

ANNUAL REPORT

for the

Research and
Innovation in STEAM
Education (RISE)
Institute

Fiscal Year 2023

submitted to

The Vice President of
Research Michigan
Technological University

Attn: Kathleen
Halvorsen

Associate Vice President for Research Development

submitted by

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September 16, 2023



RISE Institute Annual Report

1. Mission Statement

Maintain a robust and diverse community of stakeholders at Michigan Tech, who will serve as the bridge from proposal preparation and submission through empirical activities to outreach and dissemination by engaging in the following activities:

- serve the research and scholarship activities of the community of educational researchers at Michigan Tech;
- build capacity and diversity in STEAM disciplines through networking, scholarly pursuits and interdisciplinary research related to innovative pedagogy, transformative learning, and cutting-edge teaching and learning practices; and
- maximize inter-department collaboration to eliminate program duplication, enabling effective use of resources while maximizing the impact made on the Michigan Tech community.

Vision: A collaborative, interdisciplinary community fostering excellent and inclusive STEAM opportunities for all.

Core Values: Cooperation, Loyalty, Perseverance, Honesty, Objectivity

2. Summary of FY23 Activities and Highlights

During FY23 the RISE leadership worked with the Executive Directors and Membership to address the recommendations for continued support. Objectives and Strategies were developed to be the go-to institute for education-focused proposals and for incorporating strong "broader impacts" education sections for researchers. The Director recruited and hired Dr. Yin-Yin (Sarah) Tan as Program Development Specialist for RISE to meet our objectives. The Director is also coordinating with Thomas Oliver, Center for Science and Environmental Outreach [CSEO](#).

- i. The Institute is governed by a Director who collaborates with a 4-member Executive Committee. The Director and Executive Committee's governance is guided by an external Advisory Board.
- ii. Members in RISE use the google group rise-l@mtu.edu. There is a join link on the RISE website for people who want to be members. This sends an email to the Director to contact that person. They are then added to the google group and added to the website. The membership list was reviewed purging and verifying current members.
- iii. Two new members joined in FY23, Vijaya V. N. Sriram Malladi, MEEM Dept & Smitha Rao Hatti, Biomedical Engineering Dept.
- iv. Members were involved in voting in support of the new governance of RISE in March, 2023. Members unanimously supported the election for New Executive Committee Members: Marika Seigel replacing Jean Kampe and Michelle Jarvie-Eggart replacing Amanda Gonczi. In March a draft Charter was distributed to all members for review and comment. The RISE Charter was then reviewed by the AVPRD and finalized in April. On April 18, 2023, there was an in-person membership meeting to finalize the Charter

and discuss plans to recruit and hire a Program Development Specialist. Presentation slides along with meeting minutes were distributed to all members following the meeting.

- v. Links to [proposal opportunities](#) are posted on the RISE website. In addition, messages are sent by the RISE Director to members with updates, as well as external sponsored opportunities that are generated through Grantforward.com.
- vi. Current center/institute member list (See appendix F)

3. Budget Overview

- a. FY23 budget summary includes \$27,497 in revenue plus \$40,671 in carry forward. Expenditures were \$17,760. Balance at year end equals \$50,408. (see appendices A & B for detail expenditures and income).
- b. Rise Institute IRAD was used to enhance member capacity in the enterprise program senior project support, and for the Pavlis Honors College I-Corps program (\$5,381), the Director salary and fringe (\$10,805), providing matching grants (\$781), food for member meetings/books/supplies/software (\$793). These services and assistance were provided directly impact members to help them to be more competitive for external sponsored awards.
- c. Research/outreach proposals submitted during the FY23 included (10, \$4,746,890) and awards (3, \$758,924). Two are pending and 1 was tabled. (see table 1 in appendix D for individual proposals/awards)
- d. Senior project/enterprise proposals submitted during the FY22 included (20, \$249,687.00) and awards (17, \$208,239). (see table 2 in appendix D for individual proposals/awards)
- e. Budget projection chart from ASPIRE database with five-year forecast of proposals in progress (2, \$35,268), current projects (31, \$1,393,260), anticipated (1, \$367,816), and total projected IRAD returns (\$44,742) (See appendix E).

4. Future Plans and Goals

- a. Strategic goals for the next year and for the next five years are to continue supporting the Research Development Specialist position at 50% part time with the goal to be self-supporting 100% full time. Also, to continue to coordinate with the new CSEO Director and the new Director of CTL, Jeff Toorongian to develop workshops to assist researchers in developing proposals.
- b. Financial goals are to increase the amount of IRAD to fund the Research Development Specialist position. Membership goals are to be more widely recognized on campus for faculty and staff from all colleges.
- c. No space or facility needs/goals are needed for RISE institute and members.
- d. Coordinating with the GLRC, CSEO and CTL is necessary.
- e. With successfully funded large proposals going through RISE there will be IRAD available to increase the Research Development Specialist position to full-time.

