

**NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY
COOPERATIVE RESEARCH CENTERS**

Final Report

2003-2004 STRUCTURAL INFORMATION^{1,2}

- **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).

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NOTE: 2003-2004 data collected from 44/44 Center Director Surveys (100% response rate).

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Table 1: 2003-2004 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
Active						
1984	Microcontamination Control	Northeastern Univ. Busnaina	Univ. of Arizona Parks	Rensselaer Polytechnic Institute Rose		
1985	Measurement and Control Engineering	Univ. of Tennessee, Knoxville Cook	Oklahoma State Univ. Misawa			
1985	Nondestructive Evaluation	Iowa State Univ. Thompson				
1986	Berkeley Sensor & Actuator Center	Univ. of California, Berkeley Muller	Univ. of California, Davis Tien			
1988	Ceramic and Composite Materials	Univ. of New Mexico Datye	Rutgers Univ. Niesz	Pennsylvania State Univ. Adair		
1993*\$	Particulate Materials	Pennsylvania State Univ. Adair				
1994*	Advanced Computing and Communication	North Carolina State Univ. Kekas	Duke Univ. Trivedi			
1994*	Advanced Processing and Packaging Studies	Ohio State Univ. Sastry	Univ. of California, Davis Shoemaker	North Carolina State Univ. Schwartz		
1994*	Design of Analog/Digital Integrated Circuits	Washington State Univ. Ringo	Univ. of Washington Sechen	State Univ. of NY, Stony Brook Leuciuc	Oregon State Univ. Moon	
1994*	Engineering Tribology	Georgia Institute of Technology Danyluk	Northwestern Univ. Keer			
1994*	Software Engineering	Ball State Univ. Zage	West Virginia Univ. McLaughlin			
1995	Coatings Research	Univ. of Southern Mississippi Urban	Eastern Michigan Univ. Provder			
1995	Glass Research	Alfred Univ., College of Ceramics Seward	Univ. of Missouri, Rolla Smith	Pennsylvania State Univ. Pantano		
1995	Health Management	Univ. of Washington Conrad	Univ. of California, Berkeley Rundall			
1995	Manufacturing & Packaging of Micro, Optical & Digital El	Univ. of Colorado, Boulder Mahajan				
1995	Pharmaceutical Processing Research	Purdue Univ. Kildsig	Univ. of Connecticut Pikal	Univ. of Puerto Rico Ghaly	Univ. of Minnesota	
1996	Power Systems Engineering	Cornell Univ. Thomas	Univ. of California, Berkeley Oren	Univ. of Illinois Urbana, Champaign Sauer	Univ. of Wisconsin, Madison Demarco	Washington State Univ. (23) Bose
1997	Advanced Polymer and Composite Engineering	Ohio State Univ. Koelling	Florida State Univ. Wang	Univ. of Wisconsin Osswald		
1997	Built Environment	Univ. of California, Berkeley Arens				
1997	Management of Information	Univ. of Arizona Nunamaker				
1997	Virtual Proving Ground Simulation	Univ. of Iowa Chen	Univ. of Texas, Austin Longoria			
1998	Advanced Studies in Novel Surfactants	Columbia Univ. Somasundaran				
1998	Information Technology and Organizations Consortium	Univ. of California, Irvine Gurbaxani				
1998	Precision Metrology	Univ. of North Carolina, Charlotte Hocken				
1998	Silicon Wafer Engineering and Defect Science	North Carolina State Univ. Rozgonyi	Univ. of California, Berkeley Weber			
1998	Wireless Electromagnetic Compatibility	Univ. of Oklahoma Grant				

* Report sorted by Status, Organized by Year Funded; * = Last year funded by NSF; # = Inactive during fiscal year; \$ = merged with another center during fiscal year

