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# Michigan Technological University

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**Federal Awards Supplemental Information**  
**June 30, 2023**

**Independent Auditor's Reports**

Report on Schedule of Expenditures of Federal Awards Required by the Uniform Guidance 1

Report on Internal Control Over Financial Reporting and on Compliance and Other Matters  
Based on an Audit of Financial Statements Performed in Accordance with *Government  
Auditing Standards* 2-3

Report on Compliance for Each Major Federal Program and Report on Internal Control Over  
Compliance Required by the Uniform Guidance 4-6

**Schedule of Expenditures of Federal Awards** 7-19

**Notes to Schedule of Expenditures of Federal Awards** 20

**Schedule of Findings and Questioned Costs** 21-22

Report on Schedule of Expenditures of Federal Awards Required by the Uniform Guidance

**Independent Auditor's Report**

To the Board of Trustees  
Michigan Technological University

We have audited the financial statements of Michigan Technological University (the "University"), a component unit of the State of Michigan, as of and for the year ended June 30, 2023 and the related notes to the financial statements, which collectively comprise the University's basic financial statements. We issued our report thereon dated October 5, 2023, which contained an unmodified opinion on the financial statements. Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the basic financial statements. We have not performed any procedures with respect to the audited financial statements subsequent to October 5, 2023.

The accompanying schedule of expenditures of federal awards is presented for the purpose of additional analysis, as required by the Uniform Guidance, and is not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

*Plante & Moran, PLLC*

March 13, 2024

Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

**Independent Auditor's Report**

To Management and the Board of Trustees  
Michigan Technological University

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of Michigan Technological University (the "University") as of and for the year ended June 30, 2023 and the related notes to the financial statements, which collectively comprise the University's basic financial statements, and have issued our report thereon dated October 5, 2023. The financial statements of Michigan Tech Fund, a blended component unit, were not audited in accordance with *Government Auditing Standards*.

**Report on Internal Control Over Financial Reporting**

In planning and performing our audit of the financial statements, we considered the University's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, we do not express an opinion on the effectiveness of the University's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the University's financial statements will not be prevented, or detected and corrected, on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified.

**Report on Compliance and Other Matters**

As part of obtaining reasonable assurance about whether the University's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

To Management and the Board of Trustees  
Michigan Technological University

**Purpose of this Report**

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the University's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the University's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

*Plante & Moran, PLLC*

October 5, 2023

Report on Compliance for Each Major Federal Program and Report on Internal Control Over Compliance  
Required by the Uniform Guidance

**Independent Auditor's Report**

To the Board of Trustees  
Michigan Technological University

**Report on Compliance for Each Major Federal Program**

***Opinion on Each Major Federal Program***

We have audited Michigan Technological University's (the "University"), a component unit of the State of Michigan, compliance with the types of compliance requirements identified as subject to audit in the U.S. Office of Management and Budget (OMB) *Compliance Supplement* that could have a direct and material effect on the University's major federal program for the year ended June 30, 2023. The University's major federal program is identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

In our opinion, the University complied, in all material respects, with the compliance requirements referred to above that could have a direct and material effect on the major federal program for the year ended June 30, 2023.

***Basis for Opinion on Each Major Federal Program***

We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America (GAAS); the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (the "Uniform Guidance"). Our responsibilities under those standards and the Uniform Guidance are further described in the *Auditor's Responsibilities for the Audit of Compliance* section of our report.

We are required to be independent of the University and to meet our other ethical responsibilities in accordance with relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on compliance for each major federal program. Our audit does not provide a legal determination of the University's compliance with the compliance requirements referred to above.

***Responsibilities of Management for Compliance***

Management is responsible for compliance with the requirements referred to above and for the design, implementation, and maintenance of effective internal control over compliance with the requirements of laws, statutes, regulations, rules, and provisions of contracts or grant agreements applicable to the University's federal program.

### ***Auditor's Responsibilities for the Audit of Compliance***

Our objectives are to obtain reasonable assurance about whether material noncompliance with the compliance requirements referred to above occurred, whether due to fraud or error, and express an opinion on the University's compliance based on our audit. Reasonable assurance is a high level of assurance but is not absolute assurance and, therefore, is not a guarantee that an audit conducted in accordance with GAAS, *Government Auditing Standards*, and the Uniform Guidance will always detect material noncompliance when it exists. The risk of not detecting material noncompliance resulting from fraud is higher than for that resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Noncompliance with the compliance requirements referred to above is considered material if there is a substantial likelihood that, individually or in the aggregate, it would influence the judgment made by a reasonable user of the report on compliance about the University's compliance with the requirements of each major federal program as a whole.

In performing an audit in accordance with GAAS, *Government Auditing Standards*, and the Uniform Guidance, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material noncompliance, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the University's compliance with the compliance requirements referred to above and performing such other procedures as we considered necessary in the circumstances.
- Obtain an understanding of the University's internal control over compliance relevant to the audit in order to design audit procedures that are appropriate in the circumstances and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control over compliance. Accordingly, no such opinion is expressed.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and any significant deficiencies and material weaknesses in internal control over compliance that we identified during the audit.

### **Report on Internal Control Over Compliance**

A deficiency in internal control over compliance exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A material weakness in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A significant deficiency in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the *Auditor's Responsibilities for the Audit of Compliance* section above and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies in internal control over compliance. Given these limitations, during our audit we did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses, as defined above. However, material weaknesses or significant deficiencies in internal control over compliance may exist that were not identified.

Our audit was not designed for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, no such opinion is expressed.

To the Board of Trustees  
Michigan Technological University

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

*Plante & Moran, PLLC*

March 13, 2024



Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Student Financial Assistance Cluster</b>					
<b>Department of Education</b>					
Federal Supplemental Educational Opportunity Grant	Direct	84.007	P007A222046	\$ -	\$ 243,577
Federal Work-Study Program	Direct	84.033	P033A222046	-	325,420
Federal Pell Grant Program	Direct	84.063	P063P220234	-	4,944,840
Federal Perkins Loan Program	Direct	84.038	N/A	-	4,077,300
Federal Direct Student Loans	Direct	84.268	P268K230234	-	24,490,551
Total Student Financial Assistance Cluster				-	34,081,688
<b>Research and Development Cluster</b>					
<b>U.S. Department of Agriculture</b>					
Agriculture and Food Research Initiative (AFRI)	Direct	10.310	2023-67022-39754	-	20,453
Agriculture and Food Research Initiative (AFRI)	Direct	10.310	2017-67013-26261	-	60,188
Agriculture and Food Research Initiative (AFRI)	Direct	10.310	2020-67023-31638	-	158,807
Agriculture and Food Research Initiative (AFRI)	Direct	10.310	2022-67014-37035	-	184,997
Passed through the Pennsylvania State University: Agriculture and Food Research Initiative (AFRI)	Pass-through	10.310	S002482-USDA	-	3,283
Passed through the Keweenaw Bay Ojibwa Community College: 1994 Institutions Research Program	Pass-through	10.227	2020-01-MTU	-	6,986
Passed through the Worcester Polytechnic Institute: International Agricultural Education Fellowship Program	Pass-through	10.619	11161-GR	-	94,323
Cooperative Forestry Research	Direct	10.202	NI2MSCFRXXXG027	-	247,437
Cooperative Forestry Research	Direct	10.202	NI23MSCFRXXXG004	-	178,282
Cooperative Forestry Research	Direct	10.202	NI21MSCFRXXXG022	-	44,109
Subtotal U.S. Department of Agriculture				-	998,865
<b>U.S. Department of Agriculture - Forest Service</b>					
Continuing KISMA priority invasive species control and outreach with partners and community	Direct	10.RD	22-PA-11090700-003	-	17,366
Applied Carbon Research and Management	Direct	10.RD	20-CR11242306-109	-	17,869
Estimating Upland Watersheds Risk to Increased Sediment, Ash and Nutrients Due to Wildfires in the Continental US	Direct	10.RD	20-JV-11221634-214	-	19,127
Long-term Effects of Hurricane Hugo and Prescribed Fire Management on Sustainability of Coastal Plain Forests	Direct	10.RD	21-JV-11330180-051	-	5,758
Analysis support and expert knowledge for scaling aggregated, object-based estimations of fuels, energy flux, and emissions	Direct	10.RD	21-CR-111221633-152	-	60,451
Forest management strategies in a changing world	Direct	10.RD	22-JV-11242307-069	-	6,809
Advancement of the Riparian Buffer Delineation Model and Its Utility Across a Variety of Ecosystems	Direct	10.RD	18-CS-1132422-306	-	5,293
Using UAS Based LIDAR to Map Archaeology Features	Direct	10.RD	19-PA-11091000-012	-	6,518
Demonstrate the Durability of Enhanced Domestic Hardwoods for U.S. Army Tactical Trailer Decking	Direct	10.RD	19-JV-11111133-064	-	64,238
Ottawa NF- Assessment of Stream Restoration to Inform Future Efforts to Maintain Coldwater Streams	Direct	10.RD	21-PA-11090700-002	-	(1,914)
Response of forest and peatland ecosystems to environmental change: new continuation	Direct	10.RD	22-JV-11242306-037	-	25,406
Geospatial Monitoring for Effective Peatland Management in Central Africa	Direct	10.RD	23-JV-11132762-079	-	25,938
WFES-FuelRX Collaboration	Direct	10.RD	23-CR-11261925-033	-	9,886
Passed through the Nevada System of Higher Education: FASMEE Science and Coordination	Pass-through	10.RD	GR16556	-	15,813
Cooperative Forestry Assistance	Direct	10.664	20-DG-11094200-008	-	24,549
Cooperative Forestry Assistance	Direct	10.664	19-DG-11420000-032	-	(51)
Wood Utilization Assistance	Direct	10.674	23-DG-11094200-251	-	32,778
Forest Health Protection	Direct	10.680	20-DG-11094200-241	-	57,568
Forest Health Protection	Direct	10.680	21-DG-11094200-063	-	23,708
International Forestry Programs	Direct	10.684	22-DG-11132762-346	-	86,979
Partnership Agreements	Direct	10.699	17-JV-11242306-044	-	(2,177)
Partnership Agreements	Direct	10.699	20-CS-11242306-096	-	217,692
Partnership Agreements	Direct	10.699	20-CS-11242306-119	-	92,120
Partnership Agreements	Direct	10.699	19-CR-11242306-025	-	110,385
Partnership Agreements	Direct	10.699	18-CR-11242306-072	-	88,977
Partnership Agreements	Direct	10.699	22-CS-11242308-035	-	50,339
Partnership Agreements	Direct	10.699	20-JV-11330180-087	-	22,463
Partnership Agreements	Direct	10.699	21-JV11242307-050	-	46,777
Partnership Agreements	Direct	10.699	21-JV-11242307-084	-	3,450
Infrastructure Investment and Job Act Joint Fire Science Program (Research & Development)	Direct	10.714	22-JV-11242313-089	-	24,747
Subtotal U.S. Department of Agriculture - Forest Service				-	1,158,862
Total U.S. Department of Agriculture				-	2,157,727
<b>U.S. Department of Commerce - National Institute for Standards and Technology</b>					
Measurement and Engineering Research and Standards	Direct	11.609	70NANB22H113	-	86,305
Science, Technology, Business and/or Education Outreach	Direct	11.620	70NANB21H037	68,897	78,419
Subtotal U.S. Department of Commerce - National Institute for Standards and Technology				68,897	164,724
<b>U.S. Department of Commerce - National Oceanic and Atmospheric Administration</b>					
Coastal Zone Management Estuarine Research Reserves	Direct	11.420	NA22NOS4200058	-	43,733
Climate and Atmospheric Research	Direct	11.431	NA22OAR4310213	-	14,718

