iFACT-MP

Real people. Real science. Real space impact.

Iodine, Thrusters & Thoughts

Behind the Scenes,

With Raffaello Bottai,

Thermomechanical Engineer

AEROSPAZIO

iFACT-MP

Raffaello Bottai: *Bridging Disciplines in Aerospace Design and Engineering*

For as long as he can remember, Raffaello Bottai has been fascinated by design challenges that *require him to think across disciplines*.
That passion led him to study aerospace engineering, where he specialized in propulsion and discovered a knack for bringing together mechanics, thermodynamics, and simulation into elegant engineering solutions.
Over the years, he has honed his expertise in mechanical design and Finite Element Analysis, particularly for ground support equipment and electric propulsion subsystems.

Measuring the Invisible

In the iFACT-MP project, Raffaello found the perfect stage to apply his skills. His work revolves around the thermomechanical design of the thrust balance, a delicate instrument that must be able to measure the force of iodine-fed electric thrusters with precision.
He also took on the responsibility of designing the vacuum vessel and its supporting mechanical systems, while running Monte Carlo simulations to predict how neutral particles and plume plasma behave inside the chamber.
All of this contributes to a single clear goal:
ensuring that thrust is measured accurately throughout the tests.

"Ensuring that thrust is measured accurately throughout the tests"

iFACT-MP

From Concept to Reality: Advancing Thrust Measurement for Electric Propulsion Systems

"Designing a thrust balance that can work under the conditions of this project was truly challenging," he reflects. "The propellant mass is limited, and it depletes during thruster firing yet the balance still has to deliver precise measurements."

Despite the complexity, his team has reached a major milestone: **the vacuum vessel is now fully built and ready to be installed in the new laboratory**, where the next steps of assembly and testing will begin.

For Raffaello, the excitement lies in contributing directly to the technological progress of iodine-fed electric propulsion, a field he believes will play a key role in the future of space exploration.

Measuring the Future: Raffaello Bottai on the Challenges of Iodine Propulsion

A Maker at Heart, Always Reaching for the Skies

When he steps away from engineering, Raffaello often heads for the skies. "*Flying has been one of my dreams since I was a teenager*," he shares. Today, that dream is becoming reality as he works toward his ultralight pilot license.

On the ground, he is a dedicated maker, tinkering in his garage with a 3D printer, Arduinos, and an assortment of tools, turning ideas into quirky but clever creations. And when the machines are turned off, he enjoys simply spending time with friends and family.

Insights for Aspiring Experts

Asked what advice he would offer to someone looking to pursue a career in this field, Raffaelo answers:

"Never stop studying and learning new things and skills."

iFACT-MP

Behind every thruster test and subsystem review, there's a human story, full of curiosity, ambition, and perseverance.