

NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY
COOPERATIVE RESEARCH CENTERS

Final Report

2002-2003 STRUCTURAL INFORMATION^{1,2}

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NOTE: 2002-2003 data collected from 45/45 Center Director Surveys (100% response rate).

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Table 1: 2002-2003 GENERAL CENTER INFORMATION* (Sorted Chronologically)

Yr Funded:	Center Name	University Name:	Partner University 1	Partner University 2	Partner University 4
		Director	Director	Director	Director
1984	Microcontamination Control	Univ. of Arizona	Northeastern Univ.		
1985	Measurement and Control Engineering	Parks Univ. of Tennessee, Knoxville	Bustania Oklahoma State Univ.		
1985	Nondestructive Evaluation	Cook Iowa State Univ.	Tree		
1986	Berkeley Sensor & Actuator Center	Thompson Univ. of California, Berkeley	Univ. of California, Davis		
1988	Ceramic and Composite Materials	Muller Univ. of New Mexico	Solgaard Rutgers Univ.		
1994	Software Engineering	Daye Ball State Univ.	Niesz West Virginia Univ.		
1995	Coatings Research	Zagaj Univ. of Southern Mississippi	Cowan Eastern Michigan Univ.		
1995	Manufacturing & Packaging of Micro, Optics & Digital	Urban Univ. of Colorado, Boulder	Provier		
1995	Optoelectronic Devices, Interconnects and Packaging	Mahajan Univ. of Arizona	Univ. of Maryland, College Park		
1995	Particulate Materials	Peyngambanian Pennsylvania State Univ.	Dagenais		
1995	Pharmaceutical Processing Research	Adair Purdue Univ.	Univ. of Connecticut	Univ. of Minnesota	
1996	Glass Research	Kildisig Alfred Univ., College of Ceramics	Pikal Univ. of Missouri, Rolla	Grant	
1996	Health Management	Seward Univ. of Washington	Moore Univ. of California, Berkeley	Pantano	
1996	Power Systems Engineering	Conrad Cornell Univ.	Rundall		
1997	Advanced Polymer and Composite Engineering	Thomas Ohio State Univ.	Oren Florida State Univ.	Univ. of Wisconsin, Madison	Bose
1997	Built Environment	Lee Univ. of California, Berkeley	Wang		
1997	Management of Information	Arens Univ. of Arizona			
1997	Silicon Water Engineering and Defect Science	Nuramaker North Carolina State Univ.			
1997	Virtual Proving Ground Simulation	Rozgonyi Univ. of Iowa			
1997	Wireless Electromagnetic Compatibility	Chen Univ. of Oklahoma	Univ. of Texas, Austin		
1998	Precision Metrology	Grant Univ. of North Carolina, Charlotte	Longoria		
1999	Advanced Studies in Novel Surfactants	Hocken Columbia Univ.			
1999	Advanced Vehicle Electronics	Somasundaran Auburn Univ.			
1999	Composite Reinforcement	Suhling Univ. of Missouri, Rolla			
1999	Fundamentals & Applications of Photopolymerizations	Nanni Univ. of Iowa	North Carolina State Univ.		
1999	Information Technology and Organization Consortium	Scranton Univ. of California, Irvine	Rizkalla Univ. of Colorado, Boulder		
		Gurbaxani	Bowman		

* Report sorted by Status, Organized by Year Funded; # New Center

Yr Funded:	Center Name	University Name:	Partner University 1	Partner University 2	Partner University 3	Partner University 4
		Director	Director	Director	Director	Director
1999	Intelligent Biomedical Devices & Musculoskeletal Syste	Colorado School of Mines	Rocky Mountain Musculoskeletal			
1999	Tree Genetics	Shoureshi	Komistek			
1999	Water Quality	Oregon State Univ.				
2000	Biocatalysis & Bioprocessing of Macromolecules	Straus	Arizona State Univ.			
2000	Biomolecular Interaction Technologies	Pepper	Abbaszadegan			
2001	Dielectric Studies	Polytechnic Univ. of New York				
2001	Identification Technology Research	Gross				
2001	Intelligent Maintenance Systems	Univ of New Hampshire				
2001	Membrane Applied Science and Technology	Laue				
2002	Compact High-Performance Cooling Technologies	Univ. of Wisconsin, Milwaukee				
2002	Connection One: Wireless Telecommunications Circuit	Greenberg				
2002	Engineering Logistics and Distribution	Purdue Univ.				
2002	Plasma Processing	Garimella				
2003#	Fuel Cell Center	Arizona State Univ.				
1993	Advanced Computing and Communication	Krael	University of Arizona	University of Hawaii		
1993	Machine-tool Systems	Univ. of Arkansas	Rodriguez	iskander		
1994	Advanced Processing and Packaging Studies	English	Okahoma State Univ.	Univ. of Oklahoma		
1994	Design of Analog/Digital Integrated Circuits	Old Dominion Univ.	Ingalls	Landers		
1994	Engineering Tribology	Gupla				
1997	Quality and Reliability Engineering	Univ. of South Carolina				
1993	Advanced Computing and Communication	North Carolina State Univ.	Duke Univ.			
1993	Machine-tool Systems	Kekas	Trivedi			
1994	Advanced Processing and Packaging Studies	Univ. of Illinois Urbana-Champaign				
1994	Design of Analog/Digital Integrated Circuits	Kapoor				
1994	Engineering Tribology	Ohio State Univ.	Univ. of California, Davis	North Carolina State Univ.		
1997	Quality and Reliability Engineering	Swartzel	Shoemaker	Schwartz & Sastry		
		Washington State Univ.	Univ. of Washington	State Univ. of NY, Stony Brook		
		Ringo	Sechen	Leucic		
		Georgia Institute of Technology	Northwestern Univ.			
		Danyluk	Kear			
		Rutgers Univ.				
		Elsayed				

