

Creating Connections that Drive Innovation



EXECUTIVE SUMMARY

Flux Marine is a Rhode Island-based start-up working to revolutionize the marine industry by replacing boat engines with 100% electric outboard motors. When the COVID-19 pandemic forced the closure of its workspace, they no longer had a place to test, prototype, or build their motors. At the same time, IYRS School of Technology & Trades shut its doors to in-person education, leaving its facilities and resources unused.

Thanks to 401 Tech Bridge, the two organizations found a mutually beneficial solution to their problems. 401 Tech Bridge connected Flux Marine with IYRS, which provided the facility, equipment, and expertise needed to enable Flux Marine to complete its prototype. For IYRS, the collaboration with Flux Marine enhances its curriculum by enabling students to observe and engage in the real-world process of an early-stage company transforming an idea into a product and bringing it to market, and an opportunity to develop a model for post-secondary trade school and industry collaboration.



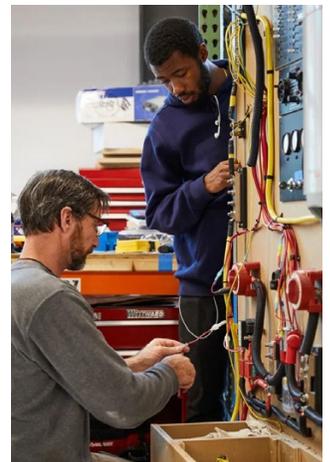
**FLUX
MARINE**

CREATING CONNECTIONS THAT DRIVE INNOVATION

IYRS School of Technology and Trades is a non-profit, post-secondary educational institution located in historic Newport, Rhode Island. The premier marine trades and modern manufacturing school in the United States, IYRS was founded in 1993 as the International Yacht Restoration School, with an initial focus on the restoration of historically significant wooden sailing yachts. Since then, IYRS has grown into a world-class learning institution offering five full-time, accredited education and training programs to teach advanced craftsmanship and technical skills in:

- Boatbuilding & Restoration
- Marine Systems
- Composites Technology
- Digital Modeling & Fabrication
- Combined Program in Composites Technology & Marine Systems

The primary focus of each area of study is workforce training—work values are a graded element of the curriculum across all programs—with a strong emphasis on hands-on work. Every program includes externships, which are off-campus experiential learning opportunities provided by employers that have partnerships with IYRS to give students practical experience in their chosen field. IYRS graduates go on to careers across a range of industries, including yacht building, historic restoration, fine furniture making, wind energy, aerospace, consumer goods prototyping, and more.



CONNECTING EARLY-STAGE COMPANIES WITH MUCH-NEEDED MANUFACTURING RESOURCES

It is this longstanding tradition of developing industry partnerships that ultimately led to a collaboration between IYRS and East Greenwich, R.I.-based Flux Marine. Founded by Ben Sorkin, Jonathan Lord, and Daylin Frantin, Flux Marine is advancing electric marine technology to deliver the world's best boating experiences. The start-up aims to revolutionize the industry by replacing the most complex aspect of the boat—the engine—with 100% electric outboard motors. Its team is currently developing proprietary technology that relies on extremely lightweight materials to build an electrified engine from the ground up to make this a reality.

Prior to the onset of the COVID-19 pandemic, Sorkin and Lord were busy working on their outboard motor technology at Boston-based Autodesk Technology Center, which provides open workspaces and equipment for teams doing forward-looking work in the areas of construction, manufacturing, and emerging technologies. Autodesk is a well-known maker of 3D design, engineering, and construction software.

Flux Marine lost access to its space at the Autodesk Technology Center when it was forced to close due to the pandemic, and they no longer had a place to test, prototype, or build their electric outboard motors. At the same time, IYRS was also forced to shut its doors to in-person education, although it retained a faculty presence at the institution.