<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>
1998#	Biological Surface Science	State Univ. of New York, Buffalo Baier	Univ. of Memphis Jahan			
1999	Advanced Vehicle Electronics	Auburn Univ. Suhling				
1999	Repair of Buildings and Bridges	Univ. of Missouri, Rolla Nanni	North Carolina State Univ. Rizkalla	Washington State Univ. Walcott		
1999	Tree Genetics	Oregon State Univ. Straus	Purdue Univ. Michler			
1999	Water Quality	Univ. of Arizona Pepper	Arizona State Univ. Abbaszadegan			
2000	Biocatalysis & Bioprocessing of Macromolecules	Polytechnic Univ. of New York Gross				
2001	Biomolecular Interaction Technologies	Univ. of New Hampshire Laue				
2001	Dielectric Studies	Pennsylvania State Univ. Randall	Univ. of Missouri, Rolla Dogan			
2001	Fundamentals & Applications of Photopolymerizations	Univ. of Iowa Scranton				
2001	Intelligent Maintenance Systems	Univ. of Wisconsin, Milwaukee Lee	Univ. of Michigan, Ann Arbor Ni			
2001	Membrane Applied Science and Technology	Univ. of Colorado, Boulder Greenberg	Univ. of Cincinnati Krantz			
2002	Compact High-Performance Cooling Technologies	Purdue Univ. Garimella				
2002	Engineering Logistics and Distribution	Univ. of Arkansas English	Oklahoma State Univ. Ingalls	Univ. of Oklahoma Pulat	Univ. of Louisville Taylor	Univ. of Florida Geunes
2002	Identification Technology Research	West Virginia Univ. Hornak				
2002	Lasers and Plasmas in Advanced Manufacturing	Old Dominion Univ. Gupta	Univ. of Michigan Mazumder			
2003	Connection One: Wireless Telecommunications Circuits	Arizona State Univ. Kiaei	Univ. of Arizona Rodriguez	Univ. of Hawaii Iskander	Rensselaer Polytechnic Institute Shur	
2003	E-Design Manufacturing	Univ. of Pittsburgh Nnaji	Virginia Tech Terpenny	Univ. of Central Florida Crumpton-Young		
2003	Fuel Cell Center	Univ. of South Carolina Van Zee				
2003	Technology and Innovation Management	Northwestern Univ. Radnor				
2003#	Computer Systems	Georgia Tech University Schwan				
New						
2004	Friction Welding	South Dakota Sch. Mine Arbegast	Univ. South Carolina Reynolds	Brigham Young University Nelson	Univ. of Missouri, Rolla Mishra	
2004	Homeland Automation	Univ. of South Florida Murphy	Univ. of Minnesota Voyles			
2004	Multiphase Flow	Michigan State University Petty	University of Tulsa Mohan			
2004	Wireless Internet Center for Advanced Technology	Poly Tech NY Sugla	Columbia University Campbell			

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IUCRC Structure Database, FY 2003-2004

