Yahriel Salinas-Reyes
The GEM Consortium, Ph.D. Engineering and Science Fellowship

Polk: Des Moines, 50316, Iowa, United States

515-314-4160   •   yahrielsreyes@gmail.com

//www.linkedin.com/in/yahriel-salinas-reyes-89ab38179

www.github.com/yahriels

I am writing to express my sincere enthusiasm and interest in the opportunity presented by the SPARCnet RaMP program. With a background rooted in aerospace engineering and a burgeoning passion for interdisciplinary research in neuroscience and computational sciences, I am eager to contribute to the innovative and collaborative research endeavors facilitated by SPARCnet.

Having recently completed my Bachelor of Aerospace Engineering from Iowa State University of Science and Technology, where I specialized in Micro-electro-mechanical Systems (MEMS) and Soft Matter Physics, I bring a unique blend of technical expertise and a passion for scientific exploration to the program. My research experiences span various prestigious institutions, including DARPA, Caltech, Boeing, and Stanford University, where I have been involved in projects ranging from wind energy research to nanomaterials synthesis.

The mission and objectives outlined in your program overview resonate deeply with my academic and professional aspirations. The prospect of being part of a cohort of postbaccalaureate researchers dedicated to addressing species responses to climate change aligns perfectly with my commitment to leveraging scientific inquiry for positive environmental and societal impact.

I am particularly drawn to the SPARCnet RaMP program's focus on investigating species responses to climate change, especially in the realm of amphibian ecology. The opportunity to work collaboratively with mentors and fellow researchers to address pressing environmental challenges aligns perfectly with my career aspirations and personal values. Additionally, the chance to engage in hands-on research, professional development, and career exploration within a supportive and diverse community is something I find incredibly appealing.

In reviewing the potential research locations and projects offered, I am excited about the prospect of contributing to projects such as thermal biology, morphological variation, trait plasticity, and statistical approaches. With my background in engineering statistics, machine learning, data science, and computational modeling, I am confident in my ability to make meaningful contributions to these areas of study.

I am particularly interested in working with mentors such as Eric Gangloff, Brandon P. Hedrick, Jeanette Moss, M. Caitlin Fisher Reid, and David A.W. Miller, whose expertise aligns closely with my research interests and skill set. I believe that my experience in experimental techniques, computational modeling, and data analysis will be valuable assets to any research team, and I am eager to leverage these skills to address the core project research questions and tailored project themes outlined by SPARCnet RaMP.

In conclusion, I am genuinely excited about the opportunity to be a part of the SPARCnet RaMP program and contribute to its mission of training the next generation of interdisciplinary scientists. I am confident that my background, skills, and passion for scientific inquiry make me a strong candidate for this program, and I look forward to the possibility of further discussing how I can contribute to the success of SPARCnet RaMP.

Looking Forward to Hearing From You,

Yahriel Salinas-Reyes

Attached: curriculum vitæ

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Education

Iowa State University of Science & Technology	**Ames**
Bachelor of Aerospace Engineering, GPA: 3.3	2023

Specialized in Micro-electro-mechanical Systems (MEMS) and Soft Matter Physics

Work Experience

Bayer Crop Science: Regulatory Group (GEM Employer*)	**Monsanto, MO**
Scientist I & Data Engineer	*01/2024- Present*

○ Engage in cutting-edge research and data engineering tasks within Bayer Crop Science's Regulatory Group, contributing to the advancement of agricultural science and technology.

DARPA: Recovering Rare-Earth Elements from E-Waste	**Ames, IA**
Research Assistant & Lab Technician	*05/2022- 12/2023*

○ Executed pivotal roles in DARPA's mission to recover rare-earth elements from electronic waste, employing innovative research techniques and laboratory methodologies to address critical environmental and technological challenges.

The Microscale & Interfacial Fluid Physics Laboratory	**Ames, IA**
Experimental Systems & Automation Engineer	*08/2021- 12/2023*

○ Demonstrated expertise in experimental systems and automation engineering at the Microscale & Interfacial Fluid Physics Laboratory, contributing to groundbreaking research in fluid dynamics and interfacial phenomena.

The Soft Matter Material Transport Group	**Ames, IA**
Undergraduate Researcher & Systems Engineer	*08/2019- 05/2022*

○ Played a key role in the Soft Matter Material Transport Group's research initiatives, focusing on the design and optimization of multi-functional piezoelectric devices for aeronautical applications, showcasing skills in systems engineering and materials science.

