

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

**FINAL  
1991-1992 STRUCTURAL INFORMATION<sup>1</sup>**

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**NOTE:** 1991-1992 TABLE DATA COLLECTED FROM 52/52 CENTER DIRECTOR SURVEYS (100% RESPONSE RATE).<sup>2</sup>

**PLEASE DIRECT QUESTIONS AND COMMENTS TO THE AUTHORS<sup>3</sup>**

**TABLE 1**  
**1991-1992 GENERAL INFORMATION**

STATUS	YEAR FUNDED	UNIVERSITY (CENTER)	DIRECTOR	# OF DEPTS. INVOLVED
<b>SELF-SUSTAINING</b>	1980	1. University of Massachusetts (Center on Research on Polymers)	Kantor, Simon W.	5
	1981	2. Case Western Reserve (Center for Applied Polymer Research)	Hiltner, Anne	7
	1982	3. North Carolina State University (Center for Communications & Signal Processing)	Abbott, George	2
		4. Rutgers University (Center for Ceramics Research)	Niesz, Dale E.	3
		5. Georgia Institute of Technology (Materials Handling Research Center)	Pence, I.W. Jr.	4
		6. Pennsylvania State University (Center for Dielectric Studies)	Dougherty, Joseph P.	5
	1984	7. Colorado School of Mines (Advanced Steel Processing and Products Research)	Krauss, George	2
		8. University of Washington (Center for Process Analytical Chemistry)	Kowalski, Bruce & Weissman, Gene	3
		9. New Jersey Institute of Technology (Hazardous Substance Management Research Center)	Magee, Richard S.	13
		10. University of Arizona (Center for Optical Circuitry)	Peyghambarian, Nasser	4
		11. Northwestern University (Center for Engineering Tribology)	Cheng, Herbert S.	5
		12. University of Arizona (Center for Microcontamination & Control)	O'Hanlon, John	5
		13. Northeastern University (Center for Electromagnetics Research)	Silevitch, Michael B.	5
		14. Lehigh University (Chemical Process Modeling & Control Research Center)	Georgakis, Christos	3
		15. Rutgers University (Centers for Plastics Recycling Research)	Saba, Raymond	9
	1985	16. University of Texas - San Antonio (Health Science Center)	Boyan, Barbara D.	5
		17. Carnegie Mellon University (Center for Iron & Steelmaking Research)	Fruehan, R.J.	3
		18. Lehigh University (Center for Innovation Management Studies)	Bean, Alden S.	2
		19. University of Texas - Arlington (Center for Advanced Electron Devices)	Mitchell, Robert	1
		20. University of Tennessee (Measurement & Control Engineering)	Garrison, Arlene A.	7
	1986	21. Oklahoma State University (Web Handling Research Center)	Reid, Karl N.	5
		22. Alfred University (Center for Glass Research)	Pye, L. David	2
		23. New Mexico Institute of Mining & Technology (Research Center for Energetic Materials)	Persson, Per-Anders	1
		24. University of Florida/Purdue (Software Engineering Research Center)	Ohanian, M.J. & DeMillo, R.A.	7
		25. University of California - Berkeley (Sensors & Actuators Centers)	Muller, Richard	5
<b>MEAN *SELF-SUSTAINING*</b>				<b>4.5</b>
<b>1 to 5 YEAR OLDS</b>	1987	26. University of Iowa (Center for Simulation & Design Optimization of Mechanical Systems)	Haug, Edward J.	6
		27. USC/UCLA (Center for Manufacturing Automation)	Bekey, G.A. & Melkanoff, M.A.	5
		28. North Carolina State University (Center for Aseptic Processing & Packing Studies)	Swartzel, K.R.	5
	1988	29. University of Colorado (Microwave & Millimeter Computer-Aided Design)	Booton, Richard	2
		30. State University of New York at Buffalo (Center for Biosurfaces)	Baier, R.	5
	1989	31. Iowa State University (Center for Nondestructive Evaluation)	Thompson, Donald O.	8
		32. University of Pittsburgh (Parallel & Distributive Intelligence Systems Research Center)	Chang, Shi-kuo	2
		33. University of New Mexico (Center for Micro-Engineered Ceramics)	Smith, Douglas M.	5
		34. Brown University/University of Rhode Island (Center for Thin Film & Interface Research)	Loferski, Joseph & Mitra, Shashanka	5
		35. University of California at San Diego (Center for Integrated Circuits & Systems)	Ku, Walter	4
		36. Georgia Institute of Technology/University of Arizona (Information Management Research)	McCracken, W.M. & Nunamaker, J.	2
		37. University of Maryland (Electronics Packaging Research Center)	Pecht, Michael G.	6
		38. Washington State University (Center for Analog/Digital Integrated Circuits)	Ringo, John	3
<b>MEAN *1 to 5 YEAR OLDS*</b>				<b>4.5</b>
<b>2 YEARS &amp; LESS</b>	1988	39. University of Illinois, Urbana (Air Conditioning & Research Center)	Bullard, Clark W.	2
		40. University of Connecticut (Center for Grinding Research & Development)	Howes, Trevor D.	5
		41. University of Michigan (Mechanical & Optical Coordinate Measurement Machines)	Ulsoy, Galip A.	3
	1991	42. Eastern Michigan University (Center for Coatings Research)	Jones, Frank	2
		43. University of North Texas (Center for Nanostructural Materials Research)	McDaniel, Floyd	3
	1992	44. University of California at Irvine (Center for High-Speed Image Processing)	Ferrari L. & Stubberud, A.	2
		45. University of Colorado at Boulder (Center for Separations using Thin Films)	Krantz, William & Noble, Richard	3
		46. Lehigh University (Center for Polymer Interfaces)	El-Aasser, Mohamed S.	5
		47. North Carolina State University (Center for Integrated Pest Management)	Coble, Harold	5
		48. Rutgers University (Center for Wireless Information Networks)	Goodman, David J.	2
		49. Villanova University (Center for Advanced Communications)	Di Giscomo, Joseph	2
		50. Carnegie-Mellon University - Center for Building Performance	Hartkopf, Volker	1
	51. Arizona State University - Center for Health Management	Zuckerman, H. & Robinson, C.	9	
<b>MEAN *2 YEARS &amp; LESS*</b>				<b>3.4</b>
<b>GRAND MEAN:</b>				<b>4.2</b>
<b>GRAND SUM:</b>				<b>213</b>

