

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

**FINAL
1997-1998 STRUCTURAL INFORMATION^{1,2}**

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NOTE: 1997-1998 data collected from 55/55 Center Director Surveys (100% response rate).

PLEASE DIRECT QUESTIONS AND COMMENTS TO THE AUTHORS³

TABLE 1
1997 - 1998 GENERAL INFORMATION

STATUS	YEAR FUNDED	UNIVERSITY (CENTER)	DIRECTORS	# OF DEPTS.
ACTIVE	1981	1. Case Western Reserve Univ. (Center for Applied Polymer Research)	Hiltner, A.	*
	1982	2. Rutgers Univ. (Center for Ceramic Research)	Niesz, D.	1
	1983	3. The Pennsylvania State Univ. (Center for Dielectric Studies)	Randall, C.	4
	1984	4. Colorado School of Mines (Center for Advanced Steel Processing and Products Research)	Matlock, D.	2
		5. Lehigh Univ. (Center for Innovation Management Studies)	Bean, A.	7
		6. Univ. of Arizona (Center for Microcontamination Control)	O'Hanlon, J.	4
	1985	7. Carnegie-Mellon Univ. (Center for Iron and Steelmaking Research)	Fruchan, R.J.	1
		8. Univ. of Tennessee (Center for Measurement and Control Engineering)	Garrison, A.	4
		9. Iowa State Univ. (Center for Nondestructive Evaluation)	Thompson, R.	14
	1986	10. Northeastern Univ. (Center for Electromagnetics Research)	Silevitch, M., DiMarzio, C., Rappaport, C., McKnight, S.	4
		11. New Mexico Institute of Mining & Technology (Center for Energetic Materials)	Cortez, Jose, L.M.	2
		12. Univ. of California-Berkeley (Center for Sensors and Actuators)	Muller, R.	5
		13. Oklahoma State Univ. (Web Handling Research Center)	Reid, K.	3
		14. Univ. of New Mexico (Center for Micro-Engineered Materials)	Datye, A., Hampden-Smith, M.	5
	1989	15. Univ. of Illinois-Urbana-Champaign (Center for Advanced Air Conditioning and Refrigeration)	Bullard, C.	3
		16. Univ. of California-San Diego (Center for Ultra High-Speed Integrated Circuits & Systems)	Ku, W.,	3
	1990	17. Univ. of Michigan (Center for Dimensional Measurement and Control in Manufacturing)	Ni, J., Hu, J.	4
		18. Univ. of Colorado-Boulder (Center for Separations Using Thin Films)	Krantz, W., Noble, R.	8
	1991	19. Villanova University (Center for Advanced Communications)	Di Giacomo, J.	3
		20. North Carolina State Univ. (Center for Integrated Past Management)	Stinner, R.	3
		21. Georgia Tech/Univ. of Arkansas (Center for Material Handling/Logistics Institute)	Nemhauser, G., Landers, T.	2
		22. Lehigh Univ. (Center for Polymer Interfaces)	Chaudhury, M.	4
		23. Rutgers Univ./State Univ. of New Jersey (Center for Wireless Information Networks)	Goodman, D. J.	4
	1992	24. Carnegie-Mellon Univ. (Center for Building Performance and Diagnostics)	Hartkopf, V., Lee, S.	5
	1993	25. North Carolina State Univ./Duke Univ. (Center for Advanced Computing and Communication)	Snyder, W., Trivedi, K.	3
		26. Ohio Univ. (Center for Corrosion in Multiphase Systems)	Jepson, W. P.	1
		27. NJ Institute of Technology/The Pennsylvania State Univ./Ohio State Univ./MIT (Center for Emission Reduction Research)	Watts, D.	8
		28. Univ. of Illinois (Center for Machine-Tool Systems)	Kapoor, S.	6
		29. Univ. of Massachusetts-Lowell (Center for Biodegradable Polymer Research)	McCarthy, S.	4
	1994	30. Washington State Univ./Univ. of Washington/Oregon State Univ./State Univ. of NY-SB (Center for Anal/Dig. Integrated Circuits)	Ringo, J., Lauitzen, P., Kiaei, S., Carlson, B.	2
		31. North Carolina State Univ./Univ. of California-Davis (Center for Aseptic Processing and Packaging Studies)	Swartzel, K., Shoemaker, S.	4
		32. Northwestern University/Georgia Institute of Tech./Univ. of Illinois-Urbana-Champaign (Center for Surface Engin. and Tribology)	Wilson, W., Danyluk, S.	4
		33. Univ. of Washington/Univ. of Minnesota/Univ. of California-Davis/Univ. of Delaware (Center for Process Analytical Chem.)	Christian, G., Koch, M.	6
		34. Purdue Univ./Univ. of Florida/Univ. of Oregon (Center for Software Engineering)	Mathur, A. P.	1
	1995	35. Univ. of Colorado-Boulder (Center for Advanced Manufacturing and Packaging of Microwave, Optical and Digital Electronics)	Mahajan, R.	2
		36. Arizona State Univ./Colorado School of Mines/Wichita State Univ. (Center for Advanced Control of Energy and Power Systems)	Heydt, G.T., Shoureshi, R., Jewell, W., Sparrow, F.	9
		37. Univ. of Texas-Arlington (Center for Advanced Electronic Materials, Devices and Systems)	Fitzer, J.	3
		38. Eastern Michigan Univ./North Dakota State Univ./Michigan Molecular Institute (Center for Coatings Research)	Jones, F., Urban, M.	4
		39. Texas A&M Univ. (Center for Ergonomics)	Congleton, J., Kerk, C., Amendola, A.	5
		40. Univ. of Arizona/Univ. of Maryland (Center for Optoelectronic Devices, Interconnects and Packaging)	Peyghambarian, N., Degenais, M.	4
		41. The Pennsylvania State Univ./Rutgers Univ. (Center for Particulate Materials)	Adair, J.	9
		42. Purdue Univ. (Center for Pharmaceutical Processing Research)	Nail, S. L.	4
	1996	43. Alfred Univ./Univ. of Missouri-Rolla (Center for Glass Research)	Seward III, T., Moore, R.	1
		44. Univ. of Connecticut (Center for Grinding Research)	Howes, T., Webster, J.	7
		45. NJ Institute of Technology/Rutgers Univ./Stevens Tech./UMDNJ/Princeton/Tufts (Center for Hazardous & Toxic Waste Mngt)	Magee, R.	14
		46. Univ. of Washington/Northwestern Univ. (Center for Health Management)	Zuckerman, H., Shortell, S.	15
		47. Cornell Univ./Univ. of California-Berkeley/Univ. of Illinois-Urbana/Univ. of Wisconsin-Madison (Center for Power Systems Engineering)	Thomas, R., Lassetter, R., Oren, S., Sauer, P.	5
	1997	48. Ohio State Univ. (Center for Advanced Polymer and Composite Engineering)	Lee, L.J.	3
		49. SUNY Buffalo/SUNY-Alfred/Univ. of Memphis/Univ. of Miami (Center for Biosurfaces)	Baier, R., Meyer, A., Clare, A., Turito, V., Hwang, N.	8
		50. Univ. of California-Berkeley (Center for Built Environments)	Arens, E.	6
		51. Univ. Arizona (Center for Management of Information)	Nunamaker, J. F.	1
		52. Rutgers Univ. (Center for Quality and Reliability Engineering)	Elsayed, E.	1
		53. North Carolina State Univ. (Center for Silicon Wafer Engineering and Defect Science)	Rozgonyi, G.	6
		54. Univ. of Iowa/Univ. of Texas-Austin (Virtual Proving Ground Simulation)	Longoria, R.	2
		55. Univ. of Oklahoma (Center for Wireless Electromagnetic Compatibility)	Grant, F. H.	2
			GRAND MEAN:	4.54
			GRAND SUM:	245
NEW CENTERS	1998	56. Univ. of California- Irvine (Information Technology and Organization)	Kramer, K.	*
		57. Univ. North Carolina-Charlotte (Precision Metrology)	Hocken, R.	*

