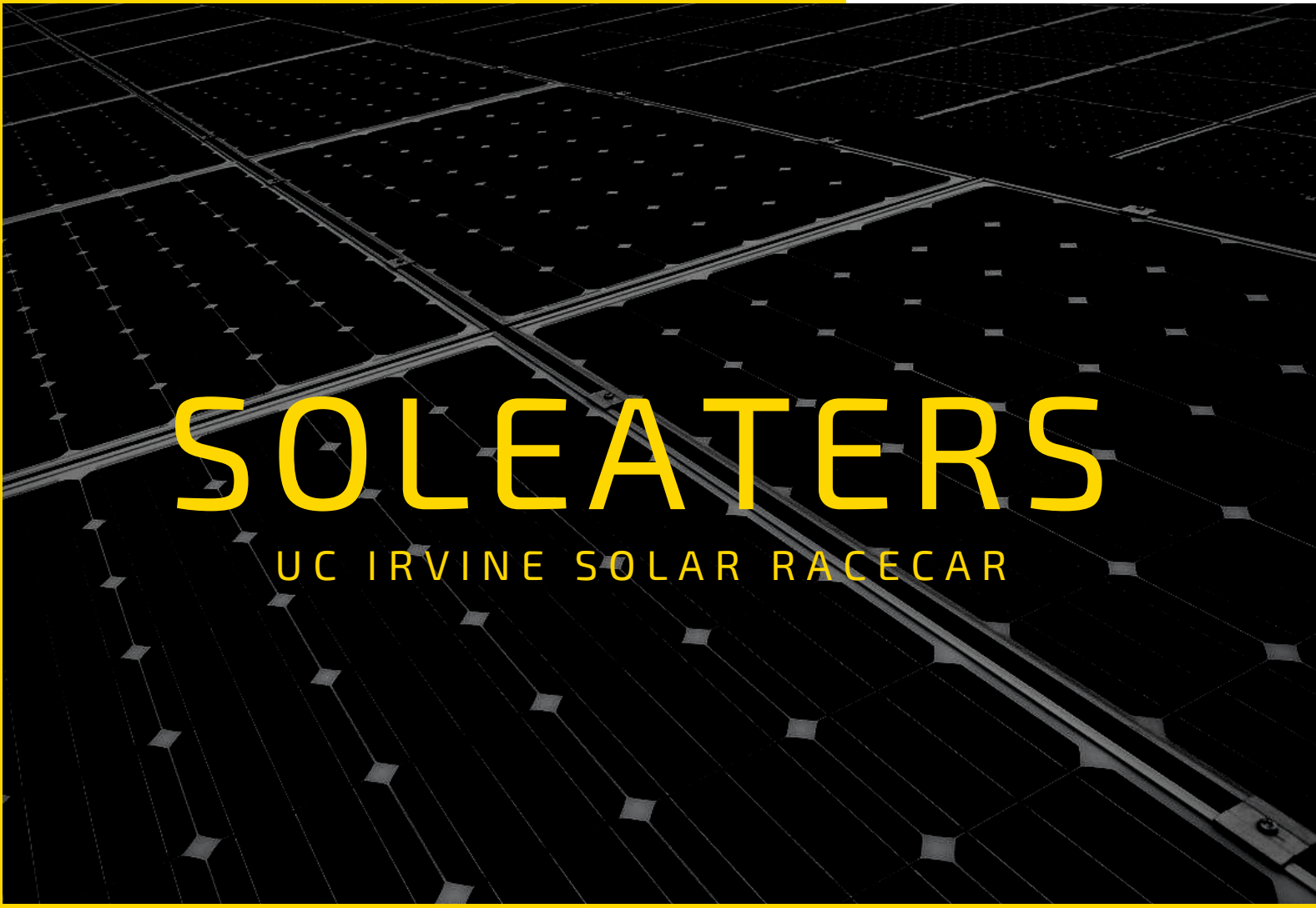
UCI ENERGY INVITATIONAL

SPONSORSHIP PACKET



SOLEATERS

UC IRVINE SOLAR RACECAR

IRVINE, CA

+1 (808)-389-2023
UCIRVINESOLARCAR@GMAIL.COM
UCIRVINESOLARCAR.COM

DEAR POTENTIAL SPONSORS,

Thank you for your consideration in sponsoring University of California, Irvine's first solar racecar team. We are a student-led team with the goal of designing and building a car completely powered by the sun. Our team is driven by our passion for renewable energy and the advancement of solar technology. Through this project, we hope to generate public interest in sustainable technologies and provide progression towards a more sustainable future by establishing a foundation for future UC Irvine students to work and learn outside the classroom.

