

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

**FINAL
1993-1994 STRUCTURAL INFORMATION¹**

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NOTE: 1993-1994 Table data collected from 56/56 Center Director Surveys (100% response rate).²

PLEASE DIRECT QUESTIONS AND COMMENTS TO THE AUTHORS³

TABLE 1
1993-1994 GENERAL INFORMATION

STATUS	YEAR FUNDED	UNIVERSITY (CENTER)	DIRECTOR	# OF DEPTS. INVOLVED
SELF-SUSTAINING	1989	1. University of Massachusetts (Center on Research on Polymers)	Moyabhan, E. Bradley	3
	1991	2. Case Western Reserve (Center for Applied Polymer Research)	Hilmer, Anne	5
	1992	3. North Carolina State University (Center for Communications & Signal Processing)	Rajula, Sarah A.	3
		4. Rutgers University (Center for Ceramic Research)	Niez, Dale E.	3
		5. Georgia Institute of Technology (Materials Handling Research Center)	Pence, I.W. Jr.	5
	1984	6. Pennsylvania State University (Center for Dielectric Studies)	Dougherty, Joseph P.	5
		7. Colorado School of Mines (Advanced Steel Processing and Products Research)	Matlock, David	3
		8. University of Washington (Center for Process Analytical Chemistry)	Kowalski, Bruce & Weisman, Gene	5
		9. New Jersey Institute of Technology (Hazardous Substance Management Research Center)	Magee, Richard S.	6
		10. University of Arizona (Center for Optical Circuitry)	Pyzdebarian, Nasser	0
SELF-SUSTAINING		11. Northwestern University (Center for Engineering, Tribology)	Cheng, Herbert S.	4
		12. University of Arizona (Center for Microcontamination & Control)	O'Hanlon, John	4
		13. Northeastern University (Center for Electromagnetics Research)	Silverich, Michael B.	3
		14. Lehigh University (Chemical Process Modeling & Control Research Center)	Georgakis, Christos	4
	1985	15. Rutgers University (Centers for Plastics Recycling Research)	Shih, Raymond	8
		16. Carnegie Mellon University (Center for Ion & Steelmaking Research)	Fuehnan, R.J. & Camb, A.W.	3
		17. Lehigh University (Center for Innovation Management Studies)	Bean, Alden S.	2
		18. University of Texas - Arlington (Center for Advanced Electron Devices)	Mitchell, Robert	1
		19. University of Tennessee (Measurement & Control Engineering)	Garrison, Arlene A.	4
		20. Iowa State University (Center for Nondestructive Evaluation)	Thompson, Donald O.	8
1986	21. Oklahoma State University (Web Handling Research Center)	Raid, Karl N.	3	
	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	2	
	24. University of Florida/Purdue (Software Engineering Research Center)	Ohanian, M.J. & DeMillo, R.A.	4	
1987	25. University of California - Berkeley (Sensors & Actuators Centers)	Muller, Richard	3	
	26. University of Iowa (Center for Simulation & Design Optimization of Mechanical Systems)	Haug, Edward J.	4	
	27. USC/UCLA (Center for Manufacturing Automation)	Bakay, G.A. & Melanoff, M.A.	2	
	28. North Carolina State University (Center for Aspheric Processing & Packing Studies)	Swartzel, K.R.	6	
1988	29. University of Colorado (Microwave & Millimeter Computer-Aided Design)	Boodon, Richard	2	
	30. State University of New York at Buffalo (Center for Biointerfaces)	Baier, R.	4	
3 to 5 YEAR OLDS	1989	31. University of Pittsburgh (Parallel & Distributive Intelligence Systems Research Center)	MEAN/SERVE/SUSTAINING*	3.9
		32. University of New Mexico (Center for Micro-Engineered Ceramics)	Chan, Shi-kwo	2
		33. Brown University/University of Rhode Island (Center for Thin Film & Interface Research)	Daye, Abhaya K.	4
		34. University of California at San Diego (Center for Integrated Circuits & Systems)	Loferski, Joseph & Mitra, Shashanka	4
		35. Georgia Institute of Technology/University of Arizona (Information Management Research)	Ku, Walter	3
	1990	36. Washington State University (Center for Analog/Digital Integrated Circuits)	McCracken, W.M. & Nunnamer, J.	2
		37. University of Illinois, Urbana (Air Conditioning & Research Center)	Kingo, John	1
		38. University of Connecticut (Center for Grinding Research & Development)	Bullard, Clark W.	2
		39. University of Michigan (Dimensional Measurement and Control in Manufacturing)	Howes, Trevor D.	4
		40. Eastern Michigan University (Center for Coatings Research)	Ni, Jun	3
	1991	41. University of North Texas (Center for Nanostructural Materials Research)	Jones, Frank	2
2 YEARS & LESS	1992	42. University of California at Irvine (Center for High-Speed Image Processing)	McDaniel, Floyd	2
		43. University of Colorado at Boulder (Center for Separations using Thin Films)	MEAN**3 to 5 YEAR OLDS**	2.7
		44. Lehigh University (Center for Polymer Interfaces)	Ferrari, L.	3
		45. North Carolina State University (Center for Integrated Pest Management)	Krentz, William & Noble, Richard	4
		46. Rutgers University (Center for Wireless Information Networks)	El-Aasser, Mohamed S.	4
		47. Villanova University (Center for Advanced Communications)	Shaner, Ronald E.	7
		48. Carnegie-Mellon University (Center for Building Performance)	Goodman, David J.	3
		49. Arizona State Uni. & Western Network for Educ. in Health Admin. (Center for Health Management)	Di Giacomo, Joseph	3
	1993	50. Ohio University (Center for Corrosion in Multiphase Systems)	Hartkopf, Volker	1
		51. University of Illinois (Center for Machine-Tool Systems)	Zackerman, H. & Robinson, C.	1.4
	1994	52. University of Massachusetts (Center for Polymer Biodegradation)	Jeppon, W. Paul	1
	53. New Jersey Institute of Technology (Center for Emission Reduction Research)	Kapoor, Shiv	6	
	54. University of Rhode Island (Center for Ocean Technology)	McCarthy, Steve	4	
	55. Stanford University (Center for Composite Design)	Watts, Daniel	4	
	56. Colorado School of Mines & Purdue University (Center for Advanced Control of Energy and Power Systems)	Callahan, Jeffrey	4	
		Tsai, Stephen	1	
		Shovchein, Reimundatiah	2	
MEAN*2 YEARS & LESS*				4.2
GRAND MEAN:				3.8
GRAND SUM:				210

