NATIONAL SCIENCE FOUNDATION

INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH CENTERS

FINAL Report

2021-2022 STRUCTURAL INFORMATION[1]

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VENTUREWELL

January, 2023

[1]**NOTE:** FY2021-2022 data collected from 80/80 Center Director Surveys (100% response rate)

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*Table 1: 2021-2022 GENERAL CENTER INFORMATION (Sorted Chronologically)***

Yr Started:	Center Name	University Name Director	Partner University 1 Director	Partner University 2 Director	Partner University 3 Director	Partner University 4 Director
Active						
2001*	Identification Technology Research	Clarkson University Schuckers	West Virginia University Valenti	University at Buffalo Govindaraju	Michigan State University Ross	IDIAP Research Institute (Switzerland)
2007	Advanced Forestry Systems	University of Maine Weiskittel	University of Washington-Seattle Campus Turnblom	University of Idaho Nelson	North Carolina State University at Raleigh Cook	Purdue University-Main Campus Jacobs
2007	Smart Vehicle Concepts	Ohio State University-Main Campus Dapino				
2008	Advanced Knowledge Enablement	Florida International University Rishe	Florida Atlantic University Furht	Dubna International Univ. (Russia) Cheremisina	Univ. of Greenwich (England) MacKinnon	
2008	Cloud & Autonomic Computing	Texas Tech University Chen	University of Arizona Hariri	University of Sonora (Mexico)		
2008	Health Organization Transformation	Texas A & M University Health Science C Kash (Ferris)	Pennsylvania State University-Main Cam Tucker	University of Louisville Johnson (Jennings)		
2008	Particulate and Surfactant Systems	University of Florida Moudgil	Columbia University in the City of New Yo Somasundaran	Dharmsinh Desai Univ. (India) Mukherjee		
2009	Electromagnetic Compatibility	Missouri University of Science and Techn Beetner	University of Houston Chen	University of Hawaii at Manoa Iskander		
2009	Embedded Systems	Arizona State University Vrudhula	Southern Illinois University Carbondale Tragoudas			
2009	Grid-Connected Advanced Power Electronic Systems	University of Arkansas Main Campus Mantooth	University of Wisconsin-Milwaukee Cuzner	Korea Univ.(South Korea) Dougal	Yonsei Univ. (South Korea)	
2009	Integration of Composites into Infrastructure	West Virginia University GangaRao	North Carolina State University at Raleigh Seracino	University of Miami Nanni	Texas A & M University Puppala	
2010	Ceramics Composites and Optical Materials Center	Rutgers University-New Brunswick Haber				
2010	Energy Harvesting Materials and Systems	Virginia Polytechnic Institute and State Un Zuo	Columbia University in the City of New Yo Yin	Pennsylvania State University-Main Cam Rahn		
2010	Membrane Science, Engineering & Technology Center	University of Arkansas Main Campus Wickramasinghe	University of Colorado at Boulder Ding	New Jersey Institute of Technology Sirkar	Pennsylvania State University-Main Cam Zydney	R & D Center for Membrane Research (T
2010	Resource Recovery and Recycling	Worcester Polytechnic Institute Mishra	Colorado School of Mines Anderson	KU Leuven (Belgium) Blanpain	Univ. of Tokyo (Japan) Fujita	
2010	Security and Software Engineering Research Center	Ball State University Lin	The University of Texas at Dallas Wong			
2010	Surveillance Research	Wright State University-Main Campus Rigling	Ohio State University-Main Campus Potter			
2010	Water Equipment and Policy	University of Wisconsin-Milwaukee Liao	Marquette University Zitomer			
2010	Wood-Based Composites	Virginia Polytechnic Institute and State Un Frazier	Oregon State University Kamke			
2010*	Manufacturing and Materials Joining Innovation Center	Ohio State University-Main Campus Ramirez	Lehigh University DuPont	Colorado School of Mines Yu	The University of Tennessee Rawn	Pennsylvania State University-Main Cam Palmer

** Report sorted by Status. Organized by Year Started. Starting in 2013-2014 report, centers' Year Funded changed to Year Started. * = Last year funded by NSF.*

IUCRC Structure Database, FY 2021-2022

***Blank rows in subsequent tables indicate that data were not provided by the Center.*

#International site data not included in this report unless otherwise footnoted.

a) Additional universities for Advanced Forestry Systems include Oregon State University (Gonzalez-Benecke) and University of Georgia (Montes.)

b) Additional universities for Hardware Embedded Systems Security include University of University of Connecticut (Chandy).

Yr Started:	Center Name	University Name Director	Partner University 1 Director	Partner University 2 Director	Partner University 3 Director	Partner University 4 Director
2011	Advanced Non-Ferrous Structural Alloys	Colorado School of Mines Clarke (Kaufman)	Iowa State University Collins			
2011	Energy-Smart Electronic Systems	Binghamton University, SUNY Sammakia	Villanova University Wemhoff	The University of Texas at Arlington Agonafer		
2011	Metamaterials	University of North Carolina at Charlotte Aggarwal	Clarkson University Crouse			
2011	Solar Powered Future	The University of Texas at Austin Korgel	Colorado State University Sampath	Texas A & M University Balog		
2012	Tire Research	Virginia Polytechnic Institute and State Un Taheri	University of Akron Main Campus Choi			
2012	Visual and Decision Informatics	University of Louisiana at Lafayette Raghavan	Stony Brook University Kaufman	University of Virginia-Main Campus Scherer	University of North Carolina at Charlotte Dou	Tampere Univ. (Finland)
2013	Arthropod Management Technologies	University of Florida Bonning	University of Kentucky Palli			
2013	Broadband Wireless Access and Applications	University of Arizona Krunz	North Carolina State University at Raleigh Guvenc	University of Mississippi Main Campus Viswanathan	Catholic University of America Liu	
2013	Cybersecurity Analytics and Automation	George Mason University Jajodia	University of North Carolina at Charlotte Lipford	Colorado State University Ray		
2013	Freeform Optics	University of Rochester Rolland	University of North Carolina at Charlotte Suleski			
2013	Research in Storage Systems	University of California-Santa Cruz Long				
2013	Science Center for Marine Fisheries	University of Southern Mississippi Powell	College of William Mary Virginia Institute f Mann			
2013	Spatiotemporal Thinking, Computing and Application	George Mason University Yang	Harvard University Subramanian			
2013	Unmanned Aircraft Systems	Brigham Young University McLain	University of Colorado at Boulder Frew	Virginia Polytechnic Institute and State Un Woolsey	University of Michigan-Ann Arbor Panagou	
2013	Wheat Genetics	Kansas State University Akhunov				
2014	Advanced Design and Man of Integrated Microfluidics	University of California-Irvine Lee	University of Illinois at Chicago Papautsky			
2014	Bioplastics and Biocomposites	North Dakota State University-Main Camp Grewell	Washington State University Yadama	Iowa State University Cochran	University of Georgia Locklin	
2014	Dielectrics and Piezoelectrics	Pennsylvania State University-Main Cam Trolier-McKinstry	North Carolina State University at Raleigh Parsons	University of Sheffield (England)		
2014	Disruptive Muscoloskeletal Innovations	University of California-San Francisco Lotz	University of Toledo-Main Campus Goel	Ohio State University-Main Campus Marras		
2014	iPerform - I/UCRC for Assistive Technologies to Enhance Human Performance	The University of Texas at Arlington Makedon				
2014	Multi-functional Integrated System Technology	University of Florida Nishida	University of Central Florida Yuan	University of Virginia-Main Campus Ghosh		