We are planning to compete in the 2020 Formula Sun Grand Prix (FSGP), a globally recognized competition gathering teams from colleges across the globe. Taking place each year, this competition is a three day racing event that will put our car's mechanical and electrical designs to the test. Additionally, this track race serves as a qualifier to the American Solar Challenge, a 2000 mile endurace race across America, which occurs every two years. To succeed in the FSGP, our car must not only meet all safety and design regulations, but also sustain speeds of over 40 mph utilizing only the power of the sun. We are working diligently to design a car that's both highly efficient and safe. As UC Irvine's first solar racecar team, we hope to leave a legacy for future UCI solar racing teams. We are relying on donors and sponsors to provide us the opportunity to compete in the 2020 Formula Sun Grand Prix. However, as a stepping stone, the team plans on competing in the Spring 2019 UCI Energy Invitational. This invitational is a time trial that tests student-built energy efficient vehicles, and our team hopes, you will be the reason we succeed.

Your experience and generosity will allow our team to:
1. Attain real world experience working with a team and industry professionals
2. Master engineering experience in designing, manufacturing, and testing
3. Compete with leading edge technology against experienced schools
4. Enhance exposure of emerging sustainable technologies to the student body and public

With this being UCI's first solar racecar team, we hope that you will consider this as the start of a relationship with our team that will last far into the future.

As a sponsor of the UCI Solar Racecar Team, you will receive extensive publicity and media coverage in Orange County and nationally through the Formula Sun Grand Prix and American Solar Challenge. Donors could have their sponsorship listed on our website and social media publications in addition to logos on our solar car and support vehicles.

Lizette Nguyen - Project Manager
lizetten@uci.edu

Gilberto Garcia - Electrical Lead
gilbermg@uci.edu

Thomas Slage - Mechanical Lead
tslagle@uci.edu

Subin Shrestha - Business Lead
tshresth@uci.edu

The SolEaters

Driven by the aspiration of building a solar car, a group of mechanical and electrical engineering students assembled in late 2016, starting the SolEaters team at UCI. The team officially started in March 2017 after receiving professional advisement from professors and mentors.

After continuous revisions and change in leadership. The team was able to clearly define and set their goals in 2018. Through the Spring 2019 UCI Energy Invitational, we plan on paving our way towards showing people that our team has a real future and to prove to ourselves that we can succeed. Through that we will guide ourselves towards the competition of the Formula Sun Grand Prix in 2020.

Our team The SolEaters, containing thirty two students from diverse majors (electrical, mechanical, biomedical, materials science engineering, physics, and business), plans to compete in the 2020 Formula Sun Grand Prix. Our goal is to design and build a functional solar car that complies with Formula Sun Grand Prix regulations. We do not plan on just racing and showing up, but being as competitively viable as possible, our goal is to make an everlasting mark on the race.

Solar Car Progress

suspension

The Suspension Subteam works to engineer one of our car's most important parts, the suspension subsystem. The suspension system keeps the car's wheels in contact with the ground, provides the driver with a comfortable ride, and allows the driver to maintain control of the car. Hence the three C's of suspension: Comfort, Control, and Contact.