**TABLE 2**  
**1991-1992 OPERATING BUDGET: BREAKDOWN OF DIRECT FUNDING**

STATUS	YEAR	ABBREVIATED NAME	TOTAL DIRECT	NSF FUNDING	INDUSTRY MEMBER FEES	OTHER INDUSTRY FUNDING	STATE FUNDING	OTHER FUNDING	UNIVERSITY DIRECT FUNDS
SELF-SUSTAINING	1980	1. Mass. (Polymers)	\$488,112	\$102,921	\$323,778	\$0	\$0	\$0	\$61,413
	1981	2. Case Western (Polymers)	\$974,000	\$13,500	-	\$147,000	\$250,000	\$563,500	\$0
	1982	3. NCSU (Communication/Signal Proc.)	\$825,553	\$30,160	\$243,679	\$496,314	\$0	\$5,200	\$50,000
		4. Rutgers (Ceramics)	\$3,869,373	\$165,012	\$381,386	\$688,159	\$1,952,000	\$347,066	\$334,750
		5. Georgia Tech. (Materials Handling)	\$2,141,044	\$116,600	\$824,444	\$0	\$300,000	\$0	\$900,000
	1984	6. Penn. State (Dielectrics Studies)	\$393,447	\$37,241	\$155,172	\$51,034	\$54,000	\$0	\$96,000
		7. Colorado School of Mines (Steel)	\$795,822	\$32,300	\$686,647	\$76,875	\$0	\$0	\$0
		8. Washington (Process Analytical Chem.)	\$1,222,186	\$59,000	\$1,212,000	\$1,416,311	\$250,000	\$0	\$284,875
		9. NJIT (Hazardous Substance Mgmt.)	\$8,383,393	\$409,491	\$772,745	\$691,683	\$3,413,075	\$2,938,039	\$160,560
		10. Arizona (Optical)	\$450,000	\$50,000	\$250,000	\$0	\$175,000	\$0	\$0
	1985	11. Northwestern (Engineering Tribology)	\$361,076	\$20,200	\$288,860	\$135,716	\$0	\$101,300	\$15,000
		12. Arizona (Microcontamination)	\$299,200	\$32,000	\$250,000	\$0	\$0	\$0	\$17,200
		13. Northeastern (Electromagnetics)	\$848,000	\$58,000	\$400,000	\$100,000	\$0	\$200,000	\$90,000
		14. Lehigh (Chemical Process)	\$406,173	\$36,226	\$297,800	\$10,000	\$0	\$55,999	\$6,150
		15. Rutgers (Plastics)	\$1,835,643	\$50,610	\$608,683	\$230,416	\$552,000	\$47,729	\$346,207
		16. Texas - San Antonio (Health Science)	\$1,093,221	\$4,630	\$180,000	\$540,000	\$0	\$5,000	\$363,591
		17. Carnegie Mellon (Iron & Steel)	\$395,000	\$25,000	\$420,000	\$100,000	\$0	\$50,000	\$0
		18. Lehigh (Innovation)	\$348,820	\$91,820	\$216,000	\$37,000	\$0	\$0	\$4,000
		19. Texas - Arlington (Adv. Electron Devices)	\$787,750	\$83,000	\$227,818	\$37,260	\$256,664	\$158,008	\$25,000
		20. Tennessee (Measurement & Control)	\$749,663	\$94,863	\$535,000	\$10,000	\$0	\$109,800	\$0
	1986	21. Oklahoma State (Web Handling)	\$469,000	\$35,000	\$400,000	\$225,000	\$25,000	\$150,000	\$34,000
		22. Alfred (Glass)	\$704,500	\$70,000	\$366,250	\$46,250	\$100,000	\$0	\$122,000
		23. New Mexico Inst. (Energetic)	\$448,059	\$34,641	\$337,418	\$0	\$0	\$0	\$76,000
		24. Florida/Purdue (Software Eng.)	\$562,940	\$50,572	\$315,806	\$51,200	\$50,000	\$11,362	\$84,000
		25. UC Berkeley (Sensors & Actuators)	\$1,095,370	\$153,255	\$441,459	\$48,626	\$192,789	\$256,373	\$5,868
MEAN *SELF-SUSTAINING*			\$1,319,054	\$74,242	\$442,288	\$205,854	\$382,821	\$199,975	\$123,065
