LSAMP **IINSPIRE** PROGRAM

2023-2024
ANNUAL CONFERENCE

Innovate in STEM

FEBRUARY 9-10, 2024
STUDENT INNOVATION CENTER
GATEWAY HOTEL & CONFERENCE CENTER
AMES, IOWA

For more information: https://www.regcytes.extension.iastate.edu/iinspire/

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

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February 2024

Welcome to the IINSPIRE LSAMP 2024 Annual Conference: Innovate in STEM

Dear Conference Participants:

Iowa State University is pleased to host this year's annual conference of the Iowa, Illinois, Nebraska Louis Stokes Alliance for Minority Participation (IINSPIRE LSAMP). The conference brings together students, faculty, and staff from 16 two-year and four-year colleges and universities in the alliance. Alliance institutions collaborate to support undergraduate students, increase their success, and provide them with academic, research, training, mentoring, and professional development opportunities. The annual conference is a celebration of our students and their accomplishments and career aspirations.

The IINSPIRE LSAMP Alliance is funded by the National Science Foundation (NSF) LSAMP Program to broaden participation in the nation's science, technology, engineering, and mathematics (STEM) workforce by increasing STEM baccalaureate and graduate degrees awarded to populations underrepresented in these disciplines. As the lead institution for this NSF alliance, Iowa State recognizes the value of alliance activities from the perspective of our own strategic mission, which is embodied in the four pillars of Innovative Solutions, Education Experience, Community Engagement, and Knowledge and Discovery. We promote student access to and participation in high-impact practices, such as undergraduate research experiences, which are so integral to the IINSPIRE LSAMP program. With the conference theme of "Innovate in STEM," it is a special opportunity for Iowa State to host an afternoon of sessions on campus at the Student Innovation Center. Our culture of "Innovate at Iowa State" is founded on the premise of "Innovation is for *all*."

As chair of the IINSPIRE LSAMP Governing Board, I extend our thanks to everyone involved with planning and organizing the conference. We sincerely appreciate the work of our campus directors and team members across the alliance who are dedicated to enriching the student experience. We are proud of the achievements of IINSPIRE students and alumni.

Welcome to Iowa State and best wishes for a successful conference!

With best regards,

Jonathan Wickert
Senior Vice President and Provost

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INVITED SPEAKERS

Chris J. Cornelius

Professor and Dr. Thomas D. McGee and Dr. Ick-Jhin Rick Yoon
Department Chair in Materials Science and Engineering
Iowa State University

Professor Chris Cornelius is the Dr. Thomas D. McGee and Dr. Ick-Jhin Rick Yoon Department Chair in Materials Science and Engineering at Iowa State University. His research explores fundamental material interrelationships between structure, physical properties, and transport using synthetic polymers, charged polymers, hybrid organic-inorganic materials, and sol-gel-derived inorganic glasses. He teaches graduate and undergraduate thermodynamics, polymer physics, transport phenomena, heat transfer, and equilibrium-stage operations. He began his academic career at Virginia Tech as the inaugural Associate Director for Research for the Institute for Critical Technology and Applied Science and Technical Director of the Center for Naval System. Before ISU, Chris was a Chemical Engineering Professor at the University of Nebraska-Lincoln. At UNL, he served as the associate dean for research and Mid-America Transportation Center diversity coordinator, and he collaborated with the Nebraska Commission on Indian Affairs, teaching Native students leadership skills and STEM possibilities. Before academia, he was a Research Engineer at Dow Plastics, running a pilot plant creating metallocene-based polyolefins and elastomers, a 3M Process Engineer managing a non-woven respirator production line, and a scientist at Sandia National Laboratories developing materials for fuel cells, water desalination, and gas separations.

›› *Keynote Speaker*

Paul Faronbi

IncrediPaul and NALA(STEM)

Paul Faronbi graduated with his B.S. in Chemical Engineering and minor in Biomedical Engineering from Iowa State University in 2016. He conducted Biomedical Engineering research at Iowa State University all 4 years in Dr. Surya Mallapragada and Dr. Don Sakaguchi's labs and completed a summer research experience at Iowa State with IINSPIRE-LSAMP funding in 2014. He also worked as a co-op and intern at Cargill and Nestle USA while in undergrad. Paul has worked for 4 different Fortune 500 companies and now currently works for Mars Inc as an R&D Sr. Process Engineer in Nashville, TN. He has a passion for leadership and loves to mentor students in STEM. When he's not traveling for work, you can usually find him traveling for STEM conferences. He's the host of the IncrediPaul Leadership Podcast and founder of IncrediPaul LLC and NALA(STEM). In his free time, you'll either find him in the gym or trying out new foods because he considers himself an avid lover of food.

