

MARCH 2024 ISSUE

UP 2 SPEED

THE OFFICIAL NEWSLETTER
OF SPARTAN RACING





CONTENTS

3 Foreword from Spartan Racing

4 Meet the Team

5 COE Appreciation

7 Shootout

9 Day of Giving

10 Silicon Valley Autoshow

11 SCCA

12 Driver Day

14 Crows Landing

15 Women in SAE

16 Progress - Subteam Updates

Powertrain Updates

Chassis Updates

Suspension Updates

Aerodynamics Updates

Electronics Updates

21 Thank you to Sponsors

22 Contact Us



FOREWORD

Dear Sponsors, Friends, Family, and Supporters,

We wanted to take a moment to express our heartfelt gratitude for your incredible support throughout our journey. Thanks to your unwavering encouragement, we've experienced a truly successful pre-season and first semester.

Reflecting on the past months fills us with pride as we celebrate our victories, such as winning the SoCal shootout and surpassing our fundraising goal by raising over \$10,000. Equally important is the time we've invested in training our new members, ensuring they feel equipped and empowered to contribute to our team's success.

Our progress is a testament to the transformative power of teamwork and dedication. While the previous season presented challenges, we've embraced them as opportunities for growth. The win at SoCal served as a powerful reminder of our potential and reignited our passion for excellence.

As we dive deeper into build season, with our upcoming competition just three months away, we're filled with excitement and anticipation. We're eager to share our journey, successes, and the valuable lessons we've learned along the way.

None of this would be possible without your continued support. Your belief in us fuels our determination, and we're honored to have you standing by our side as we strive for greatness.

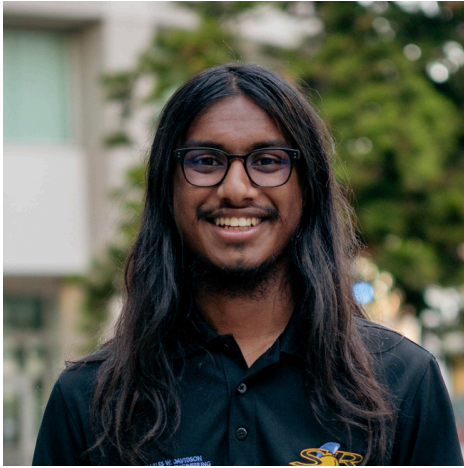
Thank you for everything.

Warm regards,

On behalf of the team,
Rahul Shetty (Chief Engineer)
Patrick McGowan (President, Business Lead)



Meet the Leads



Rahul Shetty
Chief Engineer



Patrick McGowan
President & Business Lead



Ashwin Viswesvaran
Project Manager & Chassis Lead



Joseph Tai
Electronics Lead



Shubham Mishra
Software Lead



David Peña
Powertrain Lead & Safety Officer



Asher Aldinger
Suspension Lead



Sebastian Rodriguez
Aerodynamics Lead



Shinika Balasundar
R & D Lead

College of Engineering Appreciation

**Gratitude to the Charles W. Davidson
College of Engineering & Don Beall Dean
Dr. Sheryl Ehrman**

This month, San Jose State Formula SAE has been grateful to receive the unwavering support of the Charles W. Davidson College of Engineering. Our organization's pursuit of excellence requires an intricate connection between the College of Engineering and its administrators, who make our annual projects possible. In this issue, we want to specifically express our appreciation for both the Charles W. Davidson College of Engineering and its distinguished Dean. Sheryl Ehrman, Dr. Okamoto, Dr. Viswanathan, Karen Tang and Vinh-Doan





As we gear up for another thrilling season of our Formula SAE competition, we continue to rely on our deeply rooted shared passion for innovation and engineering excellence. Under the visionary leadership of Dr. Sheryl Ehrman, who oversees 26 unique programs, 290 faculty, and more than 6,500 students, we have been able to play a role in fostering our next generation of engineering leaders. During our Driver Day, we also had the opportunity to have Dr. Ehrman drive and experience the previous year's two vehicles, SR-13 and SR-14.





SoCal Shootout

Early in the school year, Spartan Racing had the opportunity to attend the 2023 SoCal Shootout. The SoCal Shootout is an off-season unofficial event hosted by Adams Motorsports Park where teams from all over California meet to race against each other at the the park in Anaheim. Spartan Racing brought our SR-14 (EV) and SR-13 (ICE) to the race. SR-14 had just returned from comp and needed lots of work in terms of the electrical system to get it running right. SR-13, which has been retired for two years, was rebuilt and had a brand new wiring harness.