1 YEAR OLDS	1987	26. Iowa (Simulation & Design)	\$2,174,775	\$83,918	\$285,228	\$178,916	\$0	\$1,302,308	\$324,405
	27. S. California (Manufacturing)	\$847,923	\$244,228	\$158,043	\$0	\$0	\$445,652	\$0	
	28. NCSU (Aseptic Processing)	\$420,029	\$57,042	\$315,733	\$0	\$0	\$36,361	\$10,893	
	1988	29. Colorado (Microwave)	\$413,850	\$29,100	\$384,750	\$0	\$0	\$0	\$0
		30. SUNY at Buffalo (Biosurfaces)	\$565,000	\$80,000	\$200,000	\$150,000	\$0	\$0	\$135,000
	1989	31. Iowa State (Nondestructive Evaluation)	\$1,206,344	\$38,300	\$816,548	\$0	\$300,000	\$0	\$51,700
		32. Pittsburgh (Intelligence Systems)	\$266,654	\$41,854	\$226,800	\$0	\$0	\$0	\$0
		33. New Mexico (Micro-Engineered Ceramics)	\$3,247,995	\$104,377	\$450,000	\$170,000	\$80,000	\$1,593,618	\$850,000
		34. Brown/Rhode Island (Film)	\$522,730	\$0	\$72,730	\$220,000	\$200,000	\$0	\$30,000
		35. Calif. - San Diego (Integrated Circuits)	\$738,900	\$220,000	\$50,000	\$0	\$0	\$468,000	\$0
		36. Ga. Tech./Arizona (Information Mgmt.)	\$193,000	\$70,000	\$80,000	\$0	\$0	\$33,000	\$10,000
		37. Maryland (Reliable Packaging)	\$1,683,904	\$0	\$1,200,000	\$0	\$250,000	\$208,904	\$25,000
		38. Washington State (Integrated Circuits)	\$1,000,856	\$123,438	\$362,500	\$51,000	\$200,000	\$75,193	\$188,765
MEAN *1 YEAR OLDS*			\$1,621,743	\$84,629	\$354,026	\$59,224	\$79,231	\$320,234	\$125,059
1990	39. Univ. of Illinois (Air Conditioning)	\$986,000	\$70,000	\$620,000	\$150,000	\$139,000	\$0	\$7,000	
	40. Univ. of Connecticut (Grinding)	\$1,383,000	\$80,000	\$350,000	\$0	\$500,000	\$342,000	\$110,000	
	41. Univ. of Michigan (Measurement Tech.)	\$590,000	\$50,000	\$450,000	\$40,000	\$50,000	\$0	\$0	
	1991	42. Eastern Michigan University (Coatings)	\$378,184	\$73,186	\$240,000	\$0	\$50,000	\$0	\$15,000
		43. Univ. of North Texas (Nanostructure)	\$511,133	\$45,000	\$200,000	\$230,000	\$0	\$0	\$36,133
1992	44. UC Irvine (Image Processing)	\$420,000	\$100,000	\$215,000	\$70,000	\$0	\$0	\$35,000	
	45. Univ. of Colorado (Thin Film)	\$467,500	\$65,000	\$300,000	\$0	\$50,000	\$0	\$67,500	
	46. Lehigh (Polymer Interfaces)	\$535,293	\$50,000	\$350,000	\$0	\$0	\$0	\$135,293	
	47. NCSU (Pest Management)	\$384,014	\$34,014	\$350,000	\$0	\$0	\$0	\$0	
	48. Rutgers (Wireless Information)	\$966,695	\$33,027	\$570,000	\$140,000	\$0	\$0	\$223,668	
	49. Villanova (Microwave Engineering)	\$295,000	\$50,000	\$120,000	\$0	\$125,000	\$0	\$0	
	50. Carnegie-Mellon (Building Performance)	\$506,559	\$75,000	\$383,787	\$0	\$0	\$47,772	\$0	
	51. Arizona State (Health Management)	\$440,000	\$50,000	\$350,000	\$40,000	\$0	\$0	\$0	
MEAN *2 YEARS & LESS*			\$605,952	\$59,633	\$346,061	\$51,528	\$78,388	\$29,982	\$48,430
GRAND MEANS			\$1,057,999	\$73,010	\$384,721	\$138,935	\$286,559	\$187,298	\$104,598
GRAND SUMS			\$53,912,833	\$3,723,524	\$19,236,064	\$6,578,760	\$9,314,528	\$9,552,184	\$5,331,973