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Yr Started:	Center Name	University Name Director	Partner University 1 Director	Partner University 2 Director	Partner University 3 Director	Partner University 4 Director
2014	Novel High-Voltage/Temperature Materials and Structures	University of Denver Kumosa	University of Illinois at Urbana-Champaig Jasiuk	Michigan Technological University Odegard	University of Connecticut Cao	
2014	Robots and Sensors for the Human Well-being	University of Minnesota-Twin Cities Morellas	University of Pennsylvania Hsieh	Clemson University Krovi	Worcester Polytechnic Institute Xiao	
2014	Wind Energy Science, Technology and Research	University of Massachusetts-Lowell Niezrecki	The University of Texas at Dallas Rotea			
2015	Atomically Thin Multifunctional Coatings	Pennsylvania State University-Main Cam Terrones	Rice University Lou	Boise State University Estrada		
2015	Fiber-Wireless Integration and Networking	Georgia Institute of Technology-Main Ca Chang	Auburn University Main Campus Mao			
2015	Rational Catalyst Synthesis	University of South Carolina-Columbia Regalbuto	Virginia Commonwealth University Gupton	University of California-Davis Gates		
2016	Advanced Electronics through Machine Learning	University of Illinois at Urbana-Champaig Rosenbaum	Georgia Institute of Technology-Main Ca Swaminathan	North Carolina State University at Raleigh Franzon		
2016	Advanced Mammalian Biomanufacturing Innovation Center	Johns Hopkins University Betenbaugh	Clemson University Harcum	University of Delaware Lee	University of Massachusetts Amherst-Lo Yoon	University of Maryland-College Park Bentley
2016	Advanced Research in Drying	Worcester Polytechnic Institute Yagoobi	University of Illinois at Urbana-Champaig Lee			
2016	Computational Biotechnology and Genomic Medicine	University of Illinois at Urbana-Champaig Iyer	Mayo Clinic Wang			
2016	Efficient Vehicles and Sustainable Transportation Systems	Arizona State University Yu	The University of Alabama Hong	University of Louisville Park	The University of Texas at Austin Matthews	
2017	Advanced Research in Forensic Science	Florida International University Cai	University of South Alabama Chambers			
2017	Building Reliable Advances and Innovation in Neurotechnology	Arizona State University Santello	University of Houston Contreras-Vidal	Miguel Hernández Univ. of Elche (Spain)	Tecnologico de Monterrey (Mexico)	
2017	Space, High-Performance, and Resilient Computing	University of Pittsburgh-Pittsburgh Campu George	University of Florida Lam	Brigham Young University Wirthlin	Virginia Polytechnic Institute and State Un Feng	
2018	Accelerated Real Time Analytics	University of Maryland-Baltimore County Joshi	North Carolina State University at Raleigh Chirkova	Rutgers University-Newark Atluri	Rutgers University-New Brunswick Metaxas	University of Miami Ogihara
2018	Advance the Science of Exploration to Reclamation in Mining	Colorado School of Mines Monecke	Virginia Polytechnic Institute and State Un Westman			
2018	Alternative Sustainable and Intelligent Computing	Duke University Chen	Syracuse University Qiu	University of Notre Dame Shi		
2018	Big Learning	University of Florida Harley	University of Missouri-Kansas City Lu	University of Oregon Nguyen		
2018	Geomechanics and Mitigation of Geohazards	California Institute of Technology Avouac				
2018	High Pressure Plasma Energy, Agriculture, and Biomedical Technologies	Drexel University Fridman	George Washington University Keidar	University of Michigan-Ann Arbor Foster	Plasma Bioscience Research Center (Kor	
2018	Power Management Integration	Dartmouth College Sullivan	University of California-San Diego Mercier			

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2018	Science of Heterogeneous Additive Printing of 3D Materials	University of Massachusetts-Lowell Mead	University of Connecticut Ma	Georgia Institute of Technology-Main Ca Qi		
2019	Bioanalytic Metrology	University of Notre Dame Bohn	Indiana University-Bloomington Jacobson	Purdue University-Main Campus Simpson		
2019	Hardware and Embedded Systems Security and Trust	University of Cincinnati-Main Campus Emmert	Northeastern University Fei	The University of Texas at Dallas Makris	University of Virginia-Main Campus Lambert	University of California-Davis Homayoun
2019	Wind Hazard and Infrastructure Performance	Texas Tech University Mehta (Zuo)	Florida International University Zisis			
2020	Pervasive Personalized Intelligence	University of Colorado at Boulder Dig	Oregon State University Wong			
2021	Building Energy Smart Technology	University of Colorado at Boulder Krarti	CUNY City College Gonzalez			
2021	Composite and Hybrid Materials Interfacing	Georgia Institute of Technology-Main Ca Zhang	The University of Tennessee Vaidya	Oakland University Nassar		
2021	Electronic-Photonic Integrated Circuits for Aerospace	Georgia Institute of Technology-Main Ca Ralph	Vanderbilt University Reed	University of Centeral Florida Delfyett		
2021	Environmental Sustainability through Insect Farming	Texas A & M University Tomberlin	Indiana University-Bloomington Picard	Mississippi State University Jordan		
2021	High-Frequency Electronics and Circuits for Communication Systems	University of Arkansas Main Campus El-Ghazaly	Florida International University Volakis	The University of Tennessee Fathy		
2021	Infrastructure Trustworthiness in Energy Systems	University of Illinois at Urbana-Champaig Nicol	University of Arkansas Main Campus Li	Florida International University Mohammed		
2021	Innovations in Structural Integrity Assurance	Louisiana State University and Agricultura Khonsari	Louisiana Tech University Matthews			
2021	Materials Data Science for Reliability and Degradation	Case Western Reserve University French	University of Pittsburgh-Pittsburgh Campu Leu			
2021	Research toward Advancing Financial Technologies	Stevens Institute of Technology Yang	Rensselaer Polytechnic Institute Gupta			
2021	Science, Management, Applications, Regulation, and Training	Georgetown University Frieder	University of Notre Dame Nabrzyski			
2021	Solid-State Green Electric Power Generation and Storage	South Dakota School of Mines and Techn Smirnova	Syracuse University Qiao	Northeastern University Mukerjee		
2021	Stream Healthcare In Place	University of Arizona Roveda	Baylor College of Medicine Najafi	University of Southern California Armstrong	California Institute of Technology Daraio	
2021	Wildfire Interdisciplinary Research Center	San Jose State University Clements				

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Table 2: 2021-2022 OPERATING BUDGET AND TOTAL FUNDING

Center Name	Program Income + NSF/IUCRC [4]	NSF/ IUCRC [5]	Member Fees [6]	Add'l Industry [7]	Other NSF [8]	State [9]	Other Federal [10]	Non-Federal [11]
^ Advanced Knowledge Enablement	$455,000	$0	$430,000	$25,000	$2,500,000	$0	$500,000	$500,000
^ Advanced Research in Forensic S	$718,000	$443,000	$275,000	$0	$0	$0	$0	$0
^ Ceramics Composites and Optical	$535,391	$0	$535,391	$0	$0	$0	$0	$0
^ Computational Biotechnology and	$0	$0	$0	$0	$0	$0	$0	$0
^ Health Organization Transformati	$225,000	$0	$225,000	$0	$0	$0	$0	$0
^ Novel High-Voltage/Temperature	$120,000	$0	$120,000	$0	$0	$0	$0	$0
^ Smart Vehicle Concepts	$836,640	$153,160	$683,480	$0	$0	$0	$0	$0
^ Unmanned Aircraft Systems	$1,401,000	$616,000	$785,000	$0	$0	$0	$0	$0
Accelerated Real Time Analytics	$1,349,638	$600,000	$749,638	$0	$0	$0	$0	$0
Advance the Science of Exploration	$1,550,469	$609,531	$850,000	$90,938	$0	$0	$0	$0
Advanced Design and Man of Integr	$839,190	$539,190	$300,000	$0	$0	$0	$0	$0
Advanced Electronics through Mach	$0	$0	$0	$0	$0	$0	$0	$0
Advanced Forestry Systems	$2,665,171	$700,000	$1,965,171	$0	$250,000	$0	$0	$0
Advanced Mammalian Biomanufact	$1,913,500	$268,000	$1,645,500	$0	$0	$0	$0	$0
Advanced Non-Ferrous Structural Al	$643,000	$24,000	$619,000	$0	$0	$0	$1,543,500	$0
Advanced Research in Drying	$501,000	$16,000	$485,000	$0	$0	$0	$0	$0
Alternative Sustainable and Intellige	$900,000	$150,000	$750,000	$0	$0	$0	$0	$0
Arthropod Management Technologi	$833,000	$198,000	$635,000	$0	$120,000	$53,903	$0	$0
Atomically Thin Multifunctional Coat	$750,000	$120,000	$630,000	$0	$0	$0	$0	$0
Big Learning	$1,000,000	$500,000	$500,000	$0	$0	$0	$0	$0
Bioanalytic Metrology	$1,176,000	$600,000	$550,000	$26,000	$0	$0	$0	$0
Bioplastics and Biocomposites	$1,570,000	$400,000	$1,170,000	$0	$0	$0	$0	$0
Broadband Wireless Access and Ap	$1,306,000	$413,500	$562,500	$330,000	$0	$30,000	$0	$0
Building Energy Smart Technology	$386,000	$16,000	$365,000	$5,000	$0	$0	$0	$0
Building Reliable Advances and Inn	$248,500	$0	$248,500	$0	$0	$0	$0	$0
Cloud & Autonomic Computing	$525,000	$100,000	$425,000	$0	$0	$0	$0	$35,000
Composite and Hybrid Materials Int	$885,000	$450,000	$435,000	$0	$0	$0	$0	$0
Cybersecurity Analytics and Autom	$600,000	$300,000	$300,000	$0	$0	$0	$0	$0
Dielectrics and Piezoelectrics	$909,178	$78,859	$830,319	$0	$0	$0	$0	$0
Disruptive Muscoloskeletal Innovati	$625,000	$100,000	$525,000	$0	$0	$0	$0	$0
Efficient Vehicles and Sustainable T	$500,000	$0	$500,000	$0	$0	$0	$0	$0
Electromagnetic Compatibility	$1,519,000	$100,000	$1,419,000	$0	$0	$0	$70,000	$0
Electronic-Photonic Integrated Circu	$1,050,000	$450,000	$600,000	$0	$0	$0	$100,000	$500,000
Embedded Systems	$75,000	$0	$75,000	$0	$0	$0	$0	$0
Energy Harvesting Materials and Sy	$629,878	$0	$629,878	$0	$0	$0	$0	$0
Energy-Smart Electronic Systems	$1,452,133	$368,000	$1,084,133	$0	$0	$208,000	$75,000	$475,000
Environmental Sustainability throug	$862,481	$447,481	$415,000	$0	$0	$0	$0	$0
Fiber-Wireless Integration and Netw	$0	$0	$0	$0	$0	$0	$0	$0
Freeform Optics	$955,999	$307,999	$648,000	$0	$0	$0	$0	$0
Geomechanics and Mitigation of Ge	$924,929	$174,000	$375,000	$375,929	$0	$0	$0	$375,929
Grid-Connected Advanced Power E	$658,988	$223,988	$425,000	$10,000	$0	$0	$0	$0
Hardware and Embedded Systems	$1,225,000	$150,000	$1,075,000	$0	$0	$0	$740,628	$0
High Pressure Plasma Energy, Agri	$1,010,500	$510,500	$500,000	$0	$0	$0	$0	$0
High-Frequency Electronics and Cir	$750,000	$450,000	$300,000	$0	$0	$0	$0	$0
Identification Technology Research	$1,626,552	$575,221	$424,000	$627,331	$1,066,666	$80,000	$2,387,083	$90,000
Infrastructure Trustworthiness in En	$800,000	$450,000	$350,000	$0	$0	$0	$0	$0