›› *Invited Speaker*

SCHEDULE AT-A-GLANCE

	Friday, February 9	
TIME	**EVENT**	**LOCATION**
11:00AM-12:00PM	**REGISTRATION (STUDENT INNOVATION CENTER)**	**Atrium (Ground Floor)**
12:00PM-1:00PM	**LUNCH**	**Atrium (Basement)**
1:00PM-1:25PM	**TECH TALK F1A** - "Low-Cost Sensors For Agriculture" *Liang Dong, Iowa State University*	**Room 2206**
	TECH TALK F1B - "Cybersecurity: How it Affects Us All" *Doug Jacobson, Iowa State University*	**Room 4250**
	STUDENT OPPORTUNITIES FAIR	**Atrium (Ground Floor)**
1:30PM-1:55PM	**TECH TALK F2A** - "Acceleration of Artificial Intelligence With Emerging Computing Technology" *Dr. Cheng Wang, Iowa State University*	**Room 2206**
	TECH TALK F2B - "Addressing Social & Environmental Challenges in Communities Along the Mississippi River" *Dr. Jan Thompson, Iowa State University*	**Room 4250**
	STUDENT OPPORTUNITIES FAIR	**Atrium (Ground Floor)**
2:00PM-2:25PM	**TECH TALK F3A** - "Gen AI Is Here! Do We Need to Learn to CS to Code & Data Science Anymore?" *Adisak Sukul, Iowa State University*	**Room 2206**
	TECH TALK F3B - "Contributions of Mammalian Hibernation to Human Medicine" *Matt Andrews, University of Nebraska-Lincoln*	**Room 4250**
	STUDENT OPPORTUNITIES FAIR	**Atrium (Ground Floor)**
2:30PM-2:55PM	**TECH TALK F4A** - "Emerging Transportation Solutions Driven by Industry 4.0 Transformation" *Anuj Sharma, Iowa State University*	**Room 4202**
	TECH TALK F4B - "NSF EARTh Center- Exploring Environmental Careers of the Future" *Brian Ritter, Nahant Marsh Education Center*	**Room 4250**
	STUDENT OPPORTUNITIES FAIR	**Atrium (Ground Floor)**
3:00-3:25PM	**TRAVEL TO & SETUP AT GATEWAY HOTEL**	**-**

SCHEDULE AT-A-GLANCE

Friday, February 9

3:30PM-4:15PM	**STUDENT ORAL PRESENTATIONS - GROUP 1A**	**Central Prairie**
	STUDENT ORAL PRESENTATIONS - GROUP 1B	**South Prairie**
	CV, Resumé and LinkedIn Learning	**North Prairie**
4:30PM-5:30PM	**STUDENT POSTER SESSION**	**Gallery Lobby**
6:00PM-9:00PM	**STUDENT DINNER & NETWORKING** *Featuring Paul Faronbi*	**North Prairie**
6:30PM-9:00PM	**CAMPUS DIRECTORS DINNER**	**IowaStater Restaurant**

Saturday, February 10

7:30AM-8:30AM	**BREAKFAST (GATEWAY HOTEL)**	**North Prairie**
8:30AM-9:15AM	**ALL STUDENT SESSION - EMERGING CAREERS PANEL** *Paul Faronbi, Nathalie Fuentes, Abdie Mohamed, and Lizeth Tamayo*	**North Prairie**
9:30AM-10:15AM	**KEYNOTE SPEAKER** *Chris Cornelius, Iowa State University*	**North Prairie**
10:30AM-11:15AM	**SESSION S1A -** "Applying for - and Making the Most of - An Undergraduate Research Experience" *D. Raj Raman, Iowa State University*	**Central Prairie**
	SESSION S1B - "Using Generative AI to Support STEM Learning" *Abram Anders & Emily Dux Speltz, Iowa State University*	**North Prairie**
11:30AM-12:15PM	**SESSION S2A -** "Applying to Graduate School: Getting Started with the Process" *Erin Todey, Iowa State University*	**Central Prairie**
	SESSION S2B - "Unveiling the Hidden Curriculum: Navigating Resources & Discovering Your Potential" *Queenster Nartey, ILAC & STEMtelligent Founder*	**North Prairie**
12:30PM-1:00PM	**AWARDS CEREMONY**	**North Prairie**
1:00PM-2:00PM	**CLOSING REMARKS, LUNCH**	**North Prairie**

TECH TALK DESCRIPTIONS

Friday, February 9
Student Innovation Center

1:00PM – 1:25PM

LOW-COST SENSORS FOR AGRICULTURE
Liang Dong, Iowa State University
http://www.memslab.net
This talk will present several new sensors used to improve agricultural management practices and minimize negative environmental impacts.