**TABLE 3**  
**1991-1992 BUDGET FIGURES & CAPITAL FUNDING**

STATUS	YEAR	ABBREVIATED NAME	4 11 12 13				14		15	
			DIRECT FUNDING	OVERHEAD CHARGES	TOTAL BUDGET Cols (A + B)	UNIVERSITY WAIVED OVERHEAD	EFFECTIVE BUDGET Cols (C + D)	TOTAL CAPITAL FUNDING	NSF OVERHEAD (%)	INDUSTRY OVERHEAD (%)
SELF-SUSTAINING	1980	1. Mass. (Polymers)	\$488,112	\$221,884	\$709,996	\$0	\$709,996	\$0	52%	52%
	1981	2. Case Western (Polymers)	\$974,000	\$1,718,000	\$1,718,000	\$0	\$1,718,000	\$0	.	.
	1982	3. NCSU (Communication/Signal Proc.)	\$825,353	\$32,640	\$857,993	\$355,197	\$1,213,190	\$0	48%	0%
		4. Rutgers (Ceramics)	\$3,868,373	\$447,404	\$4,315,777	\$0	\$4,315,777	\$0	44%	24%
		5. Georgia Tech. (Materials Handling)	\$2,141,044	\$338,956	\$2,480,000	.	\$2,480,000	\$0	55%	55%
		6. Penn. State (Dielectrics Studies)	\$393,447	\$109,553	\$503,000	\$0	\$503,000	\$0	45%	45%
	1984	7. Colorado School of Mines (Steel)	\$795,822	\$177,803	\$973,625	\$122,908	\$1,096,533	\$600,000	24%	18%
		8. Washington (Process Analytical Chem.)	\$3,222,186	\$685,204	\$3,907,390	\$330,000	\$4,237,390	\$102,203	50%	50%
		9. NJIT (Hazardous Substance Mgmt.)	\$8,385,593	\$1,095,625	\$9,481,218	\$1,488,914	\$10,970,132	\$52,530	64%	5%
		10. Arizona (Optical)	\$450,000	\$130,000	\$605,000	\$0	\$605,000	\$173,000	49%	49%
		11. Northwestern (Engineering Tribology)	\$561,076	\$163,024	\$724,100	\$131,851	\$855,951	\$0	54%	10%
		12. Arizona (Microcontamination)	\$299,200	\$120,000	\$419,200	\$15,000	\$434,200	\$0	51%	51%
		13. Northeastern (Electromagnetics)	\$848,000	\$0	\$848,000	\$480,000	\$1,328,000	\$0	62%	0%
		14. Lehigh (Chemical Process)	\$406,175	\$31,554	\$437,729	\$0	\$437,729	\$55,999	59%	10%
		15. Rutgers (Plastics)	\$1,835,645	\$254,606	\$2,090,251	\$0	\$2,090,251	\$0	62%	62%
	1985	16. Texas - San Antonio (Health Science)	\$1,093,221	\$80,370	\$1,173,591	\$80,000	\$1,253,591	\$0	45%	10%
		17. Carnegie Mellon (Iron & Steel)	\$595,000	\$300,000	\$895,000	\$0	\$895,000	\$0	55%	55%
		18. Lehigh (Innovation)	\$348,820	\$32,873	\$381,693	\$3,700	\$385,393	\$0	55%	10%
		19. Texas - Arlington (Adv. Electron Devices)	\$787,750	\$31,740	\$819,490	\$217,768	\$1,037,258	\$521,000	47%	0%
		20. Tennessee (Measurement & Control)	\$749,663	\$25,251	\$774,914	\$273,382	\$1,048,296	\$115,000	41%	0%
	1986	21. Oklahoma State (Web Handling)	\$869,000	\$0	\$869,000	\$190,000	\$1,059,000	\$225,000	0%	0%
		22. Alfred (Glass)	\$704,500	\$162,500	\$867,000	\$0	\$867,000	\$0	75%	75%
		23. New Mexico Inst. (Energetic)	\$448,059	\$197,191	\$645,250	\$0	\$645,250	\$0	35%	35%
		24. Florida/Purdue (Software Eng.)	\$562,940	\$168,623	\$731,563	\$63,526	\$795,089	\$0	50%	25%
		25. UC Berkeley (Sensors & Actuators)	\$1,098,370	\$211,960	\$1,310,330	\$180,028	\$1,490,358	\$0	50%	0%
		MEAN "SELF-SUSTAINING"	\$1,310,954	\$269,474	\$1,580,428	\$163,845	\$1,744,273	\$73,789	49%	27%
1 to 5 YEAR OLDS	1987	26. Iowa (Simulation & Design)	\$2,174,775	\$36,082	\$2,210,857	\$157,048	\$2,367,905	\$8,475,000	43%	0%