** Report sorted Alphabetically by Center*

IUCRC Structure Database, FY 2021-2022

*** ^ denotes centers on no cost extension, they did not receive any additional NSF IUCRC funding during the reporting period.*

Center Name	Program Income [4] + NSF/IUCRC	NSF/ [5] IUCRC	Member [6] Fees	Add'l [7] Industry	Other [8] NSF	State [9]	Other [10] Federal	Non- [11] Federal
Innovations in Structural Integrity As	$650,000	$300,000	$350,000	$0	$0	$0	$0	$0
Integration of Composites into Infra	$1,130,277	$106,997	$1,023,280	$0	$200,000	$0	$0	$0
iPerform - I/UCRC for Assistive Tec	$162,000	$16,000	$146,000	$0	$218,000	$0	$0	$146,000
Manufacturing and Materials Joinin	$1,807,792	$100,000	$1,707,792	$0	$90,823	$0	$0	$0
Materials Data Science for Reliabilit	$356,495	$43,800	$312,695	$0	$0	$0	$0	$0
Membrane Science, Engineering &	$2,082,546	$1,112,546	$970,000	$0	$0	$0	$0	$0
Metamaterials	$503,332	$50,000	$430,000	$23,332	$0	$0	$0	$0
Multi-functional Integrated System T	$797,382	$397,382	$400,000	$0	$0	$0	$0	$0
Particulate and Surfactant Systems	$35,000	$0	$35,000	$0	$0	$0	$0	$0
Pervasive Personalized Intelligence	$675,000	$300,000	$375,000	$0	$0	$0	$0	$0
Power Management Integration	$675,000	$225,000	$450,000	$0	$0	$0	$0	$0
Rational Catalyst Synthesis	$750,000	$100,000	$650,000	$0	$0	$0	$0	$0
Research in Storage Systems	$450,000	$100,000	$350,000	$0	$0	$0	$200,000	$0
Research toward Advancing Financi	$875,000	$300,000	$575,000	$0	$0	$0	$0	$0
Resource Recovery and Recycling	$650,000	$50,000	$600,000	$0	$0	$0	$0	$0
Robots and Sensors for the Human	$1,067,000	$455,000	$612,000	$0	$0	$0	$0	$0
Science Center for Marine Fisheries	$568,086	$143,086	$425,000	$0	$396,469	$0	$0	$375,788
Science of Heterogeneous Additive	$1,002,843	$512,843	$490,000	$0	$0	$0	$0	$0
Science, Management, Applications	$745,000	$300,000	$425,000	$20,000	$0	$0	$0	$0
Security and Software Engineering	$45,000	$0	$45,000	$0	$0	$0	$0	$0
Solar Powered Future	$1,073,333	$265,000	$808,333	$0	$0	$0	$0	$0
Solid-State Green Electric Power G	$470,000	$20,000	$450,000	$0	$0	$300,000	$0	$0
Space, High-Performance, and Resi	$1,606,000	$166,000	$1,440,000	$0	$0	$0	$0	$0
Spatiotemporal Thinking, Computin	$1,100,900	$487,000	$613,900	$0	$235,000	$0	$55,000	$0
Stream Healthcare In Place	$930,000	$200,000	$730,000	$0	$0	$100,000	$500,000	$0
Surveillance Research	$0	$0	$0	$0	$0	$0	$0	$0
Tire Research	$679,983	$99,983	$580,000	$0	$0	$0	$0	$0
Visual and Decision Informatics	$833,100	$383,100	$450,000	$0	$0	$0	$0	$0
Water Equipment and Policy	$539,219	$39,219	$500,000	$0	$0	$0	$0	$0
Wheat Genetics	$500,000	$100,000	$400,000	$0	$0	$0	$1,500,000	$0
Wildfire Interdisciplinary Research	$749,954	$149,954	$600,000	$0	$0	$0	$1,150,000	$0
Wind Energy Science, Technology	$768,568	$219,399	$549,169	$0	$0	$0	$0	$0
Wind Hazard and Infrastructure Perf	$600,000	$300,000	$300,000	$0	$0	$0	$0	$0
Wood-Based Composites	$315,000	$0	$315,000	$0	$0	$0	$0	$0
Grand Mean	$808,762	$233,059	$556,533	$19,169	$63,462	$9,649	$110,265	$31,221
Grand Sum	$64,700,947	$18,644,738	$44,522,679	$1,533,530	$5,076,958	$771,903	$8,821,211	$2,497,717

** Report sorted Alphabetically by Center*

IUCRC Structure Database, FY 2021-2022

*** ^ denotes centers on no cost extension, they did not receive any additional NSF IUCRC funding during the reporting period.*