Last Year

Table 2: 2002-2003 OPERATING BUDGET AND TOTAL FUNDING

Center Name	Total ⁴ Funding	NSF ⁵		INDUSTRY			OTHER			
		NSF/ IUCRC	Other NSF	Member ⁶ Fees	Addl ⁷ Industry	State ⁸	University ⁹ Federal	Other ¹⁰ Federal	Non- ¹¹ Federal	Other ¹² Cash
Advanced Computing and Communication	\$718,984	\$108,000	\$91,469	\$150,000	\$24,515	\$0	\$70,000	\$275,000	\$0	\$0
Advanced Polymer and Composite Engineering	\$2,242,987	\$340,920	\$275,352	\$631,295	\$19,250	\$0	\$475,587	\$500,583	\$0	\$0
Advanced Processing and Packaging Studies	\$588,000	\$128,000	\$20,000	\$370,000	\$0	\$0	\$0	\$70,000	\$0	\$0
Advanced Studies in Novel Surfactants	\$292,000	\$100,000	\$0	\$172,000	\$20,000	\$0	\$0	\$0	\$0	\$0
Advanced Vehicle Electronics	\$1,709,500	\$102,000	\$0	\$742,500	\$0	\$0	\$0	\$0	\$0	\$865,000
Berkeley Sensor & Actuator Center	\$9,778,332	\$130,000	\$0	\$1,377,085	\$1,166,247	\$505,000	\$0	\$6,600,000	\$0	\$0
Biocatalysis & Bioprocessing of Macromolecules	\$1,300,000	\$70,000	\$0	\$390,000	\$0	\$0	\$240,000	\$350,000	\$0	\$250,000
Biomolecular Interaction Technologies	\$395,000	\$95,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0
Built Environment	\$1,120,566	\$43,000	\$0	\$270,334	\$0	\$60,000	\$0	\$58,732	\$0	\$688,500
Ceramic and Composite Materials	\$4,161,258	\$80,000	\$1,705,000	\$541,403	\$0	\$199,881	\$756,591	\$710,971	\$167,412	\$0
Coatings Research	\$570,000	\$78,000	\$20,000	\$420,000	\$50,000	\$0	\$2,000	\$0	\$0	\$0
Compact High-Performance Cooling Technologies	\$614,500	\$82,000	\$0	\$420,000	\$0	\$0	\$112,500	\$0	\$0	\$0
Composite Reinforcement	\$1,551,462	\$70,000	\$0	\$300,000	\$0	\$0	\$197,403	\$906,000	\$78,059	\$0
Connection One: Wireless Telecommunications Circui	\$1,905,000	\$80,000	\$0	\$600,000	\$925,000	\$150,000	\$150,000	\$0	\$0	\$0
Design of Analog/Digital Integrated Circuits	\$3,481,231	\$248,882	\$0	\$720,000	\$0	\$0	\$362,801	\$0	\$0	\$2,149,548
Dielectric Studies	\$2,216,000	\$130,000	\$42,000	\$544,000	\$400,000	\$0	\$100,000	\$1,000,000	\$0	\$0
Engineering Logistics and Distribution	\$2,528,271	\$260,000	\$0	\$966,353	\$257,609	\$0	\$294,309	\$750,000	\$0	\$0
Engineering Tribology	\$625,000	\$60,000	\$100,000	\$250,000	\$65,000	\$0	\$0	\$150,000	\$0	\$0
Fundamentals & Applications of Photopolymerizations	\$370,000	\$70,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0
Glass Research	\$802,600	\$141,000	\$0	\$610,500	\$0	\$0	\$51,100	\$0	\$0	\$0
Health Management	\$390,600	\$73,000	\$0	\$315,000	\$0	\$0	\$2,600	\$0	\$0	\$0
Identification Technology Research	\$1,665,000	\$75,000	\$850,000	\$600,000	\$0	\$0	\$0	\$140,000	\$0	\$0
