

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

Final Report
REVISED

1999-2000 STRUCTURAL INFORMATION^{1,2}

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NOTE: 1999-2000 data collected from 50/50 Center Director Surveys (100% response rate).

PLEASE DIRECT CORRECTIONS, QUESTIONS, AND COMMENTS TO THE AUTHORS

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Table 1: 1999-2000 GENERAL CENTER INFORMATION* (Sorted Chronologically)

<i>Yr Funded:</i>	<i>Center Name</i>	<i>University Name: Director</i>	<i>Partner University 1 Co-Director 1</i>	<i>Partner University 2 Co-Director 2</i>	<i>Partner University 3 Co-Director 3</i>	<i>Partner University 4 Co-Director 4</i>
Active						
1983	Dielectric Studies	Pennsylvania State Univ., Univ. Park Randall				
1984	Microcontamination Control	Univ. of Arizona O'Hanlon	Rensselaer Polytech Institute Rose			
1985	Measurement and Control Engineering	Univ. of Tennessee, Knoxville Garrison	Oklahoma State Univ. High			
1985	Nondestructive Evaluation	Iowa State Univ. Thompson				
1986	Sensors and Actuators	Univ. of California, Berkeley Muller	Univ. of California, Davis Tien	Stanford University Solgaard		
1988	Building Performance and Diagnostics	Carnegie Mellon Univ. Hartkopf				
1988	Microengineered Materials	Univ. of New Mexico Datye	Rutgers Univ. Niesz			
1989	Advanced Air Conditioning and Refrigeration	Univ. of Illinois Urbana-Champaign Bullard				
1990	Dimensional Measurement & Control in Manufacturing	Univ. of Michigan, Ann Arbor Hu				
1990	Membrane Applied Science and Technology	Univ. of Colorado, Boulder Noble				
1991	Advanced Communications	Villanova Univ. Di Giacomo				
1991	Integrated Pest Management	North Carolina State Univ. Stinner				
1991	Materials Handling/Logistics Institute	Georgia Institute of Technology Nemhauser	Univ. of Arkansas Taylor			
1991	Polymer Interfaces	Lehigh Univ. Chaudhury				
1991	Wireless Information Networks	Rutgers Univ. Yates				
1993	Advanced Computing and Communication	North Carolina State Univ. Kekas	Duke Univ. Trivedi			
1993	Corrosion in Multiphase Systems	Ohio University Jepson				
1993	Machine-tool Systems	Univ. of Illinois Urbana-Champaign Kapoor				
1994	Advanced Processing and Packaging Studies	North Carolina State Univ. Swartzel	Univ. of California, Davis Shoemaker	Ohio State Univ. Schwartz & Sastry		
1994	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	Northwestern Univ. Keer	Georgia Institute of Technology Danyluk			
1994	Software Engineering	Purdue Mathur	West Virginia Cowan			
1995	Advanced Electronic Materials, Devices and Systems	Univ. of Texas, Arlington Taylor	Texas A&M Fitzer			
1995	Coatings Research	Eastern Michigan Univ. Jones	Univ. of Southern Mississippi Urban			
1995	Ergonomics	Texas A&M Congleton				
1995	Man & Packaging of Micro, Optical & Digital Electronics	Univ. of Colorado, Boulder Mahajan				

* Report sorted by Status, Organized by Year Funded

<i>Yr Funded:</i>	<i>Center Name</i>	<i>University Name: Director</i>	<i>Partner University 1 Co-Director 1</i>	<i>Partner University 2 Co-Director 2</i>	<i>Partner University 3 Co-Director 3</i>	<i>Partner University 4 Co-Director 4</i>
1995	Optoelectronic Devices, Interconnects and Packaging	Univ. of Arizona Peyhgambarian	Univ. of Maryland, College Park Dagenais			
1995	Particulate Materials	Pennsylvania State Univ., Univ. Park Adair				
1995	Pharmaceutical Processing Research	Purdue Nail	Univ. of Connecticut Pikal			
1996	Glass Research	Alfred Univ., College of Ceramics Seward	Univ. of Missouri, Rolla Moore	Pennsylvania State Univ. Pantano		
1996	Hazardous & Toxic Waste Management	New Jersey Institute of Technology Watts				
1996	Health Management	Univ. of Washington Zuckerman	Univ. of California, Berkeley Shortell			
1996	Power Systems Engineering	Cornell Univ. Thomas	Univ. of California, Berkeley Oren	Univ. of Illinois Urbana-Champaign Sauer	Univ. of Wisconsin, Madison Lasseter	Washington State Univ. Bose
1997	Advanced Polymer and Composite Engineering	Ohio State Univ. Lee				
1997	Biological Surface Science	State Univ. of New York at Buffalo Baier	Univ. of Memphis Jahan	Univ. of Miami Cheung	Alfred Univ., College of Ceramics Clare	
1997	Built Environment	Univ. of California, Berkeley Arens				
1997	Management of Information	Univ. of Arizona Nunamaker				
1997	Quality and Reliability Engineering	Rutgers Univ. Elsayed				
1997	Silicon Wafer Engineering and Defect Science	North Carolina State Univ. Rozgonyi				
1997	Virtual Proving Ground Simulation	Univ. of Iowa Haug	Univ. of Texas, Austin Longoria			
1997	Wireless Electromagnetic Compatibility	Univ. of Oklahoma Grant				
1998	Precision Metrology	Univ. of North Carolina, Charlotte Hocken				
1999	Advanced Studies in Novel Surfactants	Columbia Univ. Somasundaran				
1999	Advanced Vehicle Electronics	Auburn Univ. Johnson				
1999	Composite Reinforcement	Univ. of Missouri, Rolla Nanni				
1999	Digital Video/Media Research	Rensselaer Polytech Institute Pearlman	New Jersey Institute of Technology Wolf			
1999	Information Technology and Organization	Univ. of California, Irvine Kraemer				
1999	Intelligent Biomedical Devices & Musculoskeletal Syste	Colorado School of Mines Shoureshi	Rocky Mountain Musculoskeletal Researc Komistek			
1999	Tree Genetics	Oregon State Univ. Strauss				
1999	Water Quality	Univ. of Arizona Pepper				
New/Recompleted						
1999	Biocatalysis & Bioprocessing of Macromolecules	Polytechnic University of New York Gross				
1999	Fundamentals & Applications of Photopolymerizations	Univ. of Iowa	Univ. of Colorado, Boulder			
1999	Study of Earth Oceans and Space	Univ. of New Hampshire				