Table 3: 2021-2022 CAPITAL AND IN-KIND SUPPORT

Center Name	Program Income + NSF/IUCRC	Capital and In-Kind Support [12] Total Cap In-Kind	Equip-ment	Facilities	Personnel	Software	Other Support	Admin[13] Budget
Accelerated Real Time Analytics	$1,349,638	$0	$0	$0	$0	$0	$0	31
Advance the Science of Exploration to Rec	$1,550,469	$0	$0	$0	$0	$0	$0	3
Advanced Design and Man of Integrated M	$839,190	$125,000	$0	$0	$0	$50,000	$75,000	30
Advanced Electronics through Machine Le	$0	$0	$0	$0	$0	$0	$0	0
Advanced Forestry Systems	$2,665,171	$0	$0	$0	$0	$0	$0	17
Advanced Knowledge Enablement	$455,000	$130,000	$0	$0	$90,000	$40,000	$0	0
Advanced Mammalian Biomanufacturing In	$1,913,500	$0	$0	$0	$0	$0	$0	19
Advanced Non-Ferrous Structural Alloys	$643,000	$0	$0	$0	$0	$0	$0	6
Advanced Research in Drying	$501,000	$0	$0	$0	$0	$0	$0	18
Advanced Research in Forensic Science	$718,000	$0	$0	$0	$0	$0	$0	10
Alternative Sustainable and Intelligent Com	$900,000	$0	$0	$0	$0	$0	$0	29
Arthropod Management Technologies	$833,000	$0	$0	$0	$0	$0	$0	14
Atomically Thin Multifunctional Coatings	$750,000	$0	$0	$0	$0	$0	$0	31
Big Learning	$1,000,000	$0	$0	$0	$0	$0	$0	27
Bioanalytic Metrology	$1,176,000	$550,000	$550,000	$0	$0	$0	$0	34
Bioplastics and Biocomposites	$1,570,000	$0	$0	$0	$0	$0	$0	26
Broadband Wireless Access and Applicatio	$1,306,000	$0	$0	$0	$0	$0	$0	22
Building Energy Smart Technology	$386,000	$0	$0	$0	$0	$0	$0	14
Building Reliable Advances and Innovation	$248,500	$0	$0	$0	$0	$0	$0	44
Ceramics Composites and Optical Material	$535,391	$0	$0	$0	$0	$0	$0	0
Cloud & Autonomic Computing	$525,000	$0	$0	$0	$0	$0	$0	4
Composite and Hybrid Materials Interfacing	$885,000	$0	$0	$0	$0	$0	$0	20
Computational Biotechnology and Genomi	$0	$0	$0	$0	$0	$0	$0	0
Cybersecurity Analytics and Automation	$600,000	$0	$0	$0	$0	$0	$0	38
Dielectrics and Piezoelectrics	$909,178	$25,200	$25,200	$0	$0	$0	$0	11
Disruptive Muscoloskeletal Innovations	$625,000	$0	$0	$0	$0	$0	$0	41
Efficient Vehicles and Sustainable Transpo	$500,000	$0	$0	$0	$0	$0	$0	48
Electromagnetic Compatibility	$1,519,000	$75,000	$75,000	$0	$0	$0	$0	4
Electronic-Photonic Integrated Circuits for	$1,050,000	$1,261,250	$0	$0	$0	$1,000,000	$261,250	20
Embedded Systems	$75,000	$0	$0	$0	$0	$0	$0	2
Energy Harvesting Materials and Systems	$629,878	$0	$0	$0	$0	$0	$0	32
Energy-Smart Electronic Systems	$1,452,133	$1,411,383	1,226,383	$185,000	$0	$0	$0	1
Environmental Sustainability through Insec	$862,481	$0	$0	$0	$0	$0	$0	21
Fiber-Wireless Integration and Networking	$0	$0	$0	$0	$0	$0	$0	0
Freeform Optics	$955,999	$48,000	$0	$0	$0	$0	$48,000	26
Geomechanics and Mitigation of Geohazar	$924,929	$400,000	$400,000	$0	$0	$0	$0	19
Grid-Connected Advanced Power Electroni	$658,988	$17,250	$17,250	$0	$0	$0	$0	20
Hardware and Embedded Systems Securit	$1,225,000	$10,000	$0	$0	$10,000	$0	$0	32
Health Organization Transformation	$225,000	$0	$0	$0	$0	$0	$0	12
High Pressure Plasma Energy, Agriculture,	$1,010,500	$0	$0	$0	$0	$0	$0	20
High-Frequency Electronics and Circuits fo	$750,000	$0	$0	$0	$0	$0	$0	12
Identification Technology Research	$1,626,552	$0	$0	$0	$0	$0	$0	8
Infrastructure Trustworthiness in Energy Sy	$800,000	$0	$0	$0	$0	$0	$0	43
Innovations in Structural Integrity Assuranc	$650,000	$0	$0	$0	$0	$0	$0	46
Integration of Composites into Infrastructur	$1,130,277	$0	$0	$0	$0	$0	$0	5
iPerform - I/UCRC for Assistive Technolog	$162,000	$540,000	$200,000	$300,000	$30,000	$0	$10,000	1
Manufacturing and Materials Joining Innov	$1,807,792	$2,871,123	$134,531	$78,000	$0	$973,627	$1,684,965	19
Materials Data Science for Reliability and	$356,495	$0	$0	$0	$0	$0	$0	71

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Center Name	Program Income + NSF/IUCRC	Capital and In-Kind Support [12] Total Cap In-Kind	Equip-ment	Facilities	Personnel	Software	Other Support	Admin [13] Budget
Membrane Science, Engineering & Techno	$2,082,546	$0	$0	$0	$0	$0	$0	7
Metamaterials	$503,332	$0	$0	$0	$0	$0	$0	2
Multi-functional Integrated System Technol	$797,382	$0	$0	$0	$0	$0	$0	10
Novel High-Voltage/Temperature Materials	$120,000	$0	$0	$0	$0	$0	$0	5
Particulate and Surfactant Systems	$35,000	$0	$0	$0	$0	$0	$0	2
Pervasive Personalized Intelligence	$675,000	$0	$0	$0	$0	$0	$0	10
Power Management Integration	$675,000	$0	$0	$0	$0	$0	$0	19
Rational Catalyst Synthesis	$750,000	$0	$0	$0	$0	$0	$0	16
Research in Storage Systems	$450,000	$0	$0	$0	$0	$0	$0	12
Research toward Advancing Financial Tec	$875,000	$106,562	$0	$0	$74,456	$0	$32,106	23
Resource Recovery and Recycling	$650,000	$0	$0	$0	$0	$0	$0	7
Robots and Sensors for the Human Well-b	$1,067,000	$0	$0	$0	$0	$0	$0	6
Science Center for Marine Fisheries	$568,086	$0	$0	$0	$0	$0	$0	9
Science of Heterogeneous Additive Printin	$1,002,843	$0	$0	$0	$0	$0	$0	26
Science, Management, Applications, Regul	$745,000	$0	$0	$0	$0	$0	$0	12
Security and Software Engineering Resear	$45,000	$26,080	$0	$6,000	$20,080	$0	$0	44
Smart Vehicle Concepts	$836,640	$90,000	$0	$0	$0	$60,000	$30,000	6
Solar Powered Future	$1,073,333	$0	$0	$0	$0	$0	$0	1
Solid-State Green Electric Power Generati	$470,000	$0	$0	$0	$0	$0	$0	25
Space, High-Performance, and Resilient C	$1,606,000	$0	$0	$0	$0	$0	$0	21
Spatiotemporal Thinking, Computing and A	$1,100,900	$3,425,535	3,425,535	$0	$0	$0	$0	14
Stream Healthcare In Place	$930,000	$900,000	$200,000	$200,000	$300,000	$100,000	$100,000	11
Surveillance Research	$0	$0	$0	$0	$0	$0	$0	0
Tire Research	$679,983	$0	$0	$0	$0	$0	$0	27
Unmanned Aircraft Systems	$1,401,000	$0	$0	$0	$0	$0	$0	14
Visual and Decision Informatics	$833,100	$0	$0	$0	$0	$0	$0	12
Water Equipment and Policy	$539,219	$0	$0	$0	$0	$0	$0	5
Wheat Genetics	$500,000	$0	$0	$0	$0	$0	$0	6
Wildfire Interdisciplinary Research Center	$749,954	$0	$0	$0	$0	$0	$0	3
Wind Energy Science, Technology and Re	$768,568	$0	$0	$0	$0	$0	$0	15
Wind Hazard and Infrastructure Performan	$600,000	$0	$0	$0	$0	$0	$0	37
Wood-Based Composites	$315,000	$0	$0	$0	$0	$0	$0	31
Grand Mean	$808,762	$150,155	$78,174	$9,613	$6,557	$27,795	$28,017	17.36
Grand Sum	$64,700,947	$12,012,383	$6,253,899	$769,000	$524,536	$2,223,627	$2,241,321	*N/A*

