

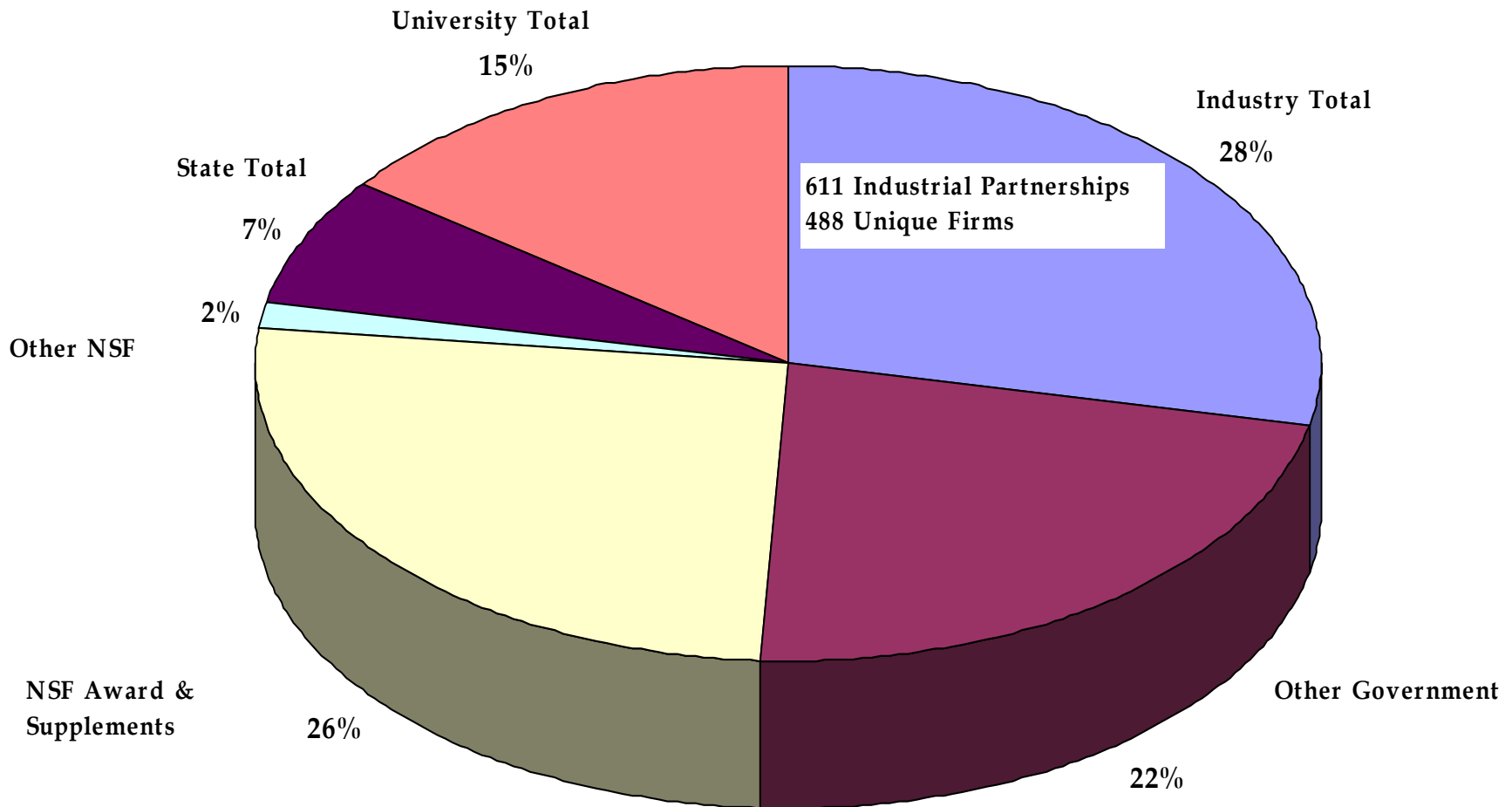
# Industrial Participation At Engineering Research Centers

	FY94	FY95	FY96	FY97	FY98
• ERC Industrial Partnerships	707	775*	688	802	611
• ERC Partner Firms	560	615	578	625	488