Table 2: 1999-2000 OPERATING BUDGET AND TOTAL FUNDING

Center Name	Total ⁴ Funding	NSF ⁵		INDUSTRY		OTHER				
		NSF/ IUCRC	Other NSF	Member ⁶ Fees	Add ⁷ Industry	State ⁸	University ⁹ Federal	Other ¹⁰ Federal	Non- ¹¹ Federal	Other ¹² Cash
Advanced Air Conditioning and Refrigeration	\$3,741,000	\$8,000	\$50,000	\$980,000	\$0	\$0	\$650,000	\$1,453,000	\$0	\$600,000
Advanced Communications	\$2,306,000	\$43,000	\$0	\$228,000	\$2,000,000	\$35,000	\$0	\$0	\$0	\$0
Advanced Computing and Communication	\$3,710,568	\$185,494	\$1,021,054	\$385,000	\$127,638	\$0	\$98,739	\$1,672,227	\$215,416	\$5,000
Advanced Electronic Materials, Devices and Systems	\$498,000	\$128,000	\$0	\$335,000	\$0	\$0	\$35,000	\$0	\$0	\$0
Advanced Polymer and Composite Engineering	\$1,624,049	\$100,000	\$417,000	\$301,750	\$200,000	\$100,000	\$246,840	\$0	\$0	\$258,459
Advanced Processing and Packaging Studies	\$578,518	\$128,000	\$0	\$355,000	\$95,518	\$0	\$0	\$0	\$0	\$0
Advanced Studies in Novel Surfactants	\$404,500	\$100,000	\$0	\$234,500	\$45,000	\$0	\$0	\$25,000	\$0	\$0
Advanced Vehicle Electronics	\$1,075,000	\$95,000	\$5,000	\$825,000	\$0	\$0	\$150,000	\$0	\$0	\$0
Analog/Digital Integrated Circuits	\$1,581,530	\$135,000	\$189,169	\$805,000	\$0	\$35,000	\$417,361	\$0	\$0	\$0
Biological Surface Science	\$572,675	\$155,000	\$0	\$200,000	\$35,000	\$0	\$90,000	\$24,475	\$0	\$68,200
Building Performance and Diagnostics	\$1,248,053	\$43,000	\$0	\$515,000	\$261,478	\$45,000	\$0	\$353,575	\$30,000	\$0
Built Environment	\$1,166,500	\$100,000	\$0	\$405,000	\$12,500	\$0	\$332,000	\$80,000	\$225,000	\$12,000
Ceramic and Composite Materials	\$6,023,480	\$197,369	\$1,081,475	\$621,523	\$15,000	\$198,800	\$281,924	\$2,548,919	\$1,078,470	\$0
Coatings Research	\$595,000	\$112,000	\$110,000	\$330,000	\$0	\$0	\$43,000	\$0	\$0	\$0
Composite Reinforcement	\$522,000	\$70,000	\$5,000	\$300,000	\$0	\$0	\$147,000	\$0	\$0	\$0
Corrosion in Multiphase Systems	\$410,000	\$35,000	\$25,000	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
Dielectric Studies	\$2,165,000	\$8,000	\$0	\$458,000	\$759,000	\$0	\$98,000	\$842,000	\$0	\$0
Digital Video/Media Research	\$519,000	\$120,000	\$120,000	\$269,000	\$10,000	\$0	\$0	\$0	\$0	\$0
Dimensional Measurement & Control in Manufacturin	\$318,000	\$43,000	\$0	\$275,000	\$0	\$0	\$0	\$0	\$0	\$0
Engineering Tribology	\$562,451	\$65,000	\$148,088	\$219,375	\$100,000	\$0	\$0	\$29,988	\$0	\$0
Ergonomics	\$402,330	\$65,000	\$5,000	\$273,330	\$0	\$0	\$0	\$59,000	\$0	\$0
Glass Research	\$1,404,174	\$88,000	\$0	\$1,012,500	\$0	\$0	\$94,482	\$209,192	\$0	\$0
Hazardous & Toxic Waste Management	\$3,945,102	\$0	\$280,000	\$322,500	\$0	\$1,167,800	\$540,000	\$1,634,802	\$0	\$0
Health Management	\$443,000	\$93,000	\$0	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
Information Technology and Organization	\$475,000	\$100,000	\$0	\$300,000	\$0	\$0	\$75,000	\$0	\$0	\$0