TABLE 2
1993-1994 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	1986	1. Mass. (Polymers)	\$196,150	\$64,570	\$131,580	\$0	\$0	\$0	\$0
	1981	2. Case Western (Polymers)	-	-	-	-	-	-	-
	1982	3. NCSU (Communication/Signal Proc.)	\$728,394	\$44,067	\$146,125	\$320,259	\$102,281	\$45,662	\$70,000
		4. Rutgers (Ceramic)	\$1,821,245	\$50,000	\$214,347	\$667,876	\$1,297,454	\$492,812	\$99,406
		5. Georgia Tech. (Materials Handling)	\$998,988	\$71,533	\$309,677	\$126,355	\$0	\$11,423	\$480,000
		6. Penn. State (Dielectrics Studies)	\$418,483	\$26,635	\$127,050	\$140,800	\$30,000	\$0	\$94,000
	1984	7. Colorado School of Mines (Steel)	\$814,613	\$38,709	\$753,009	\$14,831	\$0	\$8,064	\$0
		8. Washington (Process Analytical Chem.)	\$2,710,641	\$26,667	\$1,554,210	\$250,706	\$143,130	\$585,768	\$149,622
		9. NJIT (Hazardous Substance Mgmt.)	\$10,208,813	\$425,133	\$88,000	\$353,623	\$2,818,562	\$6,308,755	\$214,740
		10. Arizona (Optical)	\$423,269	\$79,963	\$109,000	\$330	\$228,007	\$0	\$5,969
		11. Northwestern (Engineering Tribology)	\$524,733	\$43,797	\$200,000	\$265,936	\$0	\$0	\$15,000
		12. Arizona (Microcontamination)	\$407,969	\$31,800	\$323,432	\$0	\$18,115	\$31,500	\$3,122
		13. Northeastern (Electromagnetics)	\$698,000	\$58,000	\$200,000	\$150,000	\$0	\$200,000	\$90,000
		14. Lehigh (Chemical Process)	\$306,120	\$53,000	\$243,000	\$0	\$0	\$0	\$10,120
		15. Rutgers (Plastics)	\$673,237	\$37,974	\$252,000	\$0	\$12,273	\$274,000	\$128,590
	1985	16. Carnegie Mellon (Iron & Steel)	\$868,000	\$42,000	\$625,000	\$0	\$0	\$201,000	\$0
		17. Lehigh (Innovation)	\$220,108	\$44,108	\$162,000	\$0	\$0	\$10,000	\$4,000
		18. Texas - Arlington (Adv. Electron Devices)	\$546,834	\$60,000	\$200,000	\$0	\$165,834	\$96,000	\$25,000
		19. Tennessee (Measurement & Control)	\$398,263	\$80,955	\$397,250	\$4,000	\$0	\$116,000	\$0
		20. Iowa State (Nondestructive Evaluation)	\$1,245,174	\$29,861	\$770,000	\$0	\$378,000	\$0	\$67,513
	1986	21. Oklahoma State (Web Handling)	\$659,000	\$43,000	\$400,000	\$30,000	\$102,000	\$42,000	\$42,000
		22. Alfred (Glass)	\$708,000	\$95,500	\$506,503	\$30,000	\$66,000	\$10,000	\$0
		23. New Mexico Inst. (Energetic)	\$262,660	\$35,830	\$150,830	\$0	\$0	\$0	\$76,000
		24. Florida/Purdue (Software Eng.)	\$438,000	\$60,000	\$168,000	\$90,000	\$0	\$0	\$120,000
		25. UC Berkeley (Sensors & Actuators)	\$1,614,937	\$183,150	\$577,571	\$107,359	\$214,483	\$523,920	\$8,490
	1987	26. Iowa (Simulation & Design)	\$3,285,704	\$40,000	\$240,000	\$150,000	\$0	\$2,855,704	\$0
		27. S. California (Manufacturing)	\$286,494	\$35,592	\$0	\$125,902	\$0	\$125,000	\$0
		28. NCSU (Aseptic Processing)	\$409,826	\$32,654	\$280,550	\$31,778	\$0	\$40,594	\$24,250
	1988	29. Colorado (Microwave)	\$326,300	\$45,325	\$235,000	\$21,250	\$0	\$2,825	\$2,100
		30. SUNY at Buffalo (Biosurfaces)	\$372,000	\$37,000	\$160,000	\$80,000	\$0	\$35,000	\$60,000
	MEAN *SELF-SUSTAINING*		\$1,164,585	\$66,897	\$329,198	\$102,184	\$192,381	\$414,248	\$61,721