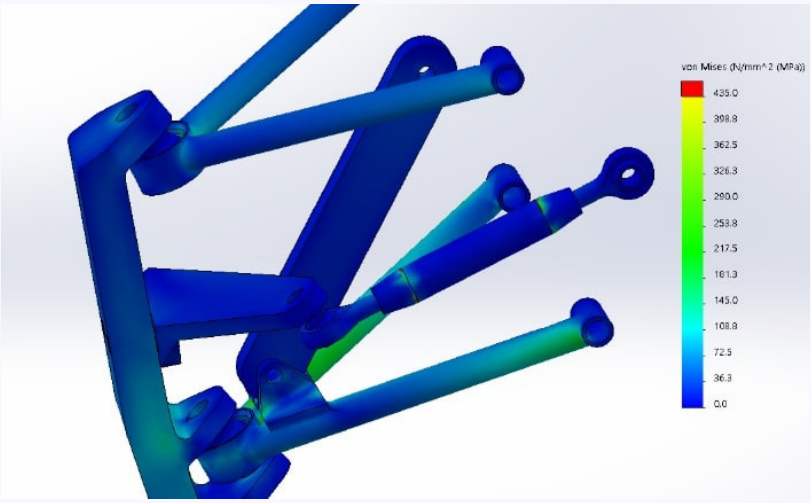
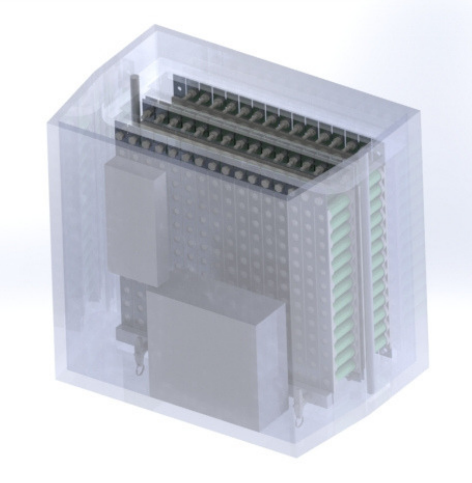
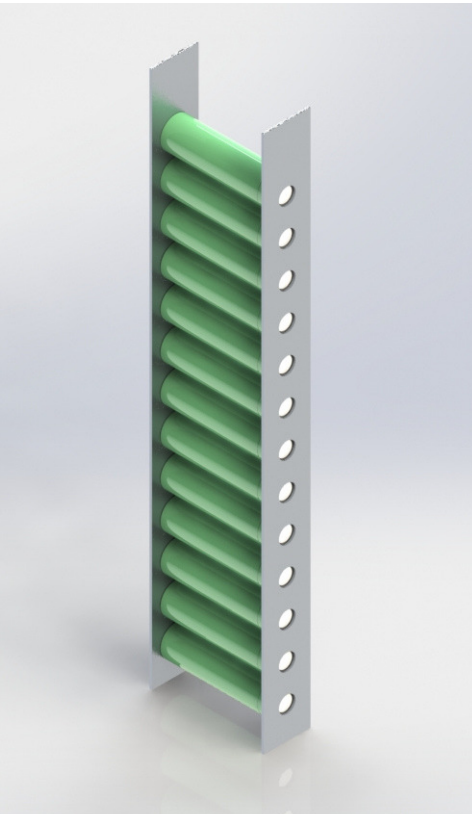


