



# BADGER SOLAR RACING

2023/2024 Sponsorship Package

**DATE:**

July 10th, 2023

**ORGANISED BY:**

Badger Solar Racing Industry  
Relations

[WWW.BADGERSOLARRACING.ORG](http://WWW.BADGERSOLARRACING.ORG)



# MEET THE TEAM



Badger Solar Racing is an extra-curricular STEM education organization from the University of Wisconsin - Madison that competes in the Formula Sun Grand Prix and American Solar Challenge Competitions. These competitions consist of designing and fabricating a fully functioning solar charged electric car for a cross-country time and distance rally event. Our members gain hands-on experience and participate in a unparalleled learning opportunity by applying what they learn in their coursework to the competition. Previously, Badger Solar Racing comepeted in the SpaceX Hyperloop Competition under the Badgerloop name, where our organization won multiple awards for innovation and overall engineering design. In addition to taking an education-oriented approach to the competition, Badger Solar Racing also provides community engagement and involvement through educational outreach, social media interaction, and vehicle reveal events.

## WHY CHOOSE US?



### INNOVATION

We pride ourselves in fabricating most of our parts from scratch rather than buying off the shelf solutions.



### SELF SUFFICIENT

Our student organization is almost entirely funded by financial and material sponsorships from gracious companies such as yours! Your contribution will always have a direct impact on the success of our team and growth of our members.

# MEET HELIOS



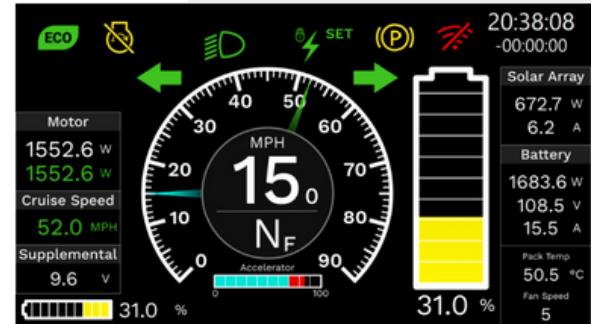
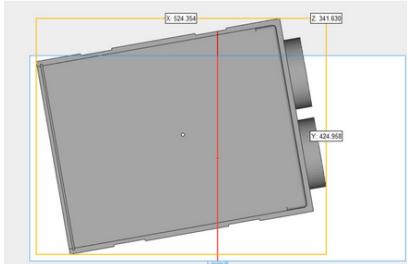
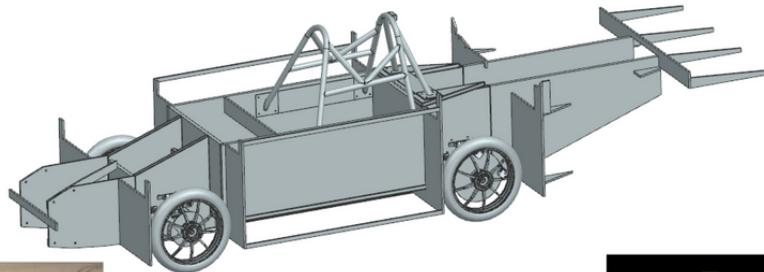
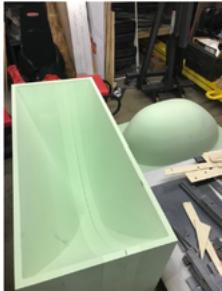
## SPEC SHEET

- 99V LITHIUM IRON PHOSPHATE BATTERY PACK WITH 3D PRINTED ENCLOSURE**
- DIRECT ELECTRIC PROPULSION VIA SINGLE IN-HUB MOTOR**
- 3D PRINTED STEERING WHEEL WITH BUILT IN DIGITAL DASHBOARD**
- 256-CELL SOLAR ARRAY WITH CUSTOM DESIGNED POWER POINT TRACKER**
- CUSTOM ALUMINUM SUSPENSION AND BRAKING SYSTEMS**
- CUSTOM DESIGNED STEEL ROLLCAGE**
- CARBON FIBER SHELL AND CHASSIS**

## ■ COMPETITION RESULTS

Helios and our team did valiantly this year after not being to a competition in over 4 years. We were able to get through scrutineering and regulations check before the group start time on the fourth day of competition. Once on the race track, we racked up an astounding 97 laps, equating to over 240 miles of driving purely on electric power derived from the sun. This hard work all culminated in us winning rookie of the year at the 2023 Electrek Formula Sun Grand Prix, a result we are looking to build on for the 2024 Electrek Formula Sun Grand Prix and 2024 American Solar Challenge.

# THE DESIGN PROCESS



## MECHANICAL DESIGN

### COMPOSITE CHASSIS

Pictured above is both the CAD design of our composite chassis and its final form. It is designed to be made of modular carbon fiber panels with a 1 inch foamboard "core" to give the carbon skin rigidity.

### STEEL ROLLCAGE

Also pictured above are both the CAD model and the final version of our rollcage, which is welded to mounting brackets which are in turn bolted into our carbon fiber chassis through custom grommet holes.

### ALUMINUM SUSPENSION AND BRAKE SYSTEMS

Our aluminum a-arms, knuckle, brake mounting brackets, and brake rotors were all designed by team members in CAD before being exported to be machined by our partners.

## ELECTRONIC DESIGN

### CUSTOM PCB'S

Our high and low voltage control boards were all designed in house, including the one used to control our digital driver dashboard pictured above.

### CUSTOM BATTERY PACK

Our battery enclosure, pictured above, was also designed in