Table 2: 2003-2004 OPERATING BUDGET AND TOTAL FUNDING

<i>Center Name</i>	<i>Total</i> ⁴ <i>Funding</i>	<i>NSF</i> ⁵		<i>INDUSTRY</i>		<i>State</i> ⁸	<i>University</i> ⁹	<i>OTHER</i>		
		<i>NSF/</i> <i>IUCRC</i>	<i>Other</i> <i>NSF</i>	<i>Member</i> ⁶ <i>Fees</i>	<i>Addl</i> ⁷ <i>Industry</i>			<i>Other</i> ¹⁰ <i>Federal</i>	<i>Non-</i> ¹¹ <i>Federal</i>	<i>Other</i> ¹² <i>Cash</i>
Advanced Computing and Communication	\$668,215	\$100,800	\$25,000	\$242,900	\$24,515	\$0	\$0	\$275,000	\$0	\$0
Advanced Polymer and Composite Engineering	\$2,090,817	\$208,000	\$275,352	\$631,295	\$0	\$0	\$475,587	\$500,583	\$0	\$0
Advanced Processing and Packaging Studies	\$405,000	\$35,000	\$20,000	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
Advanced Studies in Novel Surfactants	\$222,495	\$92,995	\$0	\$109,500	\$20,000	\$0	\$0	\$0	\$0	\$0
Advanced Vehicle Electronics	\$2,158,288	\$115,000	\$0	\$983,000	\$0	\$0	\$0	\$0	\$0	\$1,060,288
Berkeley Sensor & Actuator Center	\$9,390,016	\$83,000	\$6,000	\$1,500,000	\$26,257	\$400,123	\$0	\$7,020,285	\$354,351	\$0
Biocatalysis & Bioprocessing of Macromolecules	\$1,731,000	\$70,000	\$0	\$450,000	\$0	\$0	\$106,000	\$965,000	\$140,000	\$0
Biomolecular Interaction Technologies	\$385,000	\$95,000	\$0	\$290,000	\$0	\$0	\$0	\$0	\$0	\$0
Built Environment	\$957,616	\$43,000	\$0	\$270,000	\$23,300	\$60,000	\$0	\$58,316	\$0	\$503,000
Ceramic and Composite Materials	\$2,635,316	\$85,000	\$500,100	\$734,208	\$23,964	\$136,000	\$333,588	\$606,735	\$181,221	\$34,500
Coatings Research	\$320,000	\$20,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0
Compact High-Performance Cooling Technologies	\$2,805,229	\$700,000	\$0	\$420,000	\$480,000	\$961,028	\$112,500	\$0	\$131,701	\$0
Connection One: Wireless Telecommunications Circui	\$2,514,398	\$224,193	\$0	\$625,000	\$1,000,000	\$245,205	\$420,000	\$0	\$0	\$0
Design of Analog/Digital Integrated Circuits	\$3,176,125	\$168,500	\$0	\$600,000	\$0	\$0	\$975,625	\$0	\$0	\$1,432,000
Dielectric Studies	\$3,847,000	\$130,000	\$42,000	\$595,000	\$400,000	\$80,000	\$100,000	\$2,500,000	\$0	\$0
E-Design Manufacturing	\$816,680	\$88,680	\$0	\$330,000	\$40,000	\$0	\$220,000	\$138,000	\$0	\$0
Engineering Logistics and Distribution	\$2,433,527	\$260,000	\$12,000	\$955,000	\$321,000	\$0	\$260,527	\$625,000	\$0	\$0
Engineering Tribology	\$462,991	\$118,000	\$20,000	\$202,500	\$10,000	\$0	\$15,491	\$0	\$97,000	\$0
Fuel Cell Center	\$689,000	\$70,000	\$0	\$428,750	\$0	\$0	\$190,250	\$0	\$0	\$0
Fundamentals & Applications of Photopolymerizations	\$410,000	\$70,000	\$0	\$340,000	\$0	\$0	\$0	\$0	\$0	\$0
Glass Research	\$615,497	\$149,000	\$0	\$445,500	\$0	\$0	\$20,997	\$0	\$0	\$0
Health Management	\$280,000	\$35,000	\$0	\$245,000	\$0	\$0	\$0	\$0	\$0	\$0
Identification Technology Research	\$1,329,010	\$87,000	\$100,000	\$542,010	\$0	\$0	\$0	\$600,000	\$0	\$0
Information Technology and Organizations Consortiu	\$380,000	\$75,000	\$0	\$230,000	\$0	\$0	\$75,000	\$0	\$0	\$0
Intelligent Maintenance Systems	\$889,410	\$130,000	\$7,000	\$500,000	\$0	\$0	\$22,077	\$230,333	\$0	\$0
Lasers and Plasmas in Advanced Manufacturing	\$370,000	\$70,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0
Management of Information	\$1,423,000	\$43,000	\$0	\$525,000	\$0	\$235,000	\$0	\$600,000	\$20,000	\$0
Manufacturing & Packaging of Micro, Optical & Digital	\$1,125,545	\$43,000	\$0	\$239,615	\$0	\$0	\$27,500	\$815,430	\$0	\$0
Measurement and Control Engineering	\$685,603	\$104,350	\$151,866	\$232,500	\$16,800	\$0	\$65,987	\$64,100	\$0	\$50,000
Membrane Applied Science and Technology	\$2,265,000	\$148,000	\$1,050,000	\$360,000	\$60,000	\$41,000	\$180,000	\$0	\$0	\$426,000
Microcontamination Control	\$599,853	\$110,000	\$0	\$210,000	\$279,853	\$0	\$0	\$0	\$0	\$0
Nondestructive Evaluation	\$9,667,980	\$43,000	\$261,844	\$525,000	\$0	\$694,994	\$0	\$7,673,619	\$0	\$469,523
Particulate Materials	\$697,381	\$362,381	\$0	\$210,000	\$0	\$55,000	\$70,000	\$0	\$0	\$0
Pharmaceutical Processing Research	\$690,000	\$65,000	\$0	\$600,000	\$0	\$0	\$0	\$25,000	\$0	\$0
Power Systems Engineering	\$3,616,900	\$610,000	\$31,000	\$1,640,000	\$0	\$0	\$95,000	\$1,220,900	\$20,000	\$0
Precision Metrology	\$735,012	\$206,000	\$0	\$270,000	\$0	\$125,000	\$134,012	\$0	\$0	\$0
Repair of Buildings and Bridges	\$1,921,296	\$70,000	\$125,756	\$381,500	\$0	\$0	\$251,750	\$1,092,290	\$0	\$0
Silicon Wafer Engineering and Defect Science	\$729,000	\$89,000	\$0	\$525,000	\$50,000	\$0	\$0	\$0	\$0	\$65,000
Software Engineering	\$891,176	\$120,000	\$75,000	\$273,000	\$320,051	\$0	\$103,125	\$0	\$0	\$0
Technology and Innovation Management	\$570,000	\$70,000	\$60,000	\$300,000	\$0	\$0	\$0	\$140,000	\$0	\$0
Tree Genetics	\$434,470	\$63,000	\$0	\$150,000	\$0	\$0	\$221,470	\$0	\$0	\$0
Virtual Proving Ground Simulation	\$694,000	\$159,000	\$150,000	\$385,000	\$0	\$0	\$0	\$0	\$0	\$0
Water Quality	\$1,703,910	\$435,000	\$0	\$415,000	\$278,742	\$575,168	\$0	\$0	\$0	\$0
Wireless Electromagnetic Compatibility	\$108,000	\$48,000	\$0	\$60,000	\$0	\$0	\$0	\$0	\$0	\$0
Grand Mean	\$1,603,199	\$138,907	\$66,203	\$452,756	\$76,693	\$82,012	\$101,738	\$571,604	\$21,461	\$91,825
Grand Sum	\$70,540,756	\$6,111,899	\$2,912,918	\$19,921,278	\$3,374,482	\$3,608,518	\$4,476,486	\$25,150,591	\$944,273	\$4,040,311