3 to 5 YEAR OLDS	1989	31. Pittsburgh (Intelligence Systems)	\$176,834	\$41,854	\$135,000	\$0	\$0	\$0	\$0
		32. New Mexico (Micro-Engineered Ceramics)	\$2,219,901	\$65,568	\$378,650	\$64,865	\$0	\$1,374,000	\$336,818
		33. Brown/Rhode Island (Film)	\$353,230	\$0	\$38,250	\$245,000	\$0	\$0	\$50,000
		34. Calif. - San Diego (Integrated Circuits)	\$497,000	\$397,000	\$100,000	\$0	\$0	\$0	\$0
		35. Ga. Tech./Arizona (Information Mgmt.)	\$243,000	\$70,000	\$40,000	\$75,000	\$0	\$50,000	\$10,000
		36. Washington State (Integrated Circuits)	\$660,690	\$120,690	\$295,000	\$0	\$95,000	\$0	\$150,000
	1990	37. Univ. of Illinois (Air Conditioning)	\$827,000	\$40,000	\$630,000	\$150,000	\$0	\$0	\$7,000
		38. Univ. of Connecticut (Grinding)	\$1,990,906	\$90,000	\$348,000	\$150,000	\$342,375	\$906,976	\$153,555
		39. Univ. of Michigan (Dimensional Measurement)	\$660,000	\$60,000	\$450,000	\$150,000	\$0	\$0	\$0
	1991	40. Eastern Michigan University (Coatings)	\$301,167	\$43,667	\$210,000	\$10,000	\$30,000	\$0	\$7,500
		41. Univ. of North Texas (Nanostructure)	\$637,000	\$55,000	\$92,000	\$430,000	\$5,000	\$15,000	\$40,000
		MEAN *3 to 5 YEAR OLDS*		\$777,161	\$89,434	\$246,991	\$115,897	\$42,943	\$213,271
1 YEARS & LESS	1992	42. UC Irvine (Image Processing)	\$936,000	\$50,000	\$300,000	\$207,000	\$50,000	\$278,000	\$51,000
		43. Univ. of Colorado (Thin Film)	\$638,223	\$36,725	\$456,000	\$38,000	\$65,000	\$0	\$425,000
		44. Lehigh (Polymer Interfaces)	\$341,033	\$50,000	\$350,000	\$71,915	\$0	\$33,210	\$35,930
		45. NCSU (Pest Management)	\$183,690	\$83,690	\$300,000	\$0	\$0	\$0	\$0
		46. Rutgers (Wireless Information)	\$1,258,331	\$17,183	\$840,000	\$95,000	\$0	\$81,658	\$224,510
		47. Villanova (Advanced Communication)	\$395,000	\$50,000	\$195,000	\$0	\$150,000	\$0	\$0
		48. Carnegie-Mellon (Building Performance)	\$337,462	\$89,125	\$300,000	\$61,545	\$0	\$86,792	\$0
		49. Arizona St./West. Network (Health Mgmt.)	\$385,000	\$50,000	\$315,000	\$10,000	\$0	\$10,000	\$0
	1993	50. Ohio University (Corrosion)	\$325,000	\$84,000	\$322,000	\$85,000	\$0	\$10,000	\$24,000
	1994	51. Illinois (Machine-Tool Systems)	\$427,247	\$50,000	\$377,247	\$0	\$0	\$0	\$0
		52. Massachusetts (Polymer Biodegradation)	\$422,000	\$50,000	\$150,000	\$132,000	\$0	\$0	\$90,000
		53. NJIT (Emission Reduction)	\$1,959,000	\$50,000	\$500,000	\$471,000	\$90,000	\$600,000	\$248,000
	54. Rhode Island (Ocean Technology)	\$330,010	\$36,765	\$205,000	\$47,245	\$10,000	\$0	\$31,000	
	55. Stanford (Composite Design)	\$150,000	\$50,000	\$300,000	\$0	\$0	\$0	\$0	
	56. CSM & Purdue (Energy & Power)	\$400,000	\$50,000	\$270,000	\$0	\$0	\$50,000	\$30,000	
	MEAN *1 YEARS & LESS*		\$622,536	\$83,166	\$345,350	\$81,747	\$14,377	\$76,444	\$77,196
	GRAND MEANS		\$941,894	\$67,738	\$217,114	\$99,174	\$116,689	\$181,830	\$67,160
	GRAND SUMS		\$81,809,769	\$3,698,090	\$17,441,283	\$5,482,178	\$6,410,613	\$15,511,662	\$3,794,235

