



U.S. DEPARTMENT OF ENERGY
AlgaePrize
NextGen Algal Innovators

Team Name:

PUPR AlgaePrize Team

Team Schools/Organizations:

Polytechnic University of Puerto Rico, San Juan, PR

Abstract:

As a direct effect of ocean warming and nutrient enrichment, tones of a brown macroalgae known as sargassum, have been accumulating on shores throughout the Caribbean region since 2011. These unprecedented annual events have been detrimental not only to marine ecosystems but also to the human health and economy of coastal communities. Despite the negative impact of the brown tide described above, sargassum has the potential of being a valuable source for multiple industries including, among others, pharmaceuticals, cosmetics, fertilizers, civil construction materials, and bioplastics.

In the search for new applications of sargassum biomass, the present work aims to explore the use of this seaweed as a raw material for the fabrication of novel bio-based composite materials for 3D printing.

The project's ultimate goal is to produce sargassum-based composite materials for 3D printing having a higher content of algae biomass, and exhibiting enhanced materials properties and printability as compared to commercially available materials used in 3D printing.

The major impact of this project is its contribution to (1) improving sustainability in a cutting-edge technology like 3D printing, while addressing problems such as the macroalgae bloom and greenhouse gases, and (2) broadening participation in STEM by creating a diverse AlgaePrize team that includes Afro-Puerto Ricans, U.S. military veterans, first-generation college students, Federal Pell Grant recipients, and first-generation immigrants. Each team member will serve as role models for hundreds of underrepresented high schoolers and college students that will attend the outreach activities proposed in this research project.

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