Information Technology and Organization Consortium	\$250,000	\$75,000	\$0	\$175,000	\$0	\$0	\$0	\$0	\$0	\$0
Intelligent Biomedical Devices & Musculoskeletal Syst	\$1,440,000	\$150,000	\$0	\$700,000	\$80,000	\$50,000	\$80,000	\$380,000	\$0	\$0
Intelligent Maintenance Systems	\$1,543,000	\$135,000	\$187,500	\$415,000	\$0	\$22,000	\$12,000	\$0	\$0	\$771,500
Machine-tool Systems	\$218,000	\$43,000	\$0	\$150,000	\$25,000	\$0	\$0	\$0	\$0	\$0
Management of Information	\$1,553,000	\$43,000	\$0	\$625,000	\$0	\$265,000	\$0	\$600,000	\$20,000	\$0
Manufacturing & Packaging of Micro, Optical & Digital	\$1,257,918	\$53,000	\$0	\$328,400	\$5,000	\$46,716	\$22,500	\$802,302	\$0	\$0
Measurement and Control Engineering	\$557,811	\$84,350	\$127,334	\$225,000	\$0	\$0	\$73,127	\$30,000	\$0	\$18,000
Membrane Applied Science and Technology	\$3,461,299	\$130,000	\$91,997	\$557,500	\$0	\$135,000	\$235,874	\$0	\$0	\$2,310,928
Microcontamination Control	\$545,929	\$110,000	\$0	\$285,000	\$150,929	\$0	\$0	\$0	\$0	\$0
Nondestructive Evaluation	\$8,155,928	\$0	\$5,991	\$595,000	\$0	\$586,941	\$0	\$6,718,269	\$0	\$249,727
Optoelectronic Devices, Interconnects and Packaging	\$333,000	\$58,000	\$0	\$275,000	\$0	\$0	\$0	\$0	\$0	\$0
Particulate Materials	\$733,480	\$35,000	\$105,000	\$306,952	\$74,128	\$65,000	\$52,400	\$90,000	\$0	\$5,000
Pharmaceutical Processing Research	\$853,000	\$228,000	\$0	\$600,000	\$0	\$0	\$0	\$25,000	\$0	\$0
Plasma Processing	\$370,000	\$70,000	\$0	\$300,000	\$0	\$0	\$0	\$0	\$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	\$651,481	\$75,000	\$0	\$255,000	\$0	\$100,000	\$221,481	\$0	\$0	\$0
Quality and Reliability Engineering	\$125,000	\$75,000	\$0	\$0	\$0	\$0	\$50,000	\$0	\$0	\$0
Silicon Wafer Engineering and Defect Science	\$483,000	\$83,000	\$0	\$400,000	\$0	\$0	\$0	\$0	\$0	\$0
Software Engineering	\$876,176	\$120,000	\$0	\$273,000	\$320,051	\$60,000	\$103,125	\$0	\$0	\$0
Tree Genetics	\$1,725,079	\$68,000	\$0	\$150,000	\$0	\$0	\$0	\$1,362,528	\$144,551	\$0
Virtual Proving Ground Simulation	\$545,319	\$103,000	\$0	\$442,319	\$0	\$0	\$0	\$0	\$0	\$0
Water Quality	\$926,189	\$18,000	\$0	\$373,107	\$74,107	\$460,975	\$0	\$0	\$0	\$0
Wireless Electromagnetic Compatibility	\$355,000	\$75,000	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0	\$0
Grand Mean	\$1,546,729	\$111,248	\$81,170	\$452,039	\$81,263	\$60,145	\$83,564	\$505,340	\$9,556	\$162,405
Grand Sum	\$69,602,800	\$5,006,152	\$3,652,643	\$20,341,748	\$3,656,836	\$2,706,513	\$3,760,398	\$22,740,285	\$430,022	\$7,308,203