Figure 1. Front Suspension Von Mises





tery Box Figure 3. Cell Tower

battery

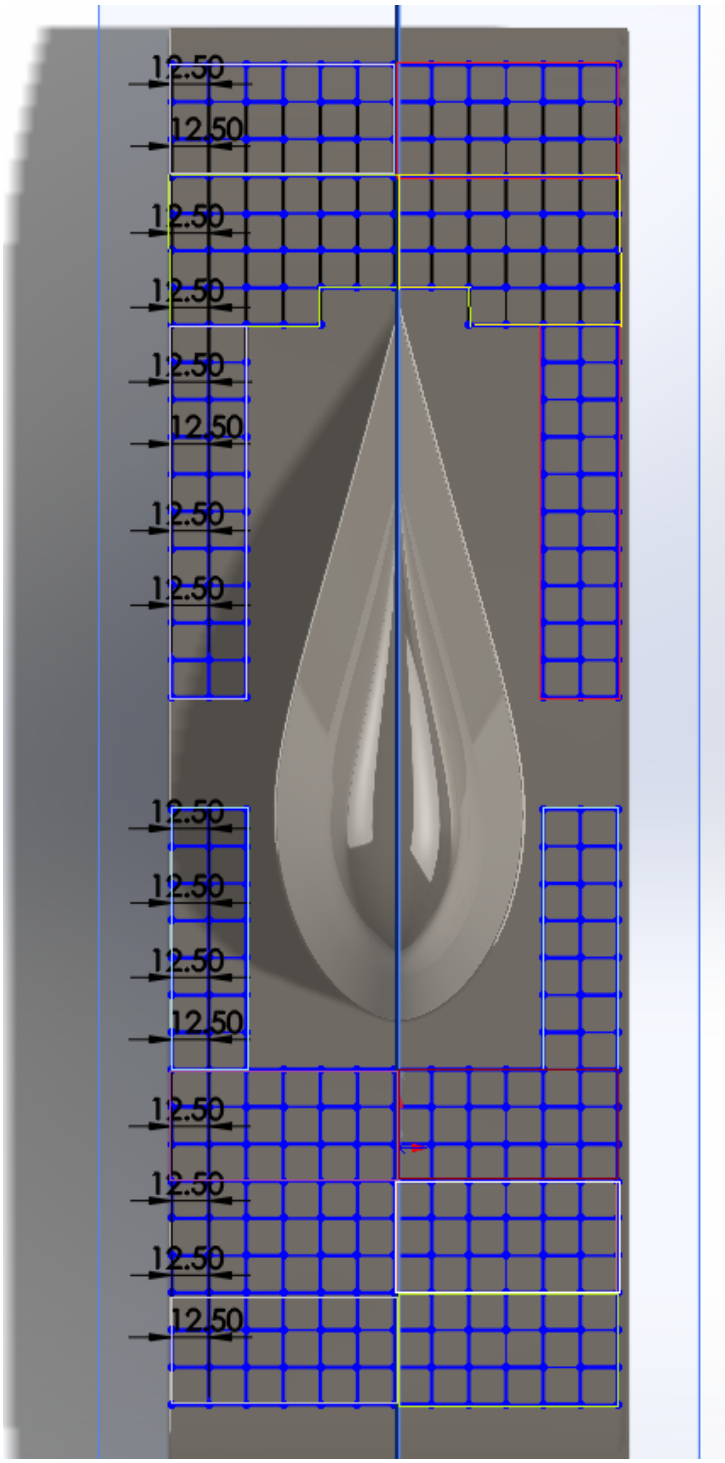
The battery is one of the core components to any electric vehicle. In order to maintain a stable source of power for the motors, the battery must be able to charge and discharge on demand. These form the primary goals of the battery system: power storage, quick charging, and adaptable discharging. While working towards these functional goals, we must also simultaneously maximize efficiency by reducing size, weight, and heat.

The battery design was created to specification to safely secure and connect the hundreds of 18650 cells in the desired configuration. One of the core technologies used in the battery design is cell wire-bonding. This cutting-edge method of lithium-ion battery construction automatically fuses each of the 18650 cells and provides a secure bond to the cell without applying the damaging heat that soldering or welding would.

Solar Car Progress

Solar

One of the main parts of our car is the solar array. The solar array is used as the only source for our car that generates power to charge the battery, run the motor, and power the auxiliary system. Therefore, the main goal of the solar array team is to fabricate a highly efficient solar arrays and then test and mount them to the car in a way that would ensure we are obtaining the maximum amount of power we can from the sun. Unlike some other teams, we decided to build our own arrays. we are restricted to use only 4m^2 of solar arrays so we decided to build 2 strings of arrays, each made up of 7 subarrays in series, that would each generate 74.4V to the charge controller (MPPT), which would boost the voltage up to the voltage needed to charge the battery. After we figured out the schematic of our solar arrays and how we are going to place them on our car, we did extensive research on encapsulation methods of the solar cells, and we are testing different methods to figure out the best way that would encapsulate our cells without reducing the efficiency of them. The encapsulation of the cells are very important because as the car moves, there are many objects that can hit the car and the solar cells, so the encapsulation works like a protective layer that protects the cells from breaking by these objects. After we encapsulated the solar arrays, we will mount them on the car and connect it to other electrical components.



Budget Breakdown

Mechanical

Aerodynamics	$500
Testing	$700
Chassis	$1,500
Suspension	$20,000
Brakes	$1,000
Steering	$700
Hardware	$2,000
Misc.	$1,500

Electrical

Motors	$32,000
Batteries	$1,000
Battery	$85
Auxiliary Pack	$9.99
Telemetry	$7,000
Solar	$4,400
Misc.	$1,500
Hardware	$2,500

Operational

Insurance	$0
Truck/Trailer	$2,000
Rental Cars	$3,000
Transportation	$(Gas Prices)
Fuel	$2,700
Lodging	$4,500
Safety kit	$750
Test Equipment	$500
ASC 2018	$8,500

Composition

Expoies	$300
Fiberglass	$1,800
Shell Molds	$100
Foam	$3,500
Misc	$2,000

Total Budget

Mechanical	$27,900
Electrical	$42,240
Composition	$7,700
Race	$9,000
Operational	$12,950

Total: **$99,900**

Our budget consists of the cost of not only the manufacturing of the car, but also the cost to compete in the race. We hope that you choose to sponsor us and build a relationship with a team of students that plan on transforming the world to a better future.

