	11	2	2	0	0	14	0	35
Center for High-Performance Reconfigurable Computing	10	11	5	1	1	3	31	0	24
Center for Hybrid Multicore Productivity Research	0	2	0	0	0	0	34	0	24
Center for Minimally Invasive Diagnostics	0	0	1	0	0	0	1	0	0
Center for Research in Intelligent Storage	4	6	4	4	0	6	15	3	15
Child Injury Prevention Studies	0	0	0	0	0	0	8	2	19
Communications Circuits & Systems	0	8	10	0	2	3	81	8	95
Compact High-Performance Cooling Technologies	1	0	5	0	0	3	48	3	31
Computational Materials Design	0	0	1	0	0	1	10	1	117
Dielectric Studies	0	1	0	0	1	3	29	0	24
E-Design	3	4	5	4	3	3	26	0	23
Electromagnetic Compatibility	0	10	5	0	5	1	12	4	47
Embedded Systems	1	2	1	0	0	0	7	0	7
Experimental Research in Computer Systems	4	28	10	0	2	0	0	5	0
Friction Stir Processing	14	6	3	1	1	0	31	15	27
Fuel Cell Center	1	0	2	0	0	0	13	1	8
Grid-Connected Advanced Power Electronic Systems	0	0	0	1	0	0	0	0	0
Health Organization Transformation	3	6	1	0	5	4	13	4	34
Identification Technology Research	11	9	1	3	1	1	65	6	19
Information Protection	0	0	0	0	0	0	0	0	3
Integration of Composites into Infrastructure	2	4	5	0	0	2	56	3	29
Intelligent Maintenance Systems	0	1	8	0	1	4	25	0	16
Membrane Applied Science & Technology	0	0	2	0	0	0	8	2	15
Net-Centrics Systems	5	2	2	2	0	0	19	4	60
Particulate and Surfactant Systems	1	2	3	0	1	1	11	0	22
Plasmas & Lasers in Advanced Manufacturing	0	0	9	0	0	3	28	0	23
Precision Forming	3	8	5	0	0	0	58	4	27
Safety, Security, Rescue Research Center	1	5	4	0	0	0	47	4	29
Silicon Solar Consortium	0	0	0	0	1	0	2	1	25
Smart Vehicle Concepts	3	5	2	0	0	0	1	0	10
Water and Environmental Technology	2	2	5	0	1	1	16	3	43
Wireless Internet Center for Advanced Technology	13	18	18	1	1	3	96	1	113
Grand Mean	2.86	4.31	3.43	0.48	0.69	1.12	22.69	2.31	28.31
Grand Sum	120	181	144	20	29	47	953	97	1189

* Report sorted by Alphabetically by Center

Table 8: 2009-2010 INTELLECTUAL PROPERTY EVENTS

Table 8: Centers Reporting One or More Intellectual Property Event Last Fiscal Year

Intellectual Property Event	# of Centers	% of Centers
Invention Disclosures	10	24%
Patent Applications	13	31%
Software Copyrights	2	5%
Patents Granted/Derived	7	17%
Licensing Agreements	5	12%
Royalties Realized	2	5%

Table 8: Total Number and Means of Intellectual Property Events Last Fiscal Year

Intellectual Property Event	Total for all Centers	Mean for All Centers
Invention Disclosures	33	0.79
Patent Applications	34	0.81
Software Copyrights	2	0.05
Patents Granted/Derived	11	0.26
Licensing Agreements	8	0.19
Royalties Realized	5	0.12

APPENDIX

FOOTNOTES AND SPECIAL CONSIDERATIONS

Footnotes appear on top of columns and/or at end of rows for each Table and are described in this Appendix.

- 1) All averages and sums exclude missing data. With the exception of percentages, data from multi-university centers has been aggregated across universities; percentages represent averages for the reporting universities.
- 2) This report includes only data on Centers which were considered active participants in the NSF IUCRC Program during the 2009-2010 fiscal year.
- 3) On Table 1, "YEAR FUNDED" indicates the year NSF gave the center the operating grant it is currently operating under.
- 4) On Table 2, "TOTAL FUNDING" refers to the total cash income coming into the Center.
- 5) On Table 2, "NSF FUNDING" refers to two kinds of support, "IUCRC FUNDING" which refers to the total support provided by the IUCRC program, including operating grant, self-sustaining Center funding, evaluator support, TIE awards, RUI/PUI awards, etc. "NSF OTHER" refers to cash support for Center operations provided by other NSF groups or divisions. Neither of these categories includes money transferred through NSF from other Federal Agencies (MIPRs).
- 6) On Table 2, "INDUSTRY MEMBERSHIP FEES" refers to the total cash membership fees from Center members.
- 7) On Table 2, "INDUSTRY OTHER" refers to additional industry cash funding for operations provided by industrial members (e.g., enhancements, donations, etc.) which is applied to the Center as a whole (e.g., income that results in outcomes shared equally by all Center members).
- 8) On Table 2, "STATE TOTAL" refers to the support provided by state government and/or an agency or program funded by state government.
- 9) On Table 2, "UNIV. TOTAL" refers to the support for the Center operating costs including salary, travel, and overhead returned to the Center. It does NOT include items such as utilities and space.
- 10) On Table 2, "OTHER FEDERAL AGENCY" refers to cash support for Center operations provided by other Federal funding sources, but does NOT include funding from NSF.
- 11) On Table 2, "OTHER NON-FEDERAL AGENCY" refers to cash support for Center operations provided by other non-Federal funding sources, foundations, etc.
- 12) On Table 2, "OTHER FUNDING" refers to any other cash support, such as contracts, received by Center researchers that would not have been received if the Center did not exist. The funding would not result in outcomes shared equally by Center members.
- 13) On Table 3, "CAPITAL AND IN-KIND CONTRIBUTIONS" refers to capital support for items of value over \$25,000 and includes equipment, facilities, personnel, and software.
- 14) On Table 3, "% to MEM" refers to the overhead rate charged to industry membership fees.
- 15) On Table 3, "TYPICAL OVERHEAD" refers to the typical university Federally Negotiated Facilities and Administrative rate (indirect) charged to funding sources.
- 16) On Table 3, "ADMIN. BUDGET (%)" refers to the estimated percentage of the Center's direct operating budget allocated to administration (e.g., administrative salaries, travel, telephone).
- 17) On Table 4, "FEES" are broken down into primary, secondary, and tertiary (the latter two represent variable membership fees).
- 18) On Table 5, "FACULTY SCIENTISTS" includes the Center Director(s) and Faculty Researchers.
- 19) On Table 6, "TIME ALLOCATION" refers to allocation of director's full-time equivalent for budgetary purposes.
- 20) On Table 7, "STUDENTS RECEIVING DEGREE" refers to the number of Ph.D.'s, M.S.'s, and B.A./B.S.'s that received a degree during the reporting period.
- 21) On Table 7, "STUDENTS HIRED BY INDUSTRY" refers to the number of Ph.D.'s, M.S.'s, and B.A./B.S.'s that were hired by member companies during the reporting period.
- 22) On Table 7, "PUBLICATIONS" refers to the publications in the open literature the Center researchers produced based on Center research including publications reported that have a Center industry member as an author.