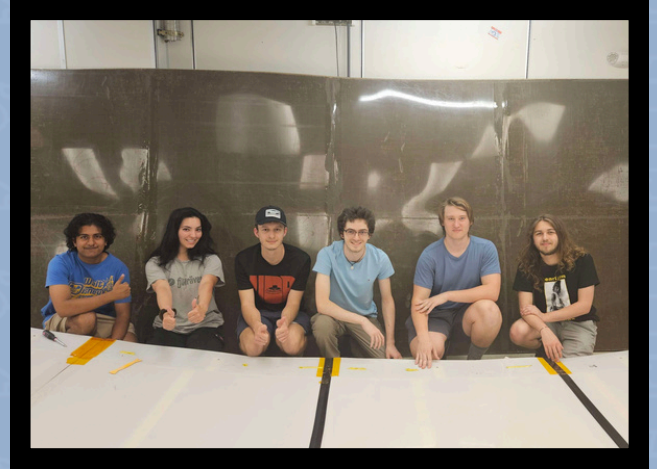




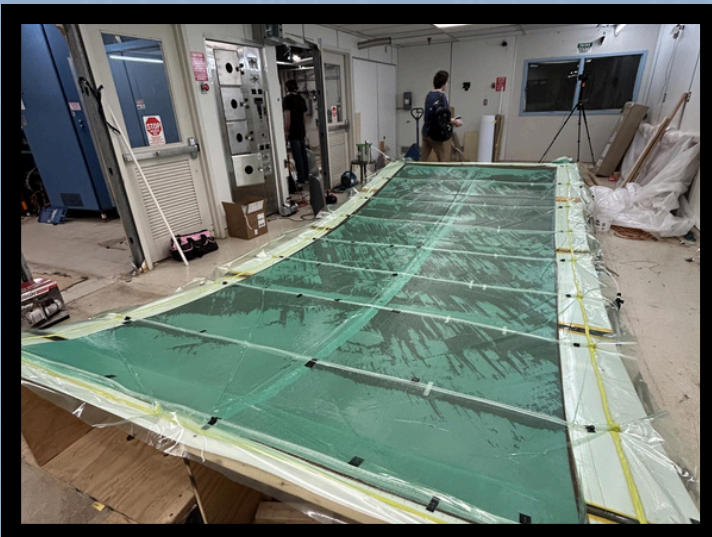
**WITH THE CLOCK TICKING...  
LET'S SEE WHAT THE TEAM  
HAS WORKED ON**

## AERODYNAMICS & COMPOSITES

The Aerodynamics and Composites team has been unstoppable for the past month. They've completed all the woodworking necessary for the bottom mold of the aerobody and assembled one third of it in the past month. Additionally, the top mold of the aerobody has been designed and the corresponding woodworking was completed the day this newsletter was released. Due to space restrictions, the team is currently assembling both the bottom and top mold one third at a time. Once the bottom and top molds are completely assembled, the Aerodynamics and Composites team will begin the process of creating the aerobody's composites, which will be mounted onto our car. The aerobody's canopy mold is nearly ready for composites, with finishing touches being made days before this newsletter's release. After a few coats of wood filler were applied, the preparatory work for the canopy is now complete, the aerodynamics team can begin the process of constructing the canopy composites.



We would like to thank Professor DeMauro for graciously allowing us to use his lab to construct the top mold of our car's aero-body. At time of writing, we are on the search for more storage space. If anyone from the Rutgers School of Engineering is reading this and knows of any other storage options (like a garage or warehouse) to store a 16 feet long by 6 feet wide aero-body, we would be forever grateful if you could contact us and refer to said storage space.



## BUSINESS

Not to be out done, the Logistics sub-team has been laying the groundwork for future club activities. They've been formulating a contingency planning for FSGP, in the event our team is eliminated in the scrutineering process. They've also coordinated the shift schedule, selecting which people will operate at which time, for our exhibition at the New York International Auto Show, which will be discussed later in detail.