TABLE 2
1997 - 1998 OPERATING BUDGET: TOTAL FUNDING⁵

YEAR FUNDED	ABBREVIATED NAME	Total Funding	NSF		INDUSTRY		STATE TOTAL	UNIV. TOTAL	OTHER		
			IUCRC FUNDING	NSF OTHER	MEMBERSHIP FEES	OTHER			FEDERAL AGENCY	NON-FEDERAL AGENCY	OTHER FUNDING
1981	1. Case Western Reserve (Applied Polymer Research)	\$1,500,000	\$33,000	\$0	\$600,000	\$0	\$0	\$0	\$867,000	\$0	\$0
1982	2. Rutgers Univ. (Ceramic Research)	\$6,406,075	\$0	\$0	\$270,000	\$1,855,005	\$300,000	\$1,183,185	\$2,707,885	\$90,000	\$0
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	\$1,857,000	\$32,000	\$0	\$425,000	\$0	\$0	\$100,000	\$0	\$40,000	\$1,260,000
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	\$1,167,270	\$33,000	\$0	\$1,130,270	\$0	\$0	\$4,000	\$0	\$0	\$0
	5. Lehigh Univ. (Center for Innovation Management Studies)	\$350,885	\$56,885	\$114,000	\$180,000	\$0	\$0	\$0	\$0	\$0	\$0
	6. Univ. of Arizona (Center for Microcontamination Control)	\$500,000	\$0	\$5,000	\$450,000	\$0	\$0	\$45,000	\$0	\$0	\$0
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	\$988,000	\$38,000	\$0	\$950,000	\$0	\$0	\$0	\$0	\$0	\$0
	8. Univ. of Tennessee (Measurement and Control Engineering)	\$731,985	\$85,242	\$20,000	\$370,000	\$144,000	\$0	\$67,743	\$45,000	\$0	\$0
	9. Iowa State Univ. (Nondestructive Evaluation)	\$4,377,365	\$70,000	\$46,600	\$630,000	\$0	\$0	\$1,051,576	\$2,326,009	\$0	\$253,180
1986	10. Northeastern Univ. (Electromagnetics Research)	\$2,385,000	\$32,000	\$0	\$313,000	\$0	\$0	\$90,000	\$150,000	\$0	\$1,800,000
	11. New Mexico Institute of Mining & Technology (Energetic Materials)	\$324,000	\$38,000	\$0	\$110,000	\$0	\$0	\$76,000	\$100,000	\$0	\$0
	12. Univ. of California-Berkeley (Sensors and Actuators)	\$8,824,883	\$44,700	\$448,679	\$1,295,926	\$894,943	\$19,518	\$8,091	\$6,020,836	\$92,189	\$0
	13. Oklahoma State Univ. (Web Handling Research Center)	\$1,098,791	\$77,612	\$0	\$475,000	\$90,030	\$89,867	\$320,175	\$0	\$0	\$46,107
1988	14. Univ. of New Mexico (Micro-Engineered Materials)	\$2,146,036	\$38,000	\$65,100	\$314,000	\$15,000	\$76,000	\$173,000	\$0	\$0	\$1,464,936
1989	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	\$2,263,000	\$33,000	\$0	\$800,000	\$110,000	\$0	\$700,000	\$50,000	\$0	\$570,000
	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	\$482,719	\$83,000	\$0	\$150,000	\$0	\$0	\$4,719	\$245,000	\$0	\$0
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	\$482,000	\$32,000	\$0	\$350,000	\$100,000	\$0	\$0	\$0	\$0	\$0
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	\$1,239,000	\$33,000	\$5,000	\$440,000	\$0	\$61,000	\$40,000	\$0	\$0	\$660,000
1991	19. Villanova University (Adv. Communications)	\$451,921	\$32,000	\$0	\$347,500	\$0	\$35,000	\$0	\$37,421	\$0	\$0
	20. North Carolina State Univ. (Integrated Pest Management)	\$355,411	\$33,000	\$0	\$221,840	\$0	\$0	\$10,000	\$34,571	\$56,000	\$0
	21. Georgia Tech. (Material Handling/Logistics Institute)	\$1,415,355	\$73,000	\$191,476	\$490,000	\$20,000	\$50,000	\$443,269	\$147,610	\$0	\$0
	22. Lehigh Univ. (Polymer Interfaces)	\$430,311	\$64,386	\$10,000	\$210,000	\$93,700	\$0	\$52,225	\$0	\$0	\$0
	23. Rutgers Univ. (Wireless Info. Networks)	\$3,912,956	\$88,000	\$1,154,626	\$690,000	\$68,200	\$4,079	\$23,900	\$1,830,182	\$53,969	\$0
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	\$868,700	\$40,000	\$49,060	\$365,000	\$0	\$30,240	\$40,000	\$249,400	\$80,000	\$15,000
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	\$2,240,276	\$168,830	\$5,000	\$370,000	\$307,658	\$30,000	\$157,638	\$319,648	\$20,000	\$861,502
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	\$127,423	\$52,423	\$0	\$0	\$0	\$0	\$75,000	\$0	\$0	\$0
	27. NJ Institute of Tech. (Emission Reduction Research)	\$2,511,075	\$250,000	\$99,960	\$200,000	\$30,000	\$70,000	\$87,638	\$1,773,477	\$0	\$0