Table 4: 2021-2022 INDUSTRY MEMBERSHIP DESCRIPTORS

	2021-2022 MEMBERSHIPS				LIFETIME MEMBERSHIPS[14]			ANNUAL FEES[15]		
Center Name	Current	Starting	New	Left	Starting	New	Left	Primary	Secondary	Tertiary
Accelerated Real Time Analytics	19	21	1	3	11	17	6	$50,000	$25,000	
Advance the Science of Exploration to	23	8	15	0	7	26	1	$50,000	$25,000	
Advanced Design and Man of Integrate	10	11	0	1	13	24	14	$50,000		
Advanced Electronics through Machine	9	9	0	0	12	17	7	$50,000		
Advanced Forestry Systems	103	102	1	0	68	291	187	$25,000	$12,500	
Advanced Knowledge Enablement	43	38	5	0	10	100	60	$50,000	$5,000	
Advanced Mammalian Biomanufacturin	30	30	0	0	16	31	2	$55,000		
Advanced Non-Ferrous Structural Alloy	15	13	2	0	9	27	12	$54,000	$18,000	
Advanced Research in Drying	12	11	3	2	9	19	6	$50,000	$25,000	$5,000
Advanced Research in Forensic Scienc	8	10	0	2	17	26	20	$25,000	$5,000	
Alternative Sustainable and Intelligent	11	12	0	1	14	19	8	$50,000		
Arthropod Management Technologies	12	12	0	0	7	16	4	$55,000	$30,000	
Atomically Thin Multifunctional Coating	12	5	7	0	12	23	11	$45,000	$22,500	
Big Learning	12	8	6	2	26	38	25	$50,000	$25,000	
Bioanalytic Metrology	12	13	1	2	12	14	2	$50,000	$25,000	
Bioplastics and Biocomposites	28	29	7	8	31	61	33	$30,000	$15,000	
Broadband Wireless Access and Applic	13	12	4	3	16	45	31	$50,000	$25,000	
Building Energy Smart Technology	11	0	11	0	11	11	0	$50,000	$25,000	
Building Reliable Advances and Innova	8	8	0	0	11	17	12	$50,000	$25,000	
Ceramics Composites and Optical Mat	7	9	0	2	19	33	27	$40,000	$15,000	
Cloud & Autonomic Computing	10	11	0	1	13	61	39	$50,000	$25,000	
Composite and Hybrid Materials Interfa	13	0	13	0	13	13	0	$30,000	$15,000	
Computational Biotechnology and Gen	3	3	0	0	7	10	7	$50,000		
Cybersecurity Analytics and Automatio	8	9	3	4	7	21	14	$50,000		
Dielectrics and Piezoelectrics	26	25	1	0	24	38	13	$37,800	$12,600	
Disruptive Muscoloskeletal Innovations	10	8	3	1	7	26	26	$40,000		
Efficient Vehicles and Sustainable Tran	11	11	1	1	18	31	21	$50,000		
Electromagnetic Compatibility	30	40	4	14	15	112	72	$70,000	$35,000	
Electronic-Photonic Integrated Circuits	13	0	13	0	13	13	0	$50,000		
Embedded Systems	1	7	0	6	7	41	40	$50,000	$25,000	$5,000
Energy Harvesting Materials and Syste	16	11	6	1	11	45	29	$40,000	$20,000	
Energy-Smart Electronic Systems	30	28	2	0	15	60	31	$50,000	$25,000	
Environmental Sustainability through In	15	0	15	0	15	15	0	$50,000	$25,000	
Fiber-Wireless Integration and Networki	7	7	0	0	9	18	9	$100,000	$50,000	$25,000
Freeform Optics	16	20	2	6	7	39	22	$48,000	$24,000	
Geomechanics and Mitigation of Geoh	9	8	2	1	10	13	4	$50,000	$25,000	
Grid-Connected Advanced Power Elect	19	16	5	2	17	49	30	$40,000	$5,000	
Hardware and Embedded Systems Sec	23	25	1	3	24	31	7	$50,000	$25,000	
Health Organization Transformation	6	8	2	4	10	71	65	$50,000	$25,000	
High Pressure Plasma Energy, Agricult	14	14	0	0	9	16	1	$50,000		
High-Frequency Electronics and Circuit	10	0	10	0	10	10	0	$50,000	$25,000	$10,000
Identification Technology Research	20	17	4	1	8	81	68	$50,000	$10,000	
Infrastructure Trustworthiness in Energ	8	0	8	0	8	8	0	$50,000	$25,000	
Innovations in Structural Integrity Assur	8	0	8	0	8	8	0	$50,000	$25,000	
Integration of Composites into Infrastru	41	37	6	2	15	106	68	$30,000	$15,000	$5,000
iPerform - I/UCRC for Assistive Techn	2	2	0	0	8	14	7	$50,000	$20,000	
Manufacturing and Materials Joining In	47	52	3	8	25	105	63	$55,000	$27,500	

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	2021-2022 MEMBERSHIPS				LIFETIME MEMBERSHIPS[14]			ANNUAL FEES[15]		
Center Name	**Current**	**Starting**	**New**	**Left**	**Starting**	**New**	**Left**	**Primary**	**Secondary**	**Tertiary**
Materials Data Science for Reliability a	7	0	7	0	7	7	0	$50,000	$25,000	
Membrane Science, Engineering & Tec	16	17	2	3	8	37	25	$60,000	$30,000	
Metamaterials	9	9	0	0	8	22	15	$45,000	$25,000	
Multi-functional Integrated System Tec	7	10	1	4	10	32	23	$50,000	$25,000	
Novel High-Voltage/Temperature Mater	10	10	0	0	13	27	16	$40,000	$20,000	
Particulate and Surfactant Systems	2	2	0	0	43	70	67	$35,000	$15,000	
Pervasive Personalized Intelligence	5	3	2	0	7	5	0	$75,000	$37,500	
Power Management Integration	11	6	5	0	2	13	3	$50,000	$25,000	
Rational Catalyst Synthesis	12	14	2	4	7	22	11	$50,000	$25,000	
Research in Storage Systems	10	9	3	2	10	28	18	$50,000	$15,000	
Research toward Advancing Financial	17	0	17	0	17	17	0	$50,000	$25,000	
Resource Recovery and Recycling	13	14	0	1	14	50	37	$40,000		
Robots and Sensors for the Human We	11	8	4	1	15	48	33	$35,000	$10,000	
Science Center for Marine Fisheries	14	14	0	0	9	17	4	$50,000	$25,000	
Science of Heterogeneous Additive Pri	13	11	3	1	10	19	6	$50,000	$15,000	$5,000
Science, Management, Applications, R	7	0	7	0	7	7	0	$50,000	$25,000	
Security and Software Engineering Res	2	11	0	9	20	74	75	$40,000	$5,000	
Smart Vehicle Concepts	17	18	0	1	14	54	37	$66,000	$20,000	$10,000
Solar Powered Future	17	14	13	10	6	54	37	$50,000	$25,000	
Solid-State Green Electric Power Gene	11	11	0	0	11	0	0	$50,000	$25,000	
Space, High-Performance, and Resilien	22	34	6	18	35	65	45	$40,000		
Spatiotemporal Thinking, Computing a	9	10	2	3	10	42	29	$50,000		
Stream Healthcare In Place	14	0	14	0	14	14	0	$50,000	$25,000	
Surveillance Research	10	10	0	0	8	18	8	$50,000	$25,000	
Tire Research	19	19	0	0	18	25	16	$40,000	$20,000	
Unmanned Aircraft Systems	14	14	0	0	9	41	28	$44,000		
Visual and Decision Informatics	9	9	3	3	17	49	40	$50,000	$20,000	
Water Equipment and Policy	11	12	1	2	6	29	20	$50,000	$25,000	
Wheat Genetics	8	8	0	0	12	16	8	$50,000	$20,000	
Wildfire Interdisciplinary Research Cent	12	0	12	0	12	12	0	$50,000		
Wind Energy Science, Technology and	15	13	2	0	10	23	8	$44,944	$16,854	$5,000
Wind Hazard and Infrastructure Perfor	6	6	1	1	6	8	2	$50,000		
Wood-Based Composites	10	13	1	4	8	26	17	$35,000		
Grand Mean	14.80	13.11	3.54	1.85	13.34	36.01	21.65	$48,247	$21,848	$8,750
Grand Sum	1184	1049	283	148	1067	2881	1732			

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Table 5: 2021-2022 HUMAN RESOURCES