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Passed through University of Michigan CIGLR SOAR Support	Pass-through	11.RD	ADVANCE ACCOUNT	\$ -	\$ 6,212
Passed through Mid-Atlantic Fishery Management Council 2023 Fishery-independent bottom longline survey of the mid-Atlantic golden tilefish stock	Pass-through	11.RD	Agreement signed 10/31/2022	-	36,362
Passed through Great Lakes Observing System: Integrated Ocean Observing System (IOOS)	Pass-through	11.012	IOOS098/YR3-NCCOS-01	-	18,275
Integrated Ocean Observing System (IOOS)	Pass-through	11.012	IOOS098/HFR-02	-	68,784
Integrated Ocean Observing System (IOOS)	Pass-through	11.012	Project No. IOOS098/YR3-NBN-21	-	22,869
Integrated Ocean Observing System (IOOS)	Pass-through	11.012	IOOS001/YR1-NBN-02	-	12,571
Integrated Ocean Observing System (IOOS)	Pass-through	11.012	IOOS098/YR2-NBN-11	-	48,796
Passed through Michigan Department of Environment, Great Lakes, and Energy: Coastal Zone Management Administration Awards	Pass-through	11.419	Project #: 2022-309-Toolkit Te	-	41,563
Coastal Zone Management Administration Awards	Pass-through	11.419	PROJECT #: 2023-309-TECHNICAL	-	9,304
Passed through Board of Supervisors of Louisiana State University Gulf Coast Ecosystem Restoration Science Observation, Monitoring, and Technology	Pass-through	11.451	SUBAWARD NO. PO-0000038194	-	38,376
Passed through Ohio State University Center for Sponsored Coastal Ocean Research_Coastal Ocean Program	Pass-through	11.478	PO#RF01495490/PROJECT #60061695	-	3,631
Passed through Regents of the University of Michigan Ocean Exploration	Pass-through	11.011	SUBK00014120	-	70,180
Sea Grant Support	Pass-through	11.417	SUBK00012244	-	29,820
Sea Grant Support	Pass-through	11.417	SUBK00012245	-	28,457
Sea Grant Support	Pass-through	11.417	SUBK00016477	-	86,378
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUBK00015596 PO# 3006671074	-	37,432
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUBAWARD NO. SUBK00015597	-	205,815
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	Subcontract No. SUBK00011367	-	91,758
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUBK00017717	-	4,674
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUBK00017652	-	110,117
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUNK00017907	-	11,002
Passed through University of Wisconsin-Madison National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	846K333	-	17,549
Weather and Air Quality Research	Pass-through	11.459	0000001819	-	10,944
Subtotal U.S. Department of Commerce - National Oceanic and Atmospheric Administration				-	1,069,320
Total U.S. Department of Commerce				68,897	1,234,044
<b>U.S. Department of Defense - U.S. Air Force</b>					
Experiments, Scenarios, CONOPS, and Prototype Engineering (ESCAPE)	Direct	12.RD	FA8750-16-C-0072	-	71,210
Multi-Scale Fusion & Allocation for Heterogeneous Sensing (MSFAHS)	Direct	12.RD	FA8750-21-C-1003	-	444,506
Air Force Defense Research Sciences Program	Direct	12.800	FA9550-17-1-0201	-	14,188
Air Force Defense Research Sciences Program	Direct	12.800	FA9550-20-1-0434	-	110,088
Passed through Applied Research Solutions, Inc Fusion of Observation, Intereence and Learning (FOIL)	Pass-through	12.RD	SUB CON NO. S00016/PO S00016	-	84,073
Passed through ARCTOS Technology Solutions, LLC Aerospace Propulsion Outreach: Electrical Power Generation	Pass-through	12.RD	ARCTOS Subcontract Agmt PO ID	-	12,746
Passed through Information Systems Laboratories Cognitive Fully-Adaptive Radar (CoFAR) Scheduler	Pass-through	12.RD	Subcontract 10063; PO 2200011	-	140,040
Passed through Pennsylvania State University Air Force Defense Research Sciences Program	Pass-through	12.800	Sub No. S001884-AFOSR	-	116,157
Passed through Karax LLC Degradation-induced Performance Loss in composites: Modeling damage accumulation through concurrent Environmental and Mechanical loads	Pass-through	12.RD	Research Agreement	-	30,069
Passed through Booz-Allen-Hamilton Research, Analysis and Development for Advanced Signal Processing of a CDO Environment	Pass-through	12.RD	Sub #S903841BAH: Prime #FA8075	-	409,684
RAZOR	Pass-through	12.RD	IDIQ SubcontractA33024/P111850	-	151,490
Passed through Lincoln Labs MIT MITLL Ice Experiments Field Support	Pass-through	12.RD	PO #7000570552	-	16,580
Passed through Endectra, LLC Multifunctional Integrated Cargo Pocket UAS Phase II	Pass-through	12.RD	MTU AGREEMENT #2005006	-	51,264

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Passed through Leidos Inc.					
PRIDE (Passive Radio Frequency Identification Environment)	Pass-through	12.RD	P010189654 / FA8650-16-C-1732	\$ -	\$ 2,582
Passed through Northrop Grumman					
PRECISE	Pass-through	12.RD	PO #5300003528	-	48,014
Passed through MTRI Inc.					
Sub-Wavelength All Motions Information (SWAMI)	Pass-through	12.RD	MTU Agreement #2206023	-	12,395
Passed through Research Associates of Syracuse, Inc					
Complex Emitter Behavioral Analysis Using Machine Learning	Pass-through	12.RD	MTU Agreement #2206019	-	33,851
Passed through Soar Technology, Inc.					
Rapid Data and Sensor Fusion for Collaborative Automated Target Acquisition	Pass-through	12.RD	PO-0000181:FA86512- ID 10535	-	31,563
Passed through Utah State University Research Foundation					
Auris: A Cubesat to Characterize and Locate Geostationary Communications Emitters	Pass-through	12.RD	CP0053711	-	13,247
Auris nanosatellite development Phase B	Pass-through	12.RD	CP0072013	-	180,226
Subtotal U.S. Department of Defense - U.S. Air Force				-	1,973,953
<b>U.S. Department of Defense - U.S. Army</b>					
Basic Scientific Research	Direct	12.431	W911NF-22-2-0066	-	43,132
Robotic Platform Soil and Terrain Characterization for Close to Real Time GO/NOGO Maps	Direct	12.RD	W9132T21C0016	-	85,378
Development of a Diesel Electric Hybrid HMMWV Demonstration Platform with Power Sharing	Direct	12.RD	W50RAJ2290011	780,289	1,728,045
OPFOR Hierarchical AI for Field Exercises and Training	Direct	12.RD	W912CG-21-C-0016	-	324,673
MPVs Product Improvements	Direct	12.RD	W56HZV-19-C-0053 WD09	-	208,329
Defense Mobility System	Direct	12.RD	W56HZV-19-C-0053 WD 016	11,734	11,734
MAPS Integration	Direct	12.RD	W56HZV-19-C-0053	-	691,980
CASSINO	Direct	12.RD	W56HZV-19-C-0053 WD 018	-	360,931
Sensors for Adaptive Armor	Direct	12.RD	W56HZV-19-C-0053 WD 023	206,557	210,238
EHP Roller Technical Manual	Direct	12.RD	W56HZV-19-C-0053 WD 025	-	61,870
M1E1 Track Loads Phase 4	Direct	12.RD	W56HZV-19-C-0053 WD 027	85,519	85,519
ONR PAM	Direct	12.RD	W56HZV-19-C-0053 WD 028	358,917	526,330
Water Bison	Direct	12.RD	W56HZV-19-C-0053 WD 032	-	357,263
Robotic Live Fire Test Stand	Direct	12.RD	W56HZV-19-C-0053 WD 033	-	172,758
Wear Plate & Center Guide Testing	Direct	12.RD	W56HZV-19-C-0053 WD 034	-	59,241
Sensors for Adaptive Armor	Direct	12.RD	W56HZV-19-C-0053 WD 035	372,484	413,987
Bevometer	Direct	12.RD	W56HZV-19-C-0053 WD 036	-	37,285
EHP Roller Software	Direct	12.RD	W56HZV-19-C-0053 WD 037	-	144,068
Stryker APU	Direct	12.RD	W56HZV-19-C-0053 WD 039	-	78,739
PDM HTV SUPPORT	Direct	12.RD	W56HZV-19-C-0053 WD 040	-	218,692
EHP Roller PCB	Direct	12.RD	W56HZV-19-C-0053 WD 041	-	145,559
CRREL Winter Testing	Direct	12.RD	W56HZV-19-C-0053 WD 042	-	110,787
M172A2 25T STL8 RAM TEST	Direct	12.RD	W56HZV-19-C-0053 WD 043	-	288,505
Camera Integration	Direct	12.RD	W56HZV-19-C-0053 WD 044	-	68,830
Multi-Threat Radar Installations & Characterization (MTRIC)	Direct	12.RD	W56HZV-19-C-0053 WD 045	-	33,490
Robotic Platform Soil and Terrain Characterization for Close to Real Time GO/NOGO Maps	Direct	12.RD	W9132T21C0016	-	139,463
SAR Signature Management	Direct	12.RD	W912HZ23C0022	-	1,646
Passed through SOSSEC, Incorporated					
Modeling and Algorithm Development for Adaptive Adversarial AI for Complex Autonomy	Pass-through	12.RD	ERDC-MECI-PLA-0003	-	136,289
Passed through University of California at San Diego					
Deployment and Recovery of Experimental Buoy - 2022	Pass-through	12.RD	Univ Calif PUR00416739	-	4,929
Passed through Fibertek					
DO 91, Detection and Classification Algorithm for UAV Radar	Pass-through	12.RD	Agreement NO. 8237390801	-	278,903
DO 91, Detection and Classification Algorithm for UAV Radar	Pass-through	12.RD	AGREEMENT NO 821739018	-	88,222
Passed through Helios Remote Sensing Systems					
Soldier-borne Radar Detector - Phase II	Pass-through	12.RD	Subcontract No. 1335-S01-HRSSI	-	170,930
Passed through Great Lakes Sound & Vibration Inc					
GLSV Test Course October 2022	Pass-through	12.RD	Michigan Tech Test Course Lice	-	6,000
Passed through Stevens Institute of Technology					
ENTERPRISE: SERC Aural Signal Analytics Library	Pass-through	12.RD	2103140-01 Prime HQ003419D0003	-	461
Passed through National Center for the Advancement of STEM Education					
ENTERPRISE: Robot Leader Follower Phase 2	Pass-through	12.RD	GRANT W15QKN-20-1-1000	-	(4,071)
ENTERPRISE: Real Time Strategy Game for Military Commanders Phase 2 and Investigation of VR/AR/XR Technology Applied with Eye and Hand Interaction	Pass-through	12.RD	Agreement # P0001/Grant W15QKN	-	5,006
Passed through Regents of the University of Michigan					
Research and Technology Development	Pass-through	12.910	SUBK00017449	-	33,339
Research and Technology Development	Pass-through	12.910	SUBK00011314 PO#3005489743	-	1,623
Passed through Ideal Innovations, Inc. (I3)					
Real-time Radio-Frequency Characterization of Unmanned Airborne Systems	Pass-through	12.RD	SUBCONTRACT AGMT 18F0117-MI	-	62,589
Passed through Globe Tech, LLC					
Circuit Board Repair, Inspection and Testing	Pass-through	12.RD	MTU CO #2212032P23-1 and Globe	-	2,446
Passed through MTRI Inc.					
Online and Offline Terrain Strength Estimation Using Remote Sensing for Ground Vehicle Mobility Planning	Pass-through	12.RD	MTU Agreement 2110030	-	48,201