* Report sorted Alphabetically by Center

Table 3: 2003-2004 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 Computing and Communication	\$668,215	\$0	\$0	\$0	\$0	\$0	\$0	16	46	16
Advanced Polymer and Composite Engineering	\$2,090,817	\$60,000	\$0	\$30,000	\$20,000	\$3,000	\$7,000	0	47	10
Advanced Processing and Packaging Studies	\$405,000	\$0	\$0	\$0	\$0	\$0	\$0	10	47	0
Advanced Studies in Novel Surfactants	\$222,495	\$67,500	\$67,500	\$0	\$0	\$0	\$0	5	63	25
Advanced Vehicle Electronics	\$2,158,288	\$510,000	\$500,000	\$0	\$0	\$10,000	\$0	0	46	5
Berkeley Sensor & Actuator Center	\$9,390,016	\$200,000	\$200,000	\$0	\$0	\$0	\$0	0	52	8
Biocatalysis & Bioprocessing of Macromolecules	\$1,731,000	\$140,000	\$20,000	\$0	\$120,000	\$0	\$0	10	66	5
Biomolecular Interaction Technologies	\$385,000	\$210,000	\$100,000	\$50,000	\$50,000	\$5,000	\$5,000	11	46	0
Built Environment	\$957,616	\$0	\$0	\$0	\$0	\$0	\$0	0	52	12
Ceramic and Composite Materials	\$2,635,316	\$0	\$0	\$0	\$0	\$0	\$0	0	55	10
Coatings Research	\$320,000	\$0	\$0	\$0	\$0	\$0	\$0	0	43	0
Compact High-Performance Cooling Technologies	\$2,805,229	\$0	\$0	\$0	\$0	\$0	\$0	0	52	0
Connection One: Wireless Telecommunications Circuit	\$2,514,398	\$6,710,000	\$1,000,000	\$1,000,000	\$410,000	\$2,000,000	\$2,300,000	10	50	30
Design of Analog/Digital Integrated Circuits	\$3,176,125	\$170,000	\$70,000	\$0	\$0	\$0	\$100,000	0	47	15
Dielectric Studies	\$3,847,000	\$70,000	\$30,000	\$0	\$40,000	\$0	\$0	0	45	15
E-Design Manufacturing	\$816,680	\$300,000	\$0	\$0	\$0	\$300,000	\$0	17	49	18
Engineering Logistics and Distribution	\$2,433,527	\$3,546,560	\$0	\$0	\$46,560	\$3,500,000	\$0	33	47	10
Engineering Tribology	\$462,991	\$0	\$0	\$0	\$0	\$0	\$0	0	52	0
Fuel Cell Center	\$689,000	\$40,565	\$0	\$40,565	\$0	\$0	\$0	0	45	7
Fundamentals & Applications of Photopolymerizations	\$410,000	\$80,000	\$80,000	\$0	\$0	\$0	\$0	0	47	8
Glass Research	\$615,497	\$0	\$0	\$0	\$0	\$0	\$0	7	78	57
Health Management	\$280,000	\$0	\$0	\$0	\$0	\$0	\$0	0	52	20
Identification Technology Research	\$1,329,010	\$0	\$0	\$0	\$0	\$0	\$0	0	46	10
Information Technology and Organizations Consortium	\$380,000	\$50,000	\$0	\$50,000	\$0	\$0	\$0	5	52	25
Intelligent Maintenance Systems	\$889,410	\$66,022	\$0	\$0	\$0	\$0	\$66,022	0	47	9
Lasers and Plasmas in Advanced Manufacturing	\$370,000	\$30,000	\$0	\$0	\$30,000	\$0	\$0	0	42	18
Management of Information	\$1,423,000	\$0	\$0	\$0	\$0	\$0	\$0	0	51	15
Manufacturing & Packaging of Micro, Optical & Digital E	\$1,125,545	\$42,500	\$42,500	\$0	\$0	\$0	\$0	5	47	20
Measurement and Control Engineering	\$685,603	\$98,500	\$31,000	\$0	\$37,500	\$29,000	\$1,000	0	45	30
Membrane Applied Science and Technology	\$2,265,000	\$0	\$0	\$0	\$0	\$0	\$0	6	50	24
Microcontamination Control	\$599,853	\$0	\$0	\$0	\$0	\$0	\$0	0	58	22
Nondestructive Evaluation	\$9,667,980	\$0	\$0	\$0	\$0	\$0	\$0	0	46	11
Particulate Materials	\$697,381	\$0	\$0	\$0	\$0	\$0	\$0	0	45	10
Pharmaceutical Processing Research	\$690,000	\$0	\$0	\$0	\$0	\$0	\$0	51	51	0
Power Systems Engineering	\$3,616,900	\$264,000	\$207,500	\$0	\$16,500	\$40,000	\$0	5	50	15
Precision Metrology	\$735,012	\$15,628	\$15,628	\$0	\$0	\$0	\$0	0	33	5
Repair of Buildings and Bridges	\$1,921,296	\$100,000	\$0	\$0	\$50,000	\$0	\$50,000	0	48	25
Silicon Wafer Engineering and Defect Science	\$729,000	\$0	\$0	\$0	\$0	\$0	\$0	9	47	12
Software Engineering	\$891,176	\$0	\$0	\$0	\$0	\$0	\$0	16	48	16
Technology and Innovation Management	\$570,000	\$40,000	\$0	\$0	\$0	\$0	\$40,000	10	49	19
Tree Genetics	\$434,470	\$0	\$0	\$0	\$0	\$0	\$0	0	43	0
Virtual Proving Ground Simulation	\$694,000	\$47,273	\$0	\$0	\$0	\$47,273	\$0	0	47	10
Water Quality	\$1,703,910	\$0	\$0	\$0	\$0	\$0	\$0	0	51	0
Wireless Electromagnetic Compatibility	\$108,000	\$412,341	\$412,341	\$0	\$0	\$0	\$0	25	46	15
Grand Mean	\$1,603,199	\$301,611	\$63,102	\$26,604	\$18,649	\$134,870	\$58,387	5.7045455	49.295455	13.227273
Grand Sum	\$70,540,756	\$13,270,889	\$2,776,469	\$1,170,565	\$820,560	\$5,934,273	\$2,569,022	N/A	N/A	N/A