Spartan Racing placed 1st and 3rd in EV and Combustion respectively after a valiant effort. SR-14 shined through as an immensely fast car and got its redemption after not being allowed to run at our competition. Lap after lap we were setting the fastest time and at no point were there any major failures or faults that prevented the team from running. For the most part the team just had to keep the battery temps low in the hot SoCal sun. SR-13 was not as lucky as SR-14 but, despite the age and runtime, showed how fast she still is. SR-13 was the only combustion car that was still in competition trim.



SR-14

Almost every other team had unrestricted engines, new intake designs, and new engine tunes. SR-13 was fiercely competitive and it looked like the team might also win the combustion class. However, in a twist of fate during our second run, the radiator blew and the car put itself in limp mode, killing our lap. The team scrambled to get the car fixed and in just the nick of time managed to get it out for a third run. Because of our mishap during our second outing, we finished 3rd after Berkely (1st) and Pomona (2nd). The SoCal shootout was a much-needed morale booster after our poor outing at Michigan last year. It gave the team a taste of victory, a perception of how fast we are, and demonstrated that Spartan Racing can, and does, produce fast cars.

SR-13



Day of Giving



Spartan Racing Crowdfunding
\$10,000 GOAL

We initially were trying to raise 8,000 dollars but later raised our goal. Thanks to all of our supporters, we achieved our goal of \$10,000! Collectively SJSU raised over 1 million dollars; a first in CSU history

Our lead donor, the **Beall Family Foundation**, provided the team with 4,000 dollars. The **Beall Foundation** has long supported Spartan Racing and provides us with an incredibly generous donation every year of \$15,000.

The money we raised during the Day of Giving has gone towards purchasing battery cells, allowing our team to focus on our other endeavors.

This year Spartan Racing Participated in the annual SJSU Day of Giving. The Day of Giving encourages donors to all donate on the same day. With most organizations on campus participating it brings a lot of attention to the school and enables for a greater number of donations



Battery Module



The Silicon Valley Auto Show is an annual car show that takes place in Santa Clara. The event allows auto manufacturers to exhibit their new products and prototype vehicles to the public. The show also has modified and custom cars on display. Spartan Racing had a booth showcasing SR-13 and SR-14. We shared the space with our good friends from SJSU's BAJA team.



One of the highlights of the weekend was Spartan Racing being exhibited on Channel 5 news! We were able to show off our cars to the broader public and it was a lot of fun having people come by the booth mentioning they had seen us on the news.



Another one of our major supporters is the **San Francisco Region SCCA**. Spartan Racing volunteers at the races that the SCCA puts on and we work the race. We do everything from E-Crew, tech, flagging and even announcing! The students love to volunteer for the SCCA and the SCCA compensates the team for working the weekend. We love talking and hanging out with everyone from the SCCA. The SFR SCCA also had a booth at the Silicon Valley Autoshow. They had a SRF3 Spec Racer Ford and a Star Mazda Formula car. We want to thank everyone at the SCCA for their support and we are looking forward to many more years of working with the SCCA! We even ran into our close team friend and long-time **SCCA Racer Dave Allen!**





Driver Day

On January 24th and 25th, we held our Driver's Day event, where our designers, supporters, sponsors, and alumni got to drive the cars they had a hand in producing. This year, our engineers *and* sponsors got to drive SR-13 and SR-14.

Although we initially had a couple issues with SR-13, our team worked diligently to keep both cars in running order. In total both cars had more than 7 hours of run time.

We want to extend a warm thank you to all of our sponsors, school faculty, family members and alumni who were in attendance, including **Dean Sheryl Ehrman** and **Associate Dean Nicole Okamoto**, as well as Dave Allen.







Crow's Landing

Our team often tests at Crow's Landing near Patterson, CA thanks to the **SFR SCCA**. An old WWII Airfield turned raceway, the site offers 2 miles of the unrestricted testing area.

The SFR SCCA lets us have a section of the runway for testing while they run their autocross events. The team works the corners for autocross and goes for ride alongs in the racers' cars. This lets the team get up close and personal to a different style of racing.

Crow's Landing is typically a two-day event on the weekend, with team members camping. Not only is this great for team bonding in the beginning of the season, it creates a wonderful opportunity for the interns to get hands-on with the car.



The Women Behind FSAE

March officially marks Women's History Month, and we too celebrate the women who make up our Spartan Racing team here on campus. With International Women's Day steadily coming up on the 8th, we would like to delve deeper into the women behind the team.