		27. S. California (Manufacturing)	\$847,923	\$156,327	\$1,004,250	\$205,254	\$1,209,504	\$50,000	49%	15%
		28. NCSU (Aseptic Processing)	\$420,029	\$14,530	\$434,559	\$291,445	\$726,004	\$50,000	48%	20%
	1988	29. Colorado (Microwave)	\$413,850	\$41,150	\$455,000	\$84,017	\$539,017	\$50,000	42%	5%
		30. SUNY at Buffalo (Biosurfaces)	\$565,000	\$0	\$565,000	\$120,000	\$685,000	\$400,000	52%	14%
	1989	31. Iowa State (Nondestructive Evaluation)	\$1,206,548	\$40,152	\$1,246,700	\$320,400	\$1,567,100	\$0	42%	0%
		32. Pittsburgh (Intelligence Systems)	\$268,654	\$28,346	\$297,000	\$95,240	\$392,240	\$0	47%	10%
		33. New Mexico (Micro-Engineered Ceramics)	\$3,247,995	\$823,528	\$4,071,523	\$202,492	\$4,274,015	\$727,000	45%	0%
		34. Brown/Rhode Island (Film)	\$522,730	\$19,270	\$542,000	\$94,000	\$636,000	\$200,000	10%	15%
		35. Calif. - San Diego (Integrated Circuits)	\$738,000	\$0	\$738,000	\$369,000	\$1,107,000	\$0	0%	0%
		36. Ga. Tech./Arizona (Information Mgmt.)	\$193,000	\$92,000	\$285,000	\$0	\$285,000	\$0	45%	55%
		37. Maryland (Reliable Packaging)	\$1,683,904	\$96,096	\$1,780,000	\$500,000	\$2,280,000	\$70,000	46%	0%
		38. Washington State (Integrated Circuits)	\$1,000,896	\$53,562	\$1,054,458	\$299,562	\$1,354,020	\$8,182,270	45%	0%
		MEAN "1 to 5 YEAR OLDS"	\$1,021,793	\$107,773	\$1,129,566	\$210,451	\$1,340,017	\$1,406,328	39%	14%
2 YEARS & LESS	1990	39. Univ. of Illinois (Air Conditioning)	\$986,000	\$31,000	\$1,017,000	\$216,000	\$1,233,000	\$1,000,000	53%	28%
		40. Univ. of Connecticut (Grinding)	\$1,382,000	\$21,000	\$1,403,000	\$274,920	\$1,677,920	\$350,000	47%	0%
		41. Univ. of Michigan (Measurement Tech.)	\$590,000	\$0	\$590,000	\$336,300	\$926,300	\$50,000	0%	0%
	1991	42. Eastern Michigan University (Coatings)	\$378,186	\$26,814	\$405,000	\$55,000	\$460,000	\$135,000	39%	0%
		43. Univ. of North Texas (Nanostructure)	\$511,133	\$5,000	\$516,133	\$62,069	\$578,202	\$0	45%	0%
	1992	44. UC Irvine (Image Processing)	\$420,000	\$0	\$420,000	\$125,000	\$545,000	\$0	48%	0%
		45. Univ. of Colorado (Thin Film)	\$482,500	\$0	\$482,500	\$115,500	\$598,000	\$0	44%	5%
		46. Lehigh (Polymer Interfaces)	\$535,295	\$0	\$535,295	\$0	\$535,295	\$170,000	10%	10%
		47. NCSU (Pest Management)	\$384,014	\$15,986	\$400,000	\$111,905	\$511,905	\$0	47%	10%
		48. Rutgers (Wireless Information)	\$966,695	\$16,973	\$983,668	\$422,000	\$1,405,668	\$0	64%	0%
		49. Villanova (Microwave Engineering)	\$295,000	\$0	\$295,000	\$91,200	\$386,200	\$0	0%	0%
		50. Carnegie-Mellon (Building Performance)	\$506,559	\$71,213	\$577,772	\$123,643	\$701,415	\$0	69%	69%
	51. Arizona State (Health Management)	\$440,000	\$0	\$440,000	\$0	\$440,000	\$0	51%	0%	
		MEAN "2 YEARS & LESS"	\$605,952	\$14,460	\$620,413	\$148,734	\$769,147	\$131,154	40%	9%
		GRAND MEANS:	\$1,037,099	\$163,751	\$1,200,850	\$172,085	\$1,372,935	\$426,549	44%	18%
		GRAND SUMS:	\$53,912,835	\$8,325,790	\$62,238,625	\$8,684,269	\$70,922,894	\$21,734,002	N/A	N/A