TABLE 4
1993-1994 INDUSTRY MEMBERSHIP DESCRIPTORS

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STATUS	YEAR	ABBREVIATED NAME	CURRENT MEMBERS	1993 - 1994 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)	11	12	0	1	13	17	19	40000	•	•
	1981	2. Case Western (Polymers)	10	•	•	•	•	•	•	•	•	2000
	1982	3. NCSU (Communication/Signal Proc.)	5	6	2	3	8	15	18	50000	20000	•
	1984	4. Rutgers (Ceramic)	15	13	2	0	10	32	27	40000	•	•
		5. Georgia Tech. (Materials Handling)	12	10	2	0	•	•	2	40000	20000	•
		6. Penn. State (Dielectrics Studies)	15	15	0	0	18	24	26	20000	5000	•
		7. Colorado School of Mines (Steel)	23	21	2	0	7	24	7	40000	•	•
		8. Washington (Process Analytical Chem.)	35	39	4	8	0	58	39	35000	•	•
		9. NJIT (Hazardous Substance Mgmt.)	22	27	0	5	8	34	14	30000	15000	•
		10. Arizona (Optical)	3	3	1	1	9	4	8	50000	•	•
		11. Northwestern (Engineering Tribology)	6	9	0	1	14	5	11	27500	•	•
		12. Arizona (Microcontamination)	19	17	3	1	26	18	30	40000	10000	•
		13. Northeastern (Electromagnetics)	9	13	0	4	9	6	9	50000	12500	•
	14. Lehigh (Chemical Process)	11	11	1	1	0	1	1	30000	•	•	
	15. Rutgers (Plastics)	25	25	1	1	15	53	24	60000	30K-60K	•	
	16. Carnegie Mellon (Iron & Steel)	21	22	0	1	11	17	4	45000	32000	•	
	17. Lehigh (Innovation)	9	11	0	2	12	5	6	20000	•	•	
	18. Texas - Arlington (Adv. Electron Devices)	3	4	0	1	6	5	8	50000	25000	•	
	19. Tennessee (Measurement & Control)	16	14	4	3	0	4	3	35000	15000	•	
	20. Iowa State (Nondestructive Evaluation)	22	22	1	14	13	6	6	35000	•	•	
	21. Oklahoma State (Web Handling)	17	17	2	2	5	19	6	25000	•	•	
	22. Alfred (Glass)	25	22	4	1	8	20	4	30000	•	•	
	23. New Mexico Inst. (Energetic)	10	11	2	3	9	22	21	30000	20000	•	
	24. Florida/Purdue (Software Eng.)	9	10	1	2	10	13	11	30000	•	•	
	25. UC Berkeley (Sensors & Actuators)	17	18	1	2	6	20	9	50000	7500	•	
	26. Iowa (Simulation & Design)	12	12	1	1	24	5	13	40000	•	•	
	27. S. California (Manufacturing)	0	1	0	1	4	3	5	25000	•	•	
	28. NCSU (Aseptic Processing)	9	7	2	0	8	7	7	35000	•	•	
	29. Colorado (Microwave)	16	8	8	0	10	12	5	50000	25000	•	
	30. SUNY at Buffalo (Biosurfaces)	5	4	2	1	6	3	3	40000	•	•	
3 to 5 YEAR OLDS	1989	MEAN SELF-SUSTAINING*	13.8	13.9	1.6	9.6	15.3	11.9	37500	N/A	N/A	
	31. Pittsburgh (Intelligence Systems)	5	6	0	1	2	12	5	10000	•	•	
	32. New Mexico (Micro-Engineered Ceramics)	12	10	2	0	8	11	1	30000	10000	•	
	33. Brown/Rhode Island (Film)	4	6	0	2	14	3	12	25000	10000	•	
	34. Calif. - San Diego (Integrated Circuits)	3	3	0	0	6	2	3	50000	25000	•	
	35. Ga. Tech./Arizona (Information Mgmt.)	5	4	1	0	6	5	6	40000	•	•	
	36. Washington State (Integrated Circuits)	12	9	4	1	11	10	5	30000	•	•	
	37. Univ. of Illinois (Air Conditioning)	18	17	2	1	13	9	4	40000	•	•	
	38. Univ. of Connecticut (Grinding)	10	10	4	1	7	6	3	50000	12000	•	
	39. Univ. of Michigan (Dimensional Measurement)	10	10	1	1	8	4	2	50000	•	•	
1991	40. Eastern Michigan University (Coatings)	9	9	1	1	11	6	3	30000	•	•	
41. Univ. of North Texas (Nanotechnology)	6	7	1	2	4	4	2	30000	•	•		
2 YEARS & LESS	1992	MEAN 3 to 5 YEAR OLDS*	8.5	8.0	1.5	0.9	8.2	6.5	36364	N/A	N/A	
	42. UC Irvine (Image Processing)	8	8	0	0	9	4	3	25000	•	•	
	43. Univ. of Colorado (Thin Film)	12	11	1	1	8	4	3	40000	•	•	
	44. Lehigh (Polymer Interfaces)	11	11	1	1	10	3	2	35000	•	•	
	45. NCSU (Pest Management)	6	6	0	0	7	1	0	25000	•	•	
	46. Rutgers (Wireless Information)	28	24	5	1	21	6	3	30000	•	•	
	47. Villanova (Advanced Communication)	9	9	0	0	4	3	1	30000	•	•	
	48. Carnegie-Mellon (Building Performance)	16	13	3	0	3	10	0	50000	25000	•	
	49. Arizona St./West. Network (Health Mgmt.)	9	10	0	1	6	4	1	35000	•	•	
	1993	50. Ohio University (Corrosion)	14	12	3	1	4	7	2	23000	15000	•
1994	51. Illinois (Machine-Tool Systems)	6	6	0	0	0	0	0	50000	20000	•	
52. Massachusetts (Polymer Biodegradation)	10	6	4	0	0	0	0	30000	5000	•		
53. Rhode Island (Ocean Technology)	10	9	1	0	0	1	0	50000	10000	•		
54. NJIT (Emission Reduction)	11	9	2	0	0	2	0	25000	•	•		
55. Stanford (Composite Design)	5	0	0	0	0	0	0	100000	50000	25000		
56. CSM & Purdue (Energy & Power)	9	0	0	0	0	0	0	50000	•	•		
MEAN 2 YEARS & LESS*			10.9	8.9	2.3	0.3	5.3	4.3	39867	N/A	N/A	
GRAND MEANS:			12.0	11.4	1.6	1.1	6.0	10.8	7.4	37918	N/A	N/A
GRAND SUMS:			671	626	97	62	432	595	406	2085500	N/A	N/A