Integrated Pest Management	\$973,442	\$43,000	\$114,404	\$547,000	\$0	\$0	\$10,000	\$226,038	\$33,000	\$0
Intelligent Biomedical Devices & Musculoskeletal Syst	\$982,000	\$150,000	\$0	\$715,000	\$0	\$32,000	\$85,000	\$0	\$0	\$0
Machine-tool Systems	\$537,730	\$43,000	\$0	\$320,000	\$174,730	\$0	\$0	\$0	\$0	\$0
Man & Packaging of Micro, Optical & Digital Electroni	\$2,009,282	\$80,000	\$0	\$415,000	\$0	\$0	\$0	\$1,479,282	\$0	\$35,000
Management of Information	\$1,900,000	\$70,000	\$0	\$650,000	\$0	\$380,000	\$0	\$800,000	\$0	\$0
Materials Handling/Logistics Institute	\$2,193,750	\$289,000	\$174,238	\$493,993	\$68,000	\$84,824	\$814,080	\$269,615	\$0	\$0
Measurement and Control Engineering	\$689,500	\$130,000	\$5,000	\$480,000	\$74,500	\$0	\$0	\$0	\$0	\$0
Membrane Applied Science and Technology	\$1,333,756	\$48,000	\$101,000	\$414,972	\$134,256	\$45,528	\$40,000	\$550,000	\$0	\$0
Microcontamination Control	\$483,700	\$80,000	\$143,300	\$215,000	\$0	\$0	\$45,400	\$0	\$0	\$0
Nondestructive Evaluation	\$5,653,628	\$70,000	\$66,800	\$577,500	\$0	\$1,331,457	\$0	\$2,111,776	\$0	\$1,496,095
Optoelectronic Devices, Interconnects and Packaging	\$696,000	\$48,000	\$0	\$330,000	\$0	\$318,000	\$0	\$0	\$0	\$0
Particulate Materials	\$1,821,000	\$100,000	\$50,000	\$325,000	\$3,000	\$0	\$165,000	\$0	\$10,000	\$1,168,000
Pharmaceutical Processing Research	\$588,000	\$35,000	\$0	\$425,000	\$0	\$0	\$128,000	\$0	\$0	\$0
Polymer Interfaces	\$400,508	\$48,000	\$5,000	\$160,000	\$116,000	\$0	\$71,508	\$0	\$0	\$0
Power Systems Engineering	\$1,342,500	\$200,000	\$200,000	\$942,500	\$0	\$0	\$0	\$0	\$0	\$0
Precision Metrology	\$800,526	\$75,000	\$213,020	\$367,500	\$0	\$0	\$145,006	\$0	\$0	\$0
Quality and Reliability Engineering	\$570,000	\$75,000	\$75,000	\$300,000	\$0	\$0	\$35,000	\$85,000	\$0	\$0
Sensors and Actuators	\$7,968,345	\$80,000	\$0	\$1,800,000	\$5,000	\$100,000	\$0	\$5,483,345	\$500,000	\$0
Silicon Wafer Engineering and Defect Science	\$435,000	\$85,000	\$0	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
Software Engineering	\$495,000	\$85,000	\$0	\$305,000	\$105,000	\$0	\$0	\$0	\$0	\$0
Tree Genetics	\$568,347	\$68,000	\$0	\$300,000	\$0	\$0	\$200,347	\$0	\$0	\$0
Virtual Proving Ground Simulation	\$895,000	\$103,000	\$300,000	\$492,000	\$0	\$0	\$0	\$0	\$0	\$0
Water Quality	\$1,036,000	\$350,000	\$0	\$321,000	\$365,000	\$0	\$0	\$0	\$0	\$0
Wireless Electromagnetic Compatibility	\$525,000	\$70,000	\$0	\$455,000	\$0	\$0	\$0	\$0	\$0	\$0
Wireless Information Networks	\$1,527,855	\$48,000	\$343,472	\$630,000	\$0	\$227,079	\$12,904	\$161,400	\$0	\$105,000
Grand Mean	\$1,454,336	\$93,797	\$104,960	\$459,639	\$94,132	\$82,010	\$101,032	\$401,973	\$41,838	\$74,955
Grand Sum	\$72,716,799	\$4,689,863	\$5,248,020	\$22,981,943	\$4,706,620	\$4,100,488	\$5,051,591	\$20,098,634	\$2,091,886	\$3,747,754