* Report sorted Alphabetically by Center

Table 4: 2003-2004 INDUSTRY MEMBERSHIP DESCRIPTORS

CenterName	2003-2004 MEMBERS				LIFETIME MEMBERS			ANNUAL FEES		
	Current Members	Starting	New	Left	Life Starting	Life New	Life Left	Primary	Secondary	Tertiary
Advanced Computing and Communication	8	8	1	1	8	33	33	\$50,000	\$20,000	
Advanced Polymer and Composite Engineering	45	39	15	9	5	74	34	\$35,000	\$25,000	\$10,000
Advanced Processing and Packaging Studies	11	11	0	0	8	29	26	\$35,000	\$20,000	
Advanced Studies in Novel Surfactants	9	9	2	2	15	9	15	\$25,000	\$9,500	
Advanced Vehicle Electronics	18	10	8	0	11	21	3	\$75,000	\$37,500	\$10,000
Berkeley Sensor & Actuator Center	34	32	5	3	6	49	21	\$50,000		
Biocatalysis & Bioprocessing of Macromolecules	10	9	1	0	7	6	3	\$50,000	\$25,000	
Biomolecular Interaction Technologies	12	12	3	3	8	8	4	\$30,000	\$20,000	\$10,000
Built Environment	22	24	1	3	11	26	15	\$30,000	\$10,000	\$10,000
Ceramic and Composite Materials	45	31	23	9	8	76	39	\$35,000	\$10,000	\$5,000
Coatings Research	9	7	3	1	11	24	26	\$30,000		
Compact High-Performance Cooling Technologies	14	14	2	2	14	2	2	\$30,000		
Connection One: Wireless Telecommunications Circuit	13	9	6	2	9	6	2	\$50,000	\$25,000	
Design of Analog/Digital Integrated Circuits	15	16	5	6	11	49	45	\$40,000		
Dielectric Studies	23	21	6	4	18	60	55	\$30,000	\$8,500	
E-Design Manufacturing	9	0	0	0	9	9	0	\$30,000		
Engineering Logistics and Distribution	26	29	4	7	29	4	7	\$50,000	\$25,000	\$5,000
Engineering Tribology	19	15	8	4	14	8	41	\$27,500		
Fuel Cell Center	14	0	0	0	14	14	0	\$35,000	\$17,500	
Fundamentals & Applications of Photopolymerizations	15	8	7	0	9	22	7	\$40,000		
Glass Research	19	17	2	0	8	38	22	\$33,000	\$16,500	
Health Management	7	9	3	5	6	35	33	\$35,000		
Identification Technology Research	10	10	4	4	8	8	6	\$40,000		
Information Technology and Organizations Consortium	8	9	2	3	12	11	13	\$25,000		
Intelligent Maintenance Systems	14	21	9	5	25	12	12	\$35,000	\$10,000	
Lasers and Plasmas in Advanced Manufacturing	10	9	3	2	9	3	2	\$30,000	\$10,000	
Management of Information	6	7	0	1	8	13	15	\$100,000	\$50,000	\$25,000
Manufacturing & Packaging of Micro, Optical & Digital E	6	4	1	3	10	17	25	\$60,000	\$45,000	\$30,000
Measurement and Control Engineering	11	7	6	2	14	31	27	\$35,000	\$20,000	\$7,500
Membrane Applied Science and Technology	8	12	3	7	8	23	21	\$45,000		
Microcontamination Control	9	7	2	0	26	46	61	\$40,000	\$25,000	
Nondestructive Evaluation	15	17	0	2	14	37	35	\$35,000		
Pharmaceutical Processing Research	22	25	9	12	11	41	29	\$25,000	\$0	\$0
Power Systems Engineering	36	36	5	5	17	63	32	\$40,000	\$20,000	
Precision Metrology	9	9	2	2	15	10	16	\$30,000		
Repair of Buildings and Bridges	11	9	4	2	9	19	7	\$50,000	\$31,500	
Silicon Wafer Engineering and Defect Science	14	11	5	2	6	18	9	\$50,000	\$25,000	
Software Engineering	15	14	2	1	10	45	40	\$30,000	\$5,000	
Technology and Innovation Management	7	0	0	0	7	7	0	\$50,000	\$25,000	\$10,000
Tree Genetics	6	6	1	1	13	5	10	\$25,000		
Virtual Proving Ground Simulation	11	12	1	2	24	26	39	\$40,000	\$20,000	
Water Quality	30	13	19	2	16	31	17	\$30,000	\$12,000	\$3,000
Wireless Electromagnetic Compatibility	11	7	8	4	14	16	19	\$35,000	\$15,000	\$5,000
Grand Mean	15.49	13.37	4.44	2.86	11.98	25.21	20.19	\$39,430	\$20,103	\$10,038
Grand Sum	666	575	191	123	515	1084	868			