Throughout the last couple of weeks, the Finance sub-team have been focusing on completing the dares, which are difficult due to the current time constraints and disparity of dared people's schedules. Furthermore, we are planning fundraisers and thinking of potential plans for inputting purchases and allowing for better documentation of purchases. Whereas, the Marketing sub-team has been focused on keeping our community engaged and growing our presence. To that end, we have been actively posting on social media and sending out emails to sponsors requesting logos for our materials. We have also prepared for the Rutgers Day post, NYIAS posts, and the Club BBQ.



The Corporate Relations Sub-Team is moving forward with building connections and fostering partnerships. During the last month, we have been focusing on reaching out to more companies and contacting alumni for the Club's BBQ event, keeping our extremely treasured connections strong as we work towards FSGP and other initiatives.

## ELECTRICAL

### HIGH VOLTAGE

The High Voltage sub-team have been making significant progress, especially with getting the Maximum Power Point Tracking (MPPT) system up and running. After some initial testing, the MPPT can bus is fully functional, and we've cleaned up the wiring using a network switch for ethernet, which resolved some of our connectivity issues. The team also successfully programmed the board, bringing us closer to the full system integration. In addition to this, the battery box design is progressing, and we're preparing to conduct load testing once the motor is detached from the car. The team also have been working on the electrical panel enclosures and are now finalizing the motor stand, which is now complete after some time-consuming adjustments. We're also ordering necessary components such as a new ethernet bridge and finalizing the pre-charger and other related purchases.

### SOLAR

For the last month, the solar sub-team have been diligently working on the encapsulation and assembly of solar panels. Over the past couple of weeks, we have encapsulated 8 more panels, creating a new total of 12 complete solar panels. However, we have encountered a challenge with the air bubbles in some of the panels. We believe this issue can be addressed by ensuring the panels are encapsulated facing upwards to prevent solder joints from acting as stand-offs. Looking ahead, our focus will be on staying on track towards finishing 8 more encapsulated panels, reworking the array layout, as the current layout does not fit as expected. We will also start shifting back to making new panels after freeing up some space.

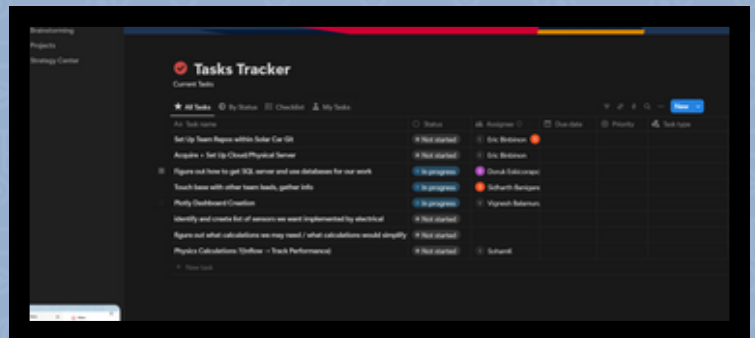
### LOW VOLTAGE

The Low Voltage Electrical sub-team has been making steady strides in enhancing the car's electrical systems. Primarily, a focus on fixing issues with the CAN bus and getting the car software working before the LV3 release. While we are still investigating the potential issues with CAN on the mainboard, we have made notable progress by placing the electronics into the battery box, soldering connectors onto the mainboard for the contactors, and beginning the rewiring to connect the contactors to the mainboard. Additionally, we wrote some basic code for the one-board plan and started organizing wires for future work. Our primary goal for the time being is to complete the rewiring of the contactors to the mainboard and test the basic code for the one-board plan. We are also documenting the current wiring setup for future reference, ensuring we can track and troubleshoot our system more efficiently.

## DATA ACQUISITION

In the last 20+ days, we have been hard at work. Currently, we are focusing on developing separate but important facets of our capabilities. Team members are independently analyzing practice datasets to strengthen Python skills with essential libraries such as Pandas, Numpy, Seaborn, and Matplotlib. We are identifying and proposing basic metrics to track each lap and our energy management strategy for the overall race. This work is laying the foundation for our broader performance analytics strategy. We are also planning on integrating our processes with the Solcast API, provided by FSGP for weather and solar irradiance prediction at the race, allowing for more accuracy in building our energy management strategy tailored towards optimizing overall lap-count and performance at FSGP this coming summer.