* Report sorted Alphabetically by Center

Table 3: 1999-2000 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 Air Conditioning and Refrigeration	\$3,741,000	\$60,000	\$20,000	\$0	\$0	\$10,000	\$30,000	0	70	10
Advanced Communications	\$2,306,000	\$0	\$0	\$0	\$0	\$0	\$0	0	85	4
Advanced Computing and Communication	\$3,710,568	\$593,000	\$523,000	\$0	\$70,000	\$0	\$0	10	50	26
Advanced Electronic Materials, Devices and Systems	\$498,000	\$1,240,000	\$1,240,000	\$0	\$0	\$0	\$0	10	44	20
Advanced Polymer and Composite Engineering	\$1,624,049	\$208,500	\$80,000	\$45,000	\$13,500	\$50,000	\$20,000	0	46	2
Advanced Processing and Packaging Studies	\$578,518	\$140,000	\$140,000	\$0	\$0	\$0	\$0	0	9	18
Advanced Studies in Novel Surfactants	\$404,500	\$14,300	\$14,300	\$0	\$0	\$0	\$0	5	70	25
Advanced Vehicle Electronics	\$1,075,000	\$500,000	\$500,000	\$0	\$0	\$0	\$0	0	0	7
Analog/Digital Integrated Circuits	\$1,581,530	\$52,000	\$35,000	\$0	\$0	\$6,000	\$11,000	0	45	15
Biological Surface Science	\$572,675	\$102,000	\$20,000	\$41,000	\$6,000	\$0	\$35,000	12	54	10
Building Performance and Diagnostics	\$1,248,053	\$0	\$0	\$0	\$0	\$0	\$0	0	50	30
Built Environment	\$1,166,500	\$22,100	\$18,100	\$4,000	\$0	\$0	\$0	0	50	9
Ceramic and Composite Materials	\$6,023,480	\$50,000	\$50,000	\$0	\$0	\$0	\$0	0	52	8
Coatings Research	\$595,000	\$0	\$0	\$0	\$0	\$0	\$0	0	46	13
Composite Reinforcement	\$522,000	\$100,000	\$0	\$0	\$50,000	\$0	\$50,000	0	49	25
Corrosion in Multiphase Systems	\$410,000	\$120,000	\$20,000	\$0	\$0	\$100,000	\$0	0	44	10
Dielectric Studies	\$2,165,000	\$940,000	\$700,000	\$200,000	\$40,000	\$0	\$0	0	0	5
Digital Video/Media Research	\$519,000	\$0	\$0	\$0	\$0	\$0	\$0	10	54	10
Dimensional Measurement & Control in Manufacturing	\$318,000	\$1,000,000	\$1,000,000	\$0	\$0	\$0	\$0	0	52	10
Engineering Tribology	\$562,451	\$0	\$0	\$0	\$0	\$0	\$0	10	47	10
Ergonomics	\$402,330	\$35,000	\$10,000	\$25,000	\$0	\$0	\$0	11	44	20
Glass Research	\$1,404,174	\$0	\$0	\$0	\$0	\$0	\$0	7	75	24
Hazardous & Toxic Waste Management	\$3,945,102	\$7,000	\$0	\$0	\$7,000	\$0	\$0	5	46	16
Health Management	\$443,000	\$0	\$0	\$0	\$0	\$0	\$0	0	0	25
Information Technology and Organization	\$475,000	\$50,000	\$50,000	\$0	\$0	\$0	\$0	5	0	0
Integrated Pest Management	\$973,442	\$0	\$0	\$0	\$0	\$0	\$0	10	48	16
Intelligent Biomedical Devices & Musculoskeletal Systems	\$982,000	\$260,000	\$150,000	\$50,000	\$20,000	\$40,000	\$0	25	50	15
Machine-tool Systems	\$537,730	\$315,000	\$315,000	\$0	\$0	\$0	\$0	15	0	15
Man & Packaging of Micro, Optical & Digital Electronics	\$2,009,282	\$500,000	\$500,000	\$0	\$0	\$0	\$0	5	47	15
Management of Information	\$1,900,000	\$0	\$0	\$0	\$0	\$0	\$0	0	51	15
Materials Handling/Logistics Institute	\$2,193,750	\$0	\$0	\$0	\$0	\$0	\$0	0	49	10
Measurement and Control Engineering	\$689,500	\$100,000	\$0	\$0	\$10,000	\$90,000	\$0	0	43	14
Membrane Applied Science and Technology	\$1,333,756	\$0	\$0	\$0	\$0	\$0	\$0	6	46	20
Microcontamination Control	\$483,700	\$35,000	\$35,000	\$0	\$0	\$0	\$0	26	26	20
Nondestructive Evaluation	\$5,653,628	\$0	\$0	\$0	\$0	\$0	\$0	0	44	0
Optoelectronic Devices, Interconnects and Packaging	\$696,000	\$30,000	\$30,000	\$0	\$0	\$0	\$0	0	52	10
Particulate Materials	\$1,821,000	\$100,000	\$100,000	\$0	\$0	\$0	\$0	0	37	22
Pharmaceutical Processing Research	\$588,000	\$60,000	\$60,000	\$0	\$0	\$0	\$0	52	26	10
Polymer Interfaces	\$400,508	\$0	\$0	\$0	\$0	\$0	\$0	12	58	0
Power Systems Engineering	\$1,342,500	\$0	\$0	\$0	\$0	\$0	\$0	0	0	10
Precision Metrology	\$800,526	\$111,000	\$10,000	\$0	\$71,000	\$30,000	\$0	0	53	5
Quality and Reliability Engineering	\$570,000	\$45,000	\$15,000	\$0	\$20,000	\$10,000	\$0	20	55	0
Sensors and Actuators	\$7,968,345	\$280,000	\$220,000	\$50,000	\$0	\$10,000	\$0	0	51	7
Silicon Wafer Engineering and Defect Science	\$435,000	\$0	\$0	\$0	\$0	\$0	\$0	9	47	18
Software Engineering	\$495,000	\$0	\$1,000	\$0	\$0	\$0	\$0	26	0	28
Tree Genetics	\$568,347	\$27,000	\$0	\$0	\$0	\$0	\$27,000	43	0	5
Virtual Proving Ground Simulation	\$895,000	\$169,000	\$0	\$0	\$0	\$169,000	\$0	0	47	10
Water Quality	\$1,036,000	\$500,000	\$0	\$500,000	\$0	\$0	\$0	0	25	5
Wireless Electromagnetic Compatibility	\$525,000	\$35,000	\$35,000	\$0	\$0	\$0	\$0	26	47	15
Wireless Information Networks	\$1,527,855	\$131,759	\$28,759	\$96,000	\$0	\$0	\$7,000	0	56	26
Grand Mean	\$1,454,336	\$161,891	\$118,403	\$20,633	\$6,276	\$10,510	\$3,673	0	70	10
Grand Sum	\$72,716,799	\$7,932,659	\$5,920,159	\$1,011,000	\$307,500	\$515,000	\$180,000	N/A	N/A	N/A