## Size

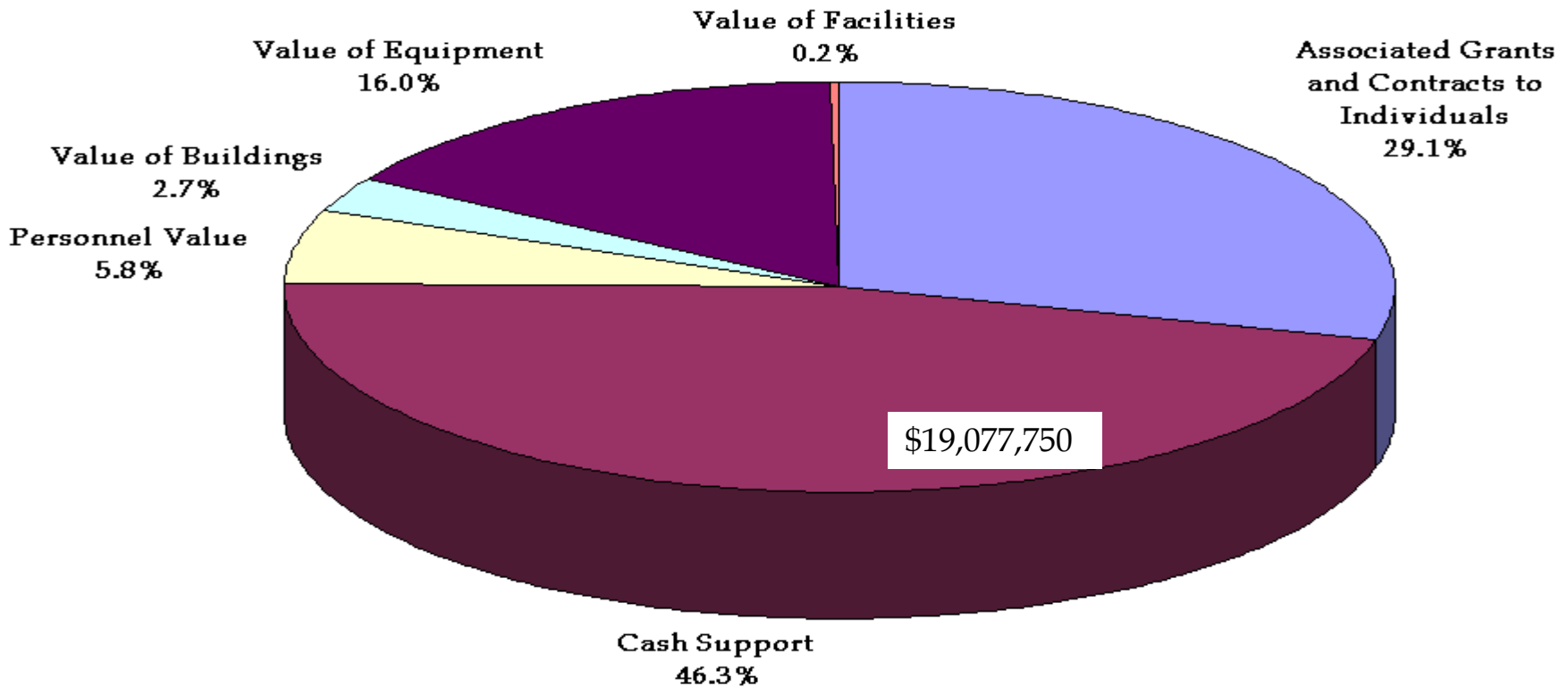
• Small	29%	23%	31%	22%	21%
• Medium	21%	17%	15%	13%	9%
• Large	50%	60%	54%	65%	70%
• Foreign Firms	10%	5%	5%	6%	6%