With the recent addition of new members, we are prioritizing proper onboarding, task prioritization and delegation, and expanding the capabilities of our team members to work on multiple projects simultaneously. Among these projects is the development of a dashboard to display our calculated Key Performance Indicators (KPIs), making our analysis accessible and actionable for everyone keeping a close eye on the Car's performance. We are consistently talking to the other sub-teams (Mechanical, Electrical, Aerodynamics) to create a clearly outlined list of sensors and key values that we should focus on monitoring, which would directly help us streamline our current focuses.



In terms of infrastructure and general logistics, we are currently utilizing a SQL server via Microsoft Azure, although we are mindful of the 2 GB/account, 1-year student account limitation. If any of you have any suggestions of possible long-term solutions, we would be very grateful. Going back to the updates, we've made unexpected early progress experimenting with Machine Learning techniques, particularly regression analysis, which shows exciting potential. As we focus on optimization and exploration, we are continuing to develop a more precise plan for interpreting key performance data and collaborating with other sub-teams to implement our findings. We are undoubtedly in the early stages of development and we are not steering away from the immense amount of tasks to take care of; instead, we are focusing on creating models and tasks to organize our workflow and develop a structure to make sure that our growth is methodical and sustainable.

# MECHANICAL

## BRAKES

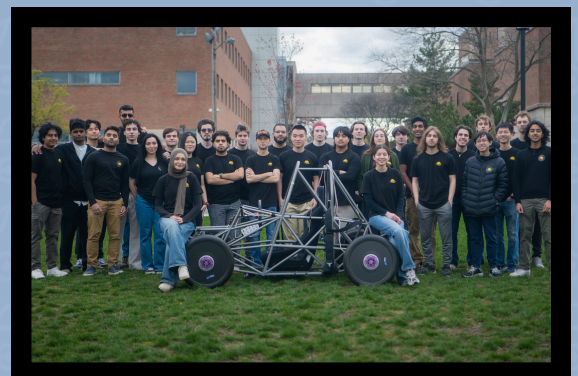
The Brakes sub-team have made significant progress on the braking system, focusing on machine critical components like the bobbins and finalizing the rear caliper mount design. We're currently refining CAD models and preparing to order the remaining materials needed to bring our designs into working order. As we move forward and towards FSGP, we are setting up for key assembly steps to ensure the braking system meets performance requirements for the car.

## SUSPENSION

The Suspension sub-team made strong progress recently, focusing on refining critical components of the system. One of such refinery works include designing a new  $\frac{3}{8}$ -inch parts for the rear, addressing a major goal for strengthening the suspension setup. A staking tool and appropriate bearings were identified, solving one of our higher-priority challenges. Permanent spacers were sourced, a new toe link was designed, and necessary fixes to the VDR were completed. Looking ahead, we are preparing to machine the new toe link and the  $\frac{3}{8}$ -inch rear parts, as well as order the staking tool, bearings, and spacers. Assembly will begin soon, followed by shock tuning and securing assemblies with jam nuts. In terms of longer term activities, we are considering a larger redesign to switch the rear from  $\frac{1}{4}$  inch to  $\frac{3}{8}$  inch thickness to further improve durability—something we plan on focusing a lot.