CYBERSECURITY: HOW IT AFFECTS US ALL
Doug Jacobson, Iowa State University
http://www.cyio.iastate.edu
Discover how advancements in Artificial Intelligence and the vulnerabilities of Cyber-Physical Systems are reshaping our understanding of digital security. This talk will unveil how cybersecurity is not just an IT issue, but a fundamental aspect impacting all areas of our lives.

1:30PM – 1:55PM

ACCELERATION OF ARTIFICIAL INTELLIGENCE WITH EMERGING COMPUTING TECHNOLOGY
Dr. Cheng Wang, Iowa State University
https://faculty.sites.iastate.edu/chengw/research
We have witnessed remarkable advances in artificial intelligence (AI) on various cognitive tasks, including computer vision and natural language processing. However, AI processing in conventional von Neumann architectures is still orders of magnitude more inefficient than the biological brain. Hence, fundamentally new approaches are needed to sustain continuous growth in the performance of computers beyond the standard CMOS technology roadmap. This talk will introduce research on AI hardware acceleration with various emerging computing technologies.

ADDRESSING SOCIAL AND ENVIRONMENTAL CHALLENGES IN COMMUNITIES ALONG THE MISSISSIPPI RIVER
Dr. Jan Thompson, Iowa State University
https://urban-ruralsystems.org/
There are many challenges in the landscape surrounding the Mississippi River, from flooding and nutrient runoff pollution to urban sprawl and rural depopulation, to name a few. This talk will explore topics being explored by university researchers, community activists, and non-governmental organizations who work together to address issues in the Mississippi River watershed. The team includes representatives/organizations from the river headwaters in Minnesota all the way to its delta in Louisiana.

TECH TALK DESCRIPTIONS

Friday, February 9
Student Innovation Center

2:00PM – 2:25PM

GEN AI IS HERE! DO WE NEED TO LEARN TO CS TO CODE AND DATA SCIENCE ANYMORE?
Adisak Sukul, Associate Teaching Professor, Department of Computer Science, Iowa State University
https://www.linkedin.com/in/adisaksukul/
In this thought-provoking Tech Talk, we'll explore the evolving landscape of Computer Science and Data Science in the age of General AI. We'll delve into how advancements in AI, like ChatGPT, are reshaping the skills and knowledge required for coding and data analysis, challenging traditional educational paradigms. Join us to discuss the future of learning in tech – is AI a replacement for foundational skills, or does it demand a new, hybrid approach to computer and data science education? This talk is a must-attend for anyone curious about the intersection of AI, education, and the future of the tech industry.

VIRTUAL: CONTRIBUTIONS OF MAMMALIAN HIBERNATION TO HUMAN MEDICINE
Matt Andrews, University of Nebraska-Lincoln
https://snr.unl.edu/aboutus/who/people/faculty-member.aspx?pid=2533
Over the past decade, the research community has begun to develop a better understanding of the biochemical and physiological basis of hibernation in mammals. With this knowledge comes the potential for applying hibernation strategies for the improvement of human health. Minimizing disuse atrophy in muscles and bones, extending the time of organ preservation, improving the treatment of trauma and hemorrhagic shock, developing new strategies to combat obesity, and preventing debilitating reperfusion injury following myocardial infarction and stroke are some examples of situations where hibernation strategies are beginning to contribute to human medicine.

2:30PM – 2:55PM

EMERGING TRANSPORTATION SOLUTIONS DRIVEN BY INDUSTRY 4.0 TRANSFORMATION
Anuj Sharma, Iowa State University
www.linkedin.com/in/anuj-sharma-link
Industry 4.0 Transformation, including 5G connectivity, crowdsourcing, social networking, big data analytics, artificial intelligence, cloud-edge computing, and immersive technologies, has completely changed the landscape of several industries and is fundamentally changing how we understand, measure, and control transportation systems. In this talk, I will share examples of how I have designed solutions based on 4.0 revolutions to understand driver behavior better, improve traffic operations, and move towards autonomy under extreme conditions.

NSF EARTH CENTER- EXPLORING ENVIRONMENTAL CAREERS OF THE FUTURE
Brian Ritter, Nahant Marsh Education Center
https://www.linkedin.com/in/brian-ritter-74ab4a20
The Environmental and Natural Resources Technology Center is a National Science Foundation-funded center focused on identifying the environmental workforce needs of the future and helping colleges prepare that workforce. We will discuss environmental employment opportunities.

SESSION DESCRIPTIONS

3:30PM – 4:15PM ➤➤ Friday, February 9 - Gateway Hotel & Conference Center

STUDENT ORAL PRESENTATIONS
Students will present their research in concurrent sessions.