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Passed through Delta Capital Research LLC				\$ -	\$ 37,488
Delta Bushing Insertions and Track Build	Pass-through	12.RD	MTU Confirming Order #2211068		
Subtotal U.S. Department of Defense - U.S. Army				1,815,500	7,480,827
<b>U.S. Department of Defense - U.S. Navy</b>					
Basic and Applied Scientific Research	Direct	12.300	N00174-19-1-0004	-	23,511
Basic and Applied Scientific Research	Direct	12.300	N00014-21-1-2877	-	293,130
Basic and Applied Scientific Research	Direct	12.300	N00014-20-1-2230	-	177,282
Autonomous Vehicle Piloting Support	Direct	12.RD	Purchase Order #JM4522137005	-	9,813
CR-02: Robust Algorithms for Complex Autonomous Robot Systems	Direct	12.RD	N00174-23-1-0003	-	10,423
Passed through Helios Remote Sensing Systems					
Long-Range Passive Surveillance in Anti-Access/Area-Denial Environments	Pass-through	12.RD	Subcontract No. 1340-S01-HRSSI	-	43,000
Passed through Soar Technology, Inc.					
Resilient Autonomous Subsystems for Unmanned Air Systems (UAS)	Pass-through	12.RD	SC-21-04-10487	-	86,760
Passed through LIFT Technology					
Michigan Tech Capabilities to Support LIFT's Hypersonic Thermal Research and Material Acceleration-Metallics	Pass-through	12.RD	LIFT Subaward Agreement C1006	-	70,609
Michigan Tech Capabilities to Support LIFT's Hypersonic Thermal Research and Material Acceleration-Metallics	Pass-through	12.RD	LIFT Subaward C2007 Phase 2	-	6,409
Passed through Applied Research in Acoustics LLC (ARIA)					
Redesign and Implementation of USDA Proxy Language-Phase II	Pass-through	12.RD	MTU#2102054	-	103,122
Passed through Advanced Technology & Research Corporation					
Ship Vibration Mitigation for Additive Manufacturing Equipment: Phase 2	Pass-through	12.RD	ATR-22-S-103019-01 N68335-22-C	-	40,708
Ship Vibration Mitigation for Additive Manufacturing Equipment: Phase 2	Pass-through	12.RD	ADVANCE ACCOUNT	-	133,487
Subtotal U.S. Department of Defense - U.S. Navy				-	998,254
<b>U.S. Department of Defense - Defense Advance Research Project</b>					
Structure Situational Awareness for Swarms (SSAS)	Direct	12.RD	HR001119C0117	-	(559)
Research and Technology Development	Direct	12.910	HR0011-20-2-0033	479,172	1,774,229
Hierarchical Adversarial Response Machine (HARM)	Direct	12.RD	HR00112090113	-	53,570
Passed through BeeHex, LLC					
Renewable 3D Food Fabrication System	Pass-through	12.RD	MTU Agreement #2202017	-	73,091
Passed through Centauri					
Moving Target Recognition	Pass-through	12.RD	SUB NTG0002644	-	1,906,572
Passed through Signature Research Inc					
Fiddler - Rapid SAR Signature Generation (RSSG)	Pass-through	12.RD	MTU Agreement #2204063	-	142,206
Passed through Leidos, Inc.					
Providence TA-2	Pass-through	12.RD	Subcontract No. P010244078	-	462,118
Passed through BAE Systems					
Toadstool	Pass-through	12.RD	BAE System Subcontract#1179564	-	49,678
Passed through Moire Incorporated					
Topology-Agnostic Resource Management and Control (TARMAC)	Pass-through	12.RD	MTU #2109080	-	56,055
Passed through Soar Technology, Inc.					
URBAN RECONNAISSANCE THROUGH SUPERVISED AUTONOMY (RUSA) PROGRAM - PHASE 2	Pass-through	12.RD	SUBCONTRACT NUMBER: SC-20-030	-	26,011
Subtotal U.S. Department of Defense - Defense Advance Research Project				479,172	4,542,971
<b>U.S. Department of Defense</b>					
Automated Bathymetry Generation and Algorithm	Direct	12.RD	HM157520P0058	-	12,959
Passed through American Foundry Society Inc					
Integration of ICME Tools in Casting Design and Process					
Optimization for Intelligent Manufacturing	Pass-through	12.RD	AFS; Prime #SP4701-17-D-1134	-	19,151
Passed through NextGen Federal Systems, LLC					
Mesosphere Observation Mission for Beacon Optimization (MOMBO)	Pass-through	12.RD	MOMBO-FFP-MTU-09142022	-	32,973
Passed through Soar Technology, Inc.					
RL-ICE PHII	Pass-through	12.RD	SC-21-001-10458	-	56,475
Localization through Optimized Coordination of Unmanned Sensor Teams for RAIDER (LOCUST-R)	Pass-through	12.RD	SC-21-009-10494	-	166,187
RL-ICE PHII Expansion	Pass-through	12.RD	SOARTECH #PO-0000211; ID#10543	-	250
Passed through LIFT Technology					
Design and construction of a pilot-scale powder atomization system to support ICME design of high performance alloys for laser-powder bed fusion	Pass-through	12.RD	MTU Agreement 2111034:PO #2022	-	30,196
Machining Samples	Pass-through	12.RD	MTU SO 2211033:PO 2022-378;Pri	-	13,461
Passed through Etegent Technologies Ltd.					
Algorithm Performance Evaluation with Low Sample Size	Pass-through	12.RD	SUBCONTRACT NO. ETE.21.012.01	-	18,309
Synthetic Aperture Radar (SAR) Image Generation Data Augmentation (SIGDA)	Pass-through	12.RD	Subcontract No. ETE.22.011.01	-	44,951
Passed through Leidos, Inc.:					
Highgarden	Pass-through	12.RD	Leidos P010276396/Prime 22-C-8	-	249,568
Ridgeback TO2	Pass-through	12.RD	PO10278283	-	48,331
Cardinal	Pass-through	12.RD	P010279506; Prime 22-C-8317	-	221,278
IVY	Pass-through	12.RD	P010252458; PRIME 21-C-2001	-	324,119
SPARTA	Pass-through	12.RD	Subcontract No:PO10276452	-	1,269,413
Impaler	Pass-through	12.RD	P010280109	-	313,254