Enter 401 Tech Bridge. 401 Tech Bridge is helping to build a community focused on solving problems and creating new solutions in the advanced materials industry. The organization was created to connect manufacturers, small businesses, research and development entities, trade organizations, and state and defense agencies to collaborate in the development of new advanced materials, technologies, and products. The organizations that comprise the 401 Tech Bridge ecosystem are a tight group—essentially a “who’s who” of those working in the advanced materials space—with shared interests. 401 Tech Bridge’s purpose is to facilitate the highly relevant and powerful interactions that are critical for start-ups and small businesses like Flux Marine.



Benjamin Sorkin
CEO/Founder
Flux Marine Ltd.



Jonathan Lord
Chief Technology Officer
Flux Marine Ltd.



Daylin Frantin
Chief Operating Officer
Flux Marine Ltd.

401 Tech Bridge was able to identify IYRS as a good fit to help Flux Marine because it knew that the facility had the equipment needed to complete the prototype, as well as leading experts in the composites field to provide additional resources and expertise. This was the first time IYRS had worked with an outside company in this manner, creating a joint working relationship in terms of providing on-site facility space/equipment and faculty expertise. In turn, Flux Marine's experience in creating its maritime innovations is helping IYRS accelerate its vision of becoming more technology-focused in its curricula.

As part of the partnership, 401 Tech Bridge awarded the company a \$10,000 Materials Innovation Challenge grant that gave Flux Marine access to IYRS's composites expertise and prototyping equipment. The team also helped Flux Marine craft a proposal for the Rhode Island Commerce Innovation Voucher program to provide much-needed funding to sustain the company's development efforts. Flux Marine was awarded \$50,000 to provide further access to IYRS' equipment and testing to help the company accelerate the development of its innovative technology.

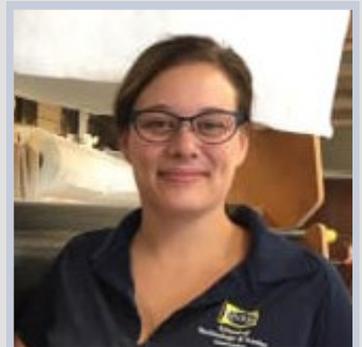


PROVIDING ACCESS TO UNPARALLELED INDUSTRY EXPERTISE

Composites technology—a key area of focus at IYRS—is responsible for some of the lightest, strongest materials in the world. IYRS faculty includes composites industry luminary Bob Lacovara, Lead Instructor and co-creator of the IYRS Composites Technology program curriculum, and Kelsey Britton, Program Manager of the Composites Technology program and herself an IYRS graduate. Lacovara and Britton brought their combined expertise to bear to help Flux Marine develop its second prototype and adapt some of the components in its motor to use composites instead of metals to further improve weight and durability.