Although engineering is still a male-dominated field, FSAE is proud to share that our team consistently has women in positions of power.

Spartan Racing remains dedicated to ensuring that those traditionally unrepresented have a voice in engineering. As our team consists of first generation college students and minorities, we understand the role we play in shaping the future of engineering.



Alyssa Froehlich

Pictured here is Alyssa Froehlich, a transfer business management student, who spent three years on the team. During her last two years, she served as Treasurer and President for both SR-13 and SR-14. During Driver Day, she had the pleasure of driving both cars which she supported to fruition.

We are very pleased with the high number of women who have joined our team this year and look forward to watch them grow and flourish as they continue their journey.

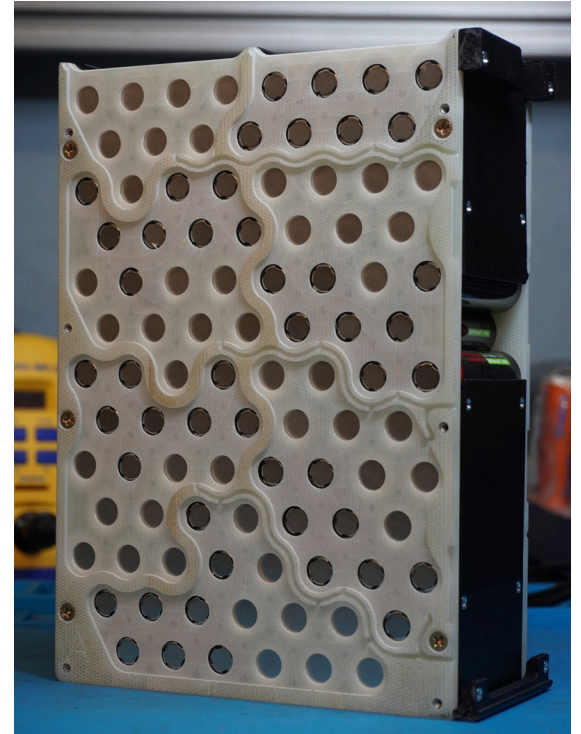




Subteam Updates: Powertrain

SR-15s powertrain has seen the most growth this year out of any system. SR-14 suffered from terrible Battery overheating problems. This is due to a number of reasons but mostly our fuselink design. This year the team has improved the packaging even further, reducing the complexity of the modules by removing all wires, better current routing between cell groups, 12 more cells per module, and improved fuselink designs for less resistance. The team has removed all wires from the modules by moving the voltage and temperature sensors to two PCBs screwed onto the modules.

This is all possible due to our incredible sponsors **Elcon Precision** and **Bayview Plastics**. Elcon provides us with a photo etching service for our fuselinks and Bayview Plastics provides us with high-quality machining of our baseplates.





Subteam Updates: Chassis

Much of our time developing SR-14 went into chassis development and we built an incredibly good chassis as noted by the judges at our competition, but there is always room for improvement. SR-15 takes the lessons learned and builds on them resulting in a chassis that shaved off two pounds while having better ergonomics for our drivers. With a better understanding of the relationship of torsional rigidity to weight, we optimized our tube selection and node location. We also raised the front roll hoop so that the steering wheel would better clear the driver's legs.

