



College of Natural Science  
**2022-2023 Dean's Research Scholars**

NATURAL SCIENCE

# X-RAY VISION.

“My research probes the nature of X-ray bright sources to constrain the mass of black holes so they can be used to understand the conditions for forming merging black holes. The high-energy wavelength imaging techniques I use in my observational astronomy research are also used extensively in fields of medicine and chemistry for X-ray imaging and spectroscopy.”

**WASUNDARA ATHUKORALALAGE**  
Astrophysics/Physics, '23



College of Natural Science  
**2022-2023 Dean's Research Scholar**

# WASUNDARA ATHUKORALALAGE

Astrophysics/Physics, '23  
Kuliyapitiya, Sri Lanka

## *A conversation with Wasundara...*

### ➤ **How has your undergraduate experience been impacted by this experience:**

I believe that communicating science results is crucial, and I've done so both via scientific writing and presentations at the professional level. I have a lead-author paper that will be submitted to a peer-reviewed journal. I was able to present at various conferences, such as the Compact Objects Michigan Conference, West Virginia University's Exploring Innovation in Appalachia, and the Conference for Undergraduate Women in Physics, where I was able to broadly disseminate my MSU research to a variety of audiences.

### ➤ **Person/People who have inspired you:**

Carl Sagan, Marie Curie.

### ➤ **Best song/group:**

BTS, Taylor Swift.

### ➤ **Book I'd recommend:**

*A Brief History of Time* by Stephen Hawking.

### ➤ **Worst invention:**

Nuclear weapons.

### ➤ **On my bucket list:**

Visit as many places of scientific significance as I can all around the world—a science pilgrimage.

### ➤ **Person I'd most like to meet (living or dead):**

Lise Meitner (an Austrian-Swedish physicist).

### ➤ **On a Saturday afternoon, you'll likely find me:**

At the MSU library with my friends.

### ➤ **Major research breakthrough of the next decade (not your own, but overall):**

Finding bacterial organisms in exoplanet atmospheres and more deep space explorations.

### ➤ **Plans after graduation:**

To attend graduate school to pursue a Ph.D. in astrophysics.

### ➤ **What are some of your favorite MSU memories:**

Painting near the Red Cedar River and feeding the ducks.

### ➤ **Importance of this scholarship to you personally and to your future career:**

As a Dean's Research Scholar, I aim to communicate MSU astrophysics research to a broader audience. One of my personal goals is to be involved in science communication so that I can help increase representation of underrepresented communities in physics around the world.

“Being a researcher at MSU has opened doors to me at other institutions; in summer 2020, I was awarded the Summer Undergraduate Research Fellowship at Caltech to pursue research in neutron stars.”

# LIGHTING THE WAY.

“My research investigates the effects of different types of light on Nile grass rats, who share a similar wake/sleep cycle to humans. The goal is to produce results that support the design of lighting systems for optimal health benefits rather than simply cost efficiency. This work is also providing insight into the development of more effective light therapy for those impacted by light-related depressive symptoms, such as Seasonal Affective Disorder.”

**EMMA BEAVER**  
Human Biology, '24



College of Natural Science  
**2022-2023 Dean's Research Scholar**

# EMMA BEAVER

Human Biology, '24  
Deckerville, Michigan

## *A conversation with Emma . . .*

➤ **Of everything you have experienced at MSU, what has surprised you the most/what is something you never expected:**

Starting college at the beginning of a pandemic was something I never anticipated; but even more, I never expected to see the type of resiliency from my fellow students throughout this experience. I have been pleasantly surprised by the optimism, flexibility and toughness of MSU students.

➤ **Person/people who have inspired you:**

My mom has been an incredible inspiration to me. She grew up having much less than I did and taught me from a young age to shoot for the stars and hold myself to high standards.

➤ **Best song/group:**

I love Twenty One Pilots and other alternative groups; but one of my all-time favorite songs is "Stand by Me," the version by a group called Music Travel Love.

➤ **Coolest gadget:**

Water bottle-shaped ice cube trays.