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Passed through Signature Research Inc					
Algorithms for Look-Down Infrared Target Exploitation-Phase II	Pass-through	12.RD	PO#01-383-02S1	\$ -	\$ 6
Information Theory Approaches for Machine Learning Algorithm Performance					
Assessment with Limited Testing Data	Pass-through	12.RD	PO#01-417-01S1 HM0476-21-C-003	-	247
SRI 6/5/23 Test Course Project	Pass-through	12.RD	MTU Test Course License	-	3,413
Passed through Stevens Institute of Technology:					
ENTERPRISE: 2019 AFRL 01 Cooling Aid for Maintainers in Protective Gear	Pass-through	12.RD	Subcontract #2102964-01	-	1,108
STUDENT DESIGN: Dry Combat Submersible Fatigue/Stress Management	Pass-through	12.RD	2103339-01/Prime HQ003419D0003	-	5,000
ENTERPRISE: Dry Combat Submersible Atmospheric Monitoring Conditioning, and Purification	Pass-through	12.RD	2102140-02 Prime HQ003419D0003	-	40
ENTERPRISE: Dry Combat Submersible Atmospheric Monitoring, Conditioning, and Purification Phase 2	Pass-through	12.RD	2103339-02/HQ003419D0003	-	2,478
ENTERPRISE: Dry Combat Submersible Salinity Specific Configuration Phase 2	Pass-through	12.RD	2103339-04/HQ003419D0003	-	5,000
Student Design: USASOC 05 Body Mounted Sensors	Pass-through	12.RD	2103339-22/Prime HQ003419D0003	-	5,000
Student Design: USASOC 03 Drone Video to Cell Tower	Pass-through	12.RD	Subcontract # 2103339-21/Prime	-	4,714
Subtotal U.S. Department of Defense				-	2,847,881
<b>U.S. Department of Defense - Defense Threat Reduction</b>					
Passed through MTRI Inc.					
Heterogeneous O7W? Learning System (HOWLS)	Pass-through	12.RD	MTU#2106030	-	23,288
TARgeting Distributed Sensors for Situational Surveillance (TARDIS3)	Pass-through	12.RD	MTU Agreement #2209070	-	1,198
Subtotal U.S. Department of Defense - Defense Threat Reduction				-	24,486
<b>U.S. Department of Defense - Missile Defense</b>					
Passed through Applied Research in Acoustics LLC (ARiA)					
Phase II STTR: MDA20-T002 Non-Real-Time Hardware-Assisted on Computer-System Simulation	Pass-through	12.RD	MTU Agreement #2112046	-	212,996
Total U.S. Department of Defense				2,294,672	18,081,368
<b>U.S. Department of Housing and Urban Development</b>					
Healthy Homes Technical Studies Grants					
Healthy Homes Technical Studies Grants	Direct	14,906	MILTS0007-17 AMEND NO. 1	15,847	15,999
Healthy Homes Technical Studies Grants	Direct	14,906	MILTS0023-21	128,022	247,883
Total U.S. Department of Housing and Urban Development				143,869	263,882
<b>U.S. Department of Interior</b>					
Passed through Keweenaw Bay Indian Community					
Study on Stream Temperature Controls at Menge Creek, Falls River, and Silver River Catchments	Pass-through	15.RD	Tier II Services Agreement	-	33,497
Assessment of risk from cumulative toxicity of chemical contaminants in Lake Superior fish to Keweenaw Bay Indian Community	Pass-through	15.RD	SERVICES AGREEMENT#2102002	-	99,371
Passed through Navajo Technical University					
Science and Technology Projects Related to Coal Mining and Reclamation	Pass-through	15.255	NTU-32351-21	-	9,945
Subtotal U.S. Department of Interior				-	142,813
<b>U.S. Department of Interior - Bureau of Indian Affairs</b>					
Tribal Climate Resilience					
Passed through Keweenaw Bay Indian Community					
Climate Resiliency Plan and amendment of the Integrated Resource Management Plan	Pass-through	15.RD	KBIC SERVICES AGRMNT #2101026	-	10,664
Methyl Mercury Source and Availability in the Torch Lake Watershed	Pass-through	15.RD	KBIC SERVICES AGMT FR #2001056	-	38,381
Subtotal U.S. Department of Interior - Bureau of Indian Affairs				-	48,447
<b>U.S. Department of Interior - Fish &amp; Wildlife Service</b>					
Cooperative Landscape Conservation					
Passed through Michigan Department of Natural Resources					
Wildlife Restoration and Basic Hunter Education	Pass-through	15.611	MOA_MTU_CKMR	-	47,865
Subtotal U.S. Department of Interior - Fish & Wildlife Service				-	93,512
<b>U.S. Department of Interior - U.S. Geological Survey</b>					
U.S. Geological Survey_ Research and Data Collection					
U.S. Geological Survey_ Research and Data Collection	Direct	15.808	G21AC10141-00	-	128,624
U.S. Geological Survey_ Research and Data Collection	Direct	15.808	G21AC10745-00	20,000	134,426
U.S. Geological Survey_ Research and Data Collection	Direct	15.808	G18AC00365	-	21,817
National Cooperative Geologic Mapping Program	Direct	15.810	G21AC10681-00	-	23,571
U.S. Geological Survey Research and Data Collection	Direct	15.808	G22AC00436-00	-	365,653
Passed through AmericaView:					
National Land Remote Sensing Education Outreach and Research	Pass-through	15.815	AV18-MI-01	-	21,366
Passed through Western Michigan University					
Earth Mapping Resources Initiative	Pass-through	15.073	Subaward No. 11469	-	582
U.S. Geological Survey_ Research and Data Collection	Pass-through	15.808	SUBAWARD #10471	-	21,657
Subtotal U.S. Department of Interior - U.S. Geological Survey				20,000	717,696
<b>U.S. Department of Interior - National Park Service</b>					
Monitoring Genetic Health of Isle Royale Wolves					
Monitoring Genetic Health of Isle Royale Wolves	Direct	15.RD	MTU CO#1909093	-	16,960
Monitoring Genetic Health of Isle Royale Wolves	Direct	15.RD	MTU CO #1909093P3	-	18,449
Cooperative Research and Training Programs – Resources of the National Park System					
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P16AC01398	-	(1,262)

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P18AC00178	\$ -	\$ (798)
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P19AC00286	-	52,846
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P20AC00377	-	29,733
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P21AC11836-00	-	80,940
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P22AC00193-01	-	35,522
Passed through Grand Portage Band of Lake Superior Chippewa Long-term water quality conditions in sentinel streams at Isle Royale National Park and Grand Portage National Monument	Pass-through	15.RD	Confirming Order #2207015	-	10,126
Subtotal U.S. Department of Interior - National Park Service				-	242,516
Total U.S. Department of Interior				20,000	1,244,984
<b>U.S. Department of Labor</b>					
Occupational Safety and Health_Susan Harwood Training Grants	Direct	17.502	SH-37201-21-60-F-26	19,939	38,237
<b>U.S. Department of Transportation</b>					
Passed through Genex Systems					
Real-Time Monitoring and Modeling of Scour - Phase II	Pass-through	20.RD	469-SB RDOTPH2-20FH3-1	-	183,952
<b>U.S. Department of Transportation - Federal Aviation</b>					
Passed through Iowa State University					
Small Unmanned Aircraft System (sUAS) for Pavement Inspection	Pass-through	20.RD	Award # 023139B	-	33,754
<b>U.S. Department of Transportation - Federal Highway</b>					
Autonomous Winter Road Maintenance Decision Making Enabled by Boosting Existing Transportation Data Infrastructure with Deep and Reinforcement Learning	Direct	20.RD	693JJ320C000022	-	228,099
Passed through Michigan Dept of Transportation					
Metropolitan Transportation Planning and State and Non-Metropolitan Planning and Research	Pass-through	20.505	Contract No. 2019-0311 Auth Z3	-	211,713
Metropolitan Transportation Planning and State and Non-Metropolitan Planning and Research	Pass-through	20.505	Contract No. 2019-0311, Aut Z1	378	377
Metropolitan Transportation Planning and State and Non-Metropolitan Planning and Research	Pass-through	20.505	2019-0311, Z2/ JN 211062NI	-	88,778
Subtotal U.S. Department of Transportation - Federal Highway				378	528,967
<b>U.S. Department of Transportation - Federal Railroad</b>					
Effect of In-Vehicle Auditory Alerts on Driver	Direct	20.RD	693JJ618C000027	23,390	28,905
Developing Safe and Efficient Driving and Routing Strategies at Railroad Grade Crossings Based on Highway-Railway Connectivity	Direct	20.RD	693JJ6-19-C-000022	-	99,572
An Integrated and Automated Decision Support System for Ground Hazard Risk Mitigation for Railway using Remote Sensing and Traditional Condition Monitoring Data	Direct	20.RD	693JJ631C000004	20,420	236,021
Wire Arc Additive Manufacturing (WAAM) for Weld Enhanced Cast Steel Coupler Knuckles	Direct	20.RD	Contract No. 693JJ622C000001	-	90,090
Expanding Summer Youth Programs in Rail through Virtual Learning and a National Campus Network	Direct	20.RD	693JJ621C000014	89,633	182,514
A Risk Informed Decision-making Framework for Coastal Railroad System Subjected to Storm Hazards and Sea Level Rise	Direct	20.RD	693JJ622C000006	4,117	89,970
Railroad Track Maintenance Life-Cycle Assessment (LCA) Development; Framework, Data, Tools, and Implications for Multi-Modal Transport Decisions	Direct	20.RD	693JJ622C000005	35,127	134,441
Passed through American Short Line and Regional Railroad Association					
Evaluation of Non-Traditional Methods of Reducing Emission in Short Line Railroad Operations	Pass-through	20.RD	MTU Agreement #2110003	-	78,594
Passed through Virginia Polytechnic Institute and State University					
Multi-Site Simulation to Examine Driver Behavior Impact of Integrated Rail Crossing Violation Warning (RCVW) and In-Vehicle Auditory/Visual Alert (IVAA) System	Pass-through	20.RD	ADV ACCT	-	49,358
Subtotal U.S. Department of Transportation - Federal Railroad				172,687	989,465
<b>U.S. Department of Transportation - National Highway Traffic Safety</b>					
Passed through The American Center for Mobility					
Automatic Shut-Off Study on Vehicles Equipped with Keyless Start	Pass-through	20.RD	2022ACM000001	-	94,689
Passed through Regents of the University of Michigan					
Development of Test Methods for Vehicle Localization Systems	Pass-through	20.RD	SUBK00017584	-	38,240
Subtotal U.S. Department of Transportation - National Highway Traffic Safety				-	132,929
Total U.S. Department of Transportation				173,065	1,869,067
<b>National Aeronautics and Space Administration</b>					
Exploring CV19 Impacts on Great Lakes Water Quality	Direct	43.RD	80NSSC20P2097	-	59,766
Science	Direct	43.001	80NSSC17K0287	-	32,820
Science	Direct	43.001	80NSSC19M0107SUP#P00001	119,296	192,862
Science	Direct	43.001	80NSSC20K0983	-	91,861