* Report sorted Alphabetically by Center

Table 4: 1999-2000 INDUSTRY MEMBERSHIP DESCRIPTORS

CenterName	1999-2000 MEMBERS			LIFETIME MEMBERS			ANNUAL FEES			
	Current Members	Starting	New	Left	Life Starting	Life New	Life Left	Primay	Secondary	Tertiary
Advanced Air Conditioning and Refrigeration	27	22	7	2	13	28	14	\$40,000		
Advanced Communications	6	13	2	9	4	20	18	\$42,000	\$15,000	\$5,000
Advanced Computing and Communication	11	10	2	1	8	26	23	\$50,000	\$20,000	
Advanced Electronic Materials, Devices and Systems	10	9	5	4	6	21	17	\$30,000	\$15,000	
Advanced Polymer and Composite Engineering	22	14	9	1	5	26	9	\$35,000	\$25,000	\$5,000
Advanced Processing and Packaging Studies	13	14	1	2	8	22	17	\$35,000	\$20,000	
Advanced Studies in Novel Surfactants	12	15	2	5	15	2	5	\$25,000	\$9,500	
Advanced Vehicle Electronics	11	0	11	0	11	0	0	\$75,000		
Analog/Digital Integrated Circuits	24	21	8	5	11	35	23	\$35,000		
Biological Surface Science	13	13	1	1	6	14	7	\$40,000		
Building Performance and Diagnostics	20	17	5	2	4	24	8	\$50,000	\$30,000	\$25,000
Built Environment	18	14	4	0	11	11	4	\$30,000	\$10,000	
Ceramic and Composite Materials	26	16	10	0	8	26	8	\$30,000	\$10,000	\$5,000
Coatings Research	11	12	1	2	11	13	13	\$30,000		
Composite Reinforcement	9	0	9	0	9	0	0	\$50,000		
Corrosion in Multiphase Systems	19	17	3	1	4	23	8	\$25,000		
Dielectric Studies	19	19	2	2	18	38	37	\$30,000	\$8,500	
Digital Video/Media Research	11	7	8	4	7	8	4	\$40,000	\$15,000	\$5,000
Dimensional Measurement & Control in Manufacturing	7	9	1	3	8	7	8	\$50,000	\$25,000	
Engineering Tribology	10	11	1	2	14	21	25	\$27,500	\$20,000	
Ergonomics	12	11	1	0	9	11	8	\$25,000	\$15,000	\$10,000
Glass Research	32	31	3	2	8	30	6	\$33,000		
Hazardous & Toxic Waste Management	10	13	0	3	8	32	30	\$30,000	\$15,000	\$7,500
Health Management	10	16	3	9	6	23	18	\$35,000		
Information Technology and Organization	10	12	1	3	12	1	3	\$25,000		
Integrated Pest Management	18	15	6	3	7	18	7	\$25,000	\$5,000	
Intelligent Biomedical Devices & Musculoskeletal Syste	14	14	0	0	14	0	0	\$50,000		
Machine-tool Systems	8	7	2	1	6	7	5	\$50,000	\$20,000	\$20,000
Man & Packaging of Micro, Optical & Digital Electronics	7	9	1	3	10	10	13	\$60,000	\$45,000	\$35,000
Management of Information	7	6	5	4	8	5	6	\$100,000	\$50,000	\$25,000
Materials Handling/Logistics Institute	14	18	1	5	18	5	9	\$50,000	\$25,000	
Measurement and Control Engineering	20	17	5	2	14	22	16	\$35,000	\$15,000	
Membrane Applied Science and Technology	10	10	1	1	8	12	8	\$40,000		
Microcontamination Control	13	14	6	7	26	34	47	\$40,000	\$10,000	
Nondestructive Evaluation	20	20	1	1	14	33	26	\$35,000		
Optoelectronic Devices, Interconnects and Packaging	14	11	7	4	9	28	23	\$50,000	\$25,000	
Particulate Materials	14	21	1	8	12	13	14	\$35,000	\$10,000	
Pharmaceutical Processing Research	21	11	12	2	11	19	9	\$25,000		
Polymer Interfaces	5	6	1	2	10	8	13	\$35,000	\$20,000	
Power Systems Engineering	26	20	12	6	17	24	15	\$40,000		
Precision Metrology	15	15	3	3	15	3	3	\$30,000		
Quality and Reliability Engineering	12	12	2	2	11	6	5	\$30,000	\$15,000	\$10,000
Sensors and Actuators	33	29	15	11	6	52	25	\$50,000		
Silicon Wafer Engineering and Defect Science	9	9	1	1	6	4	1	\$50,000	\$25,000	
Software Engineering	8	13	0	5	10	25	27	\$30,000	\$5,000	
Tree Genetics	13	0	13	0	13	0	0	\$25,000		
Virtual Proving Ground Simulation	15	17	2	4	24	19	28	\$40,000	\$20,000	
Water Quality	16	0	16	0	16	0	0	\$30,000	\$3,000	
Wireless Electromagnetic Compatibility	16	17	1	2	14	5	3	\$35,000	\$15,000	\$5,000
Wireless Information Networks	21	22	3	4	20	20	19	\$30,000		
Grand Mean	14.84	13.38	4.34	2.88	10.86	16.68	12.70	\$38,750	\$18,097	\$13,125
Grand Sum	742	669	217	144	543	834	635			