Zot.SUN

Composition

Sandwich structure of fiberglass layered around foam material ensures the body to withstand a maximum 5g load impact

Solar Array

Two sb arrays with 256 Sunpower Maxeon C60 bin kp solar cells.

Aerodynamics

Airfoil shape tested in ANSYS to reduce drag force to under 100 N for speeds of 65 mph and utilizes a flat top surface to ensure a perpendicular angle to the sun, allowing for maximum radiation absorption

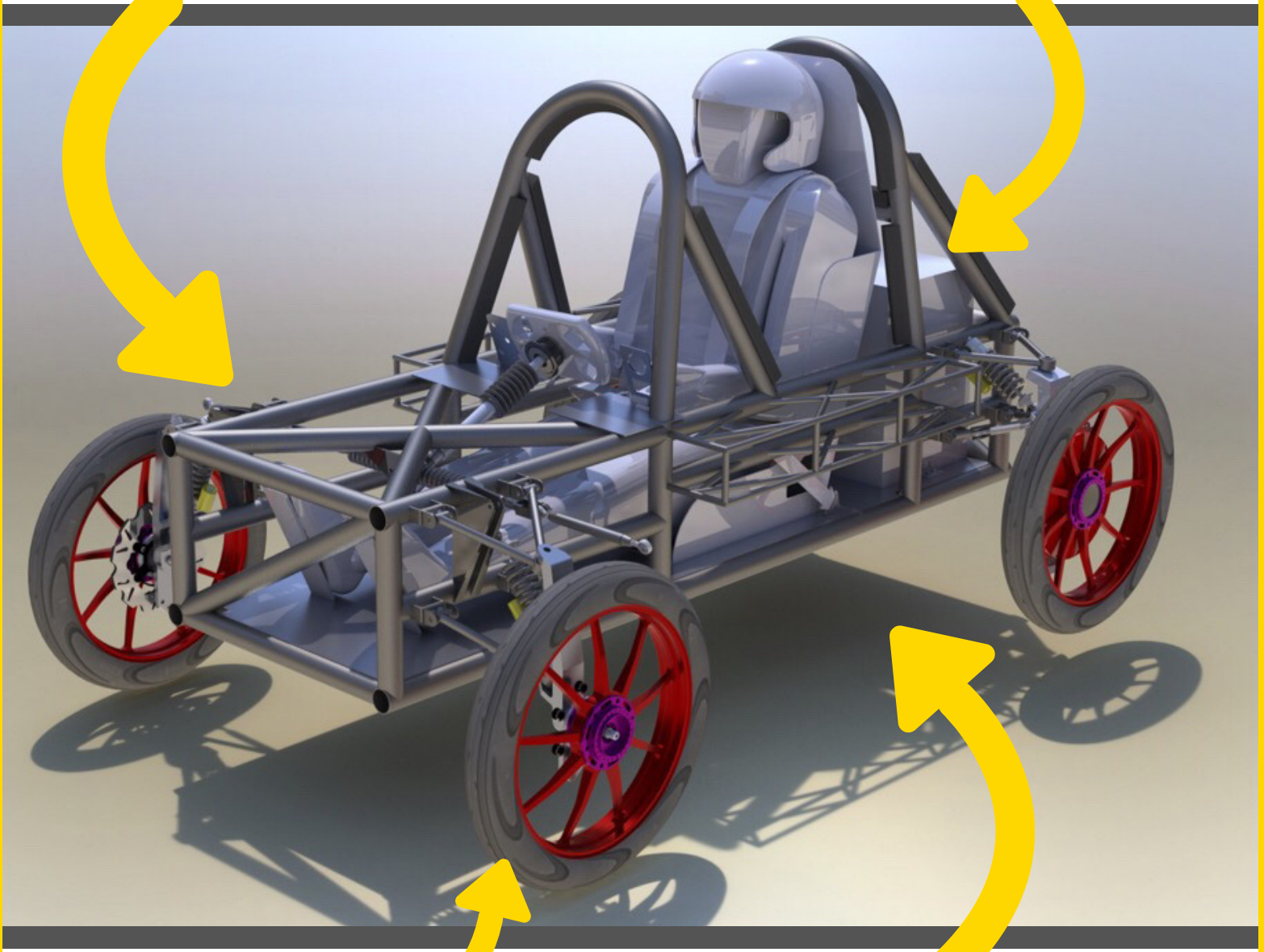
Zot.SUN

Suspension

Double A-arm suspension system designed to withstand 2G bump, 1G braking, and 1G turn

Battery

416 Li-ion Panasonic 18650 NCRBE's manufactured using wire bonding to ensure proper connections



Wheels

Ultra lightweight 1.6 kg Mitsuba aluminum wheels

Chassis

Spaceframe chassis made with 4130 chromoly tubes designed to withstand 5g loads from all directions

f

Sponsorship Levels

Sponsorship Levels	Platinum $25,000 +	Gold $10,001 - $25,000	Silver $2,501 - $10,000	Bronze $500- $2,500
Social Media				
Social Media Shoutout	🚗	🚗	🚗	🚗
Social Media Updates	🚗	🚗		
Shoutout in blog	🚗	🚗	🚗	🚗
Name on website	🚗	🚗	🚗	
Car Branding				
Logo on Car Trailer	🚗	🚗		
Logo on Chase Vehicle			🚗	
Small Logo on Car		🚗		
Medium Logo on Car	🚗			
Large Logo on Car	🚗			
Products				
T- Shirt	🚗			
Thank You letter	🚗	🚗	🚗	🚗
Stickers	🚗			
Small 3D Printed Car	🚗	🚗	🚗	🚗
Tour of Lab	🚗			
Logo on team shirt	🚗	🚗		

Gold

Sponsorship Overview

Sponsoring our team doesn't just provide the benefits discussed later in the packet. It also includes the environment, personal development and relationships built with students, and innovation in technology. America's dependence on fossil fuels is a nationwide problem that needs to be addressed. Solar technology in electric vehicles helps drive a more eco-friendly society. Solar energy is 100% renewable and leaves no carbon footprint on the Earth. The sun is accessible to even the poorest nations on Earth making it a reliable, abundant, and promising resource for clean energy. The first generation of SolEaters are students with great initiative. With no previous solar car projects at the university to set precedent, this enables our team to get first hand experience in building a solar-powered car from the ground up. Our solar vehicle project would not be possible without the generous support of our sponsors. Our team members spend countless hours on this project, driven by a shared passion for renewable energy. None of this would be possible without you. Your donation allows us to push forward with this project. Your sponsorship accelerates the innovation of solar technology and electric vehicles. The engineers of SolEaters use logical methods to solve practical problems in advancing renewable energy technology. Your support helps frame the future engineers of tomorrow to be ready to join the workforce and push the boundaries of innovations in engineering.