* Report sorted Alphabetically by Center

Table 5: 2003-2004 HUMAN RESOURCES

Center Name	RESEARCHERS				STUDENTS			
	Faculty ¹⁸ Scientists	Administrative	Post Docs	Research Staff	PhD	Masters	Undergraduate	
Advanced Computing and Communication	5	1	0	0	12	2	0	
Advanced Polymer and Composite Engineering	17	0	6	1	40	15	13	
Advanced Processing and Packaging Studies	21	0	1	0	7	8	0	
Advanced Studies in Novel Surfactants	4	1	2	0	4	2	0	
Advanced Vehicle Electronics	13	1	0	5	12	15	3	
Berkeley Sensor & Actuator Center	11	0	15	5	85	18	5	
Biocatalysis & Bioprocessing of Macromolecules	9	0	0	6	6	0	4	
Biomolecular Interaction Technologies	5	0	0	9	1	0	0	
Built Environment	4	3	1	5	2	20	0	
Ceramic and Composite Materials	19	0	5	6	20	11	9	
Coatings Research	6	1	3	2	9	0	4	
Compact High-Performance Cooling Technologies	9	0	2	0	12	7	2	
Connection One: Wireless Telecommunications Circuits	26	3	13	3	21	25	9	
Design of Analog/Digital Integrated Circuits	15	0	0	8	12	18	0	
Dielectric Studies	18	2	3	0	11	9	2	
E-Design Manufacturing	16	1	2	2	3	0	0	
Engineering Logistics and Distribution	31	6	0	8	3	34	33	
Engineering Tribology	9	0	2	1	7	2	2	
Fuel Cell Center	10	1	0	6	12	2	2	
Fundamentals & Applications of Photopolymerizations	6	0	0	3	14	0	4	
Glass Research	22	3	1	3	9	3	0	
Health Management	21	3	1	2	1	2	0	
Identification Technology Research	14	0	0	2	4	12	6	
Information Technology and Organizations Consortium	33	6	0	4	15	0	2	
Intelligent Maintenance Systems	5	4	2	0	1	4	1	
Lasers and Plasmas in Advanced Manufacturing	1	1	5	2	2	0	0	
Management of Information	6	0	0	4	14	2	2	
Manufacturing & Packaging of Micro, Optical & Digital Electroni	12	0	2	2	20	4	0	
Measurement and Control Engineering	15	1	5	1	31	13	8	
Membrane Applied Science and Technology	22	3	3	0	13	2	1	
Microcontamination Control	7	2	1	2	7	3	2	
Nondestructive Evaluation	26	8	8	22	18	23	31	
Particulate Materials	6	3	2	2	8	4	6	
Pharmaceutical Processing Research	22	17	0	0	10	4	0	
Power Systems Engineering	41	0	0	5	49	4	5	
Precision Metrology	18	1	0	3	15	9	2	
Repair of Buildings and Bridges	10	3	1	3	6	17	6	
Silicon Wafer Engineering and Defect Science	10	1	5	0	10	3	0	
Software Engineering	14	1	0	2	8	18	1	
Technology and Innovation Management	12	1	6	5	0	0	0	
Tree Genetics	2	1	4	5	1	1	32	
Virtual Proving Ground Simulation	3	0	0	5	6	2	0	
Water Quality	25	1	4	15	19	9	10	
Wireless Electromagnetic Compatibility	7	0	0	1	0	3	1	
<i>Grand Mean</i>	13.82	1.82	2.39	3.64	12.73	7.50	4.73	
<i>Grand Sum</i>	608	80	105	160	560	330	208	