* Report sorted Alphabetically by Center

Table 5: 1999-2000 HUMAN RESOURCES

CenterName	RESEARCHERS		STUDENTS		ADMINISTRATION ¹⁸			
	Faculty	Non-Faculty	Grads	Undergrads	Professional	Professional	Clerical	Clerical
	Scientists	Scientists			Full Time	Part Time	Full Time	Part Time
Advanced Air Conditioning and Refrigeration	16	5	45	25	0	1	1	0
Advanced Communications	16	7	16	6	0	0	0	0
Advanced Computing and Communication	16	3	22	0	0	0	2	1
Advanced Electronic Materials, Devices and Systems	10	2	14	2	3	0	1	2
Advanced Polymer and Composite Engineering	9	2	25	8	0	2	0	0
Advanced Processing and Packaging Studies	16	8	9	0	0	4	0	3
Advanced Studies in Novel Surfactants	4	4	5	0	0	1	1	1
Advanced Vehicle Electronics	7	1	14	10	0	1	1	0
Analog/Digital Integrated Circuits	13	0	39	4	5	1	0	2
Biological Surface Science	12	5	10	6	0	4	0	3
Building Performance and Diagnostics	4	3	8	5	2	1	2	0
Built Environment	15	6	10	2	1	2	0	1
Ceramic and Composite Materials	27	9	33	8	9	1	4	0
Coatings Research	8	5	11	4	0	1	0	1
Composite Reinforcement	4	2	6	3	0	2	0	2
Corrosion in Multiphase Systems	2	1	6	0	1	0	0	0
Dielectric Studies	4	2	8	3	1	0	0	0
Digital Video/Media Research	8	1	14	0	0	3	0	2
Dimensional Measurement & Control in Manufacturing	8	5	8	1	0	3	1	0
Engineering Tribology	8	2	6	1	0	0	0	2
Ergonomics	5	0	12	3	0	2	0	1
Glass Research	13	6	20	4	3	3	1	2
Hazardous & Toxic Waste Management	20	2	14	0	1	1	0	1
Health Management	22	4	5	0	0	4	0	2
Information Technology and Organization	12	2	12	2	0	1	0	1
Integrated Pest Management	21	1	15	18	0	1	0	1
Intelligent Biomedical Devices & Musculoskeletal Systems	5	4	8	3	0	2	0	2
Machine-tool Systems	8	1	16	4	0	1	0	2
Man & Packaging of Micro, Optical & Digital Electronics	6	2	27	2	1	1	0	0
Management of Information	6	6	19	6	1	1	1	2
Materials Handling/Logistics Institute	17	16	18	4	1	4	2	4
Measurement and Control Engineering	11	3	21	9	4	0	2	0
Membrane Applied Science and Technology	11	3	9	4	1	2	0	1
Microcontamination Control	5	3	5	0	1	0	0	0
Nondestructive Evaluation	13	21	40	37	4	0	5	0
Optoelectronic Devices, Interconnects and Packaging	7	3	4	2	0	2	0	2
Particulate Materials	12	4	11	2	1	1	1	0
Pharmaceutical Processing Research	13	1	12	0	0	0	0	1
Polymer Interfaces	14	8	4	1	0	2	1	0
Power Systems Engineering	25	50	5	0	0	14	2	11
Precision Metrology	16	4	36	10	1	0	1	0
Quality and Reliability Engineering	0	0	8	4	0	0	0	1
Sensors and Actuators	16	8	70	5	4	0	5	0
Silicon Wafer Engineering and Defect Science	7	6	13	3	0	1	0	1
Software Engineering	7	2	9	4	1	0	0	1
Tree Genetics	1	0	0	3	0	1	0	0
Virtual Proving Ground Simulation	5	14	14	1	0	3	0	2
Water Quality	8	0	4	2	0	2	0	0
Wireless Electromagnetic Compatibility	5	2	6	2	0	1	1	0
Wireless Information Networks	7	1	22	4	4	0	3	0
Grand Mean	10.50	5.00	15.36	4.54	1.00	1.54	0.76	1.16
Grand Sum	525	250	768	227	50	77	38	58