	28. Univ. of Illinois (Machine-Tool Systems)	\$463,666	\$50,000	\$0	\$250,000	\$124,666	\$0	\$0	\$0	\$0	\$39,000
	29. Univ. of Massachusetts-Lowell (Biogradable Polymer Research)	\$634,527	\$60,000	\$0	\$270,000	\$200,000	\$0	\$60,000	\$44,527	\$0	\$0
1994	30. Washington State Univ. (Analog Digital)	\$1,882,990	\$226,739	\$100,000	\$866,380	\$300,000	\$0	\$389,871	\$0	\$0	\$0
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	\$518,328	\$73,000	\$24,400	\$226,250	\$0	\$17,500	\$50,678	\$0	\$0	\$126,500
	32. Northwestern Univ. (Surface Engin. and Trib.)	\$1,007,484	\$118,000	\$25,000	\$202,500	\$10,000	\$0	\$15,491	\$0	\$97,000	\$539,493
	33. Univ. of Washington (Process Analytical Chem.)	\$1,833,000	\$0	\$0	\$1,300,000	\$30,000	\$0	\$133,000	\$210,000	\$160,000	\$0
	34. Purdue Univ. (Software Engineering)	\$946,108	\$195,000	\$0	\$280,000	\$371,108	\$0	\$50,000	\$50,000	\$0	\$0
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit.)	\$657,799	\$55,000	\$0	\$375,000	\$0	\$0	\$18,558	\$209,241	\$0	\$0
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	\$1,475,000	\$120,000	\$440,000	\$800,000	\$0	\$0	\$65,000	\$50,000	\$0	\$0
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	\$1,015,000	\$90,000	\$15,000	\$315,000	\$15,000	\$553,000	\$27,000	\$0	\$0	\$0
	38. Eastern Michigan Univ. (Coatings Research)	\$580,000	\$130,000	\$0	\$360,000	\$0	\$0	\$10,000	\$60,000	\$0	\$0
	39. Texas A&M Univ. (Center for Ergonomics)	\$419,518	\$45,000	\$5,000	\$148,333	\$91,355	\$50,000	\$12,000	\$67,830	\$0	\$0
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)	\$1,295,104	\$98,000	\$100,000	\$607,500	\$21,000	\$263,604	\$0	\$205,000	\$0	\$0
	41. The Pennsylvania State Univ. (Particulate Materials)	\$895,200	\$85,000	\$0	\$395,000	\$0	\$0	\$160,200	\$0	\$0	\$255,000
	42. Purdue Univ. (Pharmaceutical Processing Research)	\$400,316	\$50,000	\$0	\$300,000	\$0	\$0	\$50,316	\$0	\$0	\$0
1996	43. Alfred Univ. (Glass Research)	\$951,000	\$43,000	\$0	\$834,000	\$0	\$0	\$63,000	\$11,000	\$0	\$0
	44. Univ. of Connecticut (Grinding Research)	\$1,956,389	\$75,000	\$7,761	\$301,000	\$5,650	\$367,296	\$126,081	\$1,073,601	\$0	\$0
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	\$6,870,369	\$91,000	\$474,485	\$330,000	\$320,350	\$3,227,075	\$400,000	\$1,779,859	\$247,600	\$0
	46. Univ. of Washington (Health Management)	\$638,000	\$93,000	\$0	\$495,000	\$0	\$0	\$50,000	\$0	\$0	\$0
	47. Cornell Univ. (Power Systems Engineering)	\$1,175,000	\$225,000	\$0	\$560,000	\$240,000	\$0	\$150,000	\$0	\$0	\$0
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	\$627,000	\$100,000	\$0	\$327,000	\$0	\$150,000	\$50,000	\$0	\$0	\$0
	49. SUNY Buffalo (Biosurfaces)	\$665,900	\$180,200	\$0	\$270,000	\$0	\$0	\$104,500	\$111,200	\$0	\$0
	50. Univ. of California-Berkeley (Built Environments)	\$456,662	\$75,000	\$0	\$230,000	\$0	\$0	\$122,622	\$29,040	\$0	\$0
	51. Univ. Arizona (Management of Information)	\$698,000	\$50,000	\$0	\$473,000	\$0	\$0	\$150,000	\$0	\$0	\$25,000
	52. Rutgers Univ. (Quality and Reliability Engineering)	\$556,000	\$75,000	\$0	\$330,000	\$115,000	\$0	\$25,000	\$11,000	\$0	\$0
	53. North Carolina State Univ. (Silicon Wafer Eng. and Defect Science)	\$425,000	\$75,000	\$0	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	\$501,666	\$50,000	\$0	\$0	\$0	\$0	\$0	\$451,666	\$0	\$0
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	\$467,000	\$50,000	\$0	\$400,000	\$0	\$0	\$0	\$0	\$17,000	\$0
	GRAND MEAN:	\$1,444,172	\$75,255	\$61,930	\$439,694	\$101,321	\$98,076	\$127,936	\$386,691	\$17,341	\$143,922
	GRAND SUM:	\$79,429,463	\$4,139,017	\$3,406,147	\$23,743,499	\$5,572,665	\$5,394,179	\$7,036,476	\$21,268,003	\$953,758	\$7,915,718

