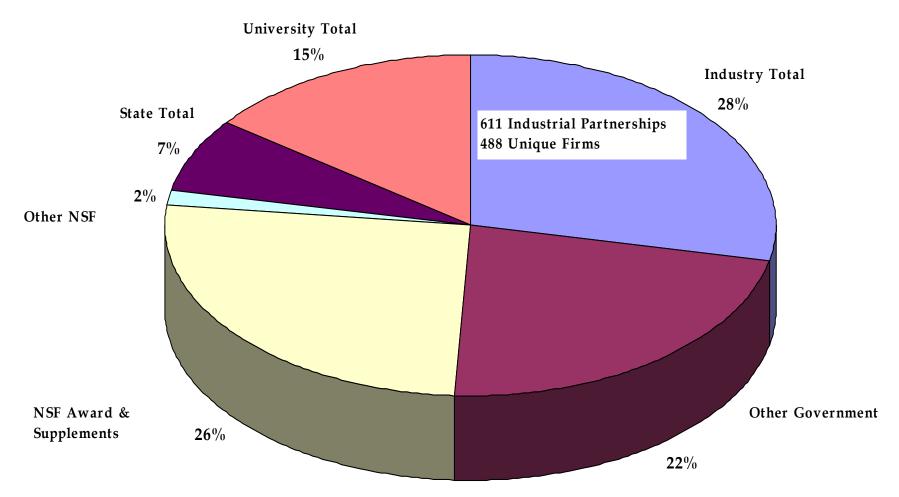
# Industrial Participation At Engineering Research Centers

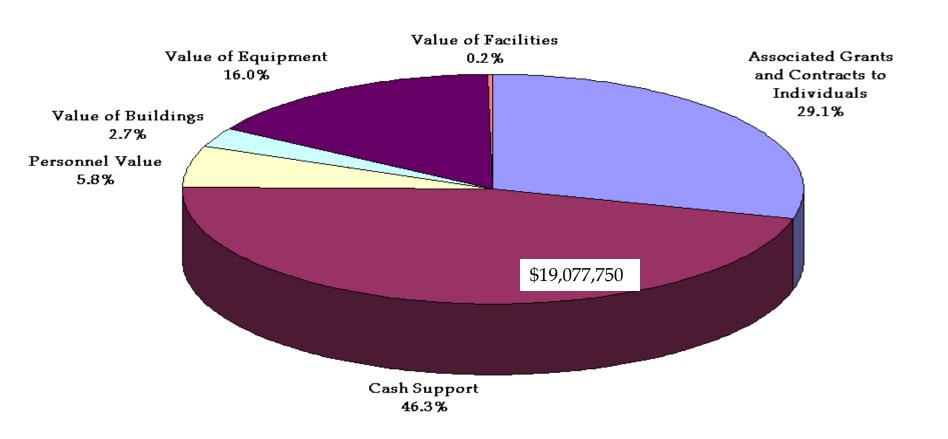
	FY94	FY95	FY96	FY97	FY98
<ul><li>ERC Industrial Partnerships</li><li>ERC Partner Firms</li></ul>	707 560	775* 615	688 578	802 625	611 488
Size					
• Small	29%	23%	31%	22%	21%
• Medium	<b>21</b> %	<b>17</b> %	<b>15</b> %	13%	9%
• Large	<b>50</b> %	60%	54%	65%	<b>70</b> %
• Foreign Firms	<b>10</b> %	5%	5%	6%	6%