TABLE 5
1993-1994 HUMAN RESOURCES

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STATUS	YEAR	ABBREVIATED NAME	RESEARCHER BREAKDOWN				STUDENTS		ADMINISTRATIVE			
			TOTAL # RESEARCHERS	# FACULTY SCIENTISTS	NON-FACULTY		# OF GRADS	# OF UNDERGRAD	PROFESSIONALS		CLERICALS	
				FT	PT			FT	PT	FT	PT	
SELF-SUSTAINING	1980	1. Mass. (Polymers)	17	17	0	0	16	0	1	0	0	1
	1981	2. Case Western (Polymers)	15	9	6	0	15	6	0	0	2	0
	1982	3. NCSU (Communication/Signal Proc.)	12	12	0	0	0	0	2	0	2	0
		4. Rutgers (Ceramic)	15	15	0	0	50	15	8	1	5	0
		5. Georgia Tech. (Materials Handling)	42	39	0	3	68	62	1	1	2	1
		6. Penn. State (Dielectrics Studies)	14	6	2	6	7	0	0	2	0	1
	1984	7. Colorado School of Mines (Steel)	6	4	2	0	20	0	1	0	0	1
		8. Washington (Process Analytical Chem.)	22	14	7	1	26	2	5	0	2	1
		9. NJIT (Hazardous Substance Mgmt.)	57	55	2	0	54	10	4	0	3	0
		10. Arizona (Optical)	9	6	0	3	7	1	0	1	0	1
		11. Northwestern (Engineering Tribology)	12	6	5	1	11	0	1	0	1	0
		12. Arizona (Microcontamination)	13	10	0	3	9	2	0	1	1	1
		13. Northeastern (Electromagnetics)	20	15	4	1	15	2	7	0	2	1
		14. Lehigh (Chemical Process)	10	8	2	0	14	1	1	0	1	0
		15. Rutgers (Plastics)	6	4	2	0	1	2	4	0	2	0
	1985	16. Carnegie Mellon (Iron & Steel)	7	5	2	0	10	10	4	0	0	8
		17. Lehigh (Innovation)	4	6	2	0	4	0	0	2	1	1
		18. Texas - Arlington (Adv. Electron Devices)	5	4	0	1	8	2	0	1	1	2
		19. Tennessee (Measurement & Control)	14	10	3	1	15	6	1	1	1	2
		20. Iowa State (Nondestructive Evaluation)	15	11	0	4	12	2	0	3	0	3
	1986	21. Oklahoma State (Web Handling)	14	13	1	0	42	3	0	2	0	4
		22. Alfred (Glass)	22	20	0	2	11	3	2	0	1	1
		23. New Mexico Inst. (Energetic)	4	3	0	1	11	20	0	2	1	1
		24. Florida/Purdue (Software Eng.)	22	20	0	2	44	9	1	2	3	4
		25. UC Berkeley (Sensors & Actuators)	11	7	4	0	33	1	1	0	2	1
	1987	26. Iowa (Simulation & Design)	50	9	38	3	74	12	2	0	4	1
		27. S. California (Manufacturing)	4	4	0	0	2	0	0	1	1	0
		28. NCSU (Aseptic Processing)	26	22	4	0	22	16	0	3	0	1
	1988	29. Colorado (Microwave)	3	3	0	0	3	0	0	2	0	1
		30. SUNY at Buffalo (Biosurfaces)	16	12	6	6	4	4	2	1	0	1
	MEAN "SELF-SUSTAINING:"	16.6	12.3	3.1	1.3	20.3	6.4	1.6	0.9	1.3	1.3	
3 to 5 YEAR OLDS	1989	31. Pittsburgh (Intelligence Systems)	2	2	0	0	5	0	0	1	0	1
		32. New Mexico (Micro-Engineered Ceramics)	31	11	10	10	35	5	1	0	2	1
		33. Brown/Rhode Island (Film)	9	8	0	1	3	0	0	2	0	1
		34. Calif. - San Diego (Integrated Circuits)	8	6	2	0	10	1	1	0	1	1
		35. Ga. Tech./Arizona (Information Mgmt.)	8	6	2	0	5	0	1	0	0	1
		36. Washington State (Integrated Circuits)	15	15	0	0	34	0	1	5	1	4
	1990	37. Univ. of Illinois (Air Conditioning)	14	13	1	0	44	28	0	1	1	0
		38. Univ. of Connecticut (Grinding)	22	14	6	2	15	2	4	2	0	2
		39. Univ. of Michigan (Dimensional Measurem)	23	8	2	13	14	2	0	2	1	1
	1991	40. Eastern Michigan University (Coatings)	11	7	3	1	6	3	0	2	0	1
		41. Univ. of North Texas (Nanostructure)	12	8	2	2	4	4	0	5	1	0
	MEAN "3 to 5 YEAR OLDS:"	14.3	8.9	2.5	2.6	15.9	4.1	0.7	1.8	0.6	1.2	
2 YEARS & LESS	1992	42. UC Irvine (Image Processing)	14	12	0	2	25	5	1	1	0	1
		43. Univ. of Colorado (Thin Film)	15	14	1	0	14	3	2	0	1	2
		44. Lehigh (Polymer Interfaces)	23	15	3	5	0	1	0	3	1	1
		45. NCSU (Pest Management)	35	32	3	0	10	4	0	1	0	1
		46. Rutgers (Wireless Information)	9	7	2	0	14	5	3	1	2	1
		47. Villanova (Advanced Communication)	8	8	0	0	8	4	1	0	0	1
		48. Carnegie-Mellon (Building Performance)	6	5	1	0	10	5	2	0	2	0
		49. Arizona St./West. Network (Health Mgmt.)	27	23	1	3	8	0	0	2	0	2
	1993	50. Ohio University (Corrosion)	7	5	1	1	10	4	1	0	0	1
	1994	51. Illinois (Machine-Tool Systems)	15	14	1	0	14	0	0	1	0	1
		52. Massachusetts (Polymer Biodegradation)	9	5	4	0	12	2	2	1	0	0
		53. NJIT (Emission Reduction)	22	20	1	1	23	0	1	0	1	0
		54. Rhode Island (Ocean Technology)	5	4	1	0	4	0	0	0	0	1
		55. Stanford (Composite Design)	3	2	0	1	5	0	1	0	0	1
		56. CSM & Purdue (Energy & Power)	4	3	1	0	4	1	2	0	1	0
		MEAN "2 YEARS & LESS:"	13.5	11.3	1.3	0.9	10.7	2.3	1.1	0.7	0.5	0.9
	GRAND MEANS:	15.2	11.4	2.5	1.4	16.9	4.8	1.3	1.0	0.9	1.2	
	GRAND SUMS:	849	636	140	80	944	270	72	56	53	65	