TABLE 4

## 1991-1992 INDUSTRY MEMBERSHIP DESCRIPTORS

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STATUS	YEAR	ABBREVIATED NAME	CURRENT MEMBERS	1991 - 1992 MEMBERS			LIFETIME MEMBERS			FEES			
				STARTING	NEW	LEFT	STARTING	NEW	LEFT	ANNUAL MEMBERSHIP PRIMARY	MEMBER FEE SECONDARY	MEMBER FEE TERTIARY	
SELF-SUSTAINING	1980	1. Mass. (Polymers)	12	15	0	3	13	17	18	\$40,000	\$0	\$0	
	1981	2. Case Western (Polymers)	12	.	.	.	.	.	.	.	.	.	
	1982	3. NCSU (Communication/Signal Proc.)	4	7	3	2	8	13	15	\$50,000	\$20,000	\$2,000	
		4. Rutgers (Ceramics)	14	17	1	3	10	28	26	\$35,000	\$0	\$0	
		5. Georgia Tech. (Materials Handling)	29	29	0	0	.	.	.	\$40,000	\$0	\$0	
		6. Penn. State (Dielectrics Studies)	14	15	3	2	18	24	26	\$20,000	\$5,000	\$0	
		1984	7. Colorado School of Mines (Steel)	22	23	1	2	7	22	7	\$37,500	\$0	\$0
		8. Washington (Process Analytical Chem.)	48	50	4	6	21	54	31	\$35,000	\$0	\$0	
		9. NJIT (Hazardous Substance Mgmt.)	32	33	1	1	8	34	9	\$30,000	\$15,000	\$0	
		10. Arizona (Optical)	5	4	2	1	9	3	7	\$50,000	\$0	\$0	
		11. Northwestern (Engineering Tribology)	9	11	0	2	14	5	10	\$27,500	\$0	\$0	
		12. Arizona (Microcontamination)	12	10	2	0	26	15	29	\$40,000	\$10,000	\$0	
		13. Northeastern (Electromagnetics)	10	11	0	1	9	6	5	\$50,000	\$0	\$0	
		14. Lehigh (Chemical Process)	11	11	0	0	0	0	0	\$30,000	\$0	\$0	
		15. Rutgers (Plastics)	44	58	0	14	15	52	23	\$60,000	30K-60K	6K-30k	
		1985	16. Texas - San Antonio (Health Science)	8	7	2	1	3	13	5	\$75,000	\$0	\$0
		17. Carnegie Mellon (Iron & Steel)	24	24	1	0	11	17	3	\$42,000	\$27,000	\$0	
		18. Lehigh (Innovation)	13	12	1	0	12	5	4	\$20,000	\$0	\$0	
		19. Texas - Arlington (Adv. Electron Devices)	4	6	0	2	6	5	7	\$50,000	\$25,000	\$0	
		20. Tennessee (Measurement & Control)	14	19	1	4	0	0	0	\$35,000	\$25,000	\$0	
		1986	21. Oklahoma State (Web Handling)	18	19	0	1	5	17	4	\$25,000	\$0	\$0
		22. Alfred (Glass)	23	20	2	1	8	16	3	\$25,000	\$0	\$0	
		23. New Mexico Inst. (Energetic)	13	14	2	3	9	20	18	\$40,000	\$0	\$0	
		24. Florida/Purdue (Software Eng.)	13	15	1	3	10	12	9	\$30,000	\$0	\$0	
		25. UC Berkeley (Sensors & Actuators)	14	17	4	3	6	19	7	\$50,000	\$0	\$0	
MEAN "SELF-SUSTAINING"			17.4	19.4	1.3	2.3	9.9	17.3	11.8	\$39,942	N/A	N/A	
2 to 5 YEAR OLDS	1987	26. Iowa (Simulation & Design)	1	16	2	2	24	4	12	\$40,000	\$0	\$0	
		27. S. California (Manufacturing)	1	4	0	1	4	3	4	\$50,000	\$0	\$0	
		28. NCSU (Aseptic Processing)	9	11	0	2	8	6	7	\$35,000	\$0	\$0	
	1988	29. Colorado (Microwave)	9	11	0	2	10	4	5	\$50,000	\$25,000	\$0	
		30. SUNY at Buffalo (Biosurfaces)	5	5	0	0	6	1	2	\$40,000	\$0	\$0	
	1989	31. Iowa State (Nondestructive Evaluation)	24	21	5	2	14	12	5	\$35,000	\$0	\$0	
		32. Pittsburgh (Intelligence Systems)	10	8	5	3	2	12	4	\$25,000	\$0	\$0	
		33. New Mexico (Micro-Engineered Ceramics)	14	15	2	1	8	9	1	\$30,000	\$10,000	\$0	
		34. Brown/Rhode Island (Film)	7	14	3	10	14	3	10	\$25,000	\$10,000	\$0	
		35. Calif. - San Diego (Integrated Circuits)	3	6	2	3	6	2	3	\$50,000	\$25,000	\$0	
		36. Ga. Tech./Arizona (Information Mgmt.)	4	4	1	1	6	4	6	\$40,000	\$0	\$0	
		37. Maryland (Reliable Packaging)	24	21	5	0	6	22	3	\$50,000	\$0	\$0	
		38. Washington State (Integrated Circuits)	13	14	2	3	11	6	4	\$30,000	\$0	\$0	
	MEAN "2 to 5 YEAR OLDS"			16.9	11.5	2.1	2.3	9.2	6.8	5.1	\$38,462	N/A	N/A
3 YEARS & LESS	1988	39. Univ. of Illinois (Air Conditioning)	17	16	1	0	13	7	3	\$40,000	\$0	\$0	
		40. Univ. of Connecticut (Grinding)	7	8	0	1	7	2	2	\$50,000	\$0	\$0	
		41. Univ. of Michigan (Measurement Tech.)	10	8	2	0	8	3	1	\$50,000	\$0	\$0	
	1991	42. Eastern Michigan University (Coatings)	4	6	3	1	6	3	1	\$30,000	\$0	\$0	
		43. Univ. of North Texas (Nanostructure)	4	6	0	2	6	0	2	\$50,000	\$20,000	\$0	
	1992	44. UC Irvine (Image Processing)	7	9	1	3	9	1	3	\$35,000	\$25,000	\$0	
		45. Univ. of Colorado (Thin Film)	8	8	3	3	8	3	3	\$37,500	\$0	\$0	
		46. Lehigh (Polymer Interfaces)	13	10	1	0	10	1	0	\$35,000	\$0	\$0	
		47. NCSU (Pest Management)	4	7	1	0	7	1	0	\$50,000	\$0	\$0	
		48. Rutgers (Wireless Information)	20	21	1	2	21	1	2	\$30,000	\$0	\$0	
		49. Villanova (Microwave Engineering)	6	4	3	1	4	3	1	\$30,000	\$0	\$0	
		50. Carnegie-Mellon (Building Performance)	7	0	7	0	3	7	0	\$50,000	\$0	\$0	
		51. Arizona State (Health Management)	10	6	4	0	6	4	0	\$35,000	\$0	\$0	
MEAN "3 YEARS & LESS"			9.5	8.4	2.1	1.0	8.3	2.8	1.4	\$40,192	N/A	N/A	
GRAND MEANS:			13.8	14.1	1.7	2.0	9.1	16.4	7.7	\$39,190	N/A	N/A	
GRAND SUMS:			689	706	85	98	435	521	330	\$1,959,308	N/A	N/A	

