GTRI and SEI Announce Recipients of Phase Two Seed Funding from the Energy and National Security Initiative

In July 2024, the Strategic Energy Institute (SEI) in partnership with Georgia Tech Research Institute (GTRI), created the Energy and National Security Initiative through a campuswide workshop. The event drew over 100 participants from more than a dozen units across Georgia Tech and GTRI. John Tien, Georgia Tech and SEI Distinguished External Fellow and Professor of Practice, and former Deputy Secretary for the Department of Homeland Security, and Tom Fanning, former CEO at Southern Company, kicked off the workshop with a stimulating conversation on the role of energy in the security of the nation and the opportunities available for Georgia Tech that aligns with its ongoing research on the topic.

The event culminated with an announcement for two rounds of seed funding, totaling up to $500,000 annually for three years. The first round was announced in September 2024 and served as a planning grant for six teams to support their initiatives in the Fall semester.

Recipients for the second phase of the seed funding have been announced with the seed funding providing research support in the Spring semester with the option for additional support through the 2025-2026 academic year. Seven interdisciplinary teams with transdisciplinary PIs and collaborative projects that include team members from Georgia Tech and GTRI have been selected to move to the second or Category B level. The projects include:

Team Name	PI(s)	Other Team Members	Description
Energy Infrastructure Security and Risk Assessment through Interactive Wargaming	Dimitri Mavris (ASDL)	Scott Duncan (ASDL) Michael Balchanos (ASDL) Charles Domercant (GTRI)	Experts from GT's Aerospace Systems Design Laboratory (ASDL), the Sam Nunn School of International Affairs (INTA) and their internal and external partners will analyze key vulnerabilities in energy infrastructure operations related to national security, focusing on interactions within and between systems of systems (SoS).
Evaluating Energy Storage Materials, Supplies, and Systems in the Context of National Security Requirements	Micah Ziegler (ChBE and SPP) Jinho Park (RISC, CIPHER Lab, GTRI)	Matt McDowell (ME and MSE) Illan Stern (RISC, CIPHER Lab, GTRI)	This project will explore the evolving requirements and performance of energy storage technologies for defense, focusing on design space, battery performance under extreme conditions, and material needs

Nanostructured Sensors for Monitoring of Nuclear Fuel Cycle	Anna Erickson (NRE)	W. Jud Ready (GTRI) Yuguo Tao (NRE) Brent Wagner (GTRI)	Advanced sensors and instrumentation are crucial for monitoring the nuclear fuel cycle amid evolving energy and security concerns. This project proposes a multi-disciplinary research effort to explore nuclear threats and the development of safe, secure civil nuclear power, nuclear waste management, and SMRs.
Resilient Critical Infrastructures via Provably Secure Control Algorithms	Dan Molzahn (ECE)	Saman Zonouz (SCP) Vladimir Kolesnikov (SCP) Samuel Litchfield (GTRI)	This project focuses on using provable cryptographic techniques to securely and efficiently solve control algorithms in real-time to ensure overall safety, security, and resilience of critical infrastructure (power grids, water networks, and communication systems).
Robust Energy Systems Planning by way of Novel Systems Engineering (RESPoNSE)	Comas Haynes (GTRI)	Matt McDowell (ME/MSE) Mathieu Dahan (ISYE)	This project will focus on an improved decision-making framework for military deployment Concepts of Operations (CONOPS) and Standard Operating Procedures (SOPs). The framework will enhance "scheduling" both on the level of deploying fuel supply assets such as fuel trucks and optimizing time allocations of sequential energy conversions.
SPARC: Severe-weather Predictive Analytics and Resilient Communication	Francisco Valdes (GTRI)	Santiago Grijalva (ECE) Trevor Lewis (GTRI) Michael Peterson (GTRI)	SPARC aims to address severe weather challenges to energy infrastructure by making energy systems more resilient through the integration of advanced predictive analytics, localized weather models, and resilient communication networks.

The Strategic Mineral Economy: Challenges and Opportunities for Critical Resources	Dylan Brewer (SOE) Bobby Harris (SOE) Matthew Swarts (GTRI, RISC)	Kevin Caravati (GTRI, RISC) Chris Gaffney (ISyE) Manho Kang (SOE) Francisco Valdes (GTRI) Micah Ziegler (ChBE, SPP) Laura Taylor (EPIcenter)	This project will focus on combining disciplinary toolkits with growing expertise in the science, engineering, policy, logistics, and economics of critical minerals supply chains to provide valuable policy insights and academic research at the frontier of this nascent field.

"This seed funding initiative of SEI and GTRI is a significant step towards advancing national security through innovative energy solutions. We believe this support will empower the funded teams to explore critical intersections between energy infrastructure and security, fostering groundbreaking advancements for a safer energy future," said Christine Conwell, interim executive director of SEI.