➤ **Worst invention:**

Roundabouts! They are so frustrating and, I feel, unnecessary when there could just be a normal intersection instead.

➤ **On my bucket list:**

A number of my bucket list items include various travel destinations I would love to visit including, but definitely not limited to, Bali, Brazil, Ireland, United Kingdom and Greece. I would also love to go backpacking or traveling across the United States to various state parks and mountain trails. On the top of my backpacking list is to visit an International Dark Sky Park to see the night sky unaffected by light pollution.

➤ **Person I'd most like to meet (living or dead):**

Jesus. This may sound cliché, but I cannot possibly think of somebody I would like to meet more than Jesus Christ himself.

➤ **On a Saturday afternoon, you'll likely find me:**

Either studying at any number of East Lansing coffee shops, bingeing movies (especially the Pitch Perfect Trilogy) with my roommate or grabbing dinner with my friends.

➤ **Plans after graduation:**

After graduation from my undergraduate program, I will pursue a master's degree or doctoral education.

“Upon completion of my degrees, I hope to . . . travel and pursue medical missions internationally within impoverished communities.”

# STRONG BEGINNINGS.

“I am a research assistant with the Strong Beginnings program, which looks at the impact preschool has on a child beginning at age three, compared to children in the same age range who remain home prior to kindergarten. The study promotes identifying learning abilities of young children and can be used to assess what school districts need to help all children be successful in school.”

**KARINA CANNING**

Human Biology, '24



College of Natural Science

**2022-2023 Dean's Research Scholar**

# KARINA CANNING

Human Biology, '24  
Edinburg, Texas

## *A conversation with Karina . . .*

### ➤ **How did you decide to attend MSU:**

My decision to attend MSU was based on fulfilling my childhood dream of going to a university outside of the state of Texas. When in high school, an MSU recruiter from the CAMP program broadened my knowledge of the university and what MSU had to offer me. My dad was born and raised in Michigan and MSU was the first out-of-state school to catch my attention; I said yes despite not visiting MSU before accepting my offer.

### ➤ **Person/people who have inspired you:**

One person who has inspired me is my Grandpa Nino because he has always pushed me to be the best version of myself. Seeing how hard he worked growing up, and how his family was always his first priority, motivated me.

### ➤ **Favorite food:**

Mexican tacos.

### ➤ **Best song/group:**

“Pretty Little Fears” by J. Cole & 6LACK.

### ➤ **Book I'd recommend:**

*Song of Achilles* by Madeline Miller.

### ➤ **Best invention:**

X-ray imaging.

### ➤ **Worst invention:**

Social media.

### ➤ **On my bucket list:**

Visit the coral reefs, skydive over the Grand Canyon (if that's possible) and swim with sharks in a cage.

### ➤ **Person I'd most like to meet (living or dead):**

I would love to meet Morgan Freeman and have a conversation on how he became as successful as he is—and because I would love to listen to his voice in person.

### ➤ **Major research breakthrough of the next decade (not your own, but overall):**

The human effect on animal evolution.

### ➤ **Where do you see yourself in 5 years:**

In medical school pursuing a focus in orthopedic medicine.

### ➤ **Where do you see yourself in 25 years:**

I would love to be head attending in my orthopedic department, or even own my own practice.

### ➤ **What are some of your favorite MSU memories:**

Camping outside of the MSU football stadium the night before the MSU vs U of M game to get front row seats in the student section.

“My plans after graduation are to pursue a master's degree in healthcare management and spend time volunteering in underserved communities.”

# PROTECTING YOUR ASH.

“The emerald ash borer (EAB) is an invasive insect that is destroying hundreds of millions of ash trees across the nation, including 40 million ash trees in Michigan. Our lab is looking at the use of another insect—the tiny stingless wasp, *Spathius galinae*—that, when released in the presence of an EAB infestation, will help control the pest in an eco-friendly and sustainable manner.”