	RESEARCHERS				STUDENTS		
Center Name	Faculty[16] Scientists	Research Staff	Post Docs	Admin-istrative	PhD	Masters	Under-graduate
Accelerated Real Time Analytics	36	1	2	6	29	10	3
Advance the Science of Exploration to Reclamation in Min	25	1	1	1	10	9	9
Advanced Design and Man of Integrated Microfluidics	11	0	6	1	11	3	15
Advanced Electronics through Machine Learning	13	1	1	1	8	2	0
Advanced Forestry Systems	28	17	8	5	12	22	17
Advanced Knowledge Enablement	12	13	1	0	8	12	7
Advanced Mammalian Biomanufacturing Innovation Cente	25	3	1	4	37	8	9
Advanced Non-Ferrous Structural Alloys	6	0	2	1	14	10	8
Advanced Research in Drying	12	1	1	2	14	2	5
Advanced Research in Forensic Science	26	3	2	4	13	5	5
Alternative Sustainable and Intelligent Computing	23	0	1	2	15	1	0
Arthropod Management Technologies	27	8	13	2	4	1	12
Atomically Thin Multifunctional Coatings	12	3	3	4	11	3	5
Big Learning	13	2	0	6	17	2	2
Bioanalytic Metrology	24	1	5	5	65	2	3
Bioplastics and Biocomposites	16	10	6	4	20	5	19
Broadband Wireless Access and Applications	22	1	1	1	17	4	5
Building Energy Smart Technology	11	0	0	3	6	4	3
Building Reliable Advances and Innovation in Neurotechn	14	2	4	3	16	0	15
Ceramics Composites and Optical Materials Center	3	1	2	1	3	5	0
Cloud & Autonomic Computing	12	0	0	0	15	13	5
Composite and Hybrid Materials Interfacing	18	0	0	2	8	1	4
Computational Biotechnology and Genomic Medicine	38	0	1	3	13	3	1
Cybersecurity Analytics and Automation	14	0	1	3	7	8	8
Dielectrics and Piezoelectrics	14	1	0	2	7	0	4
Disruptive Muscoloskeletal Innovations	21	4	1	5	6	1	2
Efficient Vehicles and Sustainable Transportation System	15	3	2	2	16	5	5
Electromagnetic Compatibility	12	4	3	1	29	10	7
Electronic-Photonic Integrated Circuits for Aerospace	11	2	2	1	5	0	1
Embedded Systems	6	0	0	1	30	15	0
Energy Harvesting Materials and Systems	16	1	5	3	5	2	2
Energy-Smart Electronic Systems	13	2	5	0	25	7	7
Environmental Sustainability through Insect Farming	13	0	2	2	6	4	5
Fiber-Wireless Integration and Networking	0	0	0	0	0	0	0
Freeform Optics	15	6	0	7	26	5	10
Geomechanics and Mitigation of Geohazards	9	1	8	1	10	0	2
Grid-Connected Advanced Power Electronic Systems	7	0	3	3	26	12	11
Hardware and Embedded Systems Security and Trust	30	2	5	7	31	18	6
Health Organization Transformation	17	2	0	3	8	2	12
High Pressure Plasma Energy, Agriculture, and Biomedica	17	6	2	1	8	2	1
High-Frequency Electronics and Circuits for Communicati	29	0	2	1	13	3	4
Identification Technology Research	28	0	1	2	43	18	29
Infrastructure Trustworthiness in Energy Systems	11	3	1	3	2	2	0
Innovations in Structural Integrity Assurance	13	0	2	3	14	1	4
Integration of Composites into Infrastructure	16	14	5	3	17	9	18
iPerform - I/UCRC for Assistive Technologies to Enhance	2	1	1	0	4	2	2
Manufacturing and Materials Joining Innovation Center	21	0	4	1	14	10	20

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Center Name	RESEARCHERS				STUDENTS		
	Faculty[16] Scientists	Research Staff	Post Docs	Admin-istrative	PhD	Masters	Under-graduate
Materials Data Science for Reliability and Degradation	10	0	1	1	2	2	6
Membrane Science, Engineering & Technology Center	24	0	4	3	19	3	2
Metamaterials	17	0	0	1	10	0	0
Multi-functional Integrated System Technology	17	6	0	1	17	0	6
Novel High-Voltage/Temperature Materials and Structures	9	2	3	1	12	0	0
Particulate and Surfactant Systems	6	2	0	2	2	0	0
Pervasive Personalized Intelligence	6	0	0	2	8	7	1
Power Management Integration	6	0	0	1	12	1	0
Rational Catalyst Synthesis	15	3	7	2	19	0	4
Research in Storage Systems	9	0	0	1	0	0	1
Research toward Advancing Financial Technologies	17	1	0	3	8	3	3
Resource Recovery and Recycling	6	1	0	2	4	2	1
Robots and Sensors for the Human Well-being	17	1	1	2	8	16	33
Science Center for Marine Fisheries	19	0	0	3	6	6	2
Science of Heterogeneous Additive Printing of 3D Material	23	0	4	4	20	5	4
Science, Management, Applications, Regulation, and Trai	5	0	0	1	2	3	7
Security and Software Engineering Research Center	5	0	0	1	5	2	1
Smart Vehicle Concepts	10	3	1	1	20	2	11
Solar Powered Future	14	0	5	1	14	3	15
Solid-State Green Electric Power Generation and Storage	16	2	3	1	7	0	4
Space, High-Performance, and Resilient Computing	18	1	0	5	34	20	34
Spatiotemporal Thinking, Computing and Application	15	4	4	5	4	2	12
Stream Healthcare In Place	33	18	15	8	5	5	13
Surveillance Research	3	0	0	0	2	1	0
Tire Research	21	0	0	1	17	5	5
Unmanned Aircraft Systems	24	0	0	1	12	13	18
Visual and Decision Informatics	23	4	0	5	23	2	6
Water Equipment and Policy	17	1	4	4	8	6	13
Wheat Genetics	12	4	5	1	1	0	5
Wildfire Interdisciplinary Research Center	13	5	2	2	0	11	6
Wind Energy Science, Technology and Research	18	0	0	3	24	2	0
Wind Hazard and Infrastructure Performance	10	6	0	3	10	0	0
Wood-Based Composites	16	5	0	1	9	4	1
Grand Mean	15.64	2.36	2.19	2.36	13.28	4.86	6.58
Grand Sum	1251	189	175	189	1062	389	526

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Table 6: 2021-2022 CENTER DIRECTOR DESCRIPTOR

**Includes only primary center director*

Center Name	TIME ALLOCATION [17] Center Administration	Other Administration	Research	Teaching	Other
Accelerated Real Time Analytics	25	5	40	20	10
Advance the Science of Exploration to Reclamation in Min	25	10	40	25	0
Advanced Design and Man of Integrated Microfluidics	10	25	40	20	5
Advanced Electronics through Machine Learning	15	5	45	25	10
Advanced Forestry Systems	25	25	20	20	10
Advanced Knowledge Enablement	10	5	40	25	20
Advanced Mammalian Biomanufacturing Innovation Cente	20	0	50	30	0
Advanced Non-Ferrous Structural Alloys	15	15	40	20	10
Advanced Research in Drying	15	40	25	15	5
Advanced Research in Forensic Science	10	30	20	20	20
Alternative Sustainable and Intelligent Computing	30	5	35	25	5
Arthropod Management Technologies	30	10	60	0	0
Atomically Thin Multifunctional Coatings	10	10	40	20	20
Big Learning	8	0	42	40	10
Bioanalytic Metrology	10	10	55	15	10
Bioplastics and Biocomposites	10	23	32	22	13
Broadband Wireless Access and Applications	15	0	50	15	20
Building Energy Smart Technology	30	5	30	30	5
Building Reliable Advances and Innovation in Neurotechn	25	35	30	10	0
Ceramics Composites and Optical Materials Center	15	35	30	10	10
Cloud & Autonomic Computing	10	35	30	20	5
Composite and Hybrid Materials Interfacing	25	10	25	25	15
Computational Biotechnology and Genomic Medicine	15	5	30	20	30
Cybersecurity Analytics and Automation	10	10	75	0	5
Dielectrics and Piezoelectrics	15	15	50	18	2
Disruptive Muscoloskeletal Innovations	5	25	40	20	10
Efficient Vehicles and Sustainable Transportation System	15	5	50	25	5
Electromagnetic Compatibility	20	10	40	20	10
Electronic-Photonic Integrated Circuits for Aerospace	10	30	35	20	5
Embedded Systems	15	15	40	15	15
Energy Harvesting Materials and Systems	20	15	45	20	0
Energy-Smart Electronic Systems	10	50	35	0	5
Environmental Sustainability through Insect Farming	10	5	30	10	45
Fiber-Wireless Integration and Networking	25	25	25	10	15
Freeform Optics	30	5	40	20	5
Geomechanics and Mitigation of Geohazards	4	13	23	60	0
Grid-Connected Advanced Power Electronic Systems	15	35	30	10	10
Hardware and Embedded Systems Security and Trust	10	5	50	25	10
Health Organization Transformation	10	10	40	30	10
High Pressure Plasma Energy, Agriculture, and Biomedic	10	10	40	40	0
High-Frequency Electronics and Circuits for Communicati	40	0	30	20	10
Identification Technology Research	25	0	40	25	10
Infrastructure Trustworthiness in Energy Systems	3	87	10	0	0
Innovations in Structural Integrity Assurance	20	20	60	0	0
Integration of Composites into Infrastructure	13	6	45	30	6
iPerform - I/UCRC for Assistive Technologies to Enhance	10	30	40	20	0
Manufacturing and Materials Joining Innovation Center	15	20	45	15	5
Materials Data Science for Reliability and Degradation	15	10	35	35	5

