



The Orbship: A Unique Fellowship Experience

Orb is proud to introduce its very first Orbship Class of 2022. However, there is a stark difference between the traditional characteristics of an internship and Orb's fellowship. For one, the individuals are *fellows*, not interns. This is because the typical atmosphere surrounding interns nowadays are the coffee-fetchers, note-taking, and low-contributing members of a company. We are doing something unparalleled here at Orb Aerospace.

The fellowship revolves around the ideals of a meritocracy where individuals will not be constrained by the standard bounds of being an intern and will experience the freedom of self-initiated work. When the fellows were accepted into their position at the company, they were given a list of milestones they could choose to complete before arriving at Node 1. The tasks accomplished were presented their first week of work to the full-time employees who then determined the amount of value that individual brought to the Orb's overall mission. This in turn was reflected into the fellow's compensation for the summer.



Top Left: Harshil Jain, Logan Henning, Frederick Brunner, John Deneen, Joshua Milnes, Ben Taylor
Bottom Left: Kriti Rathi, Alex Konwerski, Juliann Hammer



Representing college students from University of Michigan, Michigan State University, Harvard, Colorado College, and Harding, this fellow class incorporates a range of academic disciplines including mechanical, computer, civil, and aerospace engineers, to physicists, to welding technologies. Within this class of fellows, some of the projects being worked on at Orb include electric-ducted fans, additive manufacturing, acoustic analysis and propeller harmonics, fuel cells, and guidance and navigation systems. One characteristic/quality runs consistent through each project: the self-discipline and initiative for the work and aviation.



Mechanical Engineering fellow Frederick Bruner from MSU begins a 3D print on a Prusa printer.

Ownership, Responsibility, and Importance

Because Orb Aerospace is in the process of building an aircraft never created the opportunity to contribute game changing ideas is present every single day. Rather than joining a company that has been established for 50 years and remaining stagnant in progress; joining Orb is pushing the envelope and encouraging all members of the team to think creatively.

Every one of the fellow projects are instrumental in either the development of Orb's NOMAD or the growth in Orb Aerospace as a company. The projects are the fellow's own responsibly; there is no full-time engineer working the exact same project so the significance of executing your job successfully is one and the same as if you were a full-time employee. The fellows have assigned mentors there for advice and guidance if needed, but they are not working on the project alongside them.

The Past, Present, and Future

Within the first four weeks of the fellowship, significant progress has already been made across the seven different projects. The computer engineering fellows have discovered a critical error in the previous flight controller system that was preventing airspeed readings. The mechanical engineering fellows are modeling and prototyping propeller test stands, aircraft landing gear, and aircraft battery packs. The EDF team is working through XROTOR and CFD simulations, CAD modeling, prototyping, and testing propeller blades to create the most optimal power supply force.



Computer Engineering fellows Alex Konwerski and Joshua Milnes work on a PX4 Flight Controller

Over the next 8 weeks, the fellows will be full steam ahead in constructing Orb's third NOMAD prototype, T-Bird 2. All employees of Orb Aerospace have one goal in mind for the summer: Fly the damn thing. For more information on joining the Orb Ground Crew as a fellow or full-time employee, check out the [Handshake](#) or [LinkedIn](#) profile.

Orb Aerospace Participates in Selfridge STEM Outreach Events

As a partner to Michigan Air National Guard (ANG), Orb Aerospace joined Team Selfridge in two events exposing K-12 students to STEM careers, especially ones in aviation. Presenting to over 600 students over the two trips at Oakland County Airport and [Selfridge ANGB](#), Orb's flight simulator and Electric Ducted Fan (EDF) demonstration was a large success with the students as well as current military members.

Oakland County International Airport, 6/3/2022



In the left photo, two Orb fellows Kriti Rathi and Harshil Jain demonstrate a small-scale EDF to a student. The students were able to stand in front of the EDF and feel the power being generated at just 50%. The electric ducted fan is the current power source of Orb's prototypes while alternative power supply sources are developed for NOMAD.



In the left photo, Major Vaught, a KC-135 pilot from Selfridge and the director of the Team Selfridge STEM Events, flew Orb's NOMAD flight simulator which features motion elements and a Varjo virtual reality headset for a uniquely realistic flying experience. During these Selfridge STEM events, Orb had the opportunity to demonstrate the simulator to both STEM students as well as the military officers who organized the event.

Selfridge Air National Guard Base, 6/10/2022

In the photo on the right, full time employee Gavin Vonk monitors the simulator through the Varjo laptop while a student flies the NOMAD aircraft. The TV to the left of the seat projects the view that the pilot sees through the headset so onlookers can watch another person fly. Orb can have the user fly anywhere in the country, so this virtual flight took place at the Selfridge airport. Because of this unique feature, the students operated the flight simulator in a hangar on Selfridge's flight line while taking off from the exact runway that was just across the taxiway. This simulator will later be the vessel used to train Orb NOMAD pilots, so showing this technology to teenagers truly shows them what their future in aviation can look like.





In the photo on the left, fellows John Deneen and Logan Henning explain the flight controls of the NOMAD simulator to a student from the local area. The fellows' responsibilities for the STEM events include running equipment demonstrations, describing their current roles in STEM aviation at Orb, and communicating the mission and purpose of Orb Aerospace. John is currently a mechanical engineering and chemistry student at Harvard and Logan is a recently graduated physicist from Colorado College. This event gave the high students a great opportunity to ask questions and gain some advice about their future.

By inspiring the younger generation to join the world of flight, the innovation and creativity they can bring to aviation will kickstart the current industry from its stagnant state. From studying aerospace engineering to training to become a pilot or learning how to maintain aircraft, each career aligns with Orb's mission: accessible aviation for all.



Civil Engineering fellow Juliann Hammer sets up a student to fly an Orb at Selfridge's STEM Event



A-10 Static Display Aircraft from Selfridge positioned on the flight line for the students to view