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



\*Total value approximately \$150 million

# Industrial Support to Engineering Research Centers: 1998



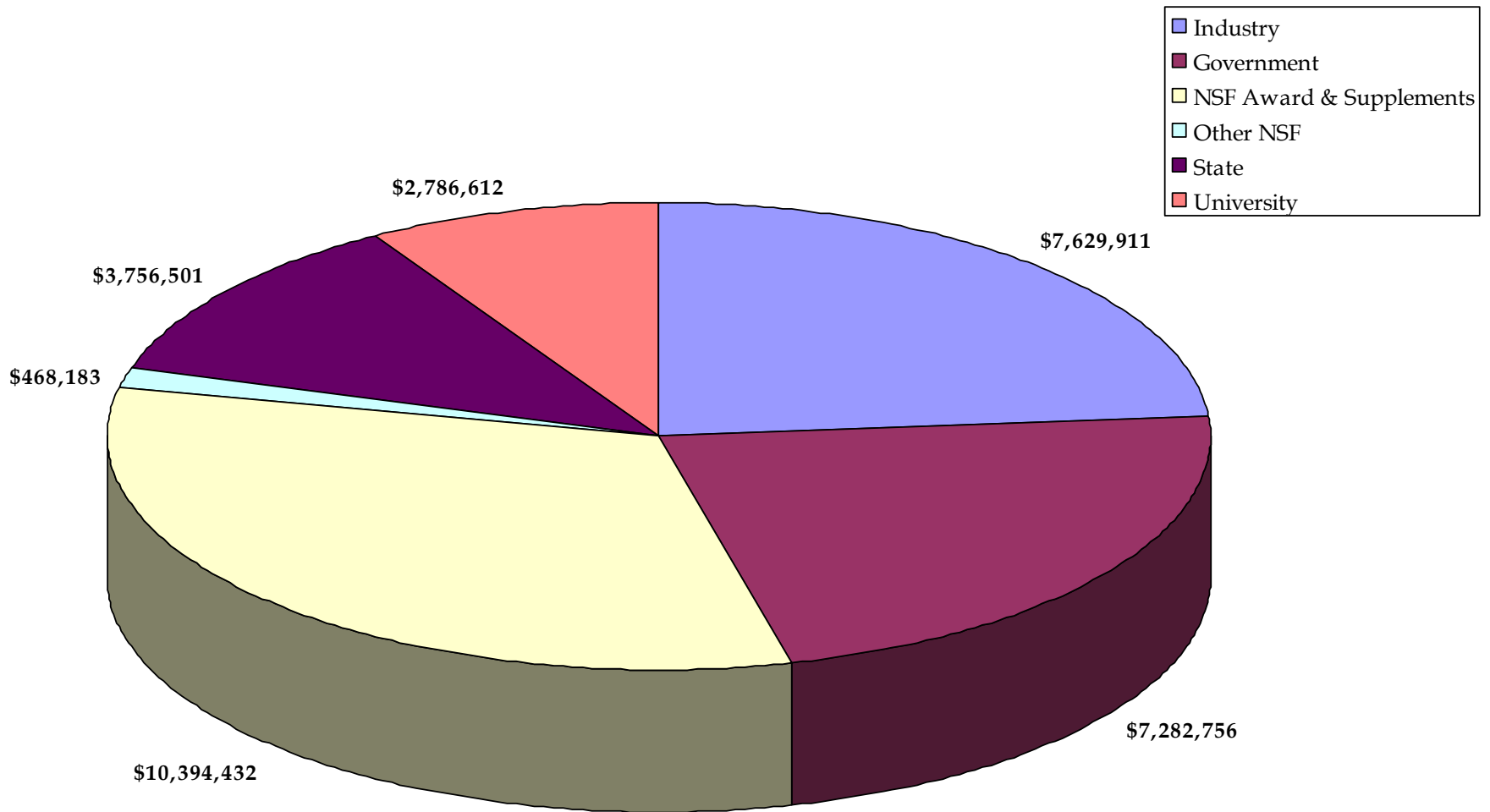
# Engineering Research Centers by Industry Category: 1999

<b>Biotechnology &amp; Bioengineering</b>	<b>Design, Systems &amp; Manufacturing</b>	<b>Materials Processing &amp; Manufacturing</b>	<b>Opto &amp; Microelectronics &amp; IT</b>	<b>Resource Recovery &amp; Utilization</b>
Biotechnology Process Engineering Center	Center for Collaborative Manufacturing	Center for Advanced Materials Processing	Center for Low Cost Electronic Packaging	Advanced Combustion 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 Product Development	Center for Advanced Engineering Fibers and Films	Center for Power Electronics Systems	
Center for Computer-Integrated Surgical Systems and Technology	Center for Reconfigurable Machining Systems			
Center for Engineering of Living Tissues				
Marine Bioproducts Engineering Center				