* Report sorted Alphabetically by Center

Table 3: 2002-2003 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	\$718,984	\$0	\$0	\$0	\$0	\$0	\$0	9	46	17
Advanced Polymer and Composite Engineering	\$2,242,987	\$44,000	\$0	\$30,000	\$4,000	\$3,000	\$7,000	0	47	0
Advanced Processing and Packaging Studies	\$588,000	\$0	\$0	\$0	\$0	\$0	\$0	0	10	0
Advanced Studies in Novel Surfactants	\$292,000	\$86,000	\$74,500	\$0	\$1,500	\$0	\$10,000	0	16	20
Advanced Vehicle Electronics	\$1,709,500	\$510,000	\$500,000	\$0	\$0	\$10,000	\$0	0	45	5
Berkeley Sensor & Actuator Center	\$9,778,332	\$125,000	\$125,000	\$0	\$0	\$0	\$0	0	51	0
Biocatalysis & Bioprocessing of Macromolecules	\$1,300,000	\$0	\$0	\$0	\$0	\$0	\$0	10	67	15
Biomolecular Interaction Technologies	\$395,000	\$205,000	\$100,000	\$50,000	\$50,000	\$5,000	\$0	10	45	20
Built Environment	\$1,120,566	\$0	\$0	\$0	\$0	\$0	\$0	0	52	11
Ceramic and Composite Materials	\$4,161,258	\$125,000	\$125,000	\$0	\$0	\$0	\$0	0	53	10
Coatings Research	\$570,000	\$1,030,000	\$700,000	\$60,000	\$250,000	\$0	\$20,000	0	43	7
Compact High-Performance Cooling Technologies	\$614,500	\$0	\$0	\$0	\$0	\$0	\$0	0	0	0
Composite Reinforcement	\$1,551,462	\$100,000	\$0	\$0	\$50,000	\$0	\$50,000	0	48	25
Connection One: Wireless Telecommunications Circuit	\$1,905,000	\$4,600,000	\$300,000	\$0	\$0	\$2,000,000	\$2,300,000	10	0	0
Design of Analog/Digital Integrated Circuits	\$3,481,231	\$228,500	\$180,000	\$0	\$0	\$43,000	\$5,500	0	47	15
Dielectric Studies	\$2,216,000	\$70,000	\$30,000	\$0	\$40,000	\$0	\$0	0	45	15
Engineering Logistics and Distribution	\$2,528,271	\$575,513	\$0	\$0	\$60,513	\$505,000	\$10,000	0	43	10
Engineering Tribology	\$625,000	\$500,000	\$10,000	\$350,000	\$85,000	\$55,000	\$0	10	52	5
Fundamentals & Applications of Photopolymerizations	\$370,000	\$0	\$0	\$0	\$0	\$0	\$0	0	48	5
Glass Research	\$802,600	\$0	\$0	\$0	\$0	\$0	\$0	0	78	36
Health Management	\$390,600	\$0	\$0	\$0	\$0	\$0	\$0	0	0	20
Identification Technology Research	\$1,665,000	\$0	\$0	\$0	\$0	\$0	\$0	0	46	10
Information Technology and Organization Consortium	\$250,000	\$0	\$0	\$0	\$0	\$0	\$0	0	52	0
Intelligent Biomedical Devices & Musculoskeletal Syste	\$1,440,000	\$90,000	\$70,000	\$0	\$20,000	\$0	\$0	24	51	0
Intelligent Maintenance Systems	\$1,543,000	\$163,000	\$25,000	\$0	\$0	\$138,000	\$0	0	47	15
Machine-tool Systems	\$218,000	\$242,400	\$242,400	\$0	\$0	\$0	\$0	15	0	15
Management of Information	\$1,553,000	\$0	\$0	\$0	\$0	\$0	\$0	0	51	15
Manufacturing & Packaging of Micro, Optical & Digital E	\$1,257,918	\$45,000	\$22,500	\$0	\$0	\$0	\$22,500	5	47	15
Measurement and Control Engineering	\$557,811	\$95,700	\$52,500	\$0	\$2,000	\$39,500	\$1,700	0	45	20
Membrane Applied Science and Technology	\$3,461,299	\$0	\$0	\$0	\$0	\$0	\$0	6	50	21
Microcontamination Control	\$545,929	\$0	\$0	\$0	\$0	\$0	\$0	0	57	21
Nondestructive Evaluation	\$8,155,928	\$0	\$0	\$0	\$0	\$0	\$0	0	46	11
Optoelectronic Devices, Interconnects and Packaging	\$333,000	\$0	\$0	\$0	\$0	\$0	\$0	0	52	10
Particulate Materials	\$733,480	\$1,205,946	\$1,150,000	\$0	\$54,946	\$1,000	\$0	0	49	20
Pharmaceutical Processing Research	\$853,000	\$0	\$0	\$0	\$0	\$0	\$0	52	52	10
Plasma Processing	\$370,000	\$0	\$0	\$0	\$0	\$0	\$0	15	0	0
Power Systems Engineering	\$3,616,900	\$264,000	\$207,500	\$0	\$16,500	\$40,000	\$0	5	50	15
Precision Metrology	\$651,481	\$0	\$0	\$0	\$0	\$0	\$0	0	34	5
Quality and Reliability Engineering	\$125,000	\$5,000	\$0	\$0	\$0	\$0	\$5,000	36	56	0
Silicon Wafer Engineering and Defect Science	\$483,000	\$0	\$0	\$0	\$0	\$0	\$0	9	46	20
Software Engineering	\$876,176	\$0	\$0	\$0	\$0	\$0	\$0	16	48	16
Tree Genetics	\$1,725,079	\$0	\$0	\$0	\$0	\$0	\$0	0	42	3
Virtual Proving Ground Simulation	\$545,319	\$169,000	\$0	\$0	\$0	\$169,000	\$0	0	47	10
Water Quality	\$926,189	\$0	\$0	\$0	\$0	\$0	\$0	0	25	0
Wireless Electromagnetic Compatibility	\$355,000	\$175,000	\$175,000	\$0	\$0	\$0	\$0	26	45	15
Grand Mean	\$1,546,729	\$236,757	\$90,876	\$10,889	\$14,099	\$66,856	\$54,038	5.7333333	41.644444	11.177778
Grand Sum	\$69,602,800	\$10,654,059	\$4,089,400	\$490,000	\$634,459	\$3,008,500	\$2,431,700	N/A	N/A	N/A