Energy Invitational

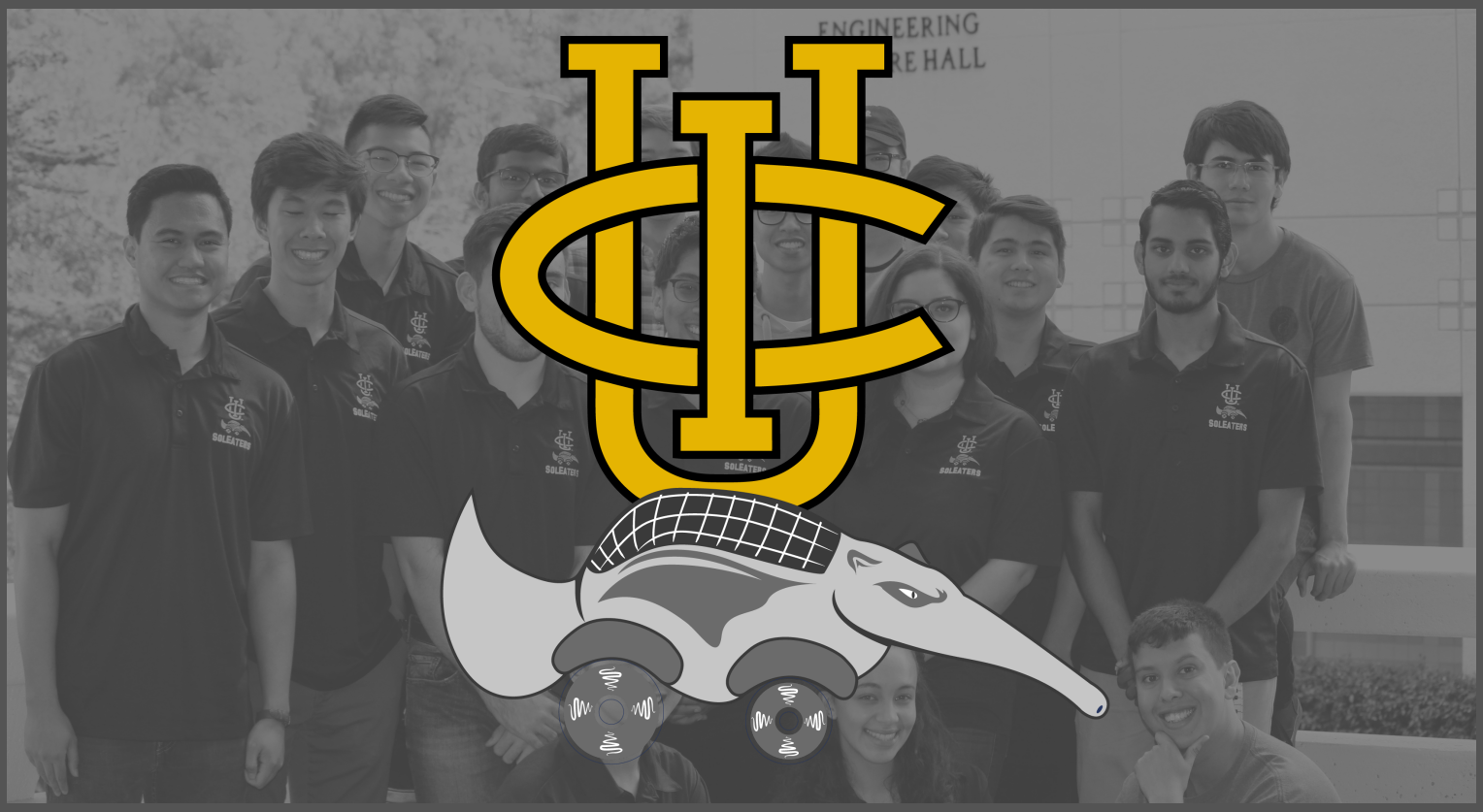
The UCI PERFORMANCE ENGINEERING PROJECT, founded in 1998 by Professor Michael McCarthy, Professor of Mechanical and Aerospace Engineering at UCI, is a time trial that tests student-built energy efficient vehicles.

Students in classes and clubs build their vehicles from the ground up or by modifying existing vehicles using a combination of energy sources. As students build their operational prototype, they acquire an understanding of electrical and mechanical engineering, aerodynamics, physics, materials science, alternative fuels, statistics, algebra, CAD/3D printing, technology and fabrication. They also learn about entrepreneurship, marketing and general management skills.

Sponsorship Levels

	Platinum $25,000 +	Gold $10,001 - $25,000	Silver $2,501 - $10,000	Bronze $500- $2,500
Social Media				
Social Media Shoutout				
Social Media Updates				
Shoutout in blog				
Name on website				
Car Branding				
Logo on Car Trailer				
Logo on Chase Vehicle				
Small Logo on Car				
Medium Logo on Car				
Large Logo on Car				
Products				
T- Shirt				
Thank You letter				
Stickers				
Model 3D Printed Car				
Tour of Lab				
Logo on team shirt				

Contact Us!



We would love to establish a partnership with you!

Team email:
ucirvinesolarcar@gmail.com
Jack Brouwer, Adviser | jb@apep.uci.edu

5200 Engineering Hall
Irvine, CA 92617-2700

UCIRVINESOLARCAR.COM

Project Manager Contact
Lizette Nguyen
lizetten@uci.edu
(714)-264-5506