TABLE 6
1993-1994 CENTER DIRECTOR DESCRIPTORS

STATUS	YEAR	ABBREVIATED NAME	DIRECTOR'S RANK	DIRECTOR TENURE	DIRECTOR REPORTS TO	TIME ALLOCATION					
						CENTER ADMIN. (%)	OTHER ADMIN. (%)	RESEARCH (%)	TEACHING (%)	OTHER (%)	ADMIN. BUDGET (%)
SELF-SUSTAINING	1980	1. Mass. (Polymers)	Professor	No	V-Chancellor	100%	0%	0%	0%	0%	28%
	1981	2. Case Western (Polymers)	Professor	Yes	Dean	30%	10%	40%	20%	0%	8%
	1982	3. NCSU (Communication/Signal Proc.)	Professor	Yes	Dean	65%	7%	20%	8%	0%	25%
		4. Rutgers (Ceramic)	Professor	Yes	Director	40%	5%	25%	25%	5%	20%
		5. Georgia Tech. (Materials Handling)	Assoc. Professor	No	Exec. V.P. Director	60%	20%	5%	10%	5%	20%
	1984	6. Penn. State (Dielectric Studies)	Professor	No	Dept. Head	20%	10%	30%	10%	0%	20%
		7. Colorado School of Mines (Steel)	Professor	Yes	V-Pres.	70%	0%	20%	0%	10%	15%
		8. Washington (Process Analytical Chem.)	Professor	Yes	V-Pres. Director	50%	50%	0%	0%	0%	18%
		9. NJIT (Hazardous Substance Mgmt.)	Professor	Yes	Director	30%	5%	35%	30%	0%	5%
		10. Arizona (Optical)	Professor	Yes	Dean	25%	10%	30%	35%	0%	7%
	11. Northwestern (Engineering Tribology)	Associate Professor	Yes	Department Head	17%	17%	33%	33%	0%	23%	
	12. Arizona (Microcontamination)	Professor	Yes	Dean	20%	30%	30%	0%	20%	15%	
	13. Northeastern (Electromagnetics)	Professor	Yes	Dean	30%	10%	30%	30%	0%	30%	
	14. Lehigh (Chemical Process)	Professor	Yes	Director	75%	5%	20%	0%	0%	24%	
	15. Rutgers (Plastics)	Professor	Yes	Dean	15%	15%	40%	20%	10%	8%	
	16. Carnegie Mellon (Iron & Steel)	Professor	Yes	Dean	45%	25%	25%	5%	0%	60%	
	17. Lehigh (Innovation)	Professor	Yes	Dean	25%	25%	25%	25%	0%	15%	
	18. Texas - Arlington (Adv. Electron Devices)	Professor	No	Dean	80%	0%	20%	0%	0%	18%	
	19. Tennessee (Measurement & Control)	Professor	Yes	Director	15%	65%	5%	5%	10%	15%	
	20. Iowa State (Nondestructive Evaluation)	Professor	Yes	Provost	15%	70%	15%	0%	0%	5%	
	21. Oklahoma State (Web Handling)	Professor	Yes	Dean	40%	20%	20%	20%	0%	30%	
	22. Alfred (Glass)	Professor	No	V-Pres.	20%	10%	30%	25%	0%	30%	
	23. New Mexico Inst. (Emergetic)	Professor	No	Dean	50%	0%	50%	0%	0%	30%	
	24. Florida/Purdue (Software Eng.)	Professor	Yes	Dean	25%	0%	25%	25%	0%	12%	
	25. UC Berkeley (Sensors & Actuators)	Professor	Yes	Chair	25%	0%	50%	25%	0%	10%	
	26. Iowa (Simulation & Design)	Professor	Yes	Dean	5%	15%	40%	20%	20%	12%	
	27. S. California (Manufacturing)	Professor	Yes	Dept. Head	0%	0%	80%	20%	0%	12%	
	28. NCSU (Aseptic Processing)	Professor	No	Dean	20%	50%	15%	15%	0%	21%	
	29. Colorado (Microwave)	Professor	Yes	V-Provost	20%	5%	40%	30%	5%	13%	