* Report sorted Alphabetically by Center

Table 4: 2002-2003 INDUSTRY MEMBERSHIP DESCRIPTORS

CenterName	2002-2003 MEMBERS				LIFETIME MEMBERS			ANNUAL FEES		
	Current Members	Starting	New	Left	Life Starting	Life New	Life Left	Primary	Secondary	Tertiary
Advanced Computing and Communication	8	10	2	4	8	32	32	\$50,000	\$20,000	
Advanced Polymer and Composite Engineering	39	20	21	2	5	59	25	\$35,000	\$25,000	\$10,000
Advanced Processing and Packaging Studies	11	12	3	4	8	29	26	\$35,000	\$20,000	
Advanced Studies in Novel Surfactants	9	8	4	3	15	7	13	\$25,000	\$9,500	
Advanced Vehicle Electronics	10	10	2	2	11	13	3	\$75,000	\$37,500	\$10,000
Berkeley Sensor & Actuator Center	32	30	6	4	6	44	18	\$50,000		
Biocatalysis & Bioprocessing of Macromolecules	9	9	0	0	7	5	3	\$50,000	\$25,000	
Biomolecular Interaction Technologies	12	8	5	1	8	5	1	\$30,000	\$20,000	\$10,000
Built Environment	24	22	4	2	11	25	12	\$30,000	\$10,000	\$30,000
Ceramic and Composite Materials	31	29	7	5	8	53	30	\$35,000	\$10,000	
Coatings Research	7	11	2	6	11	21	25	\$30,000		
Compact High-Performance Cooling Technologies	14	0	0	0	14	0	0	\$30,000		
Composite Reinforcement	9	10	0	1	9	15	5	\$50,000	\$25,000	\$15,000
Connection One: Wireless Telecommunications Circuit	9	0	0	0	9	0	0	\$50,000	\$25,000	
Design of Analog/Digital Integrated Circuits	16	18	0	2	11	44	39	\$40,000		
Dielectric Studies	21	20	5	4	18	54	51	\$30,000	\$8,500	
Engineering Logistics and Distribution	29	0	0	0	29	0	0	\$50,000	\$25,000	\$5,000
Engineering Tribology	15	9	8	2	14	0	37	\$27,500		
Fundamentals & Applications of Photopolymerizations	8	8	3	3	9	15	7	\$40,000		
Glass Research	17	29	0	12	8	36	22	\$33,000	\$16,500	
Health Management	9	11	1	3	6	32	28	\$35,000		
Identification Technology Research	10	8	4	2	8	4	2	\$40,000		
Information Technology and Organization Consortium	7	8	2	3	12	10	15	\$25,000		
Intelligent Biomedical Devices & Musculoskeletal Syste	12	12	0	0	14	7	8	\$50,000		
Intelligent Maintenance Systems	21	25	3	7	25	3	7	\$35,000	\$35,000	
Machine-tool Systems	4	7	0	3	6	8	11	\$50,000	\$20,000	
Management of Information	7	5	4	2	8	13	14	\$100,000	\$50,000	\$25,000
Manufacturing & Packaging of Micro, Optical & Digital E	4	9	0	5	10	16	22	\$60,000	\$45,000	\$35,000
Measurement and Control Engineering	7	8	2	3	14	25	25	\$35,000	\$8,000	\$7,500
Membrane Applied Science and Technology	12	12	1	1	8	20	14	\$40,000		
Microcontamination Control	7	11	5	9	26	44	61	\$40,000	\$25,000	
Nondestructive Evaluation	17	18	2	3	14	37	33	\$35,000		
Optoelectronic Devices, Interconnects and Packaging	16	26	7	17	9	50	43	\$175,000	\$100,000	
Particulate Materials	11	19	6	14	12	25	29	\$35,000	\$25,000	
Pharmaceutical Processing Research	25	26	2	3	11	32	17	\$25,000		
Plasma Processing	9	0	0	0	9	0	0	\$30,000	\$10,000	
Power Systems Engineering	36	34	9	7	17	50	23	\$40,000	\$20,000	
Precision Metrology	9	10	1	2	15	8	14	\$30,000		
Quality and Reliability Engineering	0	4	0	4	11	6	17	\$30,000	\$15,000	\$10,000
Silicon Wafer Engineering and Defect Science	11	8	5	2	6	13	7	\$50,000	\$25,000	
Software Engineering	14	13	4	3	10	43	39	\$30,000	\$5,000	
Tree Genetics	6	8	3	5	13	4	9	\$25,000		
Virtual Proving Ground Simulation	12	13	6	7	24	25	37	\$40,000	\$20,000	
Water Quality	13	19	3	9	16	12	15	\$30,000	\$15,000	\$3,000
Wireless Electromagnetic Compatibility	7	8	0	1	14	8	15	\$35,000	\$15,000	\$5,000
Grand Mean	13.69	13.00	3.16	3.82	11.93	21.16	18.98	\$42,567	\$23,667	\$13,792
Grand Sum	616	585	142	172	537	952	854			