* Report sorted Alphabetically by Center

Table 6: 2003-2004 CENTER DIRECTOR DESCRIPTORS

*Includes only primary center director

CenterName	Rank	Tenure	Reports To	TIME ALLOCATION 19				
				Center Admin	Other Admin	Research	Teaching	Other
Advanced Computing and Communication	No Academic Rank	Non-Tenure Track	Dean	75	20	0	0	5
Advanced Polymer and Composite Engineering	Associate Professor	Tenured	Dean, College of Engineering	10	5	35	40	10
Advanced Processing and Packaging Studies	Full Professor	Tenured	Department Chair	10	0	50	40	0
Advanced Studies in Novel Surfactants	Full Professor	Tenured	Dean	10	5	50	30	5
Advanced Vehicle Electronics	Full Professor	Tenured	Dean of College of Engineering	25	10	40	15	10
Berkeley Sensor & Actuator Center	No Academic Rank	Non-Tenure Track	Director, Electronics Research Laboratories	70	20	10	0	0
Biocatalysis & Bioprocessing of Macromolecules	Full Professor	Tenured	Dean	20	10	60	10	0
Biomolecular Interaction Technologies	Full Professor	Tenured	Dean, College of Life Science and Agriculture	40	40	20	0	0
Built Environment	Full Professor	Tenured	Vice Chancellor for Research	50	0	30	20	0
Ceramic and Composite Materials	Full Professor	Tenured	Vice President for Research	30	5	30	30	5
Coatings Research	Full Professor	Tenured	Dean of College of Science and Technology	0	0	0	0	0
Compact High-Performance Cooling Technologies	Full Professor	Tenured	Head of Mechanical Engineering	20	5	50	20	5
Connection One: Wireless Telecommunications Circuits	Full Professor	Tenured	Chair of Electrical Engineering	30	15	30	15	10
Design of Analog/Digital Integrated Circuits	Full Professor	Tenured	Dean	35	50	0	15	0
Dielectric Studies	Full Professor	Tenured	Director, Materials Research Institute	30	5	30	30	5
E-Design Manufacturing	Full Professor	Tenured	Dean, School of Engineering	25	5	35	25	10
Engineering Logistics and Distribution	Full Professor	Tenured	Dean of Engineering	25	50	15	5	5
Engineering Tribology	Full Professor	Tenured	Vice President and Dean of Graduate Studies	2	50	25	23	0
Fuel Cell Center	Full Professor	Tenured	Dean, College of Engineering and Information T	15	0	50	25	10
Fundamentals & Applications of Photopolymerizations	Full Professor	Tenured	Dean	5	50	40	5	0
Glass Research	Full Professor	Tenure Track	Dean, School of Engineering	75	0	15	0	10
Health Management	Full Professor	Tenured	Department Chair	22	5	30	25	18
Identification Technology Research	Full Professor	Tenured	VP for Research and Economic Development	30	5	35	25	5
Information Technology and Organizations Consortium	Full Professor	Tenured	Director of CRITO	25	25	25	25	0
Intelligent Maintenance Systems	Full Professor	Tenured	Dean	20	5	30	20	25
Lasers and Plasmas in Advanced Manufacturing	Full Professor	Non-Tenure Track	Dean, Batten College OF Engineering & Techno	25	25	50	0	0
Management of Information	Full Professor	Tenured	Interim Dean	20	10	50	20	0
Manufacturing & Packaging of Micro, Optical & Digital EI	Full Professor	Tenured	Dean, College of Engineering and Applied Scien	15	5	40	30	10
Measurement and Control Engineering	Full Professor	Tenured	Associate Dean	50	0	20	30	0
Membrane Applied Science and Technology	Full Professor	Tenured	Mechanical Eng. Dept. Chair, Univ. of Colorado	15	15	50	20	0
Microcontamination Control	Full Professor	Tenured	Dean	20	10	30	25	5
Nondestructive Evaluation	Full Professor	Tenured	Director, Inst. for Physical Research & Technolo	50	5	25	15	5
Particulate Materials	Full Professor	Tenured	Director, Materials Research Inst	10		18	67	5
Pharmaceutical Processing Research	Full Professor	Tenured	Dean	50	0	50	0	0
Power Systems Engineering	Full Professor	Tenured	Dean of Engineering	40	10	25	20	5
Precision Metrology	Full Professor	Tenured	Associate Provost for Research	10	10	25	50	5
Repair of Buildings and Bridges	Full Professor	Tenured	Vice Provost-Research	25	25	20	25	5
Silicon Wafer Engineering and Defect Science	Full Professor	Tenured	Dean, College of Engineering	20	5	40	30	5
Software Engineering	Full Professor	Tenured	Dean	25	0	50	25	0
Technology and Innovation Management	Full Professor	Tenured	VP Research	18	16	20	38	8
Tree Genetics	Full Professor	Tenured	Department Head, Forest Science	2	10	80	5	3
Virtual Proving Ground Simulation	Full Professor	Tenured	Vice President for Research	20	30	25	25	0
Water Quality	Full Professor	Tenured	Dean, College of Agriculture and Life Sciences	30	35	20	10	5
Wireless Electromagnetic Compatibility	Full Professor	Tenured	Director, School of IE	25	0	50	25	0
			Grand Mean	26.57	13.86	32.34	20.52	4.52