**TABLE 5**  
**1991-1992 HUMAN RESOURCES**

STATUS	YEAR	ABBREVIATED NAME	RESEARCHER BREAKDOWN				STUDENTS		ADMINISTRATIVE			
			TOTAL # RESEARCHERS	# FACULTY SCIENTISTS	NON-FACULTY FT	NON-FACULTY PT	# OF GRADS	# OF UNDERGRAD	PROFESSIONALS FT	PROFESSIONALS PT	CLERICALS FT	CLERICALS PT
SELF-SUSTAINING	1990	1. Mass. (Polymers)	23	18	2	3	17	4	0	1	0	1
	1991	2. Case Western (Polymers)	14	9	4	1	22	4	1	1	2	0
	1992	3. NCSU (Communication/Signal Proc.)	16	16	0	0	28	2	1	0	2	0
		4. Rutgers (Ceramics)	15	15	0	0	40	30	9	1	6	0
		5. Georgia Tech. (Materials Handling)	48	46	0	2	66	7	1	0	2	1
	1993	6. Penn. State (Dielectrics Studies)	15	7	8	0	10	1	0	2	0	1
		7. Colorado School of Mines (Steel)	9	7	2	0	26	2	1	2	0	1
		8. Washington (Process Analytical Chem.)	17	11	5	1	23	1	4	1	2	2
	1994	9. NJIT (Hazardous Substance Mgmt.)	64	56	5	5	89	12	4	1	2	0
		10. Arizona (Optical)	11	7	0	4	8	0	0	1	0	1
		11. Northwestern (Engineering Tribology)	17	6	9	2	14	0	1	0	1	0
	1995	12. Arizona (Microcontamination)	8	0	7	1	5	1	0	1	1	1
		13. Northeastern (Electromagnetics)	25	20	5	0	20	10	3	1	2	0
		14. Lehigh (Chemical Process)	14	10	1	3	12	1	1	1	1	1
	1996	15. Rutgers (Plastics)	14	9	3	2	2	1	4	1	2	0
		16. Texas - San Antonio (Health Science)	21	12	8	1	3	4	4	1	1	1
		17. Carnegie Mellon (Iron & Steel)	9	7	2	0	8	8	0	0	0	1
	1997	18. Lehigh (Innovation)	16	12	0	4	0	1	1	2	1	2
		19. Texas - Arlington (Adv. Electron Devices)	7	5	1	1	17	2	1	2	1	2
		20. Tennessee (Measurement & Control)	14	12	2	0	26	11	1	1	1	2
	1998	21. Oklahoma State (Web Handling)	14	13	0	1	22	3	0	2	0	4
		22. Alfred (Glass)	14	13	0	1	13	2	2	1	1	1
		23. New Mexico Inst. (Energetic)	5	2	0	3	8	15	0	8	0	1
	1999	24. Florida/Purdue (Software Eng.)	34	32	0	2	41	7	2	2	3	0
		25. UC Berkeley (Sensors & Actuators)	6	4	1	1	31	2	1	0	2	2
MEAN "SELF-SUSTAINING"		18.1	14.9	2.6	1.5	22.6	6.2	1.7	1.3	1.3	1.4	
3 to 4 YEAR OLDS	1997	26. Iowa (Simulation & Design)	33	14	19	0	56	10	1	1	4	2
	1998	27. S. California (Manufacturing)	12	12	0	0	12	0	1	3	0	2
	1999	28. NCSU (Aseptic Processing)	23	17	6	2	8	2	0	4	0	1
	2000	29. Colorado (Microwave)	19	5	3	2	18	0	6	2	0	1
	2001	30. SUNY at Buffalo (Biosurfaces)	21	14	4	3	8	2	1	0	0	1
		31. Iowa State (Nondestructive Evaluation)	19	11	0	8	16	2	0	1	0	3
		32. Pittsburgh (Intelligence Systems)	5	4	0	1	4	0	0	4	1	0
	2002	33. New Mexico (Micro-Engineered Ceramics)	48	17	12	19	29	6	2	0	2	0
		34. Brown/Rhode Island (Film)	11	10	1	0	3	2	0	4	0	1
		35. Calif. - San Diego (Integrated Circuits)	18	13	0	5	16	6	0	1	0	2
	2003	36. Ga. Tech./Arizona (Information Mgmt.)	6	6	0	0	6	0	1	1	0	1
		37. Maryland (Reliable Packaging)	24	6	18	0	20	2	2	0	3	0
		38. Washington State (Integrated Circuits)	23	23	0	0	68	7	0	5	1	3
	MEAN "3 to 4 YEAR OLDS"	19.6	11.7	4.8	2.1	20.3	3.0	1.1	2.0	0.5	1.2	
7 YEARS & LESS	1990	39. Univ. of Illinois (Air Conditioning)	15	13	0	2	38	19	0	1	1	0
	1991	40. Univ. of Connecticut (Grinding)	14	12	0	2	14	4	4	2	2	2
	1992	41. Univ. of Michigan (Measurement Tech.)	20	6	2	12	17	0	0	2	1	1
		42. Eastern Michigan University (Coatings)	12	7	3	2	5	3	0	1	0	1
	1993	43. Univ. of North Texas (Nanostructure)	13	7	3	3	10	0	0	5	1	0
		44. UC Irvine (Image Processing)	10	8	1	1	8	0	2	0	0	1
	1994	45. Univ. of Colorado (Thin Film)	17	14	0	3	13	2	0	2	0	1
		46. Lehigh (Polymer Interfaces)	24	15	1	8	11	0	0	3	1	2
	1995	47. NCSU (Pest Management)	33	30	3	0	7	5	0	1	0	1
		48. Rutgers (Wireless Information)	8	7	0	1	17	5	3	0	1	1
	1996	49. Villanova (Microwave Engineering)	7	6	0	1	9	4	1	0	0	0
50. Carnegie-Mellon (Building Performance)		7	5	1	1	15	7	2	1	2	0	
1997	51. Arizona State (Health Management)	22	15	1	6	3	0	0	2	0	2	
MEAN "7 YEARS & LESS"	15.4	11.2	1.2	3.2	12.8	3.8	0.9	1.5	0.7	0.9		
GRAND MEANS			17.8	12.7	2.8	2.4	19.3	6.3	1.3	1.5	1.0	1.8
GRAND SUMS			969	644	143	126	962	219	68	79	13	54