* Report sorted Alphabetically by Center

Table 5: 2002-2003 HUMAN RESOURCES

Center Name	RESEARCHERS			STUDENTS		
	Faculty 18			PhD	Masters	Undergraduate
	Scientists	Post Docs	Research Staff			
Advanced Computing and Communication	5	0	0	12	2	0
Advanced Polymer and Composite Engineering	19	6	3	6	40	15
Advanced Processing and Packaging Studies	21	1	0	7	8	0
Advanced Studies in Novel Surfactants	5	3	1	5	2	0
Advanced Vehicle Electronics	11	0	6	17	12	2
Berkeley Sensor & Actuator Center	11	15	5	85	18	5
Biocatalysis & Bioprocessing of Macromolecules	9	6	0	6	0	4
Biomolecular Interaction Technologies	6	0	6	0	0	0
Built Environment	4	1	5	3	21	3
Ceramic and Composite Materials	19	6	5	20	11	9
Coatings Research	8	3	4	9	6	5
Compact High-Performance Cooling Technologies	9	2	0	9	6	1
Composite Reinforcement	4	1	2	4	14	7
Connection One: Wireless Telecommunications Circuits	21	13	0	13	24	7
Design of Analog/Digital Integrated Circuits	15	0	8	7	2	2
Dielectric Studies	14	2	0	4	4	2
Engineering Logistics and Distribution	22	0	6	1	31	10
Engineering Tribology	9	2	1	7	2	2
Fundamentals & Applications of Photopolymerizations	6	1	3	14	0	2
Glass Research	16	1	3	9	2	0
Health Management	2	0	2	0	3	0
Identification Technology Research	13	0	2	5	12	4
Information Technology and Organization Consortium	12	2	8	0	0	0
Intelligent Biomedical Devices & Musculoskeletal Systems	8	1	3	5	8	6
Intelligent Maintenance Systems	4	5	2	0	5	0
Machine-tool Systems	3	0	0	5	7	3
Management of Information	6	0	5	13	2	4
Manufacturing & Packaging of Micro, Optical & Digital Electron	13	5	2	21	5	0
Measurement and Control Engineering	12	2	1	13	9	15
Membrane Applied Science and Technology	20	5	3	14	0	0
Microcontamination Control	5	0	0	7	1	4
Nondestructive Evaluation	19	7	25	21	16	21
Optoelectronic Devices, Interconnects and Packaging	13	4	9	15	0	4
Particulate Materials	8	1	2	8	3	3
Pharmaceutical Processing Research	18	0	0	8	3	0
Plasma Processing	1	4	2	2	0	0
Power Systems Engineering	41	0	5	49	4	5
Precision Metrology	13	0	3	13	7	5
Quality and Reliability Engineering	6	0	0	6	0	0
Silicon Wafer Engineering and Defect Science	8	9	4	11	3	1
Software Engineering	27	0	3	8	23	6
Tree Genetics	2	1	6	1	0	18
Virtual Proving Ground Simulation	3	0	5	6	2	0
Water Quality	13	1	3	4	7	1
Wireless Electromagnetic Compatibility	7	0	1	0	2	1
Grand Mean	11.36	2.44	3.42	10.51	7.27	3.93
Grand Sum	511	110	154	473	327	177