5. Challenges and Barriers

- a. The lack of Teacher Education faculty with knowledge of educational assessment strategies.
- b. Few MTU faculty have experience in STEAM education research.

Appendix A: Major expenditures FY23

Category	Expense (\$)
MMET Department IRAD: Release time for John Irwin, Director	7,577.00
Fringe Benefits	3,227.72
Other Non-Mandatory Transfers (Out) – Pavlis I-corps Enterprise/SP	5,381.28
Food – Annual membership meetings	90.40
Purchasing Qualtrics License – RISE contribution	500.00
Books and Supplies – STEM reading group (Amber Kemppainen)	202.93
Matching Grant Funds – Educational Outreach Proposal	781.00
Total Expenditures:	17,760.33

Appendix B: Total revenue & budget FY23

Category	Revenue (\$)
IRAD Transfers In	23,746.54
Other Transfers In (Senior Project return)	3,750.74
Total Revenue:	27,497.28
Carryforward:	40,671.28
Expenditures: (See Appendix A)	-17,760.33
Account Budget Balance:	50,408.23

Appendix C: Ongoing research proposals, FY23

- 1) Michigan Middle School Master Teachers Fellowship Program
Principal Investigator: Jacqueline E. Huntoon
Division/Dept: Administration/Provost Office
Sponsor: National Science Foundation
Requested Amount: \$1,887,979
Budget Start: March 2018
Budget End: Feb 2024

- 2) Collaborative Research: NSF-RISE-CAREER: Cavitation
Principal Investigator: Roohollah Askari
Division/Dept: Geological & Mining Eng & Sciences
Sponsor: National Science Foundation
Funding Amount: \$301,108
Budget Start: May 2023
Budget End: April 2028

- 3) Research Initiation: Factors Motivating Engineering Faculty to Adopt and Teach New Engineering Technologies
Principal Investigator: Michelle Jarvie-Eggart
Division/Dept: College of Engineering/Engineering Fundamentals
Sponsor: National Science Foundation
Funding Amount: \$199,633
Budget Start: Sep-2020
Budget End: Aug-2024

- 4) Research Initiation: Collaborative Research: Recognition of Gender Stereotyping as a Determinant of Stereotype Assimilation and Contrast Effects Resulting from Subtle Bias Exposure in STEM
Principal Investigator: Lorelle Meadows
Division/Dept: College of Sciences and Arts/Cognitive and Learning Sciences
Sponsor: National Science Foundation
Funding Amount: \$328,757
Budget Start: Aug-2020
Budget End: Jul-2024

- 5) Engineering Technology Scholars - IMProving REtention and Student Success (ETS-IMPRESS)
Principal Investigator: John Irwin
Division/Dept: College of Engineering/MMET
Sponsor: National Science Foundation
Funding Amount: \$999,483
Budget Start: Jan-2018
Budget End: Dec-2023

- 6) COPPE-RISE-CTE Mechatronics
Principal Investigator: John Irwin
Division/Dept: College of Engineering/MMET
Sponsor: CCISD
Funding Amount: \$40,000
Budget Start: July-2023
Budget End: June-2024

- 7) UPWAR-RISE-MiLEAP
Principal Investigator: John Irwin
Division/Dept: College of Engineering/MMET
Sponsor: Upper Peninsula Michigan Works
Funding Amount: \$ 123,406
Budget Start: July-2021
Budget End: June-2024

8) MIEDU-RISE-GEAR UP 22-23

Principal Investigator: Cassy A Tefft de Munoz

Division/Dept: Administration

Sponsor: Michigan Dept of Education

Funding Amount: \$ 156,530

Budget Start: Sept-2022

Budget End: Sept-2023

9) UNIVE-RISE-FNR-MSGC-Explore Aerospace

Principal Investigator: Jannah Tumey

Division/Dept: Administration

Sponsor: University of Michigan-Michigan Space Grant Consortium

Funding Amount: \$ 2,201

Budget Start: May-2022

Budget End: Oct-2023

10) Michigan Tech Summer Youth Programs - National Summer Transportation Institute 2023