**SEAN CROWLEY**

Biomedical Laboratory Science, '23



College of Natural Science

**2022-2023 Dean's Research Scholar**



# SEAN CROWLEY

**Biomedical Laboratory Science, '23  
Okemos, Michigan**

## *A conversation with Sean...*

➤ **How did you select your major:**

I went into freshman year thinking that the only thing I wanted was to end up somewhere in a medical lab. When I refined my interests I decided that medical school was my new end goal.

➤ **How has your undergraduate experience been impacted by this experience:**

A huge part of being a scientist is being able to comprehensively understand a problem and its various solutions. To do that you need to be proficient in so many different skills—almost all of which come from experience. Taking steps toward developing those abilities is something that I can attribute largely to my involvement in undergraduate research.

➤ **Person/people who have inspired you:**

A father who taught me hard work and confidence, a scout master who exemplified respect for others despite a difference of opinion, a coach who challenged me to never be complacent and many educators who showed me the passion that someone can bring to the job they love.

➤ **Best song/group:**

“Mr. Crowley” by Ozzy Osbourne.

➤ **Book I'd recommend:**

*The Count of Monte Cristo* by Alexandre Dumas.

➤ **On my bucket list:**

As a bit of an adrenaline junkie, I've set my sights on going to a racetrack and driving as fast as I can in a fancy new racecar. I've already been skydiving, so I think that's the next big one.

➤ **Person I'd most like to meet (living or dead):**

Julius Caesar. I have always been fascinated with ancient Rome and no amount of National Geographic can tell you everything.

➤ **Where do you see yourself in 5 years:**

Just finishing up med school and continuing my education toward a specialty that I have yet to decide. Maybe I'll take a gap year and participate in Doctors without Borders.

➤ **Where do you see yourself in 25 years:**

At this point in my career I hope to have become a predominate leader in my field. I want to have the opportunity to be a mentor to the next generation of doctors.

“... BLD will continue to give me a unique edge in my knowledge and experience of the laboratory side of medicine and will enable me to provide a higher level of care to my patients.”

# BEATING THE HEAT.

“My research involves studying an enzyme known as G6PDH, which plays an important role in plant development and stress responses, including oxidative damage during heat stress. A better understanding of G6PDH will allow plant breeders to select for plants with higher G6PDH activity, which will make the plants more resilient to heat stress and, consequently, improve crop yields.”

**CALEB FISHER**

Biochemistry & Molecular Biology, '23



College of Natural Science

**2022-2023 Dean's Research Scholar**

# CALEB FISHER

Biochemistry & Molecular Biology, '23  
Laingsburg, Michigan

## *A conversation with Caleb...*

- **Of everything you have experienced at MSU, what has surprised you the most/what is something you never expected:**  
I never expected to be in a lab working on cutting-edge research with some of the world's experts in their fields.
- **If your sibling/friend was coming to MSU, what is one piece of advice you would give them:**  
Pursue your own path and don't be afraid to put yourself out there; otherwise you may never find out what you really want from your time at MSU.
- **Person/people who have inspired you:**  
My grandfather (Grandpa Hamilton).
- **Favorite food:**  
Pad thai.
- **Best song/group:**  
"Symphony" by Marvin Gaye.
- **Book I'd recommend:**  
*Post Office* by Charles Bukowski.
- **Coollest gadget:**  
Magnifying glasses.
- **Best invention:**  
Catalytic converters.
- **Worst invention:**  
Mopeds.
- **On my bucket list:**  
Drive a Formula One car (also known as an F1 car).
- **Person I'd most like to meet (living or dead):**  
Stevie Wonder.
- **On a Saturday afternoon, you'll likely find me:**  
Hanging out with my nephew/family.
- **Plans after graduation:**  
I plan to go to graduate school to study immunology/biochemistry.
- **Where do you see yourself in 5 years:**  
I hope to be finishing a Ph.D. program and looking for a post-doc position.
- **Where do you see yourself in 25 years:**  
I hope to be running my own lab as a PI at a university or research institute.
- **What are some of your favorite MSU memories:**  
One of my favorite memories at MSU was having lab lunches with my coworkers outside in the courtyard of the Plant Biology Building during the summer months.

“Without my [undergraduate] lab experience I wouldn't have realized that I wanted to go to graduate school to pursue a doctoral degree.”