* Report sorted Alphabetically by Center

Table 6: 2002-2003 CENTER DIRECTOR DESCRIPTORS

CenterName	Rank	Tenure	Reports To	TIME ALLOCATION 19				
				Center Admin	Other Admin	Research	Teaching	Other
Advanced Computing and Communication	No Academic Rank	Non Tenured	Dean	75	20	0	0	5
Advanced Polymer and Composite Engineering	Director and Professor	Tenured	Dean	10	10	40	35	5
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	Director	Non-Tenure Track	Director, Electronics Research	70	0	0	30	0
Biocatalysis & Bioprocessing of Macromolecules	Full Professor	Tenured	Associate Dean of Research and IP	10	30	40	15	5
Biomolecular Interaction Technologies	Full Professor	Tenured	Dean, College of Life Sciences and Agriculture	40	30	20	10	0
Built Environment	Director and Professor	Tenured	Vice Chancellor for Research	50	0	30	20	0
Ceramic and Composite Materials	Full Professor	Tenured	Vice Provost for Research	20	10	40	30	0
Coatings Research	Full Professor	Tenured	Dean of College of Science and Technology	10	10	30	30	20
Compact High-Performance Cooling Technologies	Full Professor	Tenured	Head, School of Mechanical Engineering	20	5	50	20	5
Composite Reinforcement	Full Professor	Tenured	Dean	25	25	20	25	5
Connection One: Wireless Telecommunications Circuits	Full Professor	Tenured	Chair of Electrical Engineering	30	15	30	15	10
Design of Analog/Digital Integrated Circuits		Tenured	Dean	35	50	0	15	0
Dielectric Studies	Full Professor	Tenured	Director, Materials Research Institute	30	5	30	30	5
Engineering Logistics and Distribution	Director and Professor	Tenured	Dean of Engineering	25	50	15	5	5
Engineering Tribology	Full Professor	Tenured	Chair	10	50	19	10	1
Fundamentals & Applications of Photopolymerizations	Full Professor	Tenured	Dean	5	50	40	5	0
Glass Research	Full Professor	Tenure Track	Dean, School of CEMS	75	0	10	0	5
Health Management	Full Professor	Tenured	Chair, Department of Health Services	25	10	30	30	5
Identification Technology Research	Full Professor	Tenured	Vice President for Research and Economic De	25	0	25	35	15
Information Technology and Organization Consortium	Full Professor		Director, CRITO	20	10	40	20	10
Intelligent Biomedical Devices & Musculoskeletal Syste	Full Professor	Tenured	Provost	10	60	20	5	5
Intelligent Maintenance Systems	Full Professor	Tenured	Dean	0	0	0	0	0
Intelligent Maintenance Systems	Full Professor	Tenured	Dean	20	5	30	20	25
Machine-tool Systems	Full Professor	Tenured	Dean, College of Engineering	10	10	40	40	0
Management of Information	Full Professor	Tenured	Dean	20	5	50	25	0
Manufacturing & Packaging of Micro, Optical & Digital El	Full Professor	Tenured	Dean, College of Engineering and Applied Scie	15	15	40	20	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 Colorad	10	10	60	20	0
Microcontamination Control	Full Professor	Tenured	Dean	25	15	30	25	5
Nondestructive Evaluation	Full Professor	Tenured	Director, Institute for Physical Research & Tec	50	5	25	15	5
Optoelectronic Devices, Interconnects and Packaging	Full Professor	Tenured	Director	20	20	50	5	5
Particulate Materials	Full Professor	Tenured	Director, Materials Research Institute	38	0	44	14	4
Pharmaceutical Processing Research	Full Professor	Tenured	Head, Department of Industrial & Physical Phar	50	0	40	10	0
Plasma Processing	Full Professor	Non-Tenure Track	Dean, Batten College of Engineering & Techno	25	25	50	0	0
Power Systems Engineering	Full Professor	Tenured	Dean of Engineering	40	5	25	25	5
Precision Metrology	Full Professor	Tenured	Associate Provost for Research	10	10	25	50	5
Quality and Reliability Engineering	Full Professor	Tenured	Dean of Engineering	15	10	30	35	10
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	25	50	0
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	Department Head	40	20	20	20	0
Wireless Electromagnetic Compatibility	Full Professor	Tenured	Director, School of IE	25	0	50	25	0
Grand Mean				25.98	14.24	31.91	20.85	4.41