* Report sorted Alphabetically by Center

Table 6: 1999-2000 CENTER DIRECTOR DESCRIPTORS

CenterName	Rank	Tenure	Reports To	TIME ALLOCATION 19				
				Center Admin	Other Admin	Research	Teaching	Other
Advanced Air Conditioning and Refrigeration	Professor	Tenured	Department Head	30	0	30	30	10
Advanced Communications	Director	Non-Tenure Track	Vice President of Academic Affairs	50	0	25	0	25
Advanced Computing and Communication	Professor	Tenured	Dean	13	5	32	40	10
Advanced Electronic Materials, Devices and Systems	Full Professor	Tenured	Department Head	15	0	40	35	10
Advanced Polymer and Composite Engineering	Director and Professor	Tenured	Dean	10	10	40	35	5
Advanced Processing and Packaging Studies	Distinguished Professor	Tenured	Dean	0	8	80	12	0
Advanced Studies in Novel Surfactants	Professor	Tenured	Dean	10	5	40	35	10
Advanced Vehicle Electronics	Director and Professor	Tenured	Department Head and Dean	25	5	40	15	15
Analog/Digital Integrated Circuits	Professor & Associate Dean	Tenured	Dean	35	50	0	15	0
Biological Surface Science	Professor	Tenured	Provost	20	2	40	30	8
Building Performance and Diagnostics	Director and Professor	Tenured	Dean	15	0	50	35	0
Built Environment	Director and Professor	Tenured	Vice Chancellor for Research	20	20	15	40	5
Ceramic and Composite Materials	Professor	Tenured	Associate Provost for Research	20	10	40	30	0
Coatings Research	Full Professor	Tenured	Dean	20	15	57	8	0
Composite Reinforcement	Professor	Tenured	Dean	25	10	25	25	15
Corrosion in Multiphase Systems	Director and Professor	Tenured	Dean	70	0	10	20	0
Dielectric Studies	Full Professor	Tenured	Director	20	5	40	30	5
Digital Video/Media Research	Professor	Tenured	Dean	10	5	45	35	5
Dimensional Measurement & Control in Manufacturing	Professor	Tenured	Dean	10	25	35	30	0
Engineering Tribology	Professor	Tenured	Dean	10	40	20	25	5
Ergonomics	Professor	Tenured	Director of TEES	20	5	50	20	5
Glass Research	Professor	Tenure Track	Dean	75	0	10	10	5
Hazardous & Toxic Waste Management	Director	Non-Tenure Track	Provost	20	50	0	10	20
Health Management	Professor	Tenured	Department Chair	25	0	50	25	0
Information Technology and Organization	Professor	Tenured	Vice Chancellor	25	25	25	25	0
Integrated Pest Management	Professor	Tenured	Dean	20	0	63	0	17
Intelligent Biomedical Devices & Musculoskeletal Systems	Professor	Tenured	Dean	15	10	50	20	5
Machine-tool Systems	Professor	Tenured	Dean	10	10	40	40	0
Manufacturing of Micro, Optical & Digital Electronics	Director and Professor	Tenured	Dean	15	5	40	30	10
Management of Information	Professor	Tenured	Dean	20	5	50	25	0
Materials Handling/Logistics Institute	Professor	Tenured	Dean/Department Chair	25	0	50	25	0
Measurement and Control Engineering	Director	Non-Tenure Track	Dean	10	90	0	0	0
Membrane Applied Science and Technology	Professor	Tenured	Department Chair	10	10	40	40	0
Microcontamination Control	Full Professor	Tenured	Department Head and Dean	31	3	33	33	0
Nondestructive Evaluation	Full Professor	Tenured	Director	50	5	25	15	5
Optoelectronic Devices, Interconnects and Packaging	Full Professor	Tenured	Director	20	20	50	0	10
Particulate Materials	Associate Professor	Tenured	Director	50	0	30	20	0
Pharmaceutical Processing Research	Full Professor	Tenured	Department Head	15	5	40	40	0
Polymer Interfaces	Associate Professor	Tenured	Dean	20	0	40	40	0
Power Systems Engineering	Professor	Tenured	Dean	50	10	20	20	0
Precision Metrology	Distinguished Professor	Tenured	Associate Dean of Research	10	10	25	50	5
Quality and Reliability Engineering	Professor	Tenured	Dean	20	25	25	15	15
Sensors and Actuators	Professor	Tenured	Department Chair	20	15	50	8	7
Silicon Wafer Engineering and Defect Science	Professor	Tenured	Dean	25	5	40	30	5
Software Engineering	Full Professor	Tenured	Associate Dean	15	35	20	20	10
Tree Genetics	Professor	Tenured	Department Head	10	15	40	15	20
Virtual Proving Ground Simulation	Distinguished Professor	Tenured	Vice President for Research	20	30	25	25	0
Water Quality	Director	Tenure Track	Dean	35	0	50	10	5
Wireless Electromagnetic Compatibility	Full Professor	Tenured	Director	25	0	50	25	0
Wireless Information Networks	Associate Professor	Tenured	Chairman	40	0	20	40	0
Grand Mean				23.48	12.06	35.10	24.02	5.44