TABLE 3

1997- 1998 BUDGET FIGURES & CAPITAL FUNDING

Yr Funded	ABBREVIATED UNIVERSITY (CENTER) NAME	18			CAPITAL SUPPORT				IN-KIND CONTRIBUTIONS					21	22		
		16a,b	17a,b	TOTAL BUDGET	EQUIP.	FACILIT.	OTHER	Total	EQUIP.	FACILIT.	PER-SONNEL	SOFT-WARE	OTHER			TOTAL	Typical Overhead
1981	1. Case Western Reserve (Applied Polymer Research)			\$1,500,000													
1982	2. Rutgers Univ. (Ceramic Research)	\$6,406,075	\$0	\$6,406,075	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	57%	0%
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	\$1,363,200	\$493,800	\$1,857,000	\$800,000	\$0	\$120,000	\$920,000	\$20,000	\$0	\$0	\$0	\$0	\$0	\$20,000	38%	0%
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	\$884,086	\$283,184	\$1,167,270	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	50%	2%
	5. Lehigh Univ. (Center for Innovation Management Studies)	\$265,270	\$85,815	\$350,885	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	54%	13%
	6. Univ. of Arizona (Center for Microcontamination Control)	\$318,800	\$183,200	\$500,000	\$0	\$0	\$0	\$0	\$65,000	\$0	\$0	\$0	\$0	\$0	\$65,000	52%	52%
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	\$973,000	\$15,000	\$988,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	64%	0%
	8. Univ. of Tennessee (Measurement and Control Engineering)	\$731,985	\$0	\$731,985	\$0	\$0	\$0	\$0	\$15,939	\$45,000	\$20,000	\$0	\$0	\$0	\$80,939	43%	0%
	9. Iowa State Univ. (Nondestructive Evaluation)	\$3,774,817	\$602,548	\$4,377,365	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	45%	0%
1986	10. Northeastern Univ. (Electromagnetics Research)	\$1,724,240	\$660,759	\$2,385,000	\$50,000	\$0	\$0	\$50,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$100,000	56%	0%
	11. New Mexico Institute of Mining & Technology (Energetic Materials)	\$226,152	\$97,848	\$324,000	\$0	\$0	\$0	\$0	\$20,000	\$0	\$0	\$0	\$0	\$0	\$20,000	30%	30%
	12. Univ. of California-Berkeley (Sensors and Actuators)	\$7,450,788	\$1,374,095	\$8,824,883	\$0	\$0	\$0	\$0	\$247,000	\$0	\$0	\$9,000	\$0	\$0	\$256,000	0%	50%
	13. Oklahoma State Univ. (Web Handling Research Center)	\$1,098,791	\$0	\$1,098,791	\$0	\$0	\$0	\$0	\$26,090	\$0	\$20,000	\$0	\$0	\$0	\$46,090	0%	0%
1988	14. Univ. of New Mexico (Micro-Engineered Materials)	\$1,880,275	\$285,761	\$2,146,036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,000	\$0	\$0	\$4,000	48%	0%
1989	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	\$2,038,000	\$225,000	\$2,283,000	\$0	\$0	\$0	\$0	\$25,000	\$0	\$0	\$0	\$0	\$0	\$25,000	72%	0%
	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	\$482,719	\$0	\$482,719	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	5%	5%
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	\$482,000	\$0	\$482,000	\$50,000	\$0	\$20,000	\$70,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	54%	0%
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	\$981,346	\$257,654	\$1,239,000	\$20,000	\$0	\$0	\$20,000	\$25,000	\$0	\$15,000	\$0	\$0	\$0	\$40,000	44%	6%
1991	19. Villanova University (Adv. Communications)			\$451,921													
	20. North Carolina State Univ. (Integrated Pest Management)	\$321,647	\$33,764	\$355,411	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	48%	10%
	21. Georgia Tech. (Material Handling/Logistics Institute)	\$1,394,348	\$21,007	\$1,415,355	\$0	\$0	\$0	\$0	\$0	\$0	\$22,064	\$0	\$0	\$0	\$0	48%	0%
	22. Lehigh Univ. (Polymer Interfaces)	\$387,498	\$42,813	\$430,311	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	54%	13%
	23. Rutgers Univ. (Wireless Info. Networks)	\$3,889,056	\$23,900	\$3,912,956	\$0	\$96,000	\$0	\$96,000	\$339,000	\$0	\$0	\$0	\$0	\$0	\$339,000	57%	0%
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	\$758,280	\$110,420	\$868,700	\$0	\$4,100,000	\$0	\$4,100,000	\$339,585	\$0	\$0	\$0	\$0	\$0	\$339,585	57%	0%
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	\$1,657,805	\$582,471	\$2,240,276	\$0	\$0	\$0	\$0	\$0	\$0	\$15,333	\$0	\$0	\$0	\$15,333	49%	26%
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	\$127,423	\$0	\$127,423	\$160,000	\$0	\$0	\$160,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	10%	10%
	27. NJ Institute of Tech. (Emission Reduction Research)	\$1,989,486	\$521,589	\$2,511,075	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	46%	0%
	28. Univ. of Illinois (Machine-Tool Systems)	\$463,666	\$0	\$463,666	\$0	\$0	\$0	\$0	\$150,560	\$0	\$60,054	\$0	\$14,880	\$225,494	\$0	0%	15%
	29. Univ. of Massachusetts-Lowell (Biodegradable Polymer Research)	\$589,527	\$45,000	\$634,527												20%	20%
1994	30. Washington State Univ. (Analog Digital)			\$1,882,990	\$0	\$0	\$0	\$0	\$339,585	\$0	\$0	\$0	\$0	\$0	\$339,585	45%	50%
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	\$484,125	\$34,203	\$518,328	\$270,000	\$0	\$150,000	\$420,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0%	0%
	32. Northwestern Univ. (Surface Engin. and Trib.)	\$668,583	\$338,901	\$1,007,484	\$0	\$0	\$0	\$0	\$0	\$0	\$25,000	\$0	\$0	\$0	\$25,000	49%	10%
	33. Univ. of Washington (Process Analytical Chem.)	\$882,870	\$950,130	\$1,833,000	\$750,000	\$0	\$0	\$750,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	51%	51%
	34. Purdue Univ. (Software Engineering)			\$948,108												48%	25%
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit.)	\$639,241	\$18,558	\$657,799	\$0	\$0	\$0	\$0	\$120,000	\$0	\$0	\$0	\$0	\$0	\$120,000	45%	5%
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	\$1,386,000	\$89,000	\$1,475,000	\$50,000	\$0	\$1,700	\$51,700	\$150,000	\$0	\$58,000	\$750	\$0	\$0	\$208,750	53%	0%
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	\$979,000	\$36,000	\$1,015,000	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000	\$0	\$0	\$0	\$10,000	45%	0%
	38. Eastern Michigan Univ. (Coatings Research)			\$560,000												48%	0%
	39. Texas A&M Univ. (Center for Ergonomics)	\$386,960	\$32,558	\$419,518												45%	11%
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)			\$1,295,104												36%	36%
	41. The Pennsylvania State Univ. (Particulate Materials)	\$747,492	\$147,708	\$895,200	\$97,000	\$0	\$0	\$97,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	37%	9%
	42. Purdue Univ. (Pharmaceutical Processing Research)	\$296,234	\$104,082	\$400,316	\$0	\$0	\$0	\$0	\$40,000	\$0	\$0	\$0	\$0	\$0	\$40,000	52%	26%
1996	43. Alfred Univ. (Glass Research)			\$951,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	75%	75%
	44. Univ. of Connecticut (Grinding Research)	\$1,904,877	\$51,512	\$1,956,389	\$0	\$0	\$0	\$0	\$21,000	\$286,430	\$90,213	\$0	\$0	\$0	\$337,642	41%	0%
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	\$8,470,369	\$400,000	\$8,870,369	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	68%	5%
	46. Univ. of Washington (Health Management)	\$814,000	\$24,000	\$838,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0%	0%
	47. Cornell Univ. (Power Systems Engineering)	\$1,050,000	\$125,000	\$1,175,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	40%	10%
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	\$579,740	\$47,260	\$627,000	\$375,000	\$75,000	\$0	\$450,000	\$218,520	\$5,000	\$0	\$0	\$0	\$0	\$223,520	46%	0%
	49. SUNY Buffalo (Biosurfaces)			\$665,900												54%	12%
	50. Univ. of California-Berkeley (Built Environments)	\$429,862	\$27,000	\$456,862	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	50%	0%
	51. Univ. Arizona (Management of Information)	\$698,000	\$0	\$698,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0%	0%
	52. Rutgers Univ. (Quality and Reliability Engineering)	\$480,000	\$78,000	\$558,000	\$40,000	\$0	\$1,000	\$41,000	\$25,000	\$0	\$0	\$1,000	\$0	\$0	\$26,000	56%	22%
	53. North Carolina State Univ. (Silicon Wafer Eng. and Defect Science)	\$401,779	\$23,221	\$425,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	48%	10%
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	\$402,367	\$99,299	\$501,666	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	51%	0%
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	\$343,000	\$124,000	\$467,000	\$0	\$0	\$70,000	\$70,000	\$10,000	\$0	\$0	\$0	\$0	\$0	\$10,000	47%	26%
	GRAND MEAN:	\$1,329,842	\$184,550	\$1,444,172	\$56,638	\$90,872	\$7,717	\$155,228	\$48,878	\$7,158	\$7,142	\$314	\$317	\$62,063	42	12	
	GRAND SUM:			\$79,429,483	\$2,662,000	\$4,271,000	\$362,700	\$7,295,700	\$2,297,279	\$336,430	\$335,664	\$14,750	\$14,880	\$2,916,938	N/A	N/A	