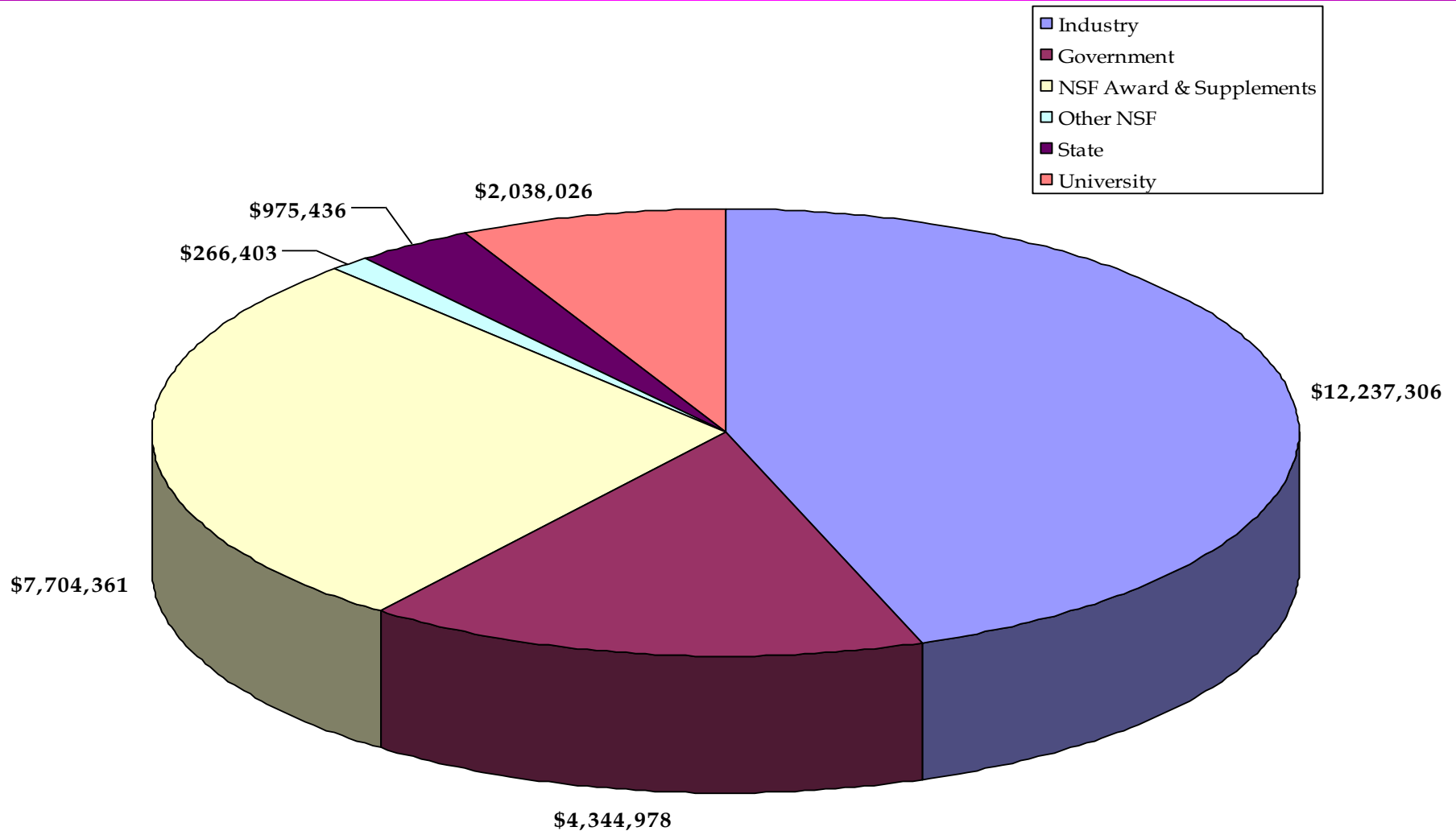
# Engineering Research Centers by Industry Category: 1998

