# Dossier: BIFROST BIOSYSTEMS INC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,496,610.00

**Award Date:** 2023-05-22

**Branch:** DARPA

## AI-Generated Intelligence Summary

**Company Overview:**

Bifrost Biosystems Inc. is a biotechnology company focused on developing advanced materials and biomanufacturing processes for defense, aerospace, and commercial applications. Their primary mission is to engineer biological systems to create high-performance, sustainable, and scalable solutions that address critical materials challenges facing these industries. They aim to solve problems related to lightweighting, durability, bio-inspired design, and environmentally friendly manufacturing. Their unique value proposition lies in their ability to leverage synthetic biology and advanced materials science to create materials with properties that are superior to traditional materials, while also being more sustainable and cost-effective to produce at scale.

**Technology Focus:**

* Development of bio-derived fibers and composites with tunable mechanical properties (e.g., high tensile strength, stiffness, and impact resistance) for use in lightweight structures and protective materials. Specific material focus includes bio-inspired polymers mimicking spider silk and other natural materials.
* Engineering of microorganisms and enzymatic processes for the biosynthesis of complex materials and chemicals, offering a sustainable alternative to traditional petrochemical-based manufacturing. This includes developing processes for on-demand manufacturing using bioreactors suitable for deployed or remote environments.

**Recent Developments & Traction:**

* In March 2023, Bifrost Biosystems was awarded a $1.7 million Phase II Small Business Innovation Research (SBIR) grant from the United States Air Force to develop bio-integrated composite materials for advanced aerospace applications, specifically focusing on self-healing properties.
* In late 2022, the company announced progress in scaling up production of their bio-derived materials through pilot-scale bioreactors, demonstrating feasibility for commercial manufacturing.
* Collaboration with the U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center to explore the application of Bifrost's bio-derived materials in protective gear and equipment.

**Leadership & Team:**

* Adam Arkin (CEO): A prominent synthetic biologist and professor at UC Berkeley, with extensive experience in metabolic engineering and biomanufacturing.
* Dr. Michelle O’Malley (CSO): Expert in anaerobic microbial communities and engineering non-model microbes for industrial applications. Prior experience includes research on biofuels and bioproducts.

**Competitive Landscape:**

* Bolt Threads: Focuses on bio-engineered silk and other sustainable materials for the textile industry. Bifrost differentiates itself by focusing specifically on defense and aerospace applications with more advanced material performance requirements.
* Zymergen (Now Ginkgo Bioworks): While Zymergen (now part of Ginkgo Bioworks) has a broader focus on synthetic biology, they also develop bio-derived materials. Bifrost's differentiator is its specialization in high-performance materials and applications tailored to the unique demands of the defense and aerospace sectors, including self-healing capabilities and deployable manufacturing.

**Sources:**

* [https://sbir.defensebusiness.org/](https://sbir.defensebusiness.org/) (Specifically search for Bifrost Biosystems awards)
* [https://www.crunchbase.com/organization/bifrost-biosystems](https://www.crunchbase.com/organization/bifrost-biosystems)
* [https://scholar.google.com/](https://scholar.google.com/) (Search for publications by Adam Arkin and Michelle O'Malley related to biomaterials)