Principal Investigator: Bradley Wells

Division/Dept: Administration

Sponsor: Michigan Dept of Transportation

Funding Amount: \$ 50,000

Budget Start: May-2023

Budget End: Sep-2023

Appendix D: Proposals submitted affiliated with RISE, FY23

Table 1: Research Proposals

STATUS	PRINCIPAL_NAME	DIVISION_NAME	SPONSOR	REQUESTED_AMOUNT
Awarded	Roohollah Askari	College of Engineering	National Science Foundation	\$668,924
Awarded	Bradley A. Wells	Administration	Michigan Dept of Transportation	\$50,000
Awarded	John Irwin	College of Engineering	Copper Country Intermediate School District (CCISD)	\$40,000
Declined	Janet M. Callahan	College of Engineering	National Science Foundation	\$1,999,999
Declined	Michelle E. Jarvie-Eggart	College of Engineering	National Science Foundation	\$298,566
Declined	Leo C. Ureel II	College of Computing	National Science Foundation	\$449,087
Declined	Shari Stockero	College of Sciences & Arts	National Science Foundation	\$1,016,835
Pending	Nicholas V. Hendrickson	College of Engineering	US Dept of Commerce	\$148,893
Pending	Kaitlyn Rawhouser	Administration	Keweenaw Community Foundation	\$6,441
Tabled	Bradley A. Wells	Administration	Michigan Dept of Transportation	\$68,145

Table 2: Enterprise/Senior Design Proposals

STATUS	PRINCIPAL_NAME	DIVISION_NAME	SPONSOR	REQUESTED_AMOUNT
Awarded	Tony J. Pinar	College of Engineering	Stevens Institute of Technology	\$5,000
Awarded	Glen E. Archer	College of Engineering	Stevens Institute of Technology	\$7,739
Awarded	Glen E. Archer	College of Engineering	Stevens Institute of Technology	\$5,000
Awarded	Sean J. Kirkpatrick	College of Engineering	Stevens Institute of Technology	\$5,000
Awarded	Nagesh Hatti	Assoc Provost Undergrad Education	Miller Electric Mfg Co	\$8,750
Awarded	Sean J. Kirkpatrick	College of Engineering	Barologics	\$8,000
Awarded	Tony N. Rogers	College of Engineering	CertainTeed Corp (CT)	\$17,500
Awarded	Steven D. Lehmann	College of Engineering	Senger Innovations LLC	\$5,000
Awarded	Tony J. Pinar	College of Engineering	Riverbend Lepak LLC	\$6,500
Awarded	Sean J. Kirkpatrick	College of Engineering	Resolve Surgical Technologies	\$17,500
Awarded	Glen E. Archer	College of Engineering	Oshkosh Corp	\$8,500

Awarded	Christopher M. Cischke	College of Engineering	Stellantis	\$17,500
Awarded	David M. Labyak	College of Engineering	Lear Corp	\$35,000
Awarded	Sean J. Kirkpatrick	College of Engineering	Medtronic Inc	\$17,500
Awarded	Tony N. Rogers	College of Engineering	Sussex IM	\$8,750
Awarded	Timothy C. Havens	College of Computing	Fincantieri Marinette Marine	\$17,500
Awarded	Sean J. Kirkpatrick	College of Engineering	LifeBridge Health	\$17,500
Declined	Sean J. Kirkpatrick	College of Engineering	US Dept of Health and Human Services	\$9,948
Declined	Tony J. Pinar	College of Engineering	Kiminker Don	\$7,500
Declined	Radheshyam Tewari	College of Engineering	Tree Frog Aquagric International LLC	\$24,000