Caltech The Kavli Nanoscience Institute: The Julia R. Greer Group	**Pasadena, CA**
Undergraduate Research Assistant	*05/2021- 08/2021*

○ Contributed to research efforts at Caltech's Kavli Nanoscience Institute, collaborating with the Julia R. Greer Group on the development of hybrid nanocomposites and the investigation of viscoelastic behavior, highlighting capabilities in nanomaterials synthesis and characterization.

Boeing: Wind Energy & Development	**Ames, IA**
Boeing Aerospace Research Fellow	*08/2021- 08/2022*

○ Served as a Boeing Aerospace Research Fellow, spearheading projects in wind energy research and development, with a focus on characterizing damping mechanisms in piezoelectric wind-energy harvesters, demonstrating expertise in aerospace engineering and renewable energy technologies.

Stanford University: Xiaolin Zheng Z-Energy Group	**Stanford, CA**
Undergraduate Research Assistant	*05/2021- 08/2021*

○ Engaged in research endeavors at Stanford University's Z-Energy Group, investigating the application of machine learning techniques in scientific methodologies and prediction, showcasing proficiency in data-driven research and computational modeling.

Iowa State University of Science & Technology	**Ames, IA**
Information Technology Specialist & Data Scientist	*08/2019- 05/2023*

○ Provided technical expertise as an Information Technology Specialist and Data Scientist at Iowa State University of Science & Technology, contributing to the implementation, monitoring, and maintenance of IT systems while leveraging data science techniques for analysis and decision-making.

Fellowship Awards

Program	Institution/Board	Year
GEM Ph.D. Fellowship* (Sci.&Eng.) *Current	The National GEM Consortium*	2024-2029*
P.B.C. (McNair Scholars)	Ronald E. McNair Postbaccalaureate Achievement Program	2021-2023
P.B.C. (Research Certificate)	Louis Stokes Alliances for Minority Participation (LSAMP)	2019-2021
Cert.(Order of The Engineer)	Engineering Accreditation Commission of ABET	2023

Key Projects

1. Experimental Techniques: Flow Separation & Chemical Sintering   **August 2019 - August 2023**
B.Tech / (Prof: Dr. Martin Thuo, Dr. Thomas Ward   *Iowa State University of Science & Technology*

- Developed hardware-software components and signal processing circuits for detecting flow instabilities in paper-based MEMS devices.
- Conducted experiments to manufacture MEMS nanocomposites and modeled shear viscosity.
- Aimed to simulate viscosity measurements at the thermal boundary for potential applications in aerospace.
- *Keywords: Systems Analysis, Interfacial Phenomena, Quantum Tunnelling Composites, Navier Stokes Equations*

2. Damping Mechanisms in Piezoelectric Wind-Energy Harvesters   **August 2021 - August 2022**
Research Fellow / Mentor -(Prof: Dr. Thomas Ward Dept. of Aerospace Engineering, ISU)   *Boeing Aerospace*

- Designed experimental setups and measurement-calibration systems for piezoelectric wind-energy harvesters.
- Collaborated on solution algorithms and continuum mechanics of conductivity to optimize wind-tunnel experiments.
- Objective was to define thermodynamic properties for enhancing wind-energy harvesting efficiency.
- *Keywords: Aerodynamics Analysis, Harmonic Response, Computational Methods, Energy Storage, Soft Matter Physics*

3. Energy Absoption in Nano-Architected Hybrid Composites   **May 2022 - August 2022**
Prof: Dr. Julia R. Greer of Materials Science, A. Mechanics, & Medical Sciences Caltech, Kavli Nanoscience Institute

- Created nanocomposites with architectural features to enhance mechanical properties.
- Investigated deformation mechanisms using dynamic mechanical analysis and scanning electron microscopy.
- Developed a semi-empirical model to understand viscoelastic effects in hybrid nanocomposites.
- *Keywords: Nanoscience, Applied Mathematics, System Modeling, Continuum Mechanics, Energy Dissipation*

4. Meta-stable Particles: Phase-change Materials and their Applications   **August 2019 - May 2022**
Prof: Dr. Martin Thuo Dept. of Materials Science and Engineering, ISU   *NSF-LSAMP*

- Conducted research on meta-stable particles and their applications in phase-change materials.
- Collaborated on developing novel materials with unique properties for various industrial applications.
- Investigated the behavior of phase-change materials under different conditions for practical utilization
- *Keywords: Materials Science, Chemical Synthesis, Solid-State Physics, Advanced Materials, Applications*

Industrial Training

1. Boeing Undergraduate Research Excellence in Engineering Internship   **Dec 2020 - Dec 2021**
(B.Tech / Intern / Mentor: Dr. Thomas Ward)

- Engaged in an intensive internship program at Boeing, gaining hands-on experience focused on wind energy harvesting, green technologies, & enhancing engineering excellence in aerospace applications. Collaborated with industry professionals on cutting-edge projects aimed at advancing aerospace technology and innovation.