## Sources of Support to Engineering Research Centers: 1998\*



<sup>\*</sup>Total value approximately \$150 million

### Industrial Support to Engineering Research Centers: 1998



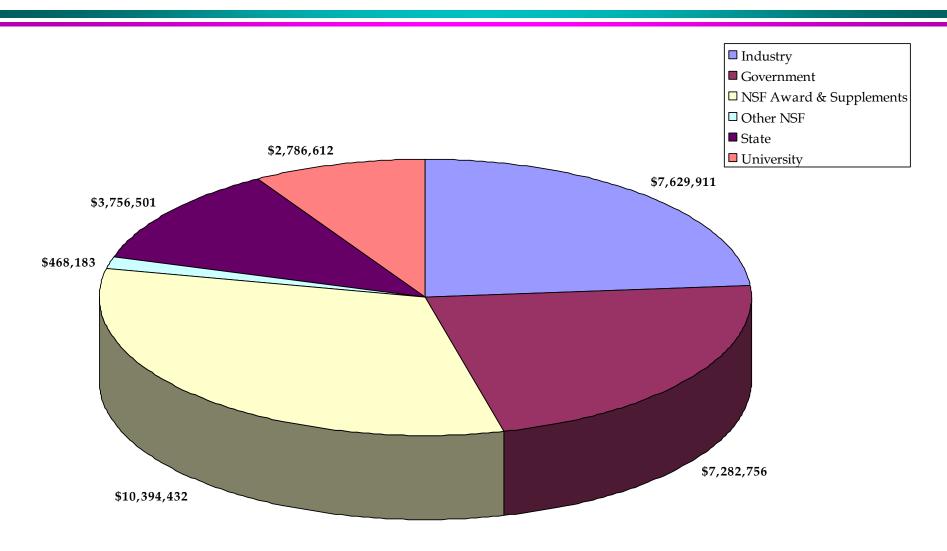
# **Engineering Research Centers by Industry Category: 1999**

Biotechnology & Bioengineering	Design, Systems & Manufacturing	Materials Processing & Manufacturing	Opto & Microelectronics & IT	Resource Recovery & Utilization
Biotechnology Process	Center for Collaborative	Center for Advanced	Center for Low Cost Electronic	Advanced Combustion
Engineering Center	Manufacturing	Materials Processing	Packaging	Engineering Research Center
Center for Biofilm Engineering	Center for Computational Field Simulation	Center for Interfacial Engineering	Data Storage Systems Center	The Offshore Technology Research Center
Center for Engineered Biomaterials	Center for Environmentally Benign Semiconductor Manufacturing	Center for Particle Science and Technology	Integrated Media Systems Center	
Center for Neuromorphic Systems Engineering	Center for Innovation in	Center for Advanced	Center for Power	
	Product Development	Engineering Fibers and Films	Electronics Systems	
Center for Computer- Integrated Surgical Systems and Technology	Center for Reconfigurable Machining Systems			
Center for Engineering of Living Tissues	Machining Systems			
Marine Bioproducts Engineering Center				

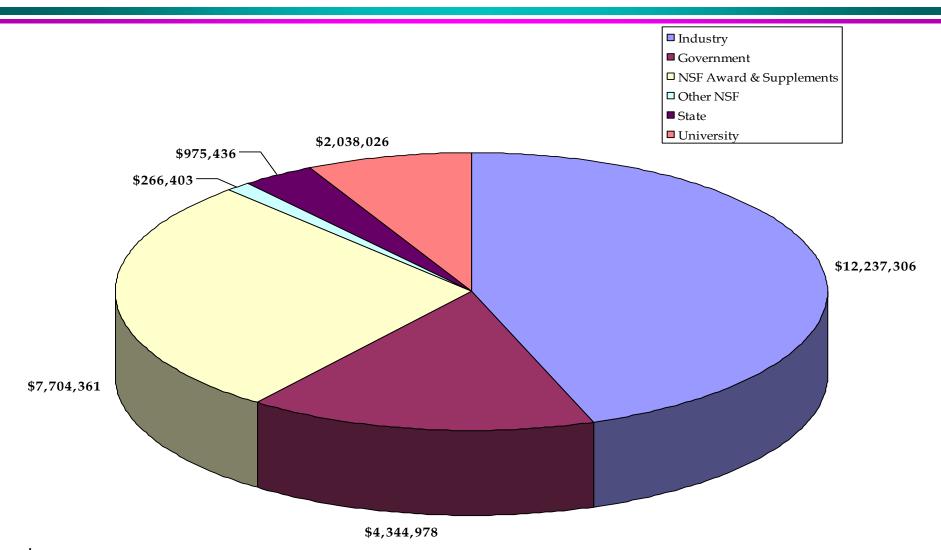
### **Engineering Research Centers** by Industry Category: 1998