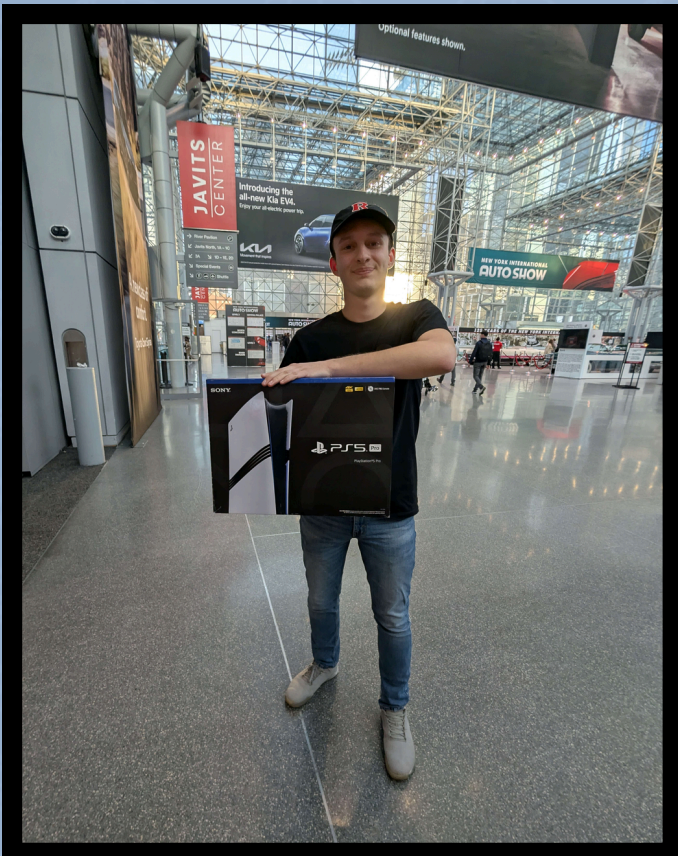
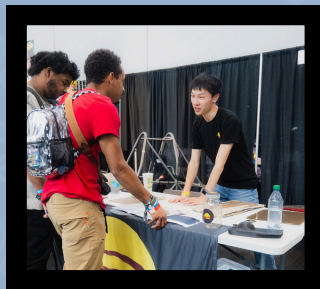
## CHASSIS

The Chassis sub-team has made significant progress over the past couple of weeks. We have successfully finalized the jig plate, and the ballast box is progressing well, with a new design concept involving bending the aluminium sheet instead of bolting, allowing for easier installation of the cover. Additionally, we have brainstormed some ideas to improve the overall quality of life in the chassis assembly process. Whilst focusing on finalizing the ballast box, we are also getting measurements for the floor plates, and determining the required dimensions for the inside panels. The team also placed an order for extension tubers and is continuing to refine the jig plate, though it still needs to be reviewed. We are also working on acquiring materials for the ballast box and preparing for further steps in the chassis extension process.



# NEW YORK INT. AUTO SHOW

Mid-April has been a busy week for the club. From April 18th to April 28th, we had the incredible honor and experience of being exhibitors at the New York International Auto Show. We exhibited our old car, Arctan, and our other car which has yet to be named at time of writing. We spoke with countless visitors to the Auto Show, from a family on a weekend excursion, to soon-to-be college students, and even fellow engineering students from NJIT.



## HIGHLIGHTS

We met: a visitor whose in-law was involved in the production of Race the Sun, the owner of our former President's favorite sunscreen brand, a person involved in making the solar panels for Stanford's Solar Car team, and even a former student who's worked on Solar Car projects themselves. Our booth had a balcony which acted as our "rest area" where we could see half of the first floor from a bird's eye view.