# CALMING INFLUENCE.

“Cannabidiol, or CBD, is known to have anti-inflammatory properties. My research focus is to test the hypothesis that CBD alters the expression of genes that are important to the functions of peripheral blood mononuclear cells, or PBMCs—the primary cells in human body immunity. If we can understand how CBD influences anti-inflammatory effects, other novel compounds could be developed to make additional anti-inflammatory therapeutics.”

**DARLA MARTINEZ**

Biochemistry & Molecular Biology, '23



College of Natural Science

**2022-2023 Dean's Research Scholar**

# DARLA MARTINEZ

Biochemistry & Molecular Biology, '23  
Saginaw, Michigan

## *A conversation with Darla...*

➤ **How did you select your major:**

I came into MSU as an engineering major and advanced in that program until the fall semester of my sophomore year. During that time, when COVID had just become a problem and all classes were virtual, I took my first engineering course and I realized it was not a good fit for me. I decided to make the switch to biochemistry and molecular biology because I thought it would be better suited for my interests, and it was the best fit for me.

➤ **How has your undergraduate experience been impacted by this experience:**

My undergraduate experience has benefited greatly since I began conducting research. It enables me to directly apply concepts that I have been taught in the classroom, so I am able to better understand the materials presented in lectures. I also am getting good experience with the lab equipment and procedures, which are valuable skills that I can apply to the jobs I am looking for in industry.

➤ **Best song/group:**

I like all types of music and my preferences change quite frequently.

➤ **Coolest gadget:**

AirPods.

➤ **Best invention:**

Computers.

➤ **Worst invention:**

The Segway.

➤ **On my bucket list:**

I hope to one day travel to Dubai.

➤ **On a Saturday afternoon, you'll likely find me:**

At home doing homework and later watching a movie, hanging out with my friends and my cat.

➤ **Major research breakthrough of the next decade (not your own, but overall):**

A cure for HIV.

➤ **Plans after graduation:**

To begin working in either the toxicology industry or the pharmaceutical development industry.

➤ **What are some of your favorite MSU memories:**

Some of my favorite MSU memories are from my freshman year before COVID, when I was spending time with my friends at dinner after a long day of classes and talking to each other about our respective days.

“This scholarship is important to me personally because it allows me to network and connect with others who have a similar passion for research.”

# REDUCING SIDE EFFECTS.

“Cisplatin is a powerful chemotherapy drug used to treat a variety of cancers. However, its adverse side effects may result in dose reduction or treatment termination, increasing patient mortality. My research focuses on the development of therapeutics that limit cisplatin’s side effects. Our lab studies found that administration of istradefylline—an FDA-approved medication used for treating Parkinson’s disease—reduces kidney toxicity and pain hypersensitivity induced by cisplatin and the associated inflammation.”

**HARI RAMAKRISHNAN**  
Physiology, '24



College of Natural Science  
**2022-2023 Dean’s Research Scholar**

# HARI RAMAKRISHNAN

Physiology, '24  
Macomb, Michigan

## *A conversation with Hari . . .*

### ➤ **How has your undergraduate experience been impacted by this experience:**

I first joined Dr. Laumet's lab through the Honors College Professorial Assistantship Program after winning a full ride in the Alumni Distinguished Scholarship competition. Through exposure to experimental design in lab meetings, learning how to perform various tests and collect data, and attending journal club meetings, my experience drastically changed my perspective on research as well as impacted my aspirations for a future career. I hope to enter an M.D./Ph.D. or D.O./Ph.D. program and become a physician-scientist, bridging the gap between clinical research and patient care.

### ➤ **Of everything you have experienced at MSU, what has surprised you the most/what is something you never expected:**

At MSU, there are more than 900 student organizations. There is a club for nearly every interest, group or initiative. And if there isn't, it's pretty easy to create one. I found so many clubs that I love and made so many friends because of them.