Biotechnology &	Design, Systems	<b>Materials Processing</b>	Opto &	Resource Recovery &
Bioengineering	& Manufacturing	& Manufacturing	Microelectronics & IT	Utilization
Biotechnology Process	Center for Collaborative	Center for Advanced	Center for Low Cost Electronic	Advanced Combustion
Engineering Center	Manufacturing	Materials Processing	Packaging	Engineering Research Center
Center for Biofilm	Center for Computational	Center for Interfacial		The Offshore Technology
Engineering	Field Simulation	Engineering	Data Storage Systems Center	Research Center
Center for Engineered Biomaterials	Center for Environmentally Benign Semiconductor Manufacturing	Center for Particle Science and Technology	Integrated Media Systems Center	
Center for Neuromorphic				
Systems Engineering	Center for Innovation in		Center for Optoelectronic	
	Product Development		Computing Systems	
Center for Emerging Cardiovascular	Center for Reconfigurable			
Technologies	Machining Systems			

### Biotechnology & Bioengineering Centers Support (5): 1998

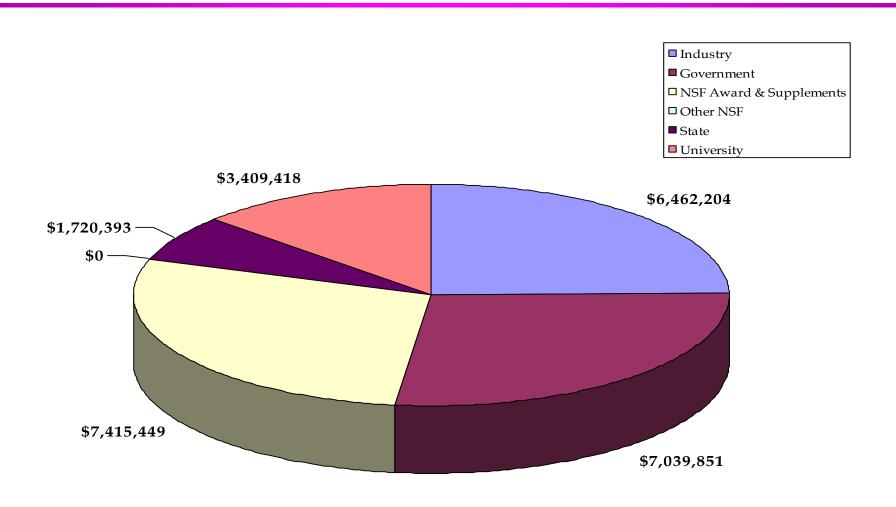


## Design Systems & Manufacturing Centers Support(5)\*: 1998

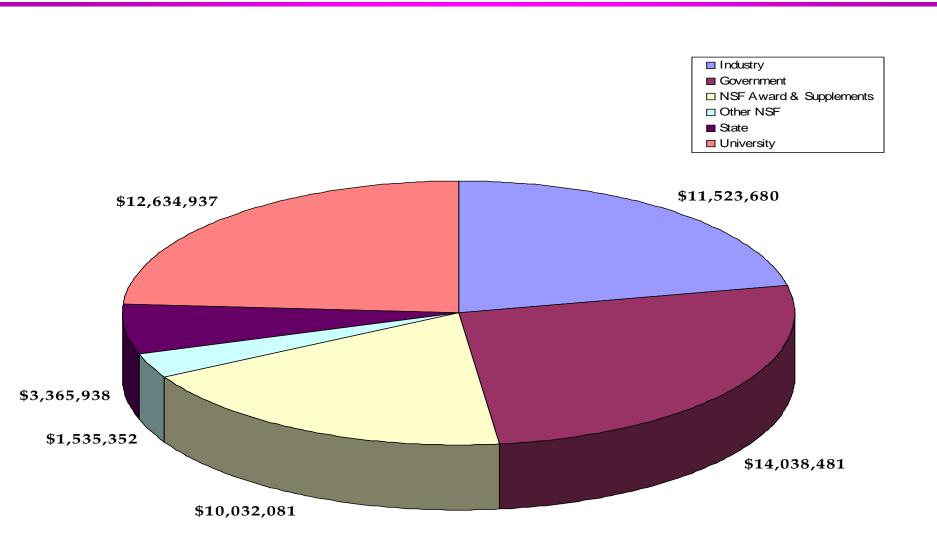


<sup>\*</sup> One center missing in the data

#### Materials Processing and Manufacturing Centers Support(3): 1998

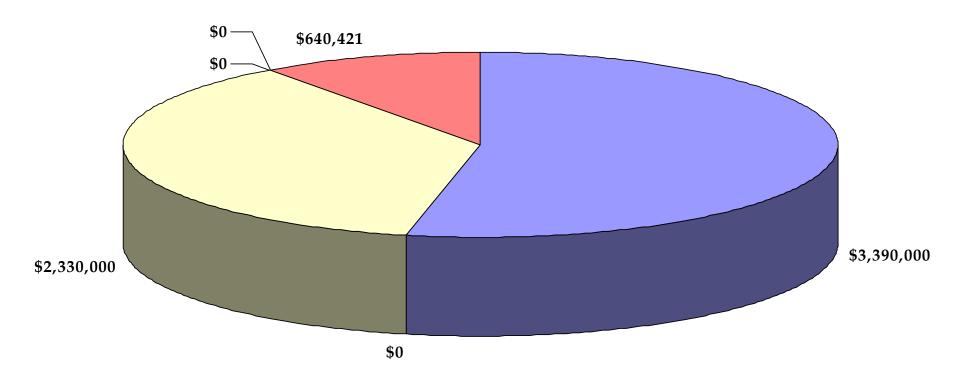


# Opto & Microelectronics & IT Centers Support(4): 1998



# Resource Recovery & Utilization Centers Support(2): 1998





## Technology Transfer "Events" at ERCs: 1996 - 1998 By Industry Sector

	1996	1997	1998