Appendix F: RISE Membership FY23

Email	College	Department	Member Name
asmirnov@mtu.edu	Engineering	geological and Mining	Aleksey Smirnov
algonczi@mtu.edu	Sciences and Arts	Cognitive and Learning Sciences	Amanda Gonczi
arbarnar@mtu.edu	Engineering	ME-EM	Andrew Barnard
ajburton@mtu.edu	Forest Resources and Env Science	Forestry	Andrew J. Burton
raswartz@mtu.edu	Engineering	Civil, Environmental, and Geospatial	R. Andrew Swartz
anmorse@mtu.edu	Engineering	Civil, Environmental, and Geospatial	Audra Morse
bhhamlin@mtu.edu	Engineering	Engineering Fundamentals	Brett Hamlin
bcbettin@mtu.edu	Computing	Computer Science	Briana Bettin
cjandrew@mtu.edu	Forest Resources and Env Science	Forestry	Carrie Andrew
heldt@mtu.edu	Engineering	Chemical	Caryn Heldt
wallace@mtu.edu	Computing	Computer Science	Charles Wallace
cmcischk@mtu.edu	Engineering	Electrical and Computer	Christopher (Kit) Cischke
clwojick@mtu.edu	Staff	Civil, Environmental, and Geospatial	Christopher Wojick
djflaspo@mtu.edu	Forest Resources and Env Science	Forestry	David J. Flaspohler
dmlabyak@mtu.edu	Engineering	Manufacturing & Mechanical Engineering Technology	David M. Labyak
drshonna@mtu.edu	Engineering	Chemical	David R. Shonnard
dllandsb@mtu.edu	Computing	Computer Science	Denise Landsberg
ealaitil@mtu.edu	Engineering	Material Science and Engineering	Edward A Laitila
eegochis@mtu.edu	Staff	GLRC	Emily Gochis
ecvye@mtu.edu			Erika Vye
ersmith@mtu.edu	Sciences and Arts	Humanities	Erin Smith
gearcher@mtu.edu	Engineering	Electrical and Computer	Glen E. Archer
gmodegar@mtu.edu	Engineering	ME-EM	Gregory M. Odegard
hademelo@mtu.edu	Engineering	Civil, Environmental, and Geospatial	Henrique De Melo E Silva
imiski@mtu.edu	Engineering	ME-EM	Ibrahim Miskioglu
jeh@mtu.edu	Engineering	geological and Mining	Jacqueline E. Huntoon
jdeclerck@mtu.edu	Engineering	ME-EM	James DeClerck
jrblough@mtu.edu	Engineering	ME-EM	Jason R. Blough
jmeldrum@mtu.edu	Staff	Keweenaw Research Center	Jay Meldrum
jsdecler@mtu.edu	CTL	Center for Teaching & Learning	Jean Straw DeClerck
jelbrown@mtu.edu	Sciences and Arts	Chemistry	Jeremy Brown
jpbos@mtu.edu	Engineering	Electrical and Computer	Jeremy P. Bos
jjworm@mtu.edu	Engineering	ME-EM	Jeremy Worm
jaszczak@mtu.edu	Sciences and Arts	Physics	John A Jaszczak
jlirwin@mtu.edu	Engineering	Manufacturing & Mechanical Engineering Technology	John L. Irwin
jsgierke@mtu.edu	Engineering	geological and Mining	John S. Gierke, PE
khungwe@mtu.edu	Sciences and Arts	Cognitive and Learning Sciences	Kedmon N. Hungwe
steelman@mtu.edu	Sciences and Arts	Cognitive and Learning Sciences	Kelly S. Steelman
kevinj@mtu.edu	Engineering	Manufacturing & Mechanical Engineering Technology	Kevin M. Johnson
lebrown@mtu.edu	Computing	Computer Science	Laura E. Brown

lkfiss@mtu.edu	Pavlis	Humanities	Laura Kasson Fiss
ureel@mtu.edu	Computing	Computer Science	Leo Ureel
linda@mtu.edu	Computing	Computer Science	Linda Ott
liz@mtu.edu	Engineering	Electrical and Computer	Liz Fujita
ljbowman@mtu.edu	Engineering	geological and Mining	Luke Bowman
mjbergst@mtu.edu	Sciences and Arts	Humanities	Maria Bergstrom
mraber@mtu.edu	Engineering	Engineering Fundamentals	Mary Raber
mrmeyer@mtu.edu	CTL	Center for Teaching & Learning	Michael R. Meyer
mejarvie@mtu.edu	Engineering	Engineering Fundamentals	Michelle Jarvie-Eggart
nhatti@mtu.edu	Engineering	Electrical and Computer	Nagesh Hatti
ndmanser@mtu.edu	Engineering	geological and Mining	Nathan D. Manser
paheiden@mtu.edu	Sciences and Arts	Chemistry	Patricia A. Heiden
pjvansus@mtu.edu	Engineering	ME-EM	Paul van Susante
rtewari@mtu.edu	Engineering	ME-EM	Radheshyam Tewari
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ratowles@mtu.edu	Engineering	ME-EM	Ryan A. Towles
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slwu@mtu.edu	Engineering	geological and Mining	Shiliang Wu
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sdlehman@mtu.edu	Engineering	Biomedical	Steven D. Lehmann
slamato@mtu.edu	Sciences and Arts	Cognitive and Learning Sciences	Susan L. Amato-Henderson
smalladi@mtu.edu	Engineering	ME-EM	Sriram Malladi
toommen@mtu.edu	Engineering	geological and Mining	Thomas Oommen
tnrogers@mtu.edu	Engineering	Chemical	Tony N. Rogers
twakeham@mtu.edu	Sciences and Arts	Biological Sciences	Travis R. Wakeham
yinyint@mtu.edu	Sciences and Arts	Cognitive and Learning Sciences	Yin-Yin (Sarah) Tan
cai@mtu.edu	Computing	Applied Computing	Yu Cai