<b>Biotechnology &amp; Bioengineering</b>	<b>Design, Systems &amp; Manufacturing</b>	<b>Materials Processing &amp; Manufacturing</b>	<b>Opto &amp; Microelectronics &amp; IT</b>	<b>Resource Recovery &amp; Utilization</b>
Biotechnology Process Engineering Center	Center for Collaborative Manufacturing	Center for Advanced Materials Processing	Center for Low Cost Electronic Packaging	Advanced Combustion 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 Product Development		Center for Optoelectronic Computing Systems	
Center for Emerging Cardiovascular Technologies	Center for Reconfigurable Machining Systems			

# Biotechnology & Bioengineering Centers Support (5): 1998

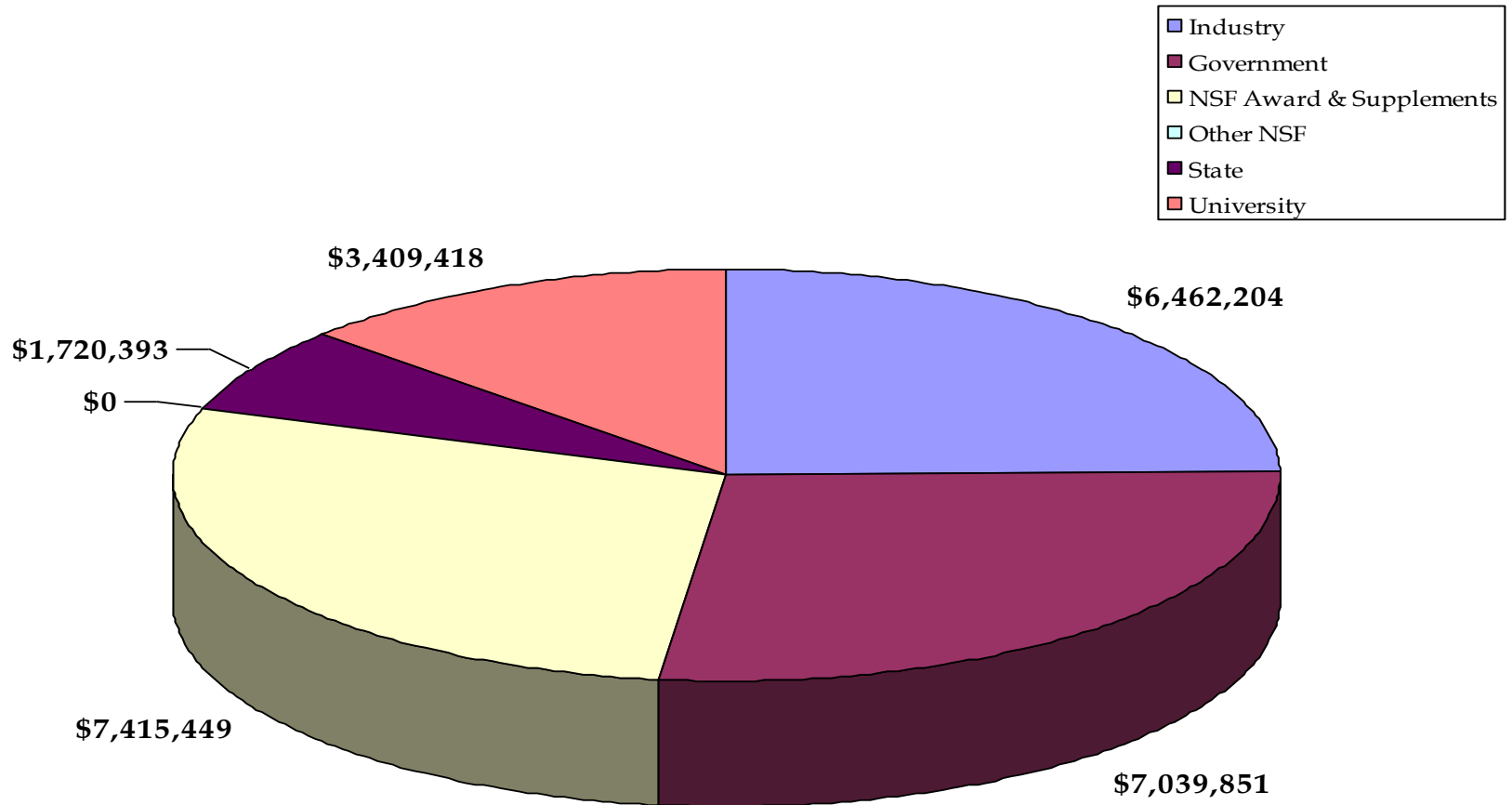


# Design Systems & Manufacturing Centers Support(5)\*: 1998



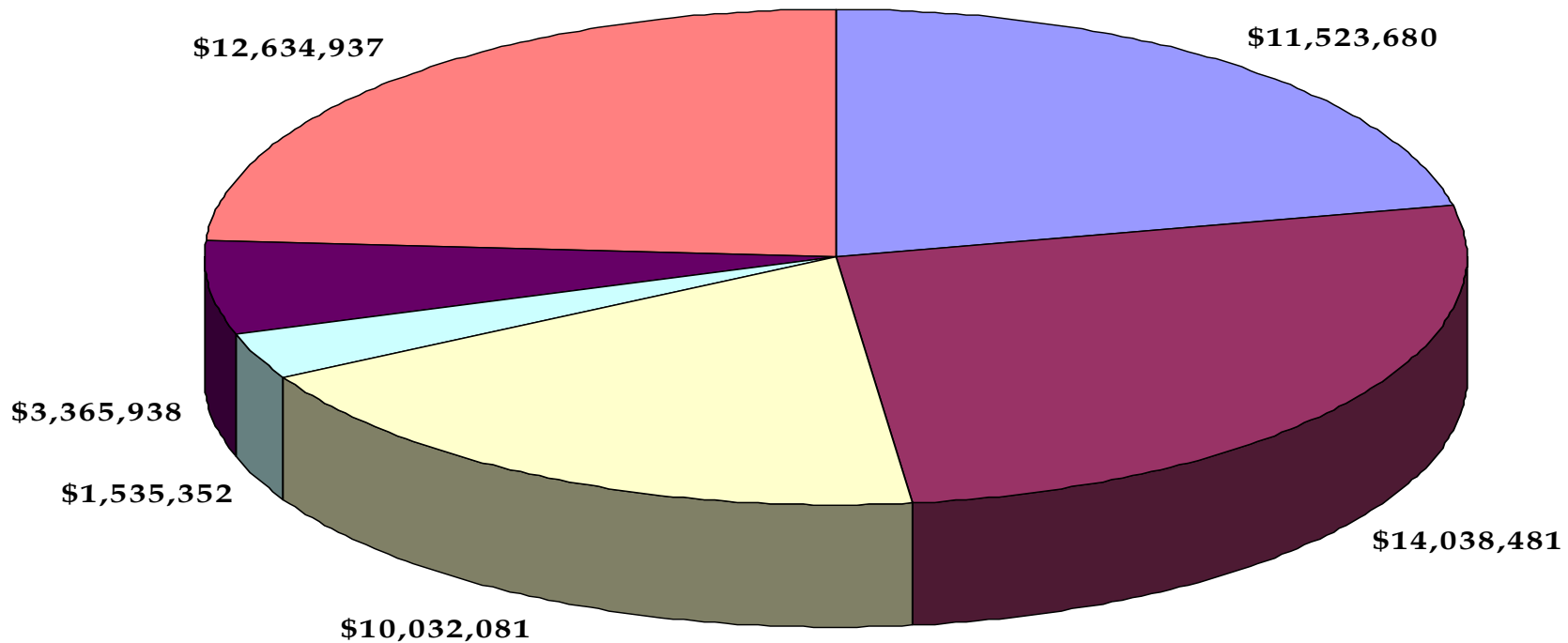
\* One center missing in the data

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

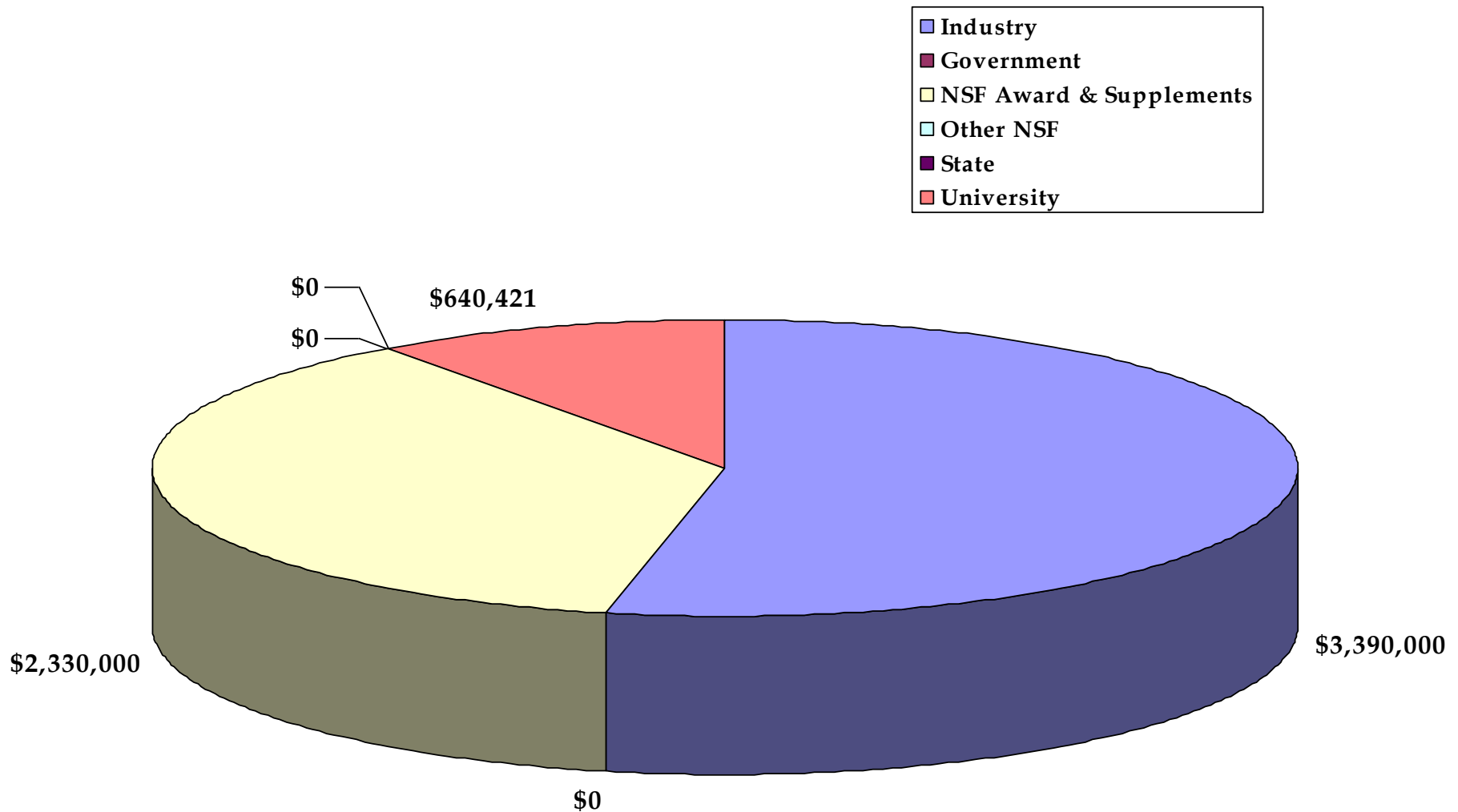




# Opto & Microelectronics & IT Centers Support(4): 1998



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



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

	1996	1997	1998
□ Biotechnology & Bioengineering	36	58	80
□ Design, Systems & Manufacturing	80	23	35
□ Materials Processing & Manufacturing	30	13	27
□ Opto & Microelectronics & IT	108	16	87
□ Resource Recovery & Utilization	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**

# ERC Productivity: 1985 - 1998

---

## 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 Productivity: 1985 - 1998

---

## 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 Productivity: 1985 - 1998

---

## 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

# ERC Productivity: 1985 - 1998

---

## Publications Acknowledging ERC Support

Peer Reviewed Conference Proceedings	5754
Peer Reviewed Technical Journals	7988
Trade Journals	317
Seminars, Colloquia, etc.	4886
Workshops, Short Courses to Industry	3617