# APPENDIX

## FOOTNOTES: SPECIAL CONSIDERATIONS

- 1) ALL *averages* and *sums* exclude missing data. Footnotes appear on top of columns and/or at end of rows for each Table and are described in this Appendix.
- 2) Please note, that while NOT listed in this year's Tables, Ohio State University (Center for Welding Research) and Rensselaer Polytechnic Institute (Computer Design) remain active, however, they are no longer formally considered to be "IUCRC Centers."
- 3) Authors' address: IUCRC Evaluation Project, Psychology Department, NCSU Box 7801, Raleigh, NC 27695.  
By telephone: Voice: (919) 515 - 3237; FAX: (919) 515 - 7634.
- 4) On Tables 2 and 3, "TOTAL DIRECT" refers to the sum of all direct funding, including: NSF, Industry Member Fees, Other Industry, State, Other, and University Direct funding.
- 5) On Table 2, "NSF FUNDING" refers to support provided by the IUCRC Program. This includes operating grants, self-sustaining center funding, evaluator supplements, TIE awards, RUI/PUI awards, etc. This Does NOT include support provided by other NSF groups or divisions.
- 6) On Table 2, "INDUSTRIAL MEMBERSHIP FEES" refers to support from industry derived from membership fees.
- 7) On Table 2, "OTHER INDUSTRY" refers to any additional support for operations provided by industrial members (e.g., enhancements, contracts, donations, etc.).
- 8) On Table 2, "STATE" refers to the support provided by state government and/or an agency or program funded by state government.
- 9) On Table 2, "OTHER" refers to support for Center operations provided by other funding sources, including other divisions in NSF, federal agencies, foundations, national labs, military agencies, etc.
- 10) On Table 2, "UNIVERSITY DIRECT" refers to actual support for Center operating costs, including: salary, travel, etc. This figure does include overhead returned to Center. However, it does NOT include cost of items like utilities or space, which universities are obligated to provide for all grants.
- 11) On Table 3, "OVERHEAD CHARGES" refers to the sum of all overhead, including: NSF, Industry Member Fees, Other Industry, State, and Other.
- 12) On Table 3, "TOTAL BUDGET" refers to the sum of DIRECT FUNDING and OVERHEAD CHARGES.
- 13) On Table 3, "UNIVERSITY-WAIVED OVERHEAD" refers to the amount of overhead the university has waived by reducing its normal overhead rate.
- 14) On Table 3, "EFFECTIVE BUDGET" refers to the value of the center's budget if full overhead were collected.
- 15) On Table 3, "CAPITAL TOTAL FUNDING" includes major capital investments/expenses (e.g., equipment, buildings, building renovations, etc.) over \$25,000. Funding for a building should have been reported when the building was occupied.
- 16) On Table 4, "FEES" are broken down into primary, secondary, and tertiary (the latter two represent variable membership fees).
- 17) On Table 5, "FT" means "Full-time" and "PT" means "Part-time."
- 18) On Table 6, "TIME ALLOCATION" refers to allocation of director's full-time equivalent for budgetary purposes.
- 19) On Table 6, "ADMIN. BUDGET (%)" refers to the estimated percentage of direct operating budget allocated to administrative salaries, center supplies, telephone, travel and related costs.
- 20) On Table 6, "IN KIND (%)" refers to the estimated percentage of direct operating budget derived from "in-kind" donations (e.g. equipment donations).