### ➤ **If your sibling/friend was coming to MSU, what is one piece of advice you would give them:**

College is what YOU make of it. It doesn't change who you are as person. It is simply a toolbox. You can achieve anything you want to at college as long as you set your mind to it, figure out the logistics, make a plan and dedicate yourself to it! Remember to always be open to new experiences and opportunities and treasure the lifelong friends you will make.

### ➤ **Person/people who have inspired you:**

My high school Science Olympiad head coach, Susan Ogden.

### ➤ **Favorite food:**

Sushi or authentic ramen.

### ➤ **Best song/group:**

Imagine Dragons.

### ➤ **Book I'd recommend:**

*Atomic Habits* by James Clear.

### ➤ **Best invention:**

Antihistamines (active ingredient in most allergy medicines).

### ➤ **On a Saturday afternoon, you'll likely find me:**

Eating with my friends at a dining hall or a restaurant on Grand River Avenue.

### ➤ **Major research breakthrough of the next decade (not your own, but overall):**

Understanding the role of various species of bacteria in the human microbiome.



“I think every undergraduate should investigate the research being conducted in their field of study.”

# FOLLOWING YOUR GUT.

“My research examines how nutrition impacts the composition of bacteria in the human gut, also known as the gut microbiome. Combining nutrition with microbiology provides insight on how what we eat affects our overall health. One day, broader research implications will hopefully result in the use of nutritional treatments that are personalized to an individual’s diet to promote the best gut health for patients.”

**MADELEINE RUSSELL**  
Microbiology, '23



College of Natural Science  
**2022-2023 Dean's Research Scholar**



# MADELEINE RUSSELL

**Microbiology, '23  
Marshall, Michigan**

## *A conversation with Madeleine . . .*

### ➤ **How did you decide to attend MSU:**

My parents are both MSU alumni, so I knew MSU was the right choice for me. I decided to attend MSU after attending the Honor's College Alumni Distinguished Scholarship competition.

### ➤ **How did you select your major:**

Most of the core conundrums we face as a society are not solvable from a simple, top-down approach. What made me interested in microbiology was the possibility of how changing something so small on the microbiological level can have a profound impact on human health.

### ➤ **How has your undergraduate experience been impacted by this experience:**

My research experience has given me the opportunity to engage with my education at a higher level. Before working in a lab, I had never really viewed research as part of my destination career path, as I had always associated research as being individualistic, which didn't align with my career goals of working in patient care. Since working in a lab, my perspective of research has changed as I have been able to develop personal and professional relationships while working on exciting projects. Additionally, my research has afforded me the space to intersect my interests of microbiology and improving patient care. Participation in undergraduate research has helped me to develop my long-term goals, approach situations with innovative solutions and extend my professional network, all of which will help me immensely as I move forward in my career.

### ➤ **Of everything you have experienced at MSU, what has surprised you the most/what is something you never expected:**

One of the amazing parts about being a student at MSU is that there are so many opportunities available to us. . . . I have thrived in the community of motivated, compassionate Spartans who are always looking for a way to improve the world around us.

### ➤ **Major research breakthrough of the next decade (not your own, but overall):**

Widespread use of mRNA vaccines.

### ➤ **Plans after graduation:**

To attend medical school and pursue a career in clinical research.

“My passion for science arises from attacking . . . problems by intervening upstream to prevent negative downstream health outcomes.”

# BIRD'S-EYE VIEW.

“My work involves tracking seasonal movements of bird species across rural, suburban, and urban greenspaces using data collected from a citizen science program. With my research project, I want to spur more studies into bolstering native bird populations, conserving habitats, and creating ample reservoirs of resources. It is my hope that this research can help increase the chances of having a broad diversity of birds for future generations to enjoy.”

## ANNALIESE SINGER

Environmental Biology/Zoology  
& Political Science-Prelaw, '23



College of Natural Science  
**2022-2023 Dean's Research Scholar**

# ANNALIESE SINGER

**Environmental Biology/Zoology and Political Science–Prelaw, '23  
Howell, Michigan**

## *A conversation with AnnaLiese...*

➤ **If your sibling/friend was coming to MSU, what is one piece of advice you would give them:**

Don't be afraid to join clubs and student organizations. They are a great way to meet people and you might end up discovering a new favorite hobby.