TABLE 4
1997 - 1998 INDUSTRY MEMBERSHIP DESCRIPTORS

YEAR FUNDED	ABBREVIATED NAME	CURRENT MEMBERS	1997-1998 MEMBERS			LIFETIME MEMBERS			ANNUAL FEES		
			STARTING	NEW	LEFT	STARTING	NEW	LEFT	PRIMARY	SECONDARY	TERTIARY
1981	1. Case Western Reserve (Applied Polymer Research)	15	-	-	-	-	-	-	-	-	-
1982	2. Rutgers Univ. (Ceramic Research)	12	12	2	2	10	34	32	\$35,000	\$10,000	\$0
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	20	12	8	0	18	34	33	\$26,000	\$7,000	\$0
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	22	24	0	2	7	27	14	\$45,000	\$0	\$0
	5. Lehigh Univ. (Center for Innovation Management Studies)	9	9	0	0	12	8	7	\$20,000	\$0	\$0
	6. Univ. of Arizona (Center for Microcontamination Control)	28	17	14	3	26	40	34	\$40,000	\$10,000	\$0
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	27	28	0	1	11	19	7	\$46,000	\$31,000	\$0
	8. Univ. of Tennessee (Measurement and Control Engineering)	13	14	2	3	14	9	11	\$35,000	\$15,000	\$0
	9. Iowa State Univ. (Nondestructive Evaluation)	22	21	3	2	14	21	14	\$35,000	\$0	\$0
1986	10. Northeastern Univ. (Electromagnetics Research)	7	7	1	1	9	10	10	\$50,000	\$15,000	\$0
	11. New Mexico Institute of Mining & Technology (Energetic Materials)	9	9	0	0	9	24	25	\$30,000	\$20,000	\$0
	12. Univ. of California-Berkeley (Sensors and Actuators)	23	21	4	2	6	28	14	\$50,000	\$7,500	\$0
	13. Oklahoma State Univ. (Web Handling Research Center)	20	19	2	1	5	24	9	\$25,000	\$0	\$0
1988	14. Univ. of New Mexico (Micro-Engineered Materials)	12	12	1	1	8	16	9	\$30,000	\$10,000	\$0
1989	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	21	21	1	1	13	13	9	\$40,000	\$0	\$0
	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	5	5	1	1	5	1	1	\$50,000	\$25,000	\$0
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	8	8	0	0	8	5	5	\$50,000	\$25,000	\$0
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	10	10	0	0	8	7	4	\$40,000	\$0	\$0
1991	19. Villanova University (Adv. Communications)	-	-	-	-	4	4	2	\$30,000	\$20,000	\$10,000
	20. North Carolina State Univ. (Integrated Pest Management)	12	12	0	0	7	8	3	\$25,000	\$5,000	\$0
	21. Georgia Tech. (Material Handling/Logistics Institute)	24	26	0	2	18	3	2	\$50,000	\$25,000	\$0
	22. Lehigh Univ. (Polymer Interfaces)	8	10	1	3	10	6	8	\$35,000	\$0	\$0
	23. Rutgers Univ. (Wireless Info. Networks)	23	21	2	0	21	12	8	\$30,000	\$0	\$0
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	11	11	2	0	4	12	5	\$50,000	\$30,000	\$25,000
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	13	8	3	0	8	22	19	\$50,000	\$20,000	\$0
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	20	21	0	1	4	19	3	\$25,000	\$0	\$0
	27. NJ Institute of Tech. (Emission Reduction Research)	4	7	0	3	9	3	7	\$50,000	\$0	\$0
	28. Univ. of Illinois (Machine-Tool Systems)	6	5	1	0	6	3	1	\$50,000	\$20,000	\$20,000
	29. Univ. of Massachusetts-Lowell (Biodegradable Polymer Research)	10	10	0	0	6	8	4	\$30,000	\$0	\$0
1994	30. Washington State Univ. (Analog Digital)	-	-	-	-	11	17	11	\$35,000	\$0	\$0
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	7	9	0	2	8	8	11	\$35,000	\$20,000	\$0
	32. Northwestern Univ. (Surface Engin. and Trib.)	8	10	1	3	14	14	15	\$27,500	\$0	\$0
	33. Univ. of Washington (Process Analytical Chem.)	36	36	2	2	14	63	47	\$35,000	\$0	\$0
	34. Purdue Univ. (Software Engineering)	-	-	-	-	10	17	19	\$30,000	\$5,000	\$0
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit.)	12	11	1	0	10	5	4	\$40,000	\$25,000	\$0
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	14	14	14	14	5	11	3	\$50,000	\$25,000	\$0
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	9	6	5	2	6	13	9	\$30,000	\$15,000	\$0
	38. Eastern Michigan Univ. (Coatings Research)	13	13	0	0	11	10	4	\$30,000	\$0	\$0
	39. Texas A&M Univ. (Center for Ergonomics)	8	9	1	2	9	2	3	\$25,000	\$15,000	\$10,000
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)	-	-	-	-	-	-	-	\$0	\$0	\$0
	41. The Pennsylvania State Univ. (Particulate Materials)	8	13	0	5	12	2	5	\$35,000	\$10,000	\$0
	42. Purdue Univ. (Pharmaceutical Processing Research)	16	12	5	1	11	1	0	\$25,000	\$0	\$0
1996	43. Alfred Univ. (Glass Research)	30	29	1	0	8	24	9	\$32,000	\$0	\$0
	44. Univ. of Connecticut (Grinding Research)	9	14	0	5	7	12	11	\$50,000	\$12,000	\$0
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	13	17	0	4	8	32	27	\$30,000	\$15,000	\$0
	46. Univ. of Washington (Health Management)	14	14	0	0	6	6	2	\$35,000	\$15,000	\$0
	47. Cornell Univ. (Power Systems Engineering)	12	12	0	0	17	2	0	\$40,000	\$0	\$0
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	19	5	14	0	5	14	0	\$25,000	\$0	\$2,000
	49. SUNY Buffalo (Biosurfaces)	-	-	-	-	6	9	6	\$40,000	\$40,000	\$40,000
	50. Univ. of California-Berkeley (Built Environments)	11	11	1	1	11	1	1	\$30,000	\$10,000	\$0
	51. Univ. Arizona (Management of Information)	8	0	8	0	8	8	0	\$50,000	\$10,000	\$0
	52. Rutgers Univ. (Quality and Reliability Engineering)	11	11	0	0	11	0	0	\$30,000	\$10,000	\$0
	53. North Carolina State Univ. (Silicon Wafer Eng. and Defect Science)	7	6	1	0	6	1	0	\$50,000	\$0	\$0
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	4	4	0	0	24	4	19	\$0	\$0	\$0
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	14	14	0	0	14	0	0	\$35,000	\$15,000	\$5,000
	GRAND MEAN:	13.94	13.27	2.08	1.43	10.04	13.13	9.55	\$35,491	\$9,954	\$2,074
	GRAND SUM:	697	650	102	70	532	696	506	N/A	N/A	N/A

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TABLE 5
1997 - 1998 HUMAN RESOURCES

