AFRL REGIONAL NETWORK MID-ATLANTIC

QUARTERLY NEWSLETTER
Q1 – 2024

Welcome to the AFRL Regional Network – Mid-Atlantic Quarterly Newsletter

Dear Members, Partners, and Friends,

As we embark on another quarter of innovation and progress, we are thrilled to extend our warmest greetings to all of our colleagues in the AFRL Regional Network – Mid-Atlantic. Since our inception in 2022, our network has flourished, expanding from eight founding members to over 40 academic institutions, organizations and companies, all united in our mission to bridge the vital gap between groundbreaking ideas and their dual-use commercialization. This growth is a testament to the vibrant ecosystem we've all created, one where academia, industry, and government collaboratively push the boundaries of what's possible.

Our success stories are increasing, and they speak volumes about the potential within our network. We've awarded over $2.5M across 19 projects and more than half of our members are actively engaged in advancing meaningful innovations. Network projects have funded more than 24 masters and graduate students across the region, they are spawning startups, and three completed projects thus far (totaling $400K) have attracted over $2.8M in follow-on funding – over a 600% return. From the development of self-healing composites for extreme environments to innovative advances in rare earth separation vital to the success of reshoring our semiconductor supply chain, our projects are creating tangible impacts, fostering economic growth, and enhancing our national security posture.

We're grateful for the recent Air Force Research Laboratory's[two-year contract extension and $15 million funding ceiling increase](). This support not only solidifies our foundation but also propels us toward new horizons of opportunity and collaboration. We're excited to introduce Dr. John Luginsland as our Collaboration Director and look forward to welcoming a new Network and Programs Director to the team in April.

Looking ahead, we remain committed to our mission to foster innovation and empower the next generation of scientists and technologists. None of this, however, would be possible without you and we want to express our sincerest gratitude to each member of our community for your relentless dedication, creativity, and collaboration. It is your contributions that make the AFRL Regional Network – Mid-Atlantic a beacon of innovation and a testament to the power of partnership.

How can you play a larger role in our success?

- Our next project proposal cycle **opens April 22**; reach out to our team prior for the essential connections to the AFRL or other member/collaborators.
- Stay tuned for and attend networking and information sessions in your area
- Join us for our annual meeting in November; date and location to be announced soon.

Warmest regards,

Patrick Govang & Emmanuel Giannelis
Co-Directors, AFRL Regional Network – Mid-Atlantic

Exciting Leadership Appointment: Dr. John W. Luginsland Steps in as Collaboration Director

We are thrilled to announce the appointment of. Dr. John W. Luginsland the Regional Network's new Collaboration Director, a role that promises to propel our network into its next phase of innovation and collaboration.

Dr. Luginsland brings a wealth of experience and a deep understanding of the intersection between academia, industry, and defense. His primary objective will be to foster partnerships and bridge connections across these sectors, especially with AFRL. These efforts are crucial for bolstering national defense and enhancing market value through technological advancements.

With a distinguished career that spans government, industry, and academia,

Dr. Luginsland's expertise in scientific research and leadership is expected to drive significant progress. His previous role as a Principal Physical Scientist at the AFRL/Air Force Office of Scientific Research has equipped him with invaluable insights into the challenges and opportunities within national security and defense technologies.

“I am deeply honored to join the AFRL Regional Network – Mid-Atlantic as the Collaboration Director,” Dr. Luginsland expressed in a recent press release. “This role presents an unparalleled opportunity to leverage our collective expertise towards addressing some of the most pressing challenges in national security and technology.”

Under Dr. Luginsland's guidance, the AFRL Regional Network – Mid-Atlantic is poised to achieve new heights in innovation and collaboration. Since its inception in 2022, the Network has seen remarkable growth, expanding its membership and securing significant funding for innovative projects. These achievements underscore the Network's commitment to nurturing the regional innovation ecosystem and its dedication to empowering the next generation of scientists and technologists.

Please join us in welcoming Dr. John W. Luginsland to his new role and supporting him as he leads our efforts to foster meaningful collaborations that will significantly contribute to our nation's defense capabilities and technological forefront.

Spring Funding Cycle

We're pleased to report that our spring funding cycle will **open on April 22** and **close on May 24**. Cycle information will be available on the funding opportunities page linked below.

Funding Opportunities

Project Highlights

In each newsletter, we look to highlight one or two Regional Network projects that are particularly interesting and/or showing significant promise. This quarter, we’re highlighting the following:

Machine Learning Driven Optimal Design of Self-Healing Vitrimer Composites for Multifunctional Coatings

Imagine you’re traveling through space and your craft is punctured by space debris. You might imagine that being a catastrophic event, however, this project team sees this possible this scenario quite differently. Aimed at

enhancing the performance of coatings used in extreme environments by leveraging the application of machine learning and data analysis tools, this collaboration involves Brookhaven National Laboratory, the National Reconnaissance Office, Columbia University, Northrop Grumman, Cornell University, the University of Buffalo, the University of Southern Mississippi, and the Air Force Research Laboratory (AFRL).

The primary goal of this team is to harness the capabilities of machine learning and data learning methodologies to discover and implement the most effective designs for coatings made of self-healing vitrimer nanocomposites (VNCs). These advanced materials are targeted for use in critical applications by the Air Force, Space Force, and Northrop Grumman, where they are expected to significantly improve operational performance in challenging conditions. The VNCs offer remarkable properties, including enhanced surface reliability, repairability, self-healing, recyclability, and reduced maintenance and support requirements – addressing a vital need within these sectors.

The project's impact is underscored by its success in being awarded funding over two competitive stages. The team harnesses deep regional expertise and highlights a concerted effort to overcome the obstacles associated with deploying self-healing technologies in environments where traditional materials may fail.

Microfluidic-accelerated directed evolution for sustainable rare earth separation

Will our phones be completely Red, White and Blue some day? Not without the work of this project. Crucial to nationalizing the microelectronics supply chain is access to rare earth elements. This collaborative effort focuses on developing alternative processes for separating rare earth elements (from US-based waste streams) and involves work at Cornell University, the startup company REEGEN, and the AFRL.

The impact of this project has been substantial, as evidenced by two competitively-awarded funding stages. These investments have facilitated significant technical advancements in the field. A notable achievement of the project is the publication of an article in the prestigious journal *Nature*, highlighting the groundbreaking findings and methodologies developed by the team. Furthermore, the success of the research has led to the founding of REEGEN, the startup company, which has achieved already national recognition. REEGEN's achievements include acceptance into a campus incubator and receiving the Activate Entrepreneur Fellowship award.

Mid-Atlantic Network Overview Video

Have you seen the Mid-Atlantic Network's overview video?Take a look here!

THANK YOU FOR READING
SEE YOU NEXT TIME!

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