* Report sorted Alphabetically by Center

Table 7: 2003-2004 CENTER OUTCOMES

Center Name:	STUDENTS RECEIVING DEGREE 20			STUDENTS HIRED BY INDUSTRY21			PUBLICATIONS 22		
	BA Grad	MA Grad	PhD Grad	BA Hired	MA Hired	PhD Hired	w/ Ctr Research	w/ IAB Members	Presentations
Advanced Computing and Communication	0	0	0	0	0	0	8	0	24
Advanced Polymer and Composite Engineering	1	3	8	0	0	0	34	2	63
Advanced Processing and Packaging Studies	0	8	7	0	0	1	20	0	15
Advanced Studies in Novel Surfactants	0	0	1	0	0	1	20	5	30
Advanced Vehicle Electronics	1	4	0	0	0	0	28	14	29
Berkeley Sensor & Actuator Center	0	20	7	0	5	2	40	0	21
Biocatalysis & Bioprocessing of Macromolecules	2	1	2	0	0	0	20	4	15
Biomolecular Interaction Technologies	0	0	0	0	0	0	2	0	0
Built Environment	2	9	2	0	1	0	18	2	39
Ceramic and Composite Materials	15	7	9	6	4	7	45	2	132
Coatings Research	3	4	4	0	0	1	15	2	20
Compact High-Performance Cooling Technologies	1	2	2	0	0	2	32	3	32
Connection One: Wireless Telecommunications Circu	0	1	1	0	0	1	0	1	9
Design of Analog/Digital Integrated Circuits	0	18	12	0	8	4	34	0	36
Dielectric Studies	1	2	2	0	0	0	10	3	14
E-Design Manufacturing	0	0	0	0	0	0	10	0	17
Engineering Logistics and Distribution	8	6	1	2	1	0	32	7	56
Engineering Tribology	0	3	1	0	0	0	11	3	15
Fuel Cell Center	0	1	2	0	1	2	0	0	2
Fundamentals & Applications of Photopolymerization	1	1	3	0	0	0	14	0	12
Glass Research	0	3	4	0	0	0	42	0	28
Health Management	0	0	0	0	0	0	4	0	25
Identification Technology Research	0	3	1	1	0	0	9	0	15
Information Technology and Organizations Consortiu	0	0	1	0	0	0	14	2	4
Intelligent Maintenance Systems	0	0	0	0	0	1	8	1	20
Lasers and Plasmas in Advanced Manufacturing	0	0	0	0	0	1	4	1	4
Management of Information	0	0	2	0	0	0	24	6	41
Manufacturing & Packaging of Micro, Optical & Digital	0	3	7	0	0	3	22	2	22
Measurement and Control Engineering	0	5	1	0	0	0	17	2	25
Membrane Applied Science and Technology	0	1	3	0	0	0	4	0	43
Microcontamination Control	1	3	0	1	0	0	17	2	26
Nondestructive Evaluation	1	1	2	1	1	2	18	1	27
Particulate Materials	3	3	3	0	2	1	14	2	38
Pharmaceutical Processing Research	0	3	3	0	2	2	3	0	3
Power Systems Engineering	15	21	18	13	1	6	97	31	117
Precision Metrology	0	1	4	0	0	2	7	0	7
Repair of Buildings and Bridges	3	7	1	0	7	0	10	4	49
Silicon Wafer Engineering and Defect Science	1	2	4	0	0	0	21	8	30
Software Engineering	0	5	1	0	4	0	10	3	35
Technology and Innovation Management	0	0	0	0	0	0	0	0	61
Tree Genetics	0	1	0	0	0	0	13	0	21
Virtual Proving Ground Simulation	0	3	1	0	0	0	0	0	10
Water Quality	3	3	4	0	0	0	5	0	32
Wireless Electromagnetic Compatibility	1	3	0	0	0	0	6	0	15
<i>Grand Mean</i>	1.43	3.66	2.82	0.55	0.84	0.89	17.32	2.57	29.07
<i>Grand Sum</i>	63	161	124	24	37	39	762	113	1279

* Report sorted by Alphabetically by Center

Table 8: 2003-2004 INTELLECTUAL PROPERTY EVENTS

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

Intellectual Property Event	# of Centers	% of Centers
Invention Disclosures	16	36.36
Patent Applications	18	40.91
Software Copyrights	5	11.36
Patents Granted/Derived	13	29.55
Licensing Agreements	8	18.18
Royalties Realized	5	11.36

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

Intellectual Property Event	Total for all Centers	Mean for All Centers
Invention Disclosures	65	1.48
Patent Applications	52	1.18
Software Copyrights	11	0.25
Patents Granted/Derived	24	0.55
Licensing Agreements	12	0.27
Royalties Realized	17	0.39

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 2003-2004 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 include 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 overhead rate 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.
- 23) Additional Universities and Directors for the Power Systems Engineering Center are: Iowa State University (Vittal), University of Colorado (Shoureshi).