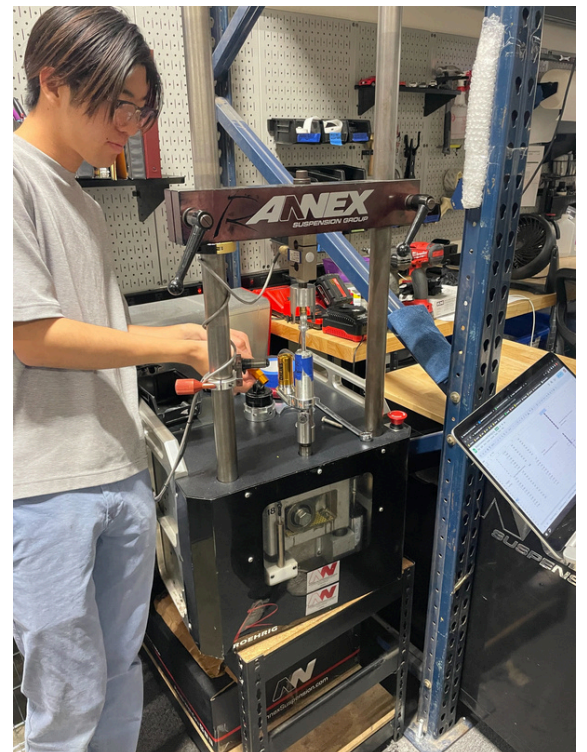
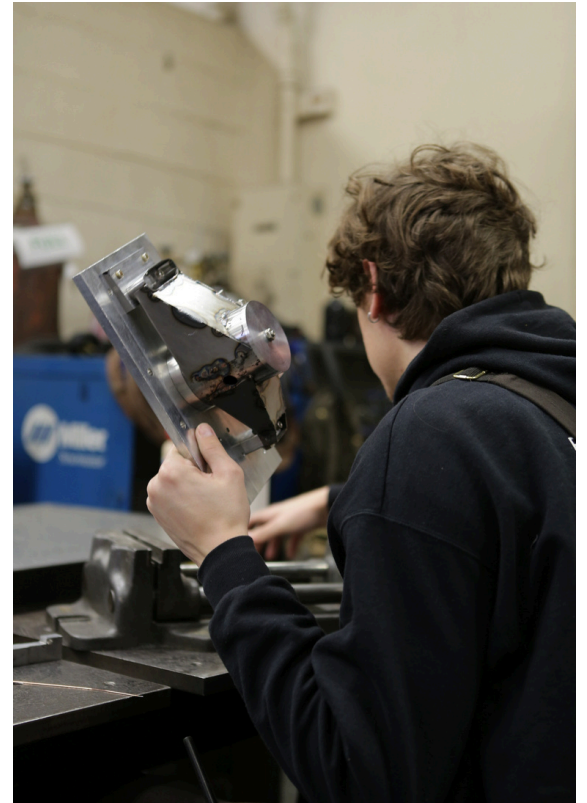




Subteam Updates: Suspension

SR-15's suspension design focused heavily on system integration with the aero package. Having a push rod in the front the suspension and aero subteams need to communicate closely to maximize our downforce. Further effort has gone into decreasing steering efforts so that our drivers experience far less fatigue.

A lot of time this year was also spent understanding damping rates and how they change the attributes of our shocks. Thanks to **Annex Suspension** we were able to spend a considerable amount of time on their shock dyno to better understand what is happening to our shocks.



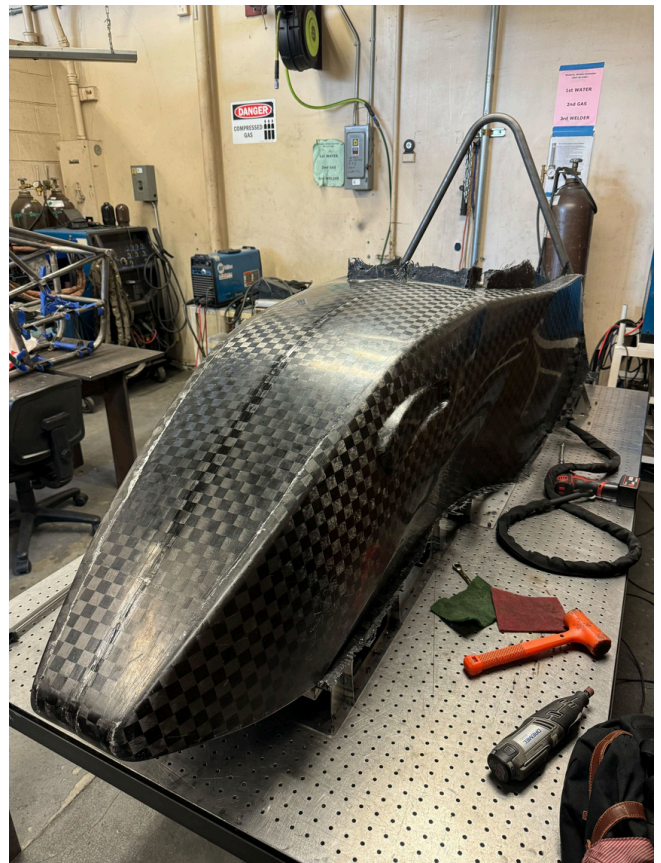


Subteam Updates: Aerodynamics

Every good formula car requires a great aero package. SR-15's aero package is 10 lbs lighter and produces 15% more downforce than SR-14. A lot of time was committed to understanding exactly how many plies of carbon were necessary on each component, tweaking mounting positioning, adding gurney flaps to features on the front wing, and improving how air flows over the rear wing while cornering.