YEAR FUNDED	ABBREVIATED NAME	RESEARCHERS BREAKDOWN			STUDENTS		ADMINISTRATIVE		CLERICAL	
		TOTAL # RESEARCHERS	# FACULTY SCIENTISTS FT & PT	# NON-FACULTY SCIENTISTS FT & PT	# OF GRADS	# OF UNDER- GRADS	PROFESSIONALS FT	PROFESSIONALS PT	CLERICAL FT	CLERICAL PT
1981	1. Case Western Reserve (Applied Polymer Research)	*	*	*	*	*	*	*	*	*
1982	2. Rutgers Univ. (Caramic Research)	14	12	2	16	39	1	0	1	0
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	6	2	4	7	2	1	0	1	0
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	8	8	0	21	7	1	0	1	0
	5. Lehigh Univ. (Center for Innovation Management Studies)	13	12	1	1	0	0	2	1	0
	6. Univ. of Arizona (Center for Microcontamination Control)	8	6	2	4	3	1	0	1	0
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	2	0	2	12	4	0	2	1	0
	8. Univ. of Tennessee (Measurement and Control Engineering)	12	10	2	13	7	3	1	0	0
	9. Iowa State Univ. (Nondestructive Evaluation)	23	12	11	25	24	3	0	5	0
1986	10. Northeastern Univ. (Electromagnetics Research)	23	13	10	16	13	1	4	2	0
	11. New Mexico Institute of Mining & Technology (Energetic Materials)	5	1	4	4	12	0	2	0	1
	12. Univ. of California-Berkeley (Sensors and Actuators)	17	11	6	74	11	7	0	4	2
	13. Oklahoma State Univ. (Web Handling Research Center)	12	7	5	26	11	0	1	0	6
1988	14. Univ. of New Mexico (Micro-Engineered Materials)	13	11	2	25	16	3	1	1	1
1989	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	14	13	1	40	25	0	1	1	0
	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	1	1	0	8	1	4	0	1	0
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	13	8	5	8	1	0	3	0	1
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	14	12	2	9	15	1	2	0	1
1991	19. Villanova University (Adv. Communications)	10	9	1	7	4	0	0	0	0
	20. North Carolina State Univ. (Integrated Pest Management)	40	29	11	4	2	0	1	0	1
	21. Georgia Tech. (Material Handling/Logistics Institute)	18	16	2	25	5	1	3	2	3
	22. Lehigh Univ. (Polymer Interfaces)	20	12	8	8	2	0	2	1	0
	23. Rutgers Univ. (Wireless Info. Networks)	7	7	0	17	2	4	0	3	0
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	6	2	4	10	5	3	0	2	0
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	18	16	2	33	1	2	0	3	1
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	7	3	4	12	2	2	0	1	0
	27. NJ Institute of Tech. (Emission Reduction Research)	37	25	12	15	5	1	1	1	2
	28. Univ. of Illinois (Machine-Tool Systems)	12	10	2	19	1	0	1	0	1
	29. Univ. of Massachusetts-Lowell (Biodegradable Polymer Research)	11	5	6	15	2	2	1	0	1
1994	30. Washington State Univ. (Analog Digital)	18	18	0	33	6	0	6	0	2
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	4	2	2	5	2	0	2	0	2
	32. Northwestern Univ. (Surfaces Engin. and Trib.)	10	8	2	10	1	0	2	0	2
	33. Univ. of Washington (Process Analytical Chem.)	25	23	2	17	1	0	5	1	0
	34. Purdue Univ. (Software Engineering)	9	9	0	9	3	1	0	0	2
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit.)	11	9	2	18	1	2	0	0	0
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	13	13	0	23	7	4	0	0	2
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	10	9	1	9	0	0	4	1	0
	38. Eastern Michigan Univ. (Coatings Research)	15	10	5	15	6	0	3	0	3
	39. Texas A&M Univ. (Center for Ergonomics)	5	3	2	6	4	4	0	0	0
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)	16	12	4	15	1	0	0	0	1
	41. The Pennsylvania State Univ. (Particulate Materials)	12	10	2	12	10	1	1	2	0
	42. Purdue Univ. (Pharmaceutical Processing Research)	8	8	0	6	0	2	0	1	0
1996	43. Alfred Univ. (Glass Research)	15	11	4	15	4	3	0	1	2
	44. Univ. of Connecticut (Grinding Research)	25	13	12	13	4	0	5	0	3
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	43	40	3	38	8	2	6	1	0
	46. Univ. of Washington (Health Management)	36	31	5	4	0	0	3	0	3
	47. Cornell Univ. (Power Systems Engineering)	13	12	1	12	4	0	4	0	2
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	10	8	2	25	6	0	1	1	0
	49. SUNY Buffalo (Biosurfaces)	12	8	4	4	5	0	7	0	4
	50. Univ. of California-Berkeley (Built Environments)	9	3	6	11	0	0	3	0	3
	51. Univ. Arizona (Management of Information)	6	3	3	12	3	4	0	1	0
	52. Rutgers Univ. (Quality and Reliability Engineering)	6	6	0	7	0	2	0	0	1
	53. North Carolina State Univ. (Silicon Wafer Eng. and Defect Science)	14	7	7	7	0	0	2	0	1
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	1	0	1	1	0	0	2	0	5
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	3	2	1	9	3	0	2	1	0
	GRAND MEAN:	13.57	10.20	3.37	15.00	5.57	1.22	1.59	0.80	1.09
	GRAND SUM:	733	551	182	810	301	66	86	43	59