CV, RESUMÉ AND LINKEDIN LEARNING
Jahnavi Pandya, MA, University of Iowa
https://www.linkedin.com/in/jahnavipandya/ | https://www.youtube.com/msjahnavi
Social media, particularly LinkedIn is found to have a significant impact on an individual's career progression in today's world. However, research suggests that many college students do not understand how to use a LinkedIn profile and market their skills to potential employers and 75% profiles contain poor to below average descriptions on the experience section (Daniels et al., 2023). This workshop aims offer ways to build a strong online profile for grad school or job applications while addressing some of the challenges and barriers students face, particularly those who are first generation and/or from minoritized backgrounds.

10:30AM – 11:15AM ➤➤ Saturday, February 10 - Gateway Hotel & Conference Center

APPLYING FOR – AND MAKING THE MOST OF – AN UNDERGRADUATE RESEARCH EXPERIENCE
D. Raj Raman, Morrill Professor, Ag & Biosystems Engineering, Iowa State University
https://www.abe.iastate.edu/abe-department/directory/profile/rajraman/
Undergraduate research experiences - either during the academic year, or during the summer (like NSF REU programs) - can be life-changing opportunities for students. I've been fortunate to have worked with ~220 undergrad researchers during my career and in this talk will share ideas on why you might want to pursue such opportunities, how to make a strong application, and key pointers on how to have a transformative experience as an undergraduate researcher. We'll have plenty of time for Q&A, so come with your questions.

USING GENERATIVE AI TO SUPPORT STEM LEARNING
Abram Anders, Iowa State University
Emily Dux Speltz, Iowa State University
https://abramanders.substack.com/
This workshop offers undergrad and graduate students in STEM an introduction to generative AI literacies. It focuses on practical strategies for effectively and responsibly using generative AI tools in learning and research. Participants will learn about the applications of these tools in on-demand learning, creative problem-solving, and academic writing.

11:30AM – 12:15PM ➤➤ Saturday, February 10 - Gateway Hotel & Conference Center

APPLYING TO GRADUATE SCHOOL: GETTING STARTED WITH THE PROCESS
Erin Todey (she/her), Assistant Director, McNair Scholars Program, Iowa State University
https://www.mcnair.iastate.edu/
This presentation will provide an overview of the graduate school application process. We will pay specific attention to the materials required (especially the CV/resume and statement of purpose) and a timeline that sets applicants up for success. Attendees will have time to engage in brainstorming and discussion about their research interests and professional goals as a way to start engaging in the application process.

UNVEILING THE HIDDEN CURRICULUM: NAVIGATING RESOURCES AND DISCOVERING YOUR POTENTIAL
Queenster Nartey, ILAC & STEMtelligent Founder
Myra James, STEMtelligent Founder & MBA Student
http://www.iinspirelac.org
Join us as we explore the often overlooked aspects of academia and personal development, discovering resources, unlocking hidden potentials, and fostering holistic well-being.

OPPORTUNITIES FAIR EXHIBITORS

Iowa NSF EPSCoR: Chemurgy 2.0, Iowa State University

IINSPIRE LSAMP Alumni Committee (ILAC)

REU in Microbiology at the Host-Pathogen Interface, University of Iowa

Translational AI Center, Iowa State University

Ronald E. McNair Program and ISU Graduate College, Iowa State University

Office of Undergraduate Research, University of Iowa

Department of Biochemistry and Molecular Biology, University of Iowa

Transfer Center, Iowa State University

Summer Program for Interdisciplinary Research and Education – Emerging Interface Technologies (SPIRE-EIT), Iowa State University

Iowa Sciences Academy, University of Iowa

Undergraduate Research Program, Iowa State University

The Graduate School, Montana State University

Nahant Marsh Education Center/Eastern Iowa Community Colleges

ISU Research Park

Iowa Lakeside Laboratory Regents Resource Center

ACKNOWLEDGMENTS

(Listed alphabetically by last name)

Annual Conference Planning Committee

Conference Co-Chairs:

Mary Darrow, Iowa State University

Diane Rover, Iowa State University

Udoyara S (Sunday) Tim, Iowa State University

Finance Chair:

Nicole Shalla, Iowa State University

Iowa State University Conference Planning and Management

Event Planners:

Rebecca Rong

Amanda Sawyer

Additional Thanks:

IINSPIRE LSAMP Campus Directors and Teams,
https://www.iinspirelsamp.org/campus-directors/

Venkata Naga Surya (Sri) Kompella, Iowa State University

Poster and Presentation Judges

www.iinspirelsamp.org

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