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Science	Direct	43.001	80NSSC20K1480	\$ -	\$ 120,045
Science	Direct	43.001	80NSSC20M022	108,768	285,504
Science	Direct	43.001	80NSSC20K1773	291,782	323,678
Science	Direct	43.001	80NSSC21K0174	-	24,368
Science	Direct	43.001	80NSSC20K0679	-	23,087
Space Technology	Direct	43.012	NNX17AJ32G	1,942,070	2,531,157
Space Technology	Direct	43.012	80NSSC21K0769	157,753	754,381
Space Technology	Direct	43.012	80NSSC21K1699	-	43,935
Science	Direct	43.001	80NSSC21K1162	-	70,354
Science	Direct	43.001	NNX16AN09G	6,414	(34,939)
Science	Direct	43.001	80NSSC19M0108 SUPPLEMENT #P003	-	209,600
Science	Direct	43.001	80NSSC19K0771	-	152,779
Science	Direct	43.001	80NSSC22K1268	-	72,545
Science	Direct	43.001	80NSSC22K1716	-	43,334
Science	Direct	43.001	80NSSC22K0504	-	13,230
Science	Direct	43.001	80NSSC22K1871	-	38,097
Science	Direct	43.001	80NSSC22K1234	-	87,649
Science	Direct	43.001	80NSSC22K1248 MOD 0001	-	91,497
Science	Direct	43.001	80NSSC22K1665	-	9,071
Science	Direct	43.001	80NSSC23K0720	-	4,229
Passed through Arizona State University:					
STUDENT DESIGN: Landing System for Uncertain Terrain	Pass-through	43.RD	NASA PRIME NNM16AA09C	-	(1)
STUDENT DESIGN: Robotic Explorer for Hypothesized Surfaces	Pass-through	43.RD	NASA PRIME NNM16ZZ09C	-	(1)
Passed through Honeybee Robotics					
RedWater: Extraction of Water from Mars' Ice Deposits	Pass-through	43.RD	Prime 80HQTR19C0017	-	9,389
Passed through Jet Propulsion Laboratory					
SMAPVEX21 Planning and Vegetation Sampling Supplement	Pass-through	43.RD	Subcontract No. 1662109	-	13,867
Passed through Grand Valley State University					
Science	Pass-through	43.001	Subaward No. 214005-MTU-01	-	29,439
Passed through Trans Astronautica Corporation					
NIAC Phase 2: Lunar Polar Mining Outpost	Pass-through	43.RD	CO #2001052	-	7,669
Passed through Purdue University					
Science	Pass-through	43.001	Subaward No. 12000414-017	-	71,146
Passed through University of Central Florida					
Exploration	Pass-through	43.003	GR102569	-	27,662
Passed through University of Maryland College Park:					
Science	Pass-through	43.001	53894-Z6044201	-	977
Passed through University Corporation for Atmospheric Research					
Science	Pass-through	43.001	SUBAWD002090/P2010817	-	56,009
Passed through Texas State University					
Office of Stem Engagement (OSTEM)	Pass-through	43.008	22008-83824-2	-	70,890
Passed through University of Michigan:					
Office of Stem Engagement (OSTEM)	Pass-through	43.008	SUBK00015391 PO#3006462575	-	335
Office of Stem Engagement (OSTEM)	Pass-through	43.008	SUBK00011994	-	5,080
Passed through Cleveland State University					
CSU Science Vessel Support	Pass-through	43.RD	MTUSO#2207026;CSUPO#1000179727	-	1,186
Passed through MTRI Inc.					
Tool for Autonomous Terrain Exploration of Remote Spaces	Pass-through	43.RD	Agreement #2203011	-	48,111
Passed through Lunar Outpost					
Design and Implementation Tools for Lunar Surface Regolith Structure Construction	Pass-through	43.RD	SUB_MTU-LO_NASASTTRPHI	-	49,181
Passed through Colorado School of Mines					
Space Technology	Pass-through	43.012	Subaward No. 402157-5802	-	102,703
Total National Aeronautics and Space Administration				2,626,083	5,734,552
<b>National Endowment for the Humanities</b>					
Promotion of the Humanities_Office of Digital Humanities					
Passed through Wayne State University	Direct	45.169	HAA-271717-20	-	6,682
Promotion of the Humanities_Division of Preservation and Access					
Passed through Wayne State University	Pass-through	45.149	Subaward No. WSU22120	-	34,578
Total National Endowment for the Humanities				-	41,260
<b>National Science Foundation</b>					
Intergovernmental Personnel Act Assignment for Jacqueline Hinton					
- Year 1 of up to 4 Total Years	Direct	47.RD	2233713	-	299,747
Engineering Grants	Direct	47.041	1639342	52,414	141,333
Engineering Grants	Direct	47.041	1709991	-	9,278
Engineering Grants	Direct	47.041	1818906	-	(2,841)
Engineering Grants	Direct	47.041	1807552	-	2,945
Engineering Grants	Direct	47.041	1827364	23,589	53,939
Engineering Grants	Direct	47.041	1846795	-	70,970
Engineering Grants	Direct	47.041	1918585	-	4,207
Engineering Grants	Direct	47.041	1920013	-	77,569
Engineering Grants	Direct	47.041	2015919	-	41,225
Engineering Grants	Direct	47.041	2025449	-	141,029
Engineering Grants	Direct	47.041	2024970	-	81,387
Engineering Grants	Direct	47.041	2105887	-	1,217

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Engineering Grants	Direct	47.041	2050739	\$ -	\$ 122,170
Engineering Grants	Direct	47.041	2119019	-	93,804
Engineering Grants	Direct	47.041	2129093	-	25,023
Engineering Grants	Direct	47.041	2143608	-	(1,340)
Engineering Grants	Direct	47.041	2138522	-	36,610
Engineering Grants	Direct	47.041	2138523	-	41,515
Engineering Grants	Direct	47.041	2220856	-	22,014
Engineering Grants	Direct	47.041	2224418	-	20,589
Engineering Grants	Direct	47.041	2239080	-	43,623
Engineering Grants	Direct	47.041	2212324	-	34,003
Engineering Grants	Direct	47.041	2301649	-	12,278
Engineering Grants	Direct	47.041	2301580	-	17,126
Mathematical and Physical Sciences	Direct	47.049	1933342	-	29,284
Mathematical and Physical Sciences	Direct	47.049	1818467	-	5,684
Mathematical and Physical Sciences	Direct	47.049	1808052	-	32,656
Mathematical and Physical Sciences	Direct	47.049	1904215	-	13,705
Mathematical and Physical Sciences	Direct	47.049	1914549	-	185,765
Mathematical and Physical Sciences	Direct	47.049	1954041	-	290,539
Mathematical and Physical Sciences	Direct	47.049	2001076	-	109,779
Mathematical and Physical Sciences	Direct	47.049	1944211	-	102,678
Mathematical and Physical Sciences	Direct	47.049	2012944	200,399	278,579
Mathematical and Physical Sciences	Direct	47.049	2108316	-	79,603
Mathematical and Physical Sciences	Direct	47.049	2117318	-	67,104
Mathematical and Physical Sciences	Direct	47.049	2118693	-	88,398
Mathematical and Physical Sciences	Direct	47.049	2111359	-	89,192
Mathematical and Physical Sciences	Direct	47.049	2203630	-	68,076
Mathematical and Physical Sciences	Direct	47.049	2209533	-	29,609
Geosciences	Direct	47.050	2130739	-	29,769
Geosciences	Direct	47.050	1754244	-	24,084
Geosciences	Direct	47.050	1806287	-	32,311
Geosciences	Direct	47.050	1828866	-	60,873
Geosciences	Direct	47.050	1914526	-	112,946
Geosciences	Direct	47.050	2019649	-	69,481
Geosciences	Direct	47.050	2021768	-	102,105
Geosciences	Direct	47.050	2133229	583,726	1,210,880
Geosciences	Direct	47.050	2136139	-	118,910
Geosciences	Direct	47.050	2113060	-	55,547
Geosciences	Direct	47.050	2217182	-	44,244
Geosciences	Direct	47.050	2221730	-	77,321
Geosciences	Direct	47.050	2218518	-	52,058
Geosciences	Direct	47.050	2220556	-	20,289
Geosciences	Direct	47.050	2232216	-	39,400
Geosciences	Direct	47.050	2235515	-	38,930
Geosciences	Direct	47.050	1639868	-	28,833
Computer and Information Science and Engineering	Direct	47.070	1750193	-	41,987
Computer and Information Science and Engineering	Direct	47.070	1823398	-	3,891
Computer and Information Science and Engineering	Direct	47.070	1829222	-	19,486
Computer and Information Science and Engineering	Direct	47.070	1938130	-	8,224
Computer and Information Science and Engineering	Direct	47.070	1909089	-	90,528
Computer and Information Science and Engineering	Direct	47.070	1901005	-	254,095
Computer and Information Science and Engineering	Direct	47.070	1928349	-	99,971
Computer and Information Science and Engineering	Direct	47.070	1909248	-	64,925
Computer and Information Science and Engineering	Direct	47.070	2105006	-	2,257
Computer and Information Science and Engineering	Direct	47.070	2106754	-	108,649
Computer and Information Science and Engineering	Direct	47.070	2133279	209,215	632,825
Computer and Information Science and Engineering	Direct	47.070	2210356	-	37,734
Computer and Information Science and Engineering	Direct	47.070	2153393	-	20,533
Computer and Information Science and Engineering	Direct	47.070	2211353	-	8,147
Computer and Information Science and Engineering	Direct	47.070	2221741	-	12,947
Computer and Information Science and Engineering	Direct	47.070	2153381	-	47,136
Computer and Information Science and Engineering	Direct	47.070	2151238	-	14,668
Computer and Information Science and Engineering	Direct	47.070	2225424	-	63,805
Computer and Information Science and Engineering	Direct	47.070	2245670	-	51,675
Biological Sciences	Direct	47.074	2011257	-	102,148
Biological Sciences	Direct	47.074	1737877	-	9,838
Biological Sciences	Direct	47.074	1754603	5,536	149,511
Biological Sciences	Direct	47.074	1941309	-	204,866
Biological Sciences	Direct	47.074	1939399	-	167,676
Biological Sciences	Direct	47.074	2031076	11,250	242,367
Biological Sciences	Direct	47.074	2141535	-	78,473
Biological Sciences	Direct	47.074	2238540	-	24,161
Social, Behavioral, and Economic Sciences	Direct	47.075	1911453	1,375	2,104
Social, Behavioral, and Economic Sciences	Direct	47.075	1921911	-	44,719
Social, Behavioral, and Economic Sciences	Direct	47.075	2009258	-	181,552



Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Social, Behavioral, and Economic Sciences	Direct	47.075	2122034	\$ -	\$ 106,441
Social, Behavioral, and Economic Sciences	Direct	47.075	2121875	33,594	106,082
STEM Education (formerly Education and Human Resources)	Direct	47.076	1546592	-	15,718
STEM Education (formerly Education and Human Resources)	Direct	47.076	1742286	-	92,755
STEM Education (formerly Education and Human Resources)	Direct	47.076	1758392	19,009	363,931
STEM Education (formerly Education and Human Resources)	Direct	47.076	2043022	-	655,764
STEM Education (formerly Education and Human Resources)	Direct	47.076	2034833	-	118,810
STEM Education (formerly Education and Human Resources)	Direct	47.076	1720566	-	74,709
STEM Education (formerly Education and Human Resources)	Direct	47.076	1760585	-	186,958
STEM Education (formerly Education and Human Resources)	Direct	47.076	1935932	-	41,741
STEM Education (formerly Education and Human Resources)	Direct	47.076	1954908	-	100,528
STEM Education (formerly Education and Human Resources)	Direct	47.076	2142309	-	127,531
Office of International Science and Engineering	Direct	47.079	1855690	-	162,822
Office of International Science and Engineering	Direct	47.079	2103105	-	46,067
Office of International Science and Engineering	Direct	47.079	2311700	-	36,181
Integrative Activities	Direct	47.083	1934346	35,145	169,812
Integrative Activities	Direct	47.083	2215734	-	432,111
NSF Technology, Innovation, and Partnerships	Direct	47.084	2236064	-	44,814
NSF Technology, Innovation, and Partnerships	Direct	47.084	2234450	-	19,465
Passed through Aren Incorporated					
Automating Element-Level Inspection of Civil Infrastructures through Computer Vision	Pass-through	47.RD	MTU Agreement #2211036	-	3,721
Passed through Stabilux Biosciences Inc.					
Engineering Grants	Pass-through	47.041	MICHIGAN TECH AGMT #1702043	-	47,758
Engineering Grants	Pass-through	47.041	MTU Agreement 2005024	-	13,692
Passed through University of Michigan					
Engineering Grants	Pass-through	47.041	SUBK00012982	-	39,675
Engineering Grants	Pass-through	47.041	UofM Subaward SUBK00015030	-	4,817
Passed through ZITechnologies, Inc.					
Engineering Grants	Pass-through	47.041	RSCH #2008057 NSF AWRD#2052302	-	37,020
Passed through Pennsylvania State University					
Geosciences	Pass-through	47.050	S000075-NSF	-	12,305
Passed through Utah State University Sponsored Programs					
Geosciences	Pass-through	47.050	202743-811	-	80,546
Passed through University of Toledo					
Computer and Information Science and Engineering	Pass-through	47.070	F-2022-4	-	9,084
Passed through Baylor University					
Biological Sciences	Pass-through	47.074	#1001076-01	-	14,112
Passed through Colorado State University					
Biological Sciences	Pass-through	47.074	G-45144-02	-	14,607
Biological Sciences	Pass-through	47.074	SUBAWARD #G-96772-1	-	76,656
Passed through Kansas State University					
Biological Sciences	Pass-through	47.074	S19023	-	74,908
Passed through North Carolina A & T State University					
Biological Sciences	Pass-through	47.074	260359B	-	92,251
Passed through Florida International University					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	800010570-01UG	-	5,830
Passed through Northern Virginia Community College					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	Subaward No. 2112-SPL-002	-	14,147
Passed through Purdue University					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	Subaward No. 10001687-004	-	3,779
Passed through San Diego State University Research Foundation					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	SA0000699	-	169,373
Passed through University of Virginia					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	GA11384.PO#2213323/PTE 1850296	-	49,924
Passed through University of Nebraska - Lincoln					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	25-0536-0045-006	-	(4,000)
Passed through University of Florida					
STEM Education (formerly Education and Human Resources)	Pass-through	47.076	SUB00003153	-	26,730
NSF Technology, Innovation, and Partnerships	Pass-through	47.084	SUB00003604	-	17,879
Total National Science Foundation				1,175,252	11,476,004
<b>Environmental Protection Agency</b>					
Innovative Water Technology Grant Program	Direct	66.521	84046901	-	84,948
<b>U.S. Department of Energy</b>					
Office of Science Financial Assistance Program	Direct	81.049	DE-SC0018942	-	44,677
Office of Science Financial Assistance Program	Direct	81.049	DE-SC0020053	-	142,483
Office of Science Financial Assistance Program	Direct	81.049	DE-SC0021168	26,339	229,460
Office of Science Financial Assistance Program	Direct	81.049	DE-SC0022095	92,237	171,031
Office of Science Financial Assistance Program	Direct	81.049	DE-SC0022128	-	223,153
University Coal Research	Direct	81.057	DE-FE0032071	316	113,057
University Coal Research	Direct	81.057	DE-FE0032236	-	15,527
Conservation Research and Development	Direct	81.086	DE-EE0008685	-	(20,804)
Conservation Research and Development	Direct	81.086	DE-EE0008800	-	581,845
Conservation Research and Development	Direct	81.086	DE-EE0009122	76,012	123,266
Conservation Research and Development	Direct	81.086	DE-EE0009209	625,966	785,820

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Advanced Research Projects Agency - Energy	Direct	81.135	DE-AR0000788	\$ -	\$ 483,346
Advanced Research Projects Agency - Energy	Direct	81.135	DE-AR0001126	69,250	166,311
Advanced Research Projects Agency - Energy	Direct	81.135	DE-AR0001336 MOD 0001	-	115,656
Advanced Research Projects Agency - Energy	Direct	81.135	DE-AR0001702	6,120	129,759
Passed through Argonne National Laboratory:					
Alternative Fuels Research with Argonne National Laboratory	Pass-through	81.RD	9F-60098	-	106,066
Investigation to Separate Lithium-ion Battery Active Cathode Materials by Chemistry Using Froth Flotation	Pass-through	81.RD	Subcontract No. 9F-60080	-	218,834
Pengfei Xue Joint Appointment Argonne National Labs	Pass-through	81.RD	Pengfei Xue Joint Appointment	-	80,195
COMPASS GLM	Pass-through	81.RD	1F-60486	-	295,853
FY2020 Interoperability and Grid Integration Support	Pass-through	81.RD	OF-60090	-	35,358
Passed through National Renewable Energy Laboratory					
A Compression Ignition Mono-Fueled NG High-Efficiency, High-Output Engine for Medium and Heavy Duty Applications	Pass-through	81.RD	NHQ-9-82305-06	-	168,995
Passed through Battelle Memorial Institute					
Reduced Cost and Complexity for Off-Highway Aftertreatment	Pass-through	81.RD	Contract No. 554645	-	230,711
Passed through Battelle Energy Alliance, LLC					
Solvent Targeted Recovery and Precipitation (STRAP) For Plastic Removal from Municipal Solid Waste (MSW)	Pass-through	81.RD	271754 AMEND NO.4	-	169,136
Passed through General Motors LLC					
Low Mass and High Efficiency Engine for Medium-Duty Truck Applications	Pass-through	81.RD	PO#4301052432	-	39,458
Passed through Honeywell Federal Manufacturing & Technologies, LLC:					
Full Field Dynamic Response For Simulation	Pass-through	81.RD	PO#N000416796	-	18,968
Simulation Methods for Optimal Fixture Design and Prediction	Pass-through	81.RD	Purchase Order N000469903/Mod.	-	56,155
Passed through QuesTek Innovations LLC					
Melt Spinning	Pass-through	81.RD	MTU SO #2110046; PO# 2878	-	14
Melt Spinning	Pass-through	81.RD	MTU SO 2302070	-	6,148
Passed through Lawrence Livermore National Security LLC					
Theoretical Support for Gas-Gun Experiments: Towards Suppression of Shockwave Instabilities and Jetting	Pass-through	81.RD	Subcontract No. B651358	-	88,937
Theoretical Support for Gas-Gun Experiments: Towards Suppression of Shockwave Instabilities and Jetting	Pass-through	81.RD	Subcontract No. B656313	-	48,541
Passed through Mesa Photonics LLC					
Cloud chamber characterization of an airborne cloud droplet imaging system	Pass-through	81.RD	MTU #2110021	-	57,320
Passed through UT-Battelle, LLC					
Control of Li Surfaces for Solid-State Batteries	Pass-through	81.RD	Subcontract No. CW34152	-	35,267
Integrated Control of Vehicle Speeds and Traffic Signals for Reducing Congestion and Energy Use Project Support	Pass-through	81.RD	CW37455	-	88,218
Passed through Sandia National Laboratories:					
Wind Turbine and Wind Farm Controls Code Evaluation for Reduced Order Models	Pass-through	81.RD	PO #2159403	-	1
Meta-Stability of Pulsed Loaded Microgrids	Pass-through	81.RD	PO #2169602	-	175,717
Technical Support and Maintenance of the Meteorological Instrument at the Michigan Regional Test Center for Solar Technologies	Pass-through	81.RD	PO 2348229	-	22,957
Enhancing the Efficiency and Resilience of PV Systems at Northern Latitudes	Pass-through	81.RD	2324302	-	62,044
Installation of Experimental Systems at the MI RTC	Pass-through	81.RD	Purchase Order No. 2324301	-	36,480
Power Electronics and Advanced Modeling and Control for Energy Systems	Pass-through	81.RD	Purchase Order No. 2460746	-	64,393
Passed through University of Wisconsin-Madison					
Great Lakes Bioenergy Research Center	Pass-through	81.RD	0000002956	-	81,844
Office of Science Financial Assistance Program	Pass-through	81.049	AGREEMENT NUMBER 812K943	-	157,749
Passed through RIKarbon, Inc.					
Office of Science Financial Assistance Program	Pass-through	81.049	Prime DE-SC0020939	-	15,068
Passed through Regents of the University of Minnesota					
Office of Science Financial Assistance Program	Pass-through	81.049	SUBAWARD NO. H007829703	-	54,440
Passed through University of Maryland College Park					
Office of Science Financial Assistance Program	Pass-through	81.049	117387-Z7159201	-	47,118
Passed through University of California, Los Angeles					
Office of Science Financial Assistance Program	Pass-through	81.049	0190 G LA568	-	36,902
Passed through The American Center for Mobility					
Conservation Research and Development	Pass-through	81.086	SUBAWARD NO: DE-EE0008407-01	-	580,974
Passed through Texas A&M University					
Conservation Research and Development	Pass-through	81.086	M2300703	-	30,948
Passed through Clemson University					
Renewable Energy Research and Development	Pass-through	81.087	Sub #2184-219-2023054	-	6,772
Passed through Gas Technology Institute					
Renewable Energy Research and Development	Pass-through	81.087	GTI Agre #S948; Project #22530	-	13,698
Renewable Energy Research and Development	Pass-through	81.087	Agreement No.SR109/Prime DE-EE	-	31,609
Passed through REMADE Institute					
Renewable Energy Research and Development	Pass-through	81.087	SUBAWARD NO. 20-01-SA-4014	8,926	167,998
Passed through Michigan State University					
Energy Efficiency and Renewable Energy Information Dissemination, Outreach, Training and Technical Analysis/Assistance	Pass-through	81.117	SUBAWARD NO. RC112846 - MTU	-	26,415
Total U.S. Department of Energy				905,166	6,661,888
<b>U.S. Department of Health and Human Services - Centers for Disease Control</b>					
Temporal and Spatial Characterization of Respirable Coal Mine Dust Using Area Monitoring Devices and X-Ray CT	Direct	93.RD	75D30119C05527	73,226	73,896