* Report sorted Alphabetically by Center

Table 7: 2002-2003 CENTER OUTCOMES

Center Name:	STUDENTS RECEIVING DEGREE 20			STUDENTS HIRED BY INDUSTRY 21			PUBLICATIONS 22		
	BA Grad	MA Grad	PhD Grad	BA Hired	MA Hired	PhD Hired	w/Ctr	w/IAB	Presentations
							Research	Members	
Advanced Computing and Communication	0	8	0	0	0	0	0	0	0
Advanced Polymer and Composite Engineering	1	3	8	0	0	0	38	2	63
Advanced Processing and Packaging Studies	0	8	7	0	0	1	20	0	15
Advanced Studies in Novel Surfactants	0	2	1	0	0	4	13	0	15
Advanced Vehicle Electronics	2	3	1	0	0	0	30	11	32
Berkeley Sensor & Actuator Center	5	5	20	0	3	10	70	5	55
Biocatalysis & Bioprocessing of Macromolecules	1	0	3	0	0	0	19	2	24
Biomolecular Interaction Technologies	1	1	0	0	0	0	1	0	1
Built Environment	1	2	0	0	0	0	0	0	0
Ceramic and Composite Materials	0	0	0	0	0	0	13	0	32
Coatings Research	2	0	0	0	0	0	6	2	16
Compact High-Performance Cooling Technologies	2	4	1	0	0	0	30		30
Composite Reinforcement	1	5	2	0	0	0	18	3	15
Connection One: Wireless Telecommunications Circu	5	8	3	3	5	3	12	3	30
Design of Analog/Digital Integrated Circuits	0	6	4	0	2	3	31	1	23
Dielectric Studies	1	2	2	0	0	0	10	3	14
Engineering Logistics and Distribution	2	5	1	0	0	1	19	5	32
Engineering Tribology	3	2	3	0	0	0	8	2	15
Fundamentals & Applications of Photopolymerization	1	1	3	0	0	0	14	0	12
Glass Research	0	0	3	0	0	0	15	3	20
Health Management	0	0	0	0	0	0	10	0	30
Identification Technology Research	0	3	1	0	1	0	7	0	13
Information Technology and Organization Consortium	1	4	6	0	0	0	0	0	0
Intelligent Biomedical Devices & Musculoskeletal Syst	10	5	2	1	3	1	6	6	10
Intelligent Maintenance Systems	0	0	1	0	0	0	12	0	20
Machine-tool Systems	0	3	1	0	0	1	12	0	3
Management of Information	0	1	2	0	0	0	21	5	35
Manufacturing & Packaging of Micro, Optical & Digital	0	5	7	0	0	0	29	2	15
Measurement and Control Engineering	0	5	1	0	0	0	17	2	25
Membrane Applied Science and Technology	1	0	3	0	0	1	8	0	15
Microcontamination Control	4	2	0	1	0	0	25	2	21
Nondestructive Evaluation	0	2	1	0	2	0	16	2	15
Optoelectronic Devices, Interconnects and Packaging	0	2	1	0	0	0	19	10	6
Particulate Materials	3	3	3	0	0	0	10	2	25
Pharmaceutical Processing Research	0	1	2	0	1	0	0	0	3
Plasma Processing	0	0	0	0	0	0	3	1	0
Power Systems Engineering	15	21	18	13	1	6	97	31	117
Precision Metrology	0	1	3	0	0	1	7	0	7
Quality and Reliability Engineering	0	0	0	0	0	0	8	1	12
Silicon Wafer Engineering and Defect Science	0	1	4	0	0	1	18	8	23
Software Engineering	0	5	1	0	3	0	9	3	38
Tree Genetics	0	0	0	0	0	0	16	0	13
Virtual Proving Ground Simulation	0	6	1	0	1	1	5	2	11
Water Quality	0	4	2	0	0	0	4	0	8
Wireless Electromagnetic Compatibility	1	2	1	0	2	0	5	2	19
Grand Mean	1.40	3.13	2.73	0.40	0.53	0.76	16.24	2.75	20.62
Grand Sum	63	141	123	18	24	34	731	121	928

Table 8: 2002-2003 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	35.56
Patent Applications	17	37.78
Software Copyrights	2	4.44
Patents Granted/Derived	11	24.44
Licensing Agreements	8	17.78
Royalties Realized	3	6.67

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	60	1.33
Patent Applications	63	1.40
Software Copyrights	9	0.20
Patents Granted/Derived	20	0.44
Licensing Agreements	9	0.20
Royalties Realized	3	0.07

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 1997-98 fiscal year. Some Centers are reporting data from different fiscal years (1996-1997 & 1997-1998), depending on when the Center had completed their fiscal year at the time NSF requested the Center Director data.
- 3) On Tables 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: Arizona State University (Heydt), Colorado School of Mines (Shoureshi), Texas A&M University (Kezunovic), Carnegie-Mellon University (Talukdar), Georgia Institute of Technology (Meliopoulos), and Iowa State University (Vittal).