SR-15's aero package is about 60% done with the body, undertray, floor, and most of the front wing done. The next steps are the lay up the elements for the rear wing, cut the foils, and assemble the wings.

Bonus: New carbon wheels!

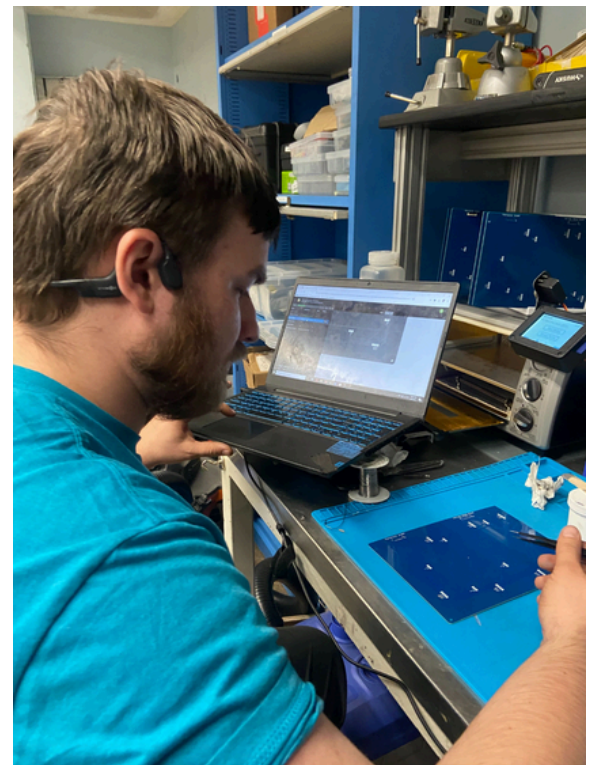




Subteam Updates: Electronics

SR-15's electronics team focused on quality of life and packaging changes to our boards. Many of the boards have been consolidated and the boards have much tighter packing. Along with simplified circuits and a far better-documented wiring harness, the team is able to operate at a higher level and spend less time diagnosing small issues.

The electronics and software team have also worked together to create our own custom Battery Management System (BMS). This custom system lets us add additional sensors inside the modules to get a better understanding of what is happening inside the accumulator.





Thank you!



SJSU SAN JOSÉ STATE UNIVERSITY

BAE SYSTEMS



ASSOCIATED STUDENTS
SAN JOSÉ STATE UNIVERSITY

SJSU | CHARLES W. DAVIDSON
COLLEGE OF ENGINEERING



BERGMAN PROTOTYPING
BOOSTING CONCEPTS TO REALITY

MILITARY ★ **FASTENERS**

Beall '60

CURVILINEAR
Components



AMK motion

KRONTEC

Gonsel's

MACHINE SHOP

Alucoat



ic3D

SKF

SIEMENS

AIRTECH
ADVANCED MATERIALS GROUP



'TORAY'

Holley

ACP
Composites



ROHDE & SCHWARZ



VR3

MASS
MASS PRECISION SHEETMETAL INC.



SCHROTH
RACING

TESLA

THERMOFUSION



AERO



MISHIMOTO

KLA+

ANDERSON POWER



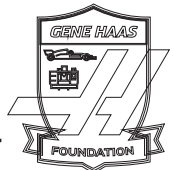
DAVIES, CRAIG

BLUE ORIGIN

PROHELION

Ansys

YAZAKI



AXXIOM

XRP
THE XTREME IN RACECAR PLUMBING

HAKKO



SOLIDWORKS

CONTACT US

Patrick McGowan - President
paddymcgowan02@gmail.com

Rahul Shetty - Chief Engineer
rahulsanjayshetty@gmail.com

David Pena - Powertrain Lead
ddrpena@gmail.com

Clarence Choi - Treasurer
clarence.choi@gmail.com

Joseph Tai - Electronics Lead
jtai4116@gmail.com

Shubham Mishra - Software Lead
mishraxshub@gmail.com

Asher Aldinger - Suspension Lead
asheraldinger@gmail.com

Shinika Balasundar - R&D Lead
shinika.balasundar@gmail.com

Ashwin Viswesvaran - Chassis Lead
ashwin.viswesvaran@gmail.com

Sebastiann Rodriguez - Aerodynamics Lead
sebas.d.rodri@gmail.com

Nathan Smurthwaite - VD Lead
natesmurt@gmail.com



@sjsufsae



@sjsuformulasae



<https://sjsuformulasae.com>



@SpartanRacingJSU