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Research and Development Cluster (Continued)</b>					
Mine Health and Safety Big Data Analysis and Text Mining by Machine Learning Algorithms	Direct	93.RD	75D30121C12375	\$ 75,172	\$ 127,558
Size-dependent Metric Analysis of Respirable Coal Mine Dust (RCMD)	Direct	93.RD	75D30122C14732	14,665	34,246
Epidemiology and Laboratory Capacity for Infectious Diseases (ELC)	Direct	93.323	AGREEMENT #: E20224555-00	-	1,387,499
Passed through Center for Construction Research and Training				-	
Occupational Safety and Health Program	Pass-through	93.262	MTU Agreement #2111015	-	29,491
Subtotal U.S. Department of Health and Human Services - Centers for Disease Control				163,063	1,652,690
<b>U.S. Department of Health and Human Services - National Institutes of Health</b>					
Food and Drug Administration Research	Direct	93.103	1R01FD007461-01	171,718	369,553
Discovery and Applied Research for Technological Innovations to Improve Human Health	Direct	93.286	1R15EB026197-01	-	72,528
Discovery and Applied Research for Technological Innovations to Improve Human Health	Direct	93.286	R01EB029570-01A0	76,359	301,327
Cancer Detection and Diagnosis Research	Direct	93.394	1R15CA242401-01	-	43,314
Cancer Treatment Research	Direct	93.395	1R15CA246336-01	-	75,331
Cardiovascular Diseases Research	Direct	93.837	1R15HL140596-01	24,804	24,804
Cardiovascular Diseases Research	Direct	93.837	1R15HL145654-01	-	548
Cardiovascular Diseases Research	Direct	93.837	1R01HL144739-01A1	-	73,791
Cardiovascular Diseases Research	Direct	93.837	1R15HL145655-01	-	102,162
Cardiovascular Diseases Research	Direct	93.837	1R15HL150703-01A1	-	228,851
Cardiovascular Diseases Research	Direct	93.837	1R01HL163159-01	-	223,135
Cardiovascular Diseases Research	Direct	93.837	1R15HL159602-01A1	-	28,973
Cardiovascular Diseases Research	Direct	93.837	1R15HL167221-01	-	125,887
Diabetes, Digestive, and Kidney Diseases Extramural Research	Direct	93.847	1R15DK134992-01	-	60,340
Extramural Research Programs in the Neurosciences and Neurological Disorders	Direct	93.853	1R15NS115032-01A1	-	317,141
Allergy and Infectious Diseases Research	Direct	93.855	1R21AI150962-01	22,002	73,311
Allergy and Infectious Diseases Research	Direct	93.855	1R21AI175913-01	-	3,707
Biomedical Research and Research Training	Direct	93.859	1R15GM137145-01	-	135,884
Biomedical Research and Research Training	Direct	93.859	1R15GM114751-02	-	(21,711)
Biomedical Research and Research Training	Direct	93.859	1R15GM135806-01	-	53,565
Biomedical Research and Research Training	Direct	93.859	1R15GM135875-01	-	132,798
Biomedical Research and Research Training	Direct	93.859	1R15GM132873-01A1	21,951	135,090
Biomedical Research and Research Training	Direct	93.859	1R15GM137298	21,289	73,902
Biomedical Research and Research Training	Direct	93.859	1R15GM139118-01A1	5,729	154,771
Biomedical Research and Research Training	Direct	93.859	1R15GM146206-01	-	176,543
Biomedical Research and Research Training	Direct	93.859	1R15GM148964-01	-	45,660
Biomedical Research and Research Training	Direct	93.859	2R15GM135806-02	-	14,680
Aging Research	Direct	93.866	1R15AG059095-01	4,077	98,033
Passed through Regents of the University of Michigan					
Research and Training in Complementary and Integrative Health	Pass-through	93.213	SUBK00013369 PO# 3006735267	-	4,292
National Center on Sleep Disorders Research	Pass-through	93.233	SUBK00003964 PO#3005929257	-	7,425
Passed through Oregon Health & Science University					
Cardiovascular Diseases Research	Pass-through	93.837	1022559, MTU	-	7,124
Passed through University of Wisconsin-Madison					
Child Health and Human Development Extramural Research	Pass-through	93.865	Subaward No. 0000000663	-	2,152
Passed through Tulane University					
Aging Research	Pass-through	93.866	TUL-HSC-559015-21/22	-	9,710
Aging Research	Pass-through	93.866	Sub Awd #TUL-HSC-560960-22/23	-	14,085
Passed through Hemex Medical					
Portable, affordable, quantitative microchip electrophoresis for hemoglobin A1C testing	Pass-through	93.RD	MTU Agreement #2112050	-	83,313
Subtotal U.S. Department of Health and Human Services - National Institute of Health				347,929	3,252,019
Total U.S. Department of Health and Human Services				510,992	4,904,709
Total Research and Development Cluster				7,937,935	53,792,670
<b>TRIO</b>					
<b>U.S. Department of Education</b>					
TRIO McNair Post-Baccalaureate Achievement	Direct	84.217	P217A220192	-	131,234
Total Clusters				7,937,935	88,005,592
<b>Other Federal Awards</b>					
<b>U.S. Department of Agriculture</b>					
Passed through Michigan Department of Education					
Child and Adult Care Food Program	Pass-through	10.558		-	13,973
<b>U.S. Department of Agriculture - Forest Service</b>					
Archaeological Collection Cooperative Management Ottawa National Forest	Direct	10.U01	18-CS-11090700-004	-	2,952
Web Development for the Climate Change Resource Center	Direct	10.U02	18-CR-11242306-085	-	80,517
Digital Science Communication	Direct	10.U03	19-CR-11242306-118	-	32,497
Supporting Science-Management Partnerships for Climate Adaptation	Direct	10.U04	20-CR-11242306-068	-	15,475
Forest Service Research Web Modernization - Content Delivery	Direct	10.U05	20-CR-11242306-094	-	115,228
Belowground Ecosystem Ecologist	Direct	10.U06	21-JV-11242306-039	-	93,941
Archaeological Collection Cooperative Management - Hiawatha National Forest	Direct	10.U07	22-CS-11091000-013	-	10,309
USDA Northern Forest Climate Hub Coordination	Direct	10.U08	22-CR-11242306-036	-	54,188
Increasing Forest Service Capacity for Climate-Informed Project Development	Direct	10.U09	22-CS-11242306-049	-	2,369
Partnership Agreements	Direct	10.699	18-CR-11242306-049	-	8,548
Partnership Agreements	Direct	10.699	22-CS-11242306-076	-	66,084
Research Joint Venture and Cost Reimbursable Agreements	Direct	10.707	19-CR-11242306-094	-	46,766
Research Joint Venture and Cost Reimbursable Agreements	Direct	10.707	21-CR-11242306-080	-	46,070
Research Joint Venture and Cost Reimbursable Agreements	Direct	10.707	21-CR-11242306-067	-	31,052
Subtotal U.S. Department of Agriculture - Forest Service				-	605,996
Total U.S. Department of Agriculture				-	619,969