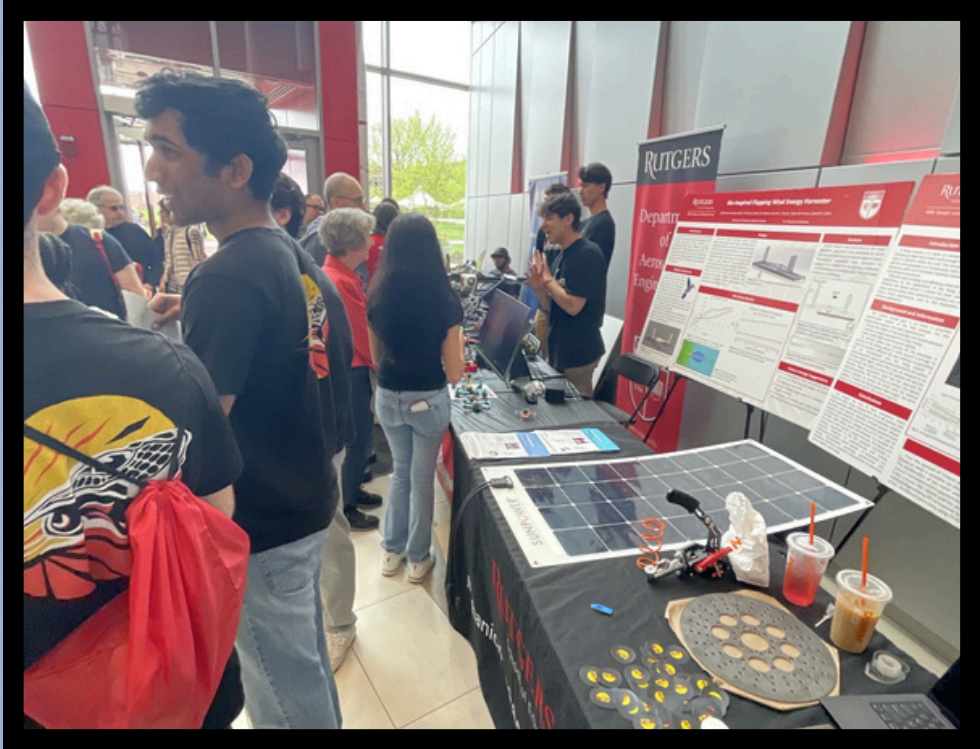


## LET'S GIVE IT UP FOR... ALEX!!

Alex Duma, a member of our Aerodynamics team, competed in a racing simulation competition hosted by Hyundai during one of the days he volunteered for the Auto Show. He emerged as one of the top 16 fastest competitors for that day he competed. Before the closing hours that day, he raced against the other 15 top racers in a 16 person tournament and won 1st place, winning a PS5 Playstation upon doing so. Let's congratulate Alex on this extraordinary achievement!

# RUTGERS DAY

Rutgers Day was a truly inspiring day, though this year's was drained out of its premier joys due to the rain, allowing for new and old students to witness the finest engineering, business, and other Rutgers' premier clubs focusing on achievement and working on amassing the greatest crowds in this convention.

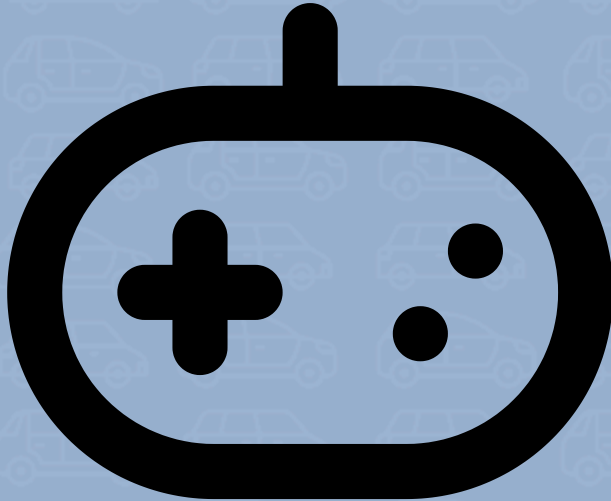


It was truly an eye-opening event to see and we are extremely grateful for having the opportunity to set up shop at Richard Weeks Hall to talk to whoever that were interested in our project; some of you reading this newsletter are here because of that conversation, and we thank you for that. These conventions are truly the events that instill passion and an entertaining show to the people we were viewing this concept for the very first time.



Now that the New York Auto Show and Rutgers Day are complete, we are gearing up, motivated, and fueled up for getting into the final stretch towards FSGP. This event was truly a marker in our journey towards competing in FSGP this summer, the achievement of reaching such a monumental position in Rutgers Solar Car Team's History regardless of our place in the competition.

# GAMES



## RIDDLE RATINGS

WHITE - HARD

SCARLET - MEDIUM

YELLOW - EASY

GREEN - NEWBIE

I'M EQUAL TO POWER, YET I EXERTED ZERO NEWTONS. WHAT AM I?

WHAT IS EQUAL TO MONEY BUT A SUNKEN COST BY DEFAULT?

I MULTIPLY YOUR WEIGHT, YET LEAVE OUR MASS UNTOUCHED. SOMEONE UNDER A TREE FOUND ME FRUITFUL IN THEIR CLUTCH. WHAT AM I?

WHAT IS THE PRESENT? (HINT: A WISE TURTLE KNOWS THE ANSWER)

WHAT ELEMENT IS ASKING YOU WHY?

**THANKS FOR  
READING!**