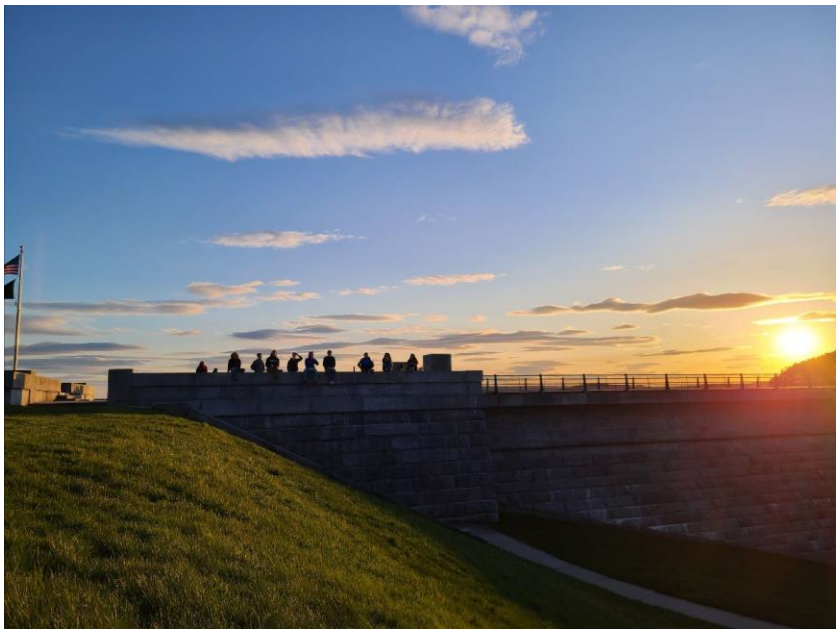
# April at-a-Glance

During the month of April, our team has worked hard on finalizing the construction, assembly, and testing of our rocket and payload systems.

We also prepared for the summer as we wrapped up the academic year to continue final developments on the rocket and payload systems, as well as ensure team readiness for the long awaited IREC competition on the week of June 20th.

We may have completed the 2021-2022 academic year, but our journey with Project Aquila is yet to come to a close. Thank you to all our sponsors, contributors and supporters for another year of lending your time, efforts and aid in support our mission at IREC!

HPRC divisional and subteam leads preparing the rocket system for recovery and payload ejection tests.



A small team retreat to Wachusett Dam in Clinton, MA to celebrate all the hard work accomplished throughout the year!

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## Rocket Division

Altair

### Aerostructures

The aerostructures subteam completed the tail cone, fin can, and airframes and prepared them for final assembly. We also finished running our ANSYS simulations for verification that our components would be able to withstand landing forces. Finally, we painted all the rocket components and started adding decals.

## Airbrakes

The airbrakes subteam completed testing of our mechanism this month. Members suspended mass from each fin in the form of water jugs and actuated the airbrakes to prove the effectiveness of the mechanism under load. Members also cut slots in the airframe so that the fins of the airbrakes could slide through.

## Couplings

The couplings subteam has attached the machined couplings to the rocket airframes. We encountered several integration issues but have made significant progress towards solving them. Several test assemblies have verified the couplings' capabilities to reduce assembly times.

## Recovery

The recovery subteam completed the first full-scale ejection test of this year's rocket with the new $CO_2$ ejection system. We also cut and prepared a new set of shock cord to replace the burnt ones from the St. Albans test flight.

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# Payload Division

Tarazed

## Payload Mechanical

The final version of the payload is now fully assembled. We spent the last month machining and 3D printing parts to finish assembling our system. We ran payload ejection test to determine the amount of $CO_2$ necessary to eject the payload from the rocket.

We also ran flight tests of our quadcopter with GPS waypoint missions, allowing us to test our quadcopter flying autonomously.

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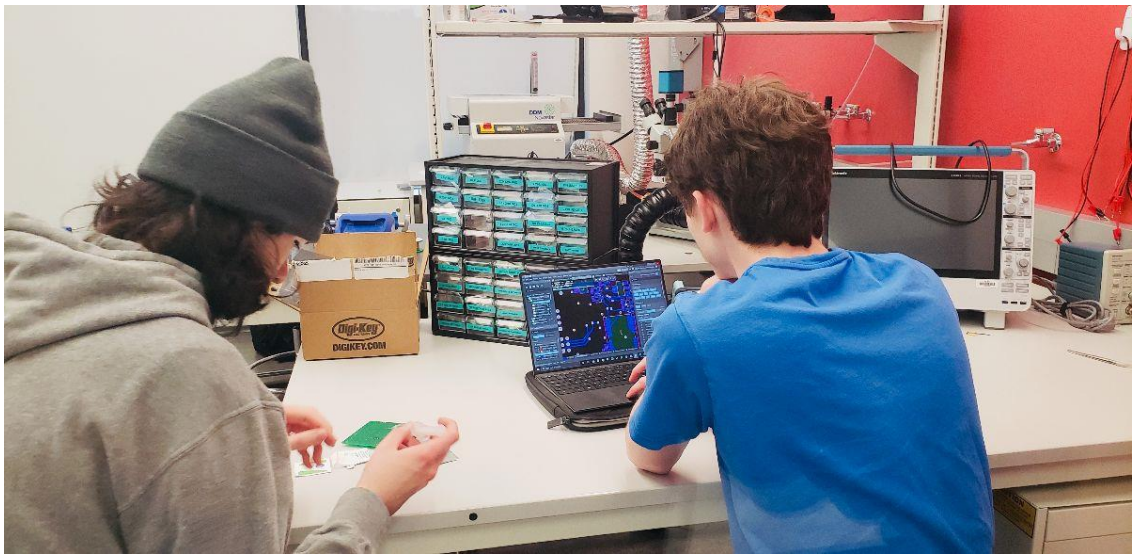
## Electronics and Programming Team




### Avionics

The avionics team assembled first revision boards of the avionics stack and began testing programming and CAN communication. Members gained experience with SMD soldering techniques and uploading code to ATMEGA chips.

### Payload EnP

The payload EnP team is working on developing the retention system software using the framework of the avionics repository. The team is currently writing state machine functions and testing code on the servos used for drone deployment. Full system testing will begin once the avionics stack is completed.