➤ **Person/people who have inspired you:**

My mom and dad have always encouraged me to chase my dreams no matter how far-fetched they may have seemed at the time.

➤ **Favorite food:**

My grandma's German chocolate cake.

➤ **Book I'd recommend:**

*Silent Spring* by Rachel Carson.

➤ **Coolest gadget:**

Portable phone chargers—because I never have to worry about my battery dying or a lack of charging stations.

➤ **Best invention:**

The Merlin Bird ID app. It's a comprehensive, global field guide right on your smartphone.

➤ **Worst invention:**

Firecrackers. Not only are they obnoxiously loud and scare pets, but they can also result in wildfires that impact whole ecosystems.

➤ **On my bucket list:**

Travel to all seven continents.

➤ **Person I'd most like to meet (living or dead):**

Rachel Carson—because her book *Silent Spring* helped strengthen my desire to dedicate my life to the protection of the environment; or Katie Ledecy, as she is one of my heroes in the world of competitive swimming.

➤ **Major research breakthrough of the next decade (not your own, but overall):**

The discovery of life on other planets.

➤ **Where do you see yourself in 5 years:**

I see myself graduating law school and working in a legal capacity for either a government agency such as the U.S. Fish and Wildlife Service, or a nonprofit organization focused on conserving our nation's wildlife.

➤ **What are some of your favorite MSU memories:**

Attending College Gameday during the 2021 U of M and MSU football game, trying out all the dining halls on campus to determine which one has the best food, and having funny and thoughtful conversations with my roommate.

“Communicating detailed issues in an easy-to-understand manner is crucial to developing better awareness in the minds of bureaucrats and the public regarding how laws and policies may impact our country's natural resources.”

# TAMING TB.

“Tuberculosis (TB) is one of the leading causes of death by infectious disease. While there are drugs to treat the disease, they are costly, time-sensitive and not always accessible. I am learning about TB cells and how small molecules that bind with a protein, MmpL3, can stop it from performing its function, thus killing the cell. Understanding these interactions can lead to the design of new drugs to treat TB that are more efficient and accessible.”

**LYDIA VALTADOROS**

Physiology, '24



College of Natural Science

**2022-2023 Dean's Research Scholar**

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# LYDIA VALTADOROS

Physiology '24  
Ann Arbor, Michigan

## *A conversation with Lydia...*

➤ **How has your undergraduate experience been impacted by this experience:**

I knew very little about academia and a career in research before I started participating in research at MSU. I now plan on participating in research for as much time as I can as an undergraduate, and possibly attending graduate or professional school to continue learning and researching.

➤ **Of everything you have experienced at MSU, what has surprised you the most/what is something you never expected:**

I knew professors and other students would be supportive, but the community at MSU is amazing. I always feel like I have someone I can reach out to no matter what problem I'm experiencing.

➤ **Person/people who have inspired you:**

My parents, my high school math teacher and my grandmothers.

➤ **Favorite food:**

Banana and peanut butter is a power combo.

➤ **Best song/group:**

Recently I've really enjoyed listening to Mac Miller.

➤ **Book I'd recommend:**

*When You Reach Me* by Rebecca Stead.

➤ **Best invention:**

The bicycle—you can get around fast and you don't have to wait on buses or worrying about finding a parking spot.

➤ **On my bucket list:**

Skiing in the Swiss Alps.

➤ **Person I'd most like to meet (living or dead):**

President Abraham Lincoln.

➤ **On a Saturday afternoon, you'll likely find me:**

Outside in the sun (for most of the year!) hanging out with friends or doing homework.

➤ **Major research breakthrough of the next decade (not your own, but overall):**

Advances in gene therapy.

➤ **What are some of your favorite MSU memories:**

Meeting lifelong friends in classes, living in East Lansing, sitting outside around campus and people watching.

➤ **Where do you see yourself in 5 years:**

I see myself pursuing other degrees after my bachelor's—so, more school!

“Schoolwork is important and always comes first. But, make sure you take advantage of social events and clubs to connect with other students.”