** Report sorted Alphabetically by Center*

IUCRC Structure Database, FY 2021-2022

**Includes only primary center director*

Center Name	TIME ALLOCATION [17] Center Administration	Other Administration	Research	Teaching	Other
Membrane Science, Engineering & Technology Center	10	5	50	30	5
Metamaterials	10	30	35	15	10
Multi-functional Integrated System Technology	8	77	5	5	5
Novel High-Voltage/Temperature Materials and Structures	10	5	40	45	0
Particulate and Surfactant Systems	8	2	52	37	1
Pervasive Personalized Intelligence	30	10	30	20	10
Power Management Integration	17	5	33	40	5
Rational Catalyst Synthesis	30	10	30	20	10
Research in Storage Systems	15	20	25	30	10
Research toward Advancing Financial Technologies	30	10	0	20	40
Resource Recovery and Recycling	15	15	40	20	10
Robots and Sensors for the Human Well-being	15	15	60	0	10
Science Center for Marine Fisheries	35	5	45	10	5
Science of Heterogeneous Additive Printing of 3D Materia	15	7	40	30	8
Science, Management, Applications, Regulation, and Trai	10	0	45	25	20
Security and Software Engineering Research Center	20	0	20	40	20
Smart Vehicle Concepts	25	0	40	20	15
Solar Powered Future	20	15	35	30	0
Solid-State Green Electric Power Generation and Storage	20	20	30	20	10
Space, High-Performance, and Resilient Computing	20	40	25	15	0
Spatiotemporal Thinking, Computing and Application	20	10	40	20	10
Stream Healthcare In Place	40	10	40	0	10
Surveillance Research	5	50	25	20	0
Tire Research	15	10	55	20	0
Unmanned Aircraft Systems	15	15	30	30	10
Visual and Decision Informatics	25	5	35	20	15
Water Equipment and Policy	20	5	45	25	5
Wheat Genetics	10	10	60	10	10
Wildfire Interdisciplinary Research Center	45	15	20	10	10
Wind Energy Science, Technology and Research	25	40	20	10	5
Wind Hazard and Infrastructure Performance	25	5	0	0	70
Wood-Based Composites	5	10	50	30	5
Grand Mean	17.39	15.94	36.78	20.34	9.56

Table 7: 2021-2022 CENTER OUTCOMES

	STUDENTS RECEIVING DEGREE [18]			STUDENTS HIRED BY MEMBERS [19]			PROJECTS[20]	PUBLICATIONS[21]		
Center Name:	BS Grad	MS Grad	PhD Grad	BS Hired*	MS Hired*	PhD Hired*		w/ Ctr Research	w/ IAB Members	Present.
Accelerated Real Time Analytics	0	7	18	0	2	2	20	49	13	40
Advance the Science of Exploration to Re	2	3	2	0	0	0	17	30	19	26
Advanced Design and Man of Integrated	15	2	9	0	0	0	7	10	2	20
Advanced Electronics through Machine Le	0	0	0	0	0	0	7	23	5	33
Advanced Forestry Systems	7	12	6	4	3	2	22	46	12	87
Advanced Knowledge Enablement	7	6	3	13	3	1	7	8	4	14
Advanced Mammalian Biomanufacturing I	0	1	5	0	0	3	29	9	1	16
Advanced Non-Ferrous Structural Alloys	8	6	7	2	2	4	26	48	9	100
Advanced Research in Drying	1	1	1	0	0	0	12	6	0	17
Advanced Research in Forensic Science	7	4	4	0	0	1	11	9	2	69
Alternative Sustainable and Intelligent Co	0	1	8	0	0	0	11	31	10	26
Arthropod Management Technologies	1	0	1	0	0	0	10	12	0	7
Atomically Thin Multifunctional Coatings	1	2	10	0	0	0	8	1	0	24
Big Learning	0	0	1	0	0	1	12	34	12	23
Bioanalytic Metrology	1	2	19	0	0	4	20	10	1	33
Bioplastics and Biocomposites	10	4	8	4	0	3	11	8	1	7
Broadband Wireless Access and Applicati	4	3	7	3	3	3	11	22	8	19
Building Energy Smart Technology	0	0	0	0	0	0	7	0	0	0
Building Reliable Advances and Innovatio	1	0	3	0	0	0	0	12	2	10
Ceramics Composites and Optical Materia	3	2	0	0	1	0	12	5	3	19
Cloud & Autonomic Computing	4	14	4	1	2	0	9	20	5	22
Composite and Hybrid Materials Interfacin	1	1	0	0	0	0	7	1	0	3
Computational Biotechnology and Genomi	0	2	9	0	0	4	4	28	2	16
Cybersecurity Analytics and Automation	9	5	0	0	0	0	6	23	0	21
Dielectrics and Piezoelectrics	1	1	1	0	0	0	20	28	4	62
Disruptive Muscoloskeletal Innovations	0	2	2	0	0	0	14	0	0	9
Efficient Vehicles and Sustainable Transp	3	3	8	0	0	0	11	18	5	34
Electromagnetic Compatibility	3	4	9	5	1	4	10	66	27	36
Electronic-Photonic Integrated Circuits for	0	0	1	0	0	0	4	6	0	7
Embedded Systems	0	1	4	0	0	0	7	3	0	2
Energy Harvesting Materials and Systems	6	5	7	0	2	1	0	54	3	33
Energy-Smart Electronic Systems	7	10	8	0	1	5	11	38	24	35
Environmental Sustainability through Inse	0	0	0	0	0	0	5	1	1	14
Fiber-Wireless Integration and Networking	0	0	0	0	0	0	0	0	0	0
Freeform Optics	4	3	4	0	2	2	16	16	4	50
Geomechanics and Mitigation of Geohaza	0	0	4	0	0	0	7	12	6	38
Grid-Connected Advanced Power Electro	4	9	9	0	0	1	10	7	3	42
Hardware and Embedded Systems Securi	2	7	9	1	2	2	22	27	3	68
Health Organization Transformation	12	3	3	0	0	0	0	13	2	20
High Pressure Plasma Energy, Agriculture	1	2	4	0	0	0	7	12	1	22
High-Frequency Electronics and Circuits f	0	1	2	0	0	0	5	0	0	11
Identification Technology Research	11	9	12	0	1	0	20	50	1	63
Infrastructure Trustworthiness in Energy S	0	0	0	0	0	0	5	2	0	2
Innovations in Structural Integrity Assuran	0	0	0	0	0	0	5	0	0	10
Integration of Composites into Infrastructu	6	4	7	0	2	2	17	20	10	54
iPerform - I/UCRC for Assistive Technolo	2	1	4	3	0	0	2	7	1	3
Manufacturing and Materials Joining Inno	8	12	11	0	3	5	32	22	11	54