<ul> <li>Biotechnology &amp; Bioengineering</li> </ul>	36	58	80
<ul> <li>Design, Systems &amp; Manufacturing</li> </ul>	80	23	35
<ul> <li>Materials Processing &amp; Manufacturing</li> </ul>	30	13	27
<ul><li>Opto &amp; Microelectronics &amp; IT</li></ul>	108	16	87
<ul> <li>Resource Recovery &amp; Utilization</li> </ul>	21	6	11

## Education Activities at Engineering Research Centers: 1998

Students participating in
center courses or educational
activities

338 K - 12

1,949 Undergrads

902 Masters

1,119 PhD's

Student personnel in centers:

1323 Grad students

618 Undergrads

Degrees granted to ERC students

122 Bachelors

156 Masters

158 Doctoral

Degrees Granted	
Bachelors	2217
Masters	2092
Doctorates	2049
ERC Graduates Hired by	
Academic Institutions	642
ERC Members	780
Foreign Industry	188
Government	42
U.S. Industry	2066

#### ERC Influence on Curriculum

Courses Modified	724
New Courses	480
New Degree Programs	15
New Textbooks	144
Students in new,	
modified curriculum	21,055

#### ERC Technology Transfer

Inventions Disclosed	520
Patents Awarded	324
Patents Filed	375
Patents Licensed	114
Software Licensed	1404
Spin-off Companies	49
Spin-off Employees	733

#### Publications Acknowledging ERC Support

Peer Reviewed Conference Proceedings	5/54
Peer Reviewed Technical Journals	7988
Trade Journals	317
Seminars, Colloquia, etc.	4886
Workshops, Short Courses to Industry	3617