	30. SUNY at Buffalo (Bioreactors)	N/A	N/A	N/A	N/A	35%	17%	27%	16%	4%	
	MEAN SEARS/SUSTAINING:*						22%	13%	38%	21%	19%
3 to 5 YEAR OLDS	1989	31. Pittsburgh (Inertial Systems)	Professor	Yes	Dean	10%	0%	40%	50%	0%	10%
		32. New Mexico (Micro-Engineered Ceramics)	Professor	Yes	Provost	30%	10%	30%	20%	10%	15%
		33. Brown/Rhode Island (Film)	Professor	Yes	Dean	10%	0%	80%	0%	10%	6%
		34. Calif. - San Diego (Integrated Circuits)	Professor	Yes	Chair	10%	10%	40%	40%	0%	12%
		35. Ga. Tech./Arizona (Information Mgmt.)	Principal Researcher	No	Dean	30%	20%	30%	20%	0%	40%
		36. Washington State (Integrated Circuits)	Professor	Yes	Dean	35%	50%	0%	15%	0%	15%
		37. Univ. of Illinois (Air Conditioning)	Professor	Yes	Head	20%	0%	30%	30%	20%	7%
		38. Univ. of Connecticut (Grinding)	Professor	Yes	Dean	30%	30%	20%	5%	15%	10%
		39. Univ. of Michigan (Dimensional Measurement)	Associate Professor	Yes	Dean	15%	15%	40%	30%	0%	10%
		40. Eastern Michigan University (Coatings)	Professor	Yes	Director	33%	0%	59%	8%	0%	4%
	41. Univ. of North Texas (Nanotechnology)	Professor	Yes	V-Pres	22%	10%	50%	20%	0%	7%	
	MEAN 3 to 5 YEAR OLDS:*						20%	13%	38%	21%	13%
2 YEARS & LESS	1992	42. UC Irvine (Image Processing)	Professor	Yes	Dean	20%	5%	35%	25%	15%	5%
		43. Univ. of Colorado (Thin Film)	Professor	Yes	Associate Dean	10%	1%	30%	50%	9%	19%
		44. Lehigh (Polymer Interfaces)	Professor	Yes	Vice Provost	20%	10%	40%	20%	0%	9%
		45. NCSU (Pest Management)	Professor	Yes	Vice Chancellor	50%	0%	38%	12%	0%	15%
		46. Rutgers (Wireless Information)	Professor	Yes	Director	40%	0%	20%	40%	0%	23%
		47. Villanova (Advanced Communication)	Staff	No	Dean	50%	25%	25%	0%	0%	15%
		48. Carnegie-Mellon (Building Performance)	Professor	No	Department Head	25%	0%	20%	70%	0%	20%
		49. Arizona St./West. Network (Health Mgmt.)	Professor	Yes	Associate Dean	10%	0%	40%	35%	0%	21%
		50. Ohio University (Corrosion)	Professor	Yes	Dean	20%	35%	15%	30%	0%	10%
		51. Illinois (Machine-Tool Systems)	Professor	Yes	Dean	10%	10%	40%	40%	0%	15%
	52. Massachusetts (Polymer Biodegradation)	Professor	Yes	Provost	20%	0%	30%	20%	0%	16%	
	53. NJIT (Emission Reduction)	Staff	No	CEES Director	40%	40%	0%	0%	0%	15%	
	54. Rhode Island (Ocean Technology)	Professor	No	Vice Provost	30%	50%	0%	0%	20%	20%	
	55. Stamford (Composite Design)	Full Professor	No	Chair	40%	0%	50%	0%	10%	20%	
	56. CSM & Purdue (Energy & Power)	Professor	Yes	Vice President	27%	10%	20%	24%	8%	20%	
	MEAN 2 YEARS & LESS:*						27%	13%	30%	24%	16%
	GRAND MEANS:						31%	15%	39%	19%	17%
	GRAND SUMS:						N/A	N/A	N/A	N/A	N/A