2. NASA Micro-G Neutral Buoyancy Experiment Design Teams Challenge   **Oct 2021-Nov 2022**
(B.Tech / Design Team Lead / Mentor: Dr. Tomas Gonzalez-Torres)

- Took part in a challenging design competition organized by NASA, focusing on developing innovative solutions for space exploration challenges. Worked in a multidisciplinary team environment to design, build, and test a prototype device, gaining valuable practical experience in problem-solving and teamwork

Relevant Research Projects and Experience

1. *Integration of Piezoresistive MEMS Sensors*   **April 2020 - August 2021**
(Research Assistant / Mentor: Dr. Martin Thuo)   *Iowa State University*

○ Explored the integration of piezoresistive MEMS sensors into computer technology, focusing on enhancing sensing capabilities in electronic devices. Yahriel contributed to experimental design and data analysis.

2. *Predictive Modeling of Olympic Triathlon Results*   **August 2021 - January 2022**
(Research Assistant / Mentor: Dr. Xiaolin Zheng)   *Stanford University, Z-Energy Lab*

○ Investigated predictive models using machine learning techniques to forecast Olympic triathlon results based on data collection, model training, and result interpretation, showcasing expertise in data-driven research.

3. *Energy Absorption in Nano-Architected Hybrid Composites*   **August 2022 - January 2023**
(Research Assistant / Mentor: Dr. Julia R. Greer)   *The Greer Group, The Kavli Nanoscience Institute*

○ Investigated energy absorption mechanisms in nano-architected hybrid composites and contributed to experimental designs, conducted mechanical tests, and analyzed data, demonstrating proficiency in scientific instrumentation.

4. *REU Site: (LAUNCH-UAS)*   **May 2023 - August 2023**
(Research Assistant / Mentor: Dr. Thomas Ward)   *NSF Award No. 1757393*

○ Mentored in the REU Site program focused on launching aerospace's underrepresented students into the next chapter, particularly in unmanned aerial systems (LAUNCH-UAS).

5. *Shear-Sensing Principals of Interfacial Viscous-Shear Flow*   **August 2021 - January 2022**
(Research Assistant / Mentor: Dr. Thomas Ward, Dr. Martin Thuo)   *Boeing Aerospace*

○ Developed experimental setups for studying shear-sensing principles in interfacial viscous-shear flow.
○ Analyzed fluid flow data and contributed to the development of understanding of interfacial stress/physics.

6. *Cutting-Edge Research in Agricultural Science and Technology*   **January 2024 - Present**
(Scientist I & Data Engineer)   *Bayer Crop Science*

○ Actively engaged in cutting-edge research in green science and technology at Bayer Crop Science.
○ Contribute to the advancement of agricultural practices and the development of biotechnological challenges.

Online Courses

○ Deep Learning: *Data Structures and Algorithms in Python* (May 2021), *Deep Learning with PyTorch: Zero to GANs* (Jan 2021), *Data Analysis with Python: Zero to Pandas* (Oct 2020)
○ MathWorks: *Machine Learning with Matlab (June 2020)*, *Matlab Onramp* (May 20xx), *Deep Learning Onramp* (May 20xx), *Machine Learning Onramp* (May 20xx), *Deep Learning with Matlab (May 20xx)*

Course Work

1. Key Courses   **August 2019-December 2023**
(Core and electives)   *Iowa State University: College of Engineering*

○ Courses: Applied Mechanics & Physics, Materials Science & Engineering, Engineering & Polymeric Chemistry, Engineering Statistics
○ Foundations: Multi-Variable Calculus Continuum Mechanics, Mechanics of Materials, Dynamics & Differential Equations
○ Lab: Numerical & Graphical Techniques, Advanced Computing, Advanced Programming Languages in C++

Technical Skills

○ Programming Language: C, C++, Java, Python, CAD & FEA, ANSYS/ABAQUS, Computational Modeling
○ Web Technology: SQL, Windows OS, Linux OS, AWS Services, MATLAB & Simulink, SAS, Iot

Achievements/Awards

○ Finalist of The Fulbright-National Geographic Award, Open Study/Research Award
○ Complete funding confirmed upon admission to Ph.D. Program. The GEM Ph.D. Engineering & Science Fellowship.

Declaration

I do hereby declare that all the details furnished above are true to the best of my knowledge and belief.