* Report sorted by Status, Organized by Year Funded then Alphabetically by Center

Table 7: 1999-2000 CENTER OUTCOMES

CenterName:	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 Research	w/ IAB Members	Presentation
	Advanced Air Conditioning and Refrigeration	14	22	0	0	2	0	0	12
Advanced Communications	2	6	0	0	2	2	5	0	0
Advanced Computing and Communication	0	12	9	0	4	0	79	8	58
Advanced Electronic Materials, Devices and Systems	0	3	2	0	0	1	14	0	6
Advanced Polymer and Composite Engineering	7	3	7	0	1	1	50	2	44
Advanced Processing and Packaging Studies	0	3	0	0	0	0	3	0	16
Advanced Studies in Novel Surfactants	0	1	2	0	0	2	10	1	15
Advanced Vehicle Electronics	2	1	0	0	0	0	2	1	2
Analog/Digital Integrated Circuits	0	9	4	0	7	2	52	0	38
Biological Surface Science	1	4	2	0	0	0	21	4	19
Building Performance and Diagnostics	0	0	2	0	0	0	19	0	150
Built Environment	1	3	0	0	0	0	8	1	7
Ceramic and Composite Materials	5	10	7	1	1	3	20	0	22
Coatings Research	0	3	2	0	0	0	18	2	20
Composite Reinforcement	0	3	0	0	0	0	32	2	18
Corrosion in Multiphase Systems	0	3	1	0	0	0	16	5	20
Dielectric Studies	3	2	0	2	1	0	16	2	34
Digital Video/Media Research	0	5	5	0	0	0	32	0	31
Dimensional Measurement & Control in Manufacturin	0	1	4	0	1	3	10	0	6
Engineering Tribology	0	2	2	0	0	0	0	4	12
Ergonomics	1	5	0	0	1	0	0	0	8
Glass Research	0	4	1	0	0	0	37	2	43
Hazardous & Toxic Waste Management	2	6	2	1	1	0	12	0	9
Health Management	0	2	2	0	0	0	8	1	22
Information Technology and Organization	1	0	1	1	0	1	8	5	10
Integrated Pest Management	9	3	1	0	0	0	19	0	33
Machine-tool Systems	4	2	4	0	0	2	10	2	12
Man & Packaging of Micro, Optical & Digital Electroni	0	0	4	0	0	0	37	5	43
Management of Information	4	6	3	0	0	0	35	4	20
Materials Handling/Logistics Institute	2	8	2	2	0	0	36	1	14
Measurement and Control Engineering	15	2	10	7	1	2	15	0	9
Membrane Applied Science and Technology	0	1	2	0	0	0	6	0	9
Nondestructive Evaluation	5	5	0	0	1	0	45	0	55
Optoelectronic Devices, Interconnects and Packaging	0	0	0	0	1	1	6	2	5
Particulate Materials	0	4	3	0	0	0	67	1	59
Pharmaceutical Processing Research	0	2	4	0	0	3	8	3	15
Polymer Interfaces	0	1	2	0	0	0	6	0	0
Power Systems Engineering	5	0	3	6	0	3	8	0	10
Precision Metrology	0	4	0	0	1	0	12	0	16
Quality and Reliability Engineering	0	0	3	0	2	0	10	1	18
Sensors and Actuators	0	9	7	0	3	4	8	1	55
Silicon Wafer Engineering and Defect Science	0	7	4	0	2	0	15	8	25
Software Engineering	0	0	0	0	0	0	0	0	0
Tree Genetics	0	0	0	0	0	0	5	2	12
Virtual Proving Ground Simulation	0	1	2	0	0	0	0	0	22
Water Quality	0	2	0	0	0	0	4	4	8
Wireless Electromagnetic Compatibility	0	2	0	0	1	0	7	0	15
Wireless Information Networks	0	4	6	0	3	5	25	6	27
Grand Mean	1.73	3.67	2.40	0.42	0.75	0.73	17.83	1.92	23.02
Grand Sum	83	176	115	20	36	35	856	92	1105

* Report sorted by Status, Organized by Year Funded then Alphabetically by Cent

Table 8: 1999-2000 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	19	38.00
Patent Applications	14	28.00
Software Copyrights	2	4.00
Patents Granted/Derived	4	8.00
Licensing Agreements	5	10.00
Royalties Realized	1	2.00

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	69	1.38
Patent Applications	30	0.60
Software Copyrights	3	0.06
Patents Granted/Derived	9	0.18
Licensing Agreements	12	0.24
Royalties Realized	1	0.02

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, "ADMIN. BUDGET (%)" refers to the estimated percentage of the Center's direct operating budget allocated to administration (e.g., administrative salaries, travel, telephone).
- 15) On Table 3, "% to MEM" refers to the overhead rate charged to industry membership fees.
- 16) On Table 3, "TYPICAL OVERHEAD" refers to the typical overhead rate charged to funding sources.
- 17) On Table 4, "FEES" are broken down into primary, secondary, and tertiary (the latter two represent variable membership fees).
- 18) On Table 5, "PROFESSIONAL ADMINISTRATIVE" includes the Center Director and Co- or Site Director.
- 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.