TABLE 7
1993-1994 INTELLECTUAL PROPERTY

	PERCENT OF CENTERS REPORTING ONE OR MORE						
	INVENTION DISCLOSURES	PATENT APPLICATIONS	SOFTWARE COPYRIGHTS	PATENTS GRANTED	LICENSING AGREEMENTS	ROYALTIES REALIZED	
SELF SUSTAINING	38%	34%	14%	23%	17%	10%	
Centers Reporting 1 or More	11	10	4	7	5	3	
3 TO 5 YEAR OLDS	9%	9%	0%	0%	9%	18%	
Centers Reporting 1 or More	1	1	0	0	1	2	
2 YEARS AND LESS	47%	13%	0%	7%	0%	0%	
Centers Reporting 1 or More	7	2	0	1	0	0	
TOTAL PERCENTAGE of Centers Reporting 1 or More	35%	24%	7%	14%	11%	9%	
TOTAL Centers Reporting 1 or More	19	13	4	8	6	5	
GRAND MEAN	0.8	0.5	0.2	0.3	0.1	0.1	
GRAND SUM	44	25	10	14	7	5	

APPENDIX

FOOTNOTES: 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 only includes data on Centers which were considered active participants in the NSF IUCRC Program during the past fiscal year. Self-sustaining Centers which are no longer affiliated with the IUCRC program are not included.
- 3) Authors' address: IUCRC Evaluation Project, Psychology Department, NCSU Box 7801, Raleigh, NC 27695.
By telephone: Voice (919) 515-3237; FAX (919) 515-1716.
- 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. Because one Center provided the total budget but failed to provide direct and indirect breakdowns the grand sums of Columns A + B will not equal Column C.
- 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 3, "IN KIND SUPPORT" refers to additional equipment or personnel contributions not reflected in operating budget figures.
- 17) On Table 4, "FEES" are broken down into primary, secondary, and tertiary (the latter two represent variable membership fees).
- 18) On Table 5, "FT" means "Full-time" and "PT" means "Part-time."
- 19) On Table 6, "TIME ALLOCATION" refers to allocation of director's full-time equivalent for budgetary purposes.
- 20) 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.