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Other Federal Awards (Continued)</b>					
<b>U.S. Department of Commerce - National Oceanic and Atmospheric Administration</b>					
Marine Sanctuary Program	Direct	11.429	NA21NOS4290004	\$ -	\$ 55,659
Marine Sanctuary Program	Direct	11.429	NA22NOS4290002	-	35,233
Passed through Regents of the University of Michigan					
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institutes	Pass-through	11.432	SUBK00015336	-	184
Total U.S. Department of Commerce				-	91,076
<b>U.S. Department of Defense - National Security Agency</b>					
GenCyber Grants Program	Direct	12.903	H98230-21-1-0116	-	168,245
GenCyber Grants Program	Direct	12.903	H98230-22-1-0192	-	48,945
Subtotal U.S. Department of Defense - National Security Agency				-	217,190
<b>U.S. Department of Defense - U.S. Army</b>					
Delivery of a Professional Development Course in Vehicle Chassis Systems, Fracture Mechanics and Corrosion	Direct	12.U01	2206037	-	24,975
Total U.S. Department of Defense				-	242,165
<b>U.S. Department of Interior - National Park Service</b>					
Report on Collected Historic Building Fragments for Keweenaw National Historical Park	Direct	15.U01	ORDER NO. 140P6421P0052	-	88
AIS outreach and portable boat wash support for KISMA	Direct	15.U02	Confirming Order #2205003	-	10,872
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P20AC00379	-	533
Cooperative Research and Training Programs – Resources of the National Park System	Direct	15.945	P18AC00331	-	28,912
Subtotal U.S. Department of Interior - National Park Service				-	40,405
<b>U.S. Department of Interior - Fish and Wildlife Service</b>					
Great Lakes Restoration	Direct	15.662	F20AC10756-00	-	1
Total U.S. Department of Interior				-	40,406
<b>U.S. Department of Labor</b>					
Mine Health and Safety Grants	Direct	17.600	MS-38903-22-55-R-26	-	264,168
<b>U.S. Department of Transportation</b>					
Intergovernmental Personnel Act Agreement with Michigan Tech University	Direct	20.U04	ASSIGNMENT AGRMT - 7/22/21	-	5,705
Intergovernmental Personnel Act Agreement with Michigan Technological University on behalf of Dr. Amlan Mukherjee	Direct	20.U05	Assignment Agreement - dated 7	-	69,951
Subtotal U.S. Department of Transportation				-	75,656
<b>U.S. Department of Transportation - Federal Highway Administration</b>					
Passed through Michigan Department of Transportation					
Roadsoft Support for MDOT Safety Services	Pass-through	20.U02	Contract # 2019-0449	-	837
Michigan Tech Summer Youth Programs - National Summer Transportation Institute 2023	Pass-through	20.U03	Contract No. 2023-0381	-	301
Highway Planning and Construction	Pass-through	20.205	2021-0058 Authorization Z9	-	439,570
Highway Planning and Construction	Pass-through	20.205	2023-0036, Authorization Z1	-	441,870
Highway Planning and Construction	Pass-through	20.205	2021-0058, Authorization Z16	-	55,563
Highway Planning and Construction	Pass-through	20.205	2021-0058, Authorization Z12	-	34,099
Highway Training and Education	Pass-through	20.215	2018-0713, Authoriz Z10-Z13	-	222,467
Highway Training and Education	Pass-through	20.215	2022-0997, AUTHORITYATIONS Z1-4	-	486,350
Subtotal U.S. Department of Transportation - Federal Highway Administration				-	1,681,077
<b>U.S. Department of Transportation - Federal Railroad Administration</b>					
Railroad Crossing Vehicle Warning (RCVW) Application Demonstrations with Connected Vehicles	Direct	20.U01	963J621C000023	51,721	214,527
Total U.S. Department of Transportation				51,721	1,971,260
<b>National Aeronautics and Space Administration</b>					
Science	Direct	43.001	80NSSC17M0076/SUPPL#004	-	177,260
Passed through University of Michigan					
Structural Characteristics of the Keweenaw and Hancock Faults in the Midcontinent Rift System and Possible Relationship to the Greenville Mountain Belt	Pass-through	43.U01	SUNK00017416	-	5,000
Office of Stem Engagement (OSTEM)	Pass-through	43.008	SUBK00015391 POW#3006462575	-	3,973
Office of Stem Engagement (OSTEM)	Pass-through	43.008	SUBK00017416	-	22,935
Office of Stem Engagement (OSTEM)	Pass-through	43.008	SUBK00011994	-	18,851
Passed through Copper Country Intermediate School District					
Office of Stem Engagement (OSTEM)	Pass-through	43.008	A2031.OTH:TASK ORDR 2102039-10	-	1,525
Total National Aeronautics and Space Administration				-	229,544
<b>National Endowment for the Arts</b>					
Passed through Michigan Council for Arts and Cultural Affairs					
Promotion of the Arts_Partnership Agreements	Pass-through	45.025	Control Number: 23PS6144	-	24,000
<b>National Endowment for Humanities</b>					
Promotion of the Humanities_Office of Digital Humanities	Direct	45.169	HAA-271717-20	-	53,227
Passed through Michigan Humanities Council					
From the Rink to the Repository: Celebrating 100 Years of Michigan Tech Hockey	Pass-through	45.U01	MI Humanities Cou/MTU #2003042	-	5,585
Promotion of the Humanities Federal/State Partnership	Pass-through	45.129	Bridge23-009	-	1,500
Passed through Teagle Foundation					
Promotion of the Humanities Teaching and Learning Resources and Curriculum Development	Pass-through	45.162	Subaward #2005503	-	25,000
Total National Endowment for Humanities				-	85,312

Schedule of Expenditures of Federal Awards

Year Ended June 30, 2023

Federal Agency/Pass-through Agency/Program Title	Direct/Pass-through	Assistance Listing Number	Grant ID / Pass-through Entity Identifying Number	Total Amount Provided to Subrecipients	Federal Expenditures
<b>Other Federal Awards (Continued)</b>					
<b>Small Business Administration</b>					
Passed through Grand Valley State University					
Small Business Development Centers	Pass-through	59.037	MISBDC-2021-01 P.O. P0093600	\$ -	\$ 42,889
Small Business Development Centers	Pass-through	59.037	MISBDC-2022-1	-	419,853
Total Small Business Association				-	462,742
<b>U.S. Environmental Protection Agency</b>					
Environmental Finance Center Grants	Direct	66.203	00E01979	-	54,173
Passed through University of New Mexico					
Surveys, Studies, Investigations, Demonstrations, and Training Grants - Section 1442 of the Safe Drinking Water Act	Pass-through	66.424	Subaward No. 281131 - 8737	-	94,726
Surveys, Studies, Investigations, Demonstrations, and Training Grants and Cooperative Agreements - Section 104(b)(3) of the Clean Water Act	Pass-through	66.436	Subaward No. 281132-8737	-	63,376
Total Environmental Protection Agency				-	212,275
<b>U.S. Department of Energy</b>					
Passed through Sandia National Laboratories					
Creation of a Northern-Climata Photovoltaic Test Site	Pass-through	81.U01	PO 2203470	-	20,400
<b>U.S. Department of Education</b>					
Passed through BHK Child Development Board					
BHK Great Explorations After School STEM Clubs	Pass-through	84.U01	MTU SO 2208033	-	9,888
Passed through UPWARD Talen Council					
Upper Peninsula Michigan Works Contractual Training for MILEAP Project	Pass-through	84.U02	MTU MILEAP Contract Document	-	25,679
Passed through Michigan Department of Education					
Michigan GEAR UP	Pass-through	84.U03	Grant No. 23-00-07, Year 3	-	56,513
Gaining Early Awareness and Readiness for Undergraduate Programs	Pass-through	84.334	Grant No. 21-00-07, Year 2	-	36,888
Total U.S. Department of Education				-	128,968
<b>U.S. Department of Homeland Security - Federal Emergency Management Agency</b>					
Passed through Michigan State Police					
Disaster Grants - Public Assistance (Presidentially Declared Disasters)	Pass-through	97.036	FEMA-4381-DR-MI	-	1,077,320
<b>U.S. Department of Justice</b>					
Passed through Michigan State Police					
Edward Byrne Memorial Justice Assistance Grant Program	Pass-through	16.738	LETTER DATED 05/23/2022	-	2,351
<b>Total Other Federal Awards</b>				<u>51,721</u>	<u>5,471,956</u>
<b>Total Federal Awards</b>				<u>\$ 7,989,656</u>	<u>\$ 93,477,548</u>

**Notes to Schedule of Expenditures of Federal Awards**

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**Year Ended June 30, 2023**

**Note 1 - Basis of Presentation**

The accompanying schedule of expenditures of federal awards (the "Schedule") includes the federal grant activity of Michigan Technological University (the "University") under programs of the federal government for the year ended June 30, 2023. The information in the Schedule is presented in accordance with the requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (the "Uniform Guidance"). Because the Schedule presents only a selected portion of the operations of the University, it is not intended to and does not present the financial position, changes in net position, or cash flows of the University.

**Note 2 - Summary of Significant Accounting Policies**

Expenditures reported in the Schedule are reported on the accrual basis of accounting. Such expenditures are recognized following the cost principles contained in Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, wherein certain types of expenditures are not allowable or are limited as to reimbursement. Negative amounts shown on the Schedule represent adjustments or credits made in the normal course of business to amounts reported as expenditures in prior years. The pass-through entity identifying numbers are presented where available.

The University elected not to use the 10 percent *de minimis* indirect cost rate to recover indirect costs, as allowed under the Uniform Guidance, since the University has an approved indirect cost rate through its cognizant agency.

**Note 3 - Adjustments and Transfers**

As allowable and in accordance with federal regulations issued by the U.S. Department of Education, during the year ended June 30, 2023, the University carried forward \$13,856 of Federal Supplemental Education Opportunity Grant Program (ALN 84.007) and \$29,120 of Federal Work-Study Program (ALN 84.033) from 2021-2022 that was spent in 2022-2023.

**Note 4 - Loan Balances**

Loans outstanding at the beginning of the year and loans made during the year are included in the federal expenditures presented in the schedule of expenditures of federal awards. The balances of loans outstanding consist solely of the Perkins Loan program, which had an outstanding loan balance of \$2,860,383 at June 30, 2023.

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## Schedule of Findings and Questioned Costs

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**Schedule of Findings and Questioned Costs**

**Year Ended June 30, 2023**

**Section I - Summary of Auditor's Results**

**Financial Statements**

Type of auditor's report issued: Unmodified

Internal control over financial reporting:

- Material weakness(es) identified? \_\_\_\_\_ Yes      X   No
- Significant deficiency(ies) identified that are not considered to be material weaknesses? \_\_\_\_\_ Yes      X   None reported
- Noncompliance material to financial statements noted? \_\_\_\_\_ Yes      X   None reported

**Federal Awards**

Internal control over major programs:

- Material weakness(es) identified? \_\_\_\_\_ Yes      X   No
- Significant deficiency(ies) identified that are not considered to be material weaknesses? \_\_\_\_\_ Yes      X   None reported
- Any audit findings disclosed that are required to be reported in accordance with Section 2 CFR 200.516(a)? \_\_\_\_\_ Yes      X   No

Identification of major programs:

ALN	Name of Federal Program or Cluster	Opinion
Various	Research and Development Cluster	Unmodified

Dollar threshold used to distinguish between type A and type B programs: \$2,804,326

Auditee qualified as low-risk auditee?   X   Yes    \_\_\_\_\_ No

**Section II - Financial Statement Audit Findings**

Reference Number	Finding
<b>Current Year</b>	None

**Section III - Federal Program Audit Findings**

Reference Number	Finding
<b>Current Year</b>	None