TABLE 6
1997 - 1998 CENTER DIRECTOR DESCRIPTORS

YEAR FUNDED	ABBREVIATED NAME	DIRECTOR'S RANK	DIRECTOR TENURE	DIRECTOR REPORTS TO	TIME ALLOCATION					ADMIN. BUDGET (%)
					CENTER ADMIN	OTHER ADMIN.	RESEARCH	TEACHING	OTHER	
1981	1. Case Western Reserve (Applied Polymer Research)	Professor	Tenured	Dean of Provost	-	-	-	-	-	-
1982	2. Rutgers Univ. (Ceramic Research)	Professor	Tenured	Dean, College of Engineering	25%	25%	25%	20%	5%	25%
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	Associate Professor	Non-Tenure Track	Director of Materials Research Laboratory	20%	5%	35%	40%	0%	8%
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	Professor	Tenured	Department Head	20%	5%	25%	40%	10%	29%
	5. Lehigh Univ. (Center for Innovation Management Studies)	Full Professor	Tenured	Dean	25%	10%	30%	10%	30%	50%
	6. Univ. of Arizona (Center for Microcontamination Control)	Professor	Tenured	Dept. Head	33%	0%	33%	33%	0%	16%
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	Professors	Tenured	CIT Dean	10%	10%	50%	20%	10%	8%
	8. Univ. of Tennessee (Measurement and Control Engineering)	Ph.D.	Non-Tenure Track	Dean	100%	0%	0%	0%	0%	18%
	9. Iowa State Univ. (Nondestructive Evaluation)	Professor	Tenured	Director, IPRT	30%	43%	15%	13%	0%	12%
1986	10. Northeastern Univ. (Electromagnetics Research)	Full Professor	Tenured	Dean of Engineering	10%	40%	30%	10%	10%	10%
	11. New Mexico Institute of Mining & Technology (Energetic Materials)	N/A	N/A	VP for Administration and Finance	20%	49%	49%	0%	0%	20%
	12. Univ. of California-Berkeley (Sensors and Actuators)	Professor	Tenured	EECS Chairperson	20%	10%	50%	10%	10%	4.25%
	13. Oklahoma State Univ. (Web Handling Research Center)	Professor	Tenured	Executive Vice President	15%	65%	10%	10%	0%	7%
1988	14. Univ. of New Mexico (Micro-Engineered Materials)	Professor	Tenured	Associate Provost for Research	20%	10%	40%	30%	0%	75%
1989	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	Professor	Tenured	Head, Dept. Of Mech. & Ind. Engineering	20%	0%	30%	30%	20%	8%
	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	Professor	Tenured	Chairman	20%	10%	40%	30%	0%	100%
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	Professor	Tenured	Dean of Engineering	15%	0%	20%	65%	0%	10%
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	Professor	Tenured	Chair of Chemical Engineering	10%	10%	40%	40%	0%	20%
1991	19. Villanova University (Adv. Communications)	.	Non-Tenure Track	VPAA	50%	0%	25%	0%	25%	25%
	20. North Carolina State Univ. (Integrated Pest Management)	Professor	Tenured	Director, CALS	35%	0%	38%	10%	17%	16%
	21. Georgia Tech. (Material Handling/Logistics Institute)	Professor	Tenured	Head/ Dept. of Chair	25%	0%	50%	25%	0%	15%
	22. Lehigh Univ. (Polymer Interfaces)	Associate Professor	Tenured	Chair of Dept of Chemical Engineering	20%	0%	40%	40%	0%	15%
	23. Rutgers Univ. (Wireless Info. Networks)	Professor II	Tenured	Chairman, Electrical and Computer Engineering	40%	0%	20%	40%	0%	26%
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	Professor, Ph.D	Tenured	Dean, College of Fine Arts	15%	0%	50%	35%	0%	30%
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	Professor	Tenured	Dean	50%	0%	15%	25%	10%	30%
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	FR Russ Professor	Tenured	Department Chairman	40%	0%	30%	30%	0%	30%
	27. NJ Institute of Tech. (Emission Reduction Research)	Director	N/A	Exec. Director-Center for Enviro. Engin. & Science	35%	25%	30%	5%	5%	15%
	28. Univ. of Illinois (Machine-Tool Systems)	Professor	Tenured	Dean, College of Engineering	10%	10%	40%	40%	0%	15%
	29. Univ. of Massachusetts-Lowell (Biodegradable Polymer Research)	Professor	Tenured	Provost	20%	0%	30%	20%	30%	10%
1994	30. Washington State Univ. (Analog Digital)	Professor & Associate Dean	Tenured	Dean	35%	50%	0%	15%	0%	15%
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	Professor	Tenured	Dean, Coll of Ag and Life Sciences	0%	8%	80%	12%	0%	18%
	32. Northwestern Univ. (Surface Engin. and Trib.)	Professor	Tenured	Dean of Engineering	10%	10%	35%	30%	15%	25%
	33. Univ. of Washington (Process Analytical Chem.)	Professional Staff	Not Applicable	Vice Provost, Office of Research	100%	0%	0%	0%	0%	30%
	34. Purdue Univ. (Software Engineering)	Professor	Tenured	Associate Dean	20%	30%	25%	25%	0%	27%
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit.)	Professor	Tenured	Dean, College of Engineering	20%	15%	40%	25%	0%	13%
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	Professor	Tenured	Dean of Engineering	10%	10%	50%	30%	0%	18%
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	Professor	Tenured	Dean of Engineering	10%	60%	10%	20%	0%	7%
	38. Eastern Michigan Univ. (Coatings Research)	Professor	Tenure-Track	Director, Coatings Research Institute	33%	0%	67%	0%	0%	15%
	39. Texas A&M Univ. (Center for Ergonomics)	Professor	Tenured	Executive Associate Dean College of Engineering	13%	7%	30%	50%	0%	-
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)	Professor	Tenured	Director of OSC	25%	10%	40%	20%	5%	5%
	41. The Pennsylvania State Univ. (Particulate Materials)	Associate Professor	Tenured	Director, Materials Research Lab	55%	0%	18%	27%	0%	21%
	42. Purdue Univ. (Pharmaceutical Processing Research)	Assistant Professor	Tenured	Dept. Head	20%	0%	60%	20%	0%	8%
1996	43. Alfred Univ. (Glass Research)	Professor	Tenure-Track	Dean	75%	5%	10%	10%	0%	26%
	44. Univ. of Connecticut (Grinding Research)	Professor of Metallurgy	Tenured	Dean, Engineering	40%	40%	10%	0%	10%	9%
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	Professor	Tenured	Provost	50%	25%	10%	0%	15%	19%
	46. Univ. of Washington (Health Management)	Professor	Tenured	Chair, Dept of Health Science	25%	0%	60%	15%	0%	20%
	47. Cornell Univ. (Power Systems Engineering)	Professor	Tenured	Director, School of EE	20%	20%	20%	40%	0%	30%
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	Professor	Tenured	Dean of Eng. College	15%	5%	35%	40%	5%	10%
	49. SUNY Buffalo (Biosurfaces)	Professor	Tenured	Vice President for Research	20%	2%	40%	30%	8%	9%
	50. Univ. of California-Berkeley (Built Environments)	Professor	Tenured	Vice Chancellor for Research	25%	25%	5%	40%	5%	21%
	51. Univ. Arizona (Management of Information)	Regents Professor	Tenured	Dean	20%	20%	10%	40%	10%	35%
	52. Rutgers Univ. (Quality and Reliability Engineering)	Professor	Tenured	dean of Engineering	15%	25%	30%	20%	20%	58%
	53. North Carolina State Univ. (Silicon Wafer Eng. and Defect Science)	Professor	Tenured	Dean, College of Engineering	5%	15%	40%	30%	10%	-
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	Associate Professor	Tenured	Dean of Engineering	15%	0%	35%	50%	0%	11%
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	Professor	Tenured	Director, School of IE	25%	0%	50%	25%	0%	15%
	GRAND MEAN:	N/A	N/A	N/A	27	13	31	24	5	21
	GRAND SUM:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 7
1997 - 1998 CENTER OUTCOMES