** Report sorted by Alphabetically by Center*
** See Table 8 for additional alumni career outcomes.*

IUCRC Structure Database, FY 2021-2022

	STUDENTS RECEIVING DEGREE[18]			STUDENTS HIRED BY MEMBERS[19]			PROJECTS[20]	PUBLICATIONS[21]		
Center Name:	BS Grad	MS Grad	PhD Grad	BS Hired*	MS Hired*	PhD Hired*		w/ Ctr Research	w/ IAB Members	Present.
Materials Data Science for Reliability and	2	0	0	0	0	0	4	4	0	10
Membrane Science, Engineering & Techn	2	0	8	0	0	2	14	27	16	28
Metamaterials	0	0	2	0	0	1	9	13	19	9
Multi-functional Integrated System Techno	1	0	2	0	0	0	9	12	2	6
Novel High-Voltage/Temperature Material	0	0	7	0	0	2	6	31	2	5
Particulate and Surfactant Systems	0	0	2	0	0	0	0	7	0	15
Pervasive Personalized Intelligence	0	6	0	0	0	0	6	6	1	7
Power Management Integration	0	1	2	0	0	1	12	7	0	13
Rational Catalyst Synthesis	3	0	10	0	0	1	11	14	2	24
Research in Storage Systems	0	0	3	0	0	0	11	7	0	11
Research toward Advancing Financial Tec	0	0	0	0	0	0	7	0	0	0
Resource Recovery and Recycling	0	1	3	0	0	1	6	7	0	21
Robots and Sensors for the Human Well-b	12	7	0	0	0	0	12	13	1	10
Science Center for Marine Fisheries	0	0	0	0	0	0	26	3	0	14
Science of Heterogeneous Additive Printin	0	0	2	0	0	0	10	5	0	11
Science, Management, Applications, Reg	1	0	0	0	0	0	7	4	4	8
Security and Software Engineering Resea	1	2	5	0	0	5	5	2	0	9
Smart Vehicle Concepts	3	2	6	0	1	0	15	42	3	45
Solar Powered Future	0	1	8	0	0	4	16	0	0	15
Solid-State Green Electric Power Generati	1	0	1	1	0	0	6	11	6	9
Space, High-Performance, and Resilient	19	10	6	6	5	3	5	32	5	15
Spatiotemporal Thinking, Computing and	5	2	2	1	1	1	11	30	9	34
Stream Healthcare In Place	2	5	4	0	0	0	11	53	2	76
Surveillance Research	0	1	1	0	0	0	1	6	0	5
Tire Research	1	2	1	1	0	1	13	6	0	0
Unmanned Aircraft Systems	7	8	7	0	1	2	18	15	2	11
Visual and Decision Informatics	3	13	13	3	0	0	8	50	1	30
Water Equipment and Policy	5	2	1	0	1	0	9	10	0	2
Wheat Genetics	4	0	2	0	0	1	8	2	0	4
Wildfire Interdisciplinary Research Center	0	0	0	0	0	0	6	0	0	0
Wind Energy Science, Technology and R	0	1	1	0	0	1	10	9	0	16
Wind Hazard and Infrastructure Performa	0	1	2	0	0	0	6	6	3	10
Wood-Based Composites	0	2	1	0	2	0	17	7	0	5
Grand Mean	2.80	2.78	4.20	0.60	0.51	0.95	10.39	16.10	3.69	22.49
Grand Sum	224	222	336	48	41	76	831	1288	295	1799

** Report sorted by Alphabetically by Center*
** See Table 8 for additional alumni career outcomes.*

Table 8: 2021-2022 ALUMNI CAREER OUTCOMES

Table 8a: Centers Reporting One or More Alumni Career Outcome Last Fiscal Year

Alumni Outcome	# of Centers	% of Centers
Hired by Industry Members	38	48%
Hired by Governmental Members	18	23%
Hired by Non-Member Industry	58	73%
Hired by Non-Member Governmental Agency	22	28%
Faculty Positions	18	23%
Postdoc Positions	32	40%
Continuing Education	47	59%
Unknown/Not Reported	0	0%

Table 8b: Total Number and Means of Alumni Career Outcomes Last Fiscal Year

Alumni Outcome	Total for All Centers	Mean for All Centers
Hired by Industry Members	133	1.66
Hired by Government Members	32	0.40
Hired by Non-Member Industry	363	4.54
Hired by Non-Member Governmental Agency	36	0.45
Faculty Positions	35	0.44
Postdoc Positions	64	0.80
Continuing Education	129	1.61
Unknown/Not Reported	0	0.00

Table 9: 2021-2022 INTELLECTUAL PROPERTY AND COMMERCIALIZATION EVENTS

Table 9a: Centers Reporting One or More Intellectual Property and Commercialization Event Last Fiscal Year

Intellectual Property Event	# of Centers	% of Centers
Invention Disclosures	28	35%
Patent Applications	29	36%
Patents Granted/Derived	17	21%
Licensing Agreements	11	14%
Royalties Realized	3	4%
Software Copyrights	3	4%
Spinoff Companies Formed	6	8%

Table 9b: Total Number and Means of Intellectual Property and Commercialization Events Last Fiscal Year

Intellectual Property Event	Total for All Centers	Mean for All Centers
Invention Disclosures	60	0.75
Patent Applications	75	0.94
Patents Granted/Derived	28	0.35
Licensing Agreements	18	0.23
Royalties Realized	7	0.09
Software Copyrights	8	0.10
Spinoff Companies Formed	8	0.10

APPENDIX

FOOTNOTES AND 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 includes only data on Centers which were actively funded or under a no cost extension in the NSF IUCRC Program during the 2020-2021 fiscal year.
3) On Table 1, “YEAR FUNDED” indicates the year NSF gave the center the operating grant under which it was originally established as an IUCRC.
4) On Table 2, “PROGRAM INCOME” refers to the total funding provided to the Center by the following sources: Member Fees,[6] and Additional Industry.[7]
5) On Table 2, “NSF/IUCRC” refers to the total funding provided by the IUCRC program, including operating grant, supplements, evaluator support, etc.
6) On Table 2, "MEMBER FEES" refers to the total funding collected by a center from membership fees, including MIPRs covering membership support.
7) On Table 2, "ADDITIONAL INDUSTRY" refers to additional member funding (e.g., enhancements, donations, etc.) which is applied to the Center as a whole (e.g., income that results in outcomes shared equally by all Center members). This includes additional support provided by members through MIPRs that is above and beyond the membership fee paid.
8) “OTHER NSF” refers to funding for the Center provided by other NSF groups o divisions. Neither of these categories includes money transferred through NSF from other Federal Agencies (MIPRs).
9) On Table 2, "STATE TOTAL" refers to the funding provided by state government and/or an agency or program funded by state government.
10) On Table 2, "OTHER FEDERAL AGENCY" refers to funding for the Center provided by other Federal funding sources, but does NOT include funding from NSF.
11) On Table 2, “OTHER NON-FEDERAL AGENCY” refers to funding for the Center provided by other non-Federal funding sources, foundations, etc.
12) On Table 3, “CAPITAL AND IN-KIND CONTRIBUTIONS” refers to in-kind donations, and capital support for items of value over $25,000 and includes equipment, facilities, personnel, and software.
13) On Table 3, "ADMIN. BUDGET (%)" refers to the estimated percentage of the primary site’s direct operating budget allocated to administration (e.g., administrative salaries, travel, telephone).
14) On Table 4, “LIFETIME MEMBERSHIPS” are calculated at the membership level, not the organization level. Lifetime “starting” is the sum of all original memberships. Lifetime “new” is the sum of all original memberships plus all reported new memberships. Lifetime “Left” is the sum of all terminated memberships. Members who leave and then rejoin a center are counted for every addition and every departure.
15) On Table 4, "FEES" are broken down into primary, secondary, and tertiary (the latter two may represent variable membership fees).
16) On Table 5, “FACULTY SCIENTISTS” includes the Center Director(s) and Faculty Researchers.
17) On Table 6, "TIME ALLOCATION" refers to percentage allocation of the primary site director's full-time equivalent for budgetary purposes.
18) On Table 7, “STUDENTS RECEIVING DEGREE” refers to the number of Center trained Ph.D./M.D.’s, M.S.’s, and B.A./B.S.’s that received a degree during the reporting period.
19) On Table 7, “STUDENTS HIRED BY MEMBERS” refers to the number of Ph.D./M.D.’s, M.S.’s, and B.A./B.S.’s that were hired by industry and government members during the reporting period. Additional alumni career outcomes are reported in Table 8.
20) On Table 7, “PROJECTS” refers to the number of research projects funded by a) IAB member fees, b) NSF IUCRC support, or c) any other support that would not have been obtained without the existence of the Center AND the results of which are shared with ALL center members. Does NOT include project that are not shared with all Center's members. Does NOT include projects carried out by Center affiliated researchers which are unrelated to the Center AND/OR the results of which are not shared with Center members.
21) On Table 7, “PUBLICATIONS” refers to the publications in the open literature the Center researchers produced based on Center research including publications reported that have a Center member as an author.

Additional Notes: Starting with FY2016 we are no longer capturing university contributions nor other cash support. Because we are no longer capturing these funding sources, the total funding for the center is not comparable to reports produced prior to FY2016.