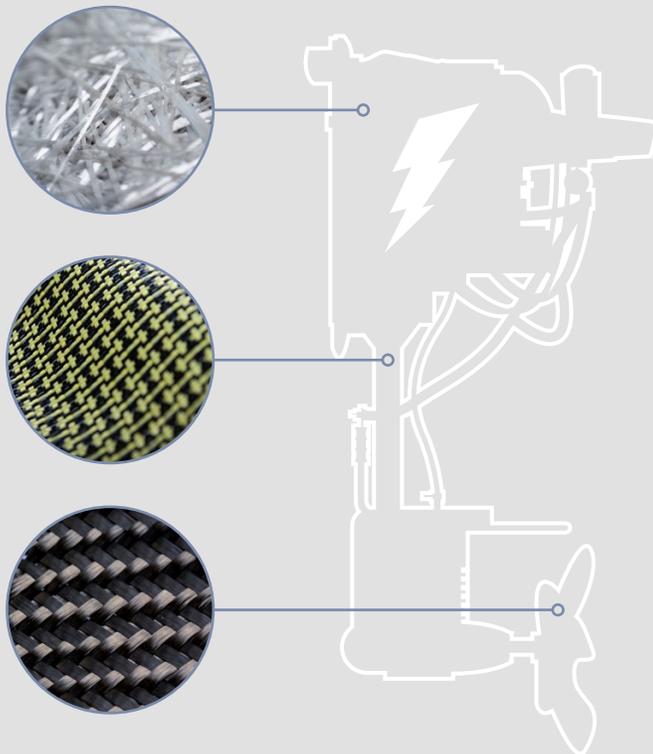


Bob Lacovara
Lead Instructor -
Composites Technology
IYRS



Kelsey Britton '16
Program Manager -
Composites Technology
IYRS

COMPOSITES IMPROVE WEIGHT AND DURABILITY



MOVING FROM PROTOTYPE TO PRODUCTION

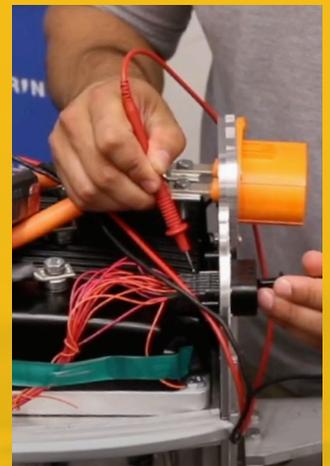
The connections created by 401 Tech Bridge also generate huge proficiencies for early-stage companies that need to ensure their prototypes can translate into real-world products. Bringing parties together that have materials expertise as well as the capability to design, build, and test creates tremendous efficiencies in the product development process, ultimately helping to accelerate the commercialization of new products.

For example, a gap that typically exists within many start-ups is design for manufacturing. While there is typically experience on the prototype side, the product must ultimately be created to enable manufacturing at scale to become viable in the long run. A lot of unnecessary costs can accrue in the manufacturing process if product development planning is not executed rigorously and well.

An experienced partner such as IYRS can assist with materials selection and help start-ups understand how to approach their design from the manufacturing point of view as well. In fact, this is another area where Bob and other IYRS faculty have been able to provide a lot of value to Flux Marine—showing them how to ensure that what they want to create can be manufactured economically at scale. The faculty sees tremendous value in the Flux Marine collaboration because it will enable its students to observe the real-world process of an early-stage company transforming an idea into a product and successfully bringing it to market.

“There is a tremendous amount of potential with the Flux Marine relationship and creating similar partnerships moving forward,” said Bill Kenyon, Director of Education at IYRS. “These real-world interactions will help IYRS to expand its position as a research-based trade school on a scale where we can help more companies develop and prototype their ideas.”

“It has been really rewarding to watch the connection of Flux Marine, a shining example of Rhode Island’s innovation community, and IYRS, an institution critical to the workforce in Rhode Island and the surrounding regions, bear fruit,” concluded Mary Johnson, Manager at 401 Tech Bridge. “These types of collaborations are essential to help small businesses and our economy thrive.”





ABOUT 401 TECH BRIDGE

401 Tech Bridge accelerates the journey from concept to prototype to commercial scale while creating business opportunities. It facilitates collaboration across industry, government, and academia and leverages the resources and expertise of its vibrant advanced materials and technology ecosystem, which spans industries and activities ranging from infrastructure development and naval research to oceanographic and offshore wind enterprises. 401 Tech Bridge offers meeting, training, lab, and equipment space for industry, government, and academic partners to collaboratively problem-solve, develop concepts, build, and test prototypes, and present solutions. It also connects companies into research divisions at the University of Rhode Island and other universities and institutions across the region, offering facilities for research, prototyping, testing and validation of concepts alongside faculty researchers and students.

The 401 Tech Bridge is a business unit of The University of Rhode Island Research Foundation and serves as a partner intermediary organization for the Naval Undersea Warfare Center Division Newport, supporting the Naval X Northeast Tech Bridge. It receives support from the U.S. Economic Development Administration, the National Institute of Standards and Technology's Manufacturing Extension Partnership (NIST MEP), the Rhode Island Commerce Corporation, The Rhode Island Foundation, and the Van Beuren Charitable Foundation.