YEAR FUNDED	ABBREVIATED NAME	STUDENTS RECEIVING DEGREE			STUDENTS HIRED BY INDUSTRY			PUBLICATIONS		
		# OF P.H.D.'s	# OF MS/MA's	# OF BS/BA's	# OF P.H.D.'s	# OF MS/MA's	# OF BS/BA's	# W/ CENTER RESEARCHERS	# W/ CENTER MEMBERS	# OF PRESENTATIONS
1981	1. Case Western Reserve (Applied Polymer Research)	*	*	*	*	*	*	19	10	25
1982	2. Rutgers Univ. (Ceramic Research)	4	1	0	1	0	0	70	0	55
1983	3. The Pennsylvania State Univ. (Dielectric Studies)	0	2	2	1	2	0	10	1	15
1984	4. Colorado School of Mines (Adv. Steel Processing and Products)	1	3	0	1	2	0	5	0	5
	5. Lehigh Univ. (Center for Innovation Management Studies)	3	0	0	0	0	0	9	1	18
	6. Univ. of Arizona (Center for Microcontamination Control)	1	3	2	3	3	1	4	0	6
1985	7. Carnegie-Mellon Univ. (Iron and Steelmaking Research)	3	3	1	3	2	1	15	2	15
	8. Univ. of Tennessee (Measurement and Control Engineering)	2	4	3	1	1	0	15	3	25
	9. Iowa State Univ. (Nondestructive Evaluation)	2	3	0	1	1	0	21	7	34
	10. Northeastern Univ. (Electromagnetics Research)	5	18	6	2	1	3	50	6	85
1986	11. New Mexico Institute of Mining & Technology (Energetic Materials)	0	0	5	0	0	0	1	0	0
	12. Univ. of California-Berkeley (Sensors and Actuators)	0	2	2	2	2	0	18	0	14
	13. Oklahoma State Univ. (Web Handling Research Center)	9	2	2	0	0	0	5	2	3
	14. Univ. of New Mexico (Micro-Engineered Materials)	9	8	5	1	2	0	9	0	10
1988	15. Univ. of Illinois-Urbana-Champaign (Adv. Air Cond. and Refrig.)	3	18	10	1	6	2	39	0	7
1989	16. Univ. of California-San Diego (Ultra High-Speed Integr. Circ. & Sys.)	3	2	1	2	1	0	5	0	4
1990	17. Univ. of Michigan (Dimensional Measure & Control in Manufac.)	5	2	1	4	1	0	12	0	7
	18. Univ. of Colorado-Boulder (Separations Using Thin Films)	2	5	0	1	1	1	11	0	12
1991	19. Villanova University (Adv. Communications)	0	3	4	*	*	*	7	0	7
	20. North Carolina State Univ. (Integrated Pest Management)	2	3	4	1	0	0	23	1	42
	21. Georgia Tech. (Material Handling/Logistics Institute)	4	7	4	2	0	0	41	0	37
	22. Lehigh Univ. (Polymer Interfaces)	2	0	0	0	0	0	4	0	1
	23. Rutgers Univ. (Wireless Info. Networks)	5	4	1	3	0	0	12	12	14
1992	24. Carnegie-Mellon Univ. (Building Performance and Diagnostics)	1	0	0	0	0	0	37	4	112
1993	25. North Carolina State Univ. (Adv. Computing and Communication)	9	4	0	3	1	0	38	5	28
	26. Ohio Univ. (Corrosion in Multiphase Sys.)	0	7	0	1	1	0	17	1	14
	27. NI Institute of Tech. (Emission Reduction Research)	0	9	1	0	0	0	21	0	10
	28. Univ. of Illinois (Machine-Tool Systems)	0	0	0	0	0	0	0	15	7
1994	29. Univ. of Massachusetts-Lowell (Biodegradable Polymer Research)	4	4	0	3	3	0	0	0	0
	30. Washington State Univ. (Analog Digital)	4	16	3	0	0	0	34	0	7
	31. North Carolina State Univ. (Aseptic Processing and Packaging)	0	0	0	0	0	0	0	0	0
	32. Northwestern Univ. (Surface Engn. and Trib.)	3	0	0	0	0	0	14	*	13
	33. Univ. of Washington (Process Analytical Chem.)	3	0	0	2	0	0	36	1	25
	34. Purdue Univ. (Software Engineering)	0	2	1	2	0	0	7	9	13
1995	35. Univ. of Colorado-Boulder (Adv. Man & Pack. of Micro, Opt. & Digit)	4	4	0	0	1	0	29	*	17
	36. Arizona State Univ. (Adv. Control of Energy and Power Sys.)	3	6	12	1	3	3	12	12	20
	37. Univ. of Texas-Arlington (Adv. Electr. Materials, Devices & Sys.)	2	0	0	0	0	0	4	3	5
	38. Eastern Michigan Univ. (Coatings Research)	3	2	2	0	0	0	11	0	16
	39. Texas A&M Univ. (Center for Ergonomics)	2	4	0	0	1	0	0	2	0
	40. Univ. of Arizona (Optoelectr. Devices, Interconn. and Packaging)	3	0	5	1	0	0	9	0	8
1996	41. The Pennsylvania State Univ. (Particulate Materials)	5	1	0	1	0	0	9	3	8
	42. Purdue Univ. (Pharmaceutical Processing Research)	3	0	2	0	0	0	0	0	6
	43. Alfred Univ. (Glass Research)	3	2	0	0	0	0	9	3	12
	44. Univ. of Connecticut (Grinding Research)	5	4	0	1	0	0	20	0	20
	45. NJ Institute of Tech. (Hazardous & Toxic Waste Mgt)	10	22	0	0	0	0	40	*	38
	46. Univ. of Washington (Health Management)	0	0	0	0	0	0	7	1	15
	47. Cornell Univ. (Power Systems Engineering)	3	6	0	0	0	0	27	0	20
1997	48. Ohio State Univ. (Adv. Polymer and Composite Eng.)	3	4	2	2	0	0	5	0	15
	49. SUNY Buffalo (Biosurfaces)	0	4	2	*	*	*	8	3	7
	50. Univ. of California-Berkeley (Built Environments)	0	4	0	0	3	0	0	0	0
	51. Univ. Arizona (Management of Information)	1	4	0	0	0	0	8	4	15
	52. Rutgers Univ. (Quality and Reliability Engineering)	0	0	0	0	0	0	3	0	4
	53. North Carolina State Univ. (Silicon Water Eng. and Detect Science)	0	1	0	1	0	0	28	12	25
	54. Univ. of Iowa (Virtual Proving Ground Simulation)	0	0	0	0	0	0	0	0	0
	55. Univ. of Oklahoma (Wireless Electromagnetic Compatibility)	0	3	3	1	0	0	6	0	11
	GRAND MEAN:	2.48	3.89	1.48	0.88	0.78	0.22	16.73	2.33	17.25
	GRAND SUM:	134	210	80	44	39	11	920	121	949

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TABLE 8
1997 - 1998 INTELLECTUAL PROPERTY EVENTS

TABLE 8a Centers Reporting One or More Intellectual Property Events		
INTELLECTUAL PROPERTY EVENT	NUMBER of CENTERS	PERCENTAGE of CENTERS
INVENTION DISCLOSURES	19	35%
PATENT APPLICATIONS	14	26%
SOFTWARE COPYRIGHTS	7	13%
PATENTS GRANTED	13	24%
LICENSING AGREEMENTS	6	11%
ROYALTIES REALIZED	1	2%

TABLE 8b Total Number and Means of Intellectual Property Events		
INTELLECTUAL PROPERTY EVENT	TOTAL for ALL CENTERS	MEAN for ALL CENTERS
INVENTION DISCLOSURES	71	1.31
PATENT APPLICATIONS	61	1.29
SOFTWARE COPYRIGHTS	9	0.17
PATENTS GRANTED	27	0.50
LICENSING AGREEMENTS	10	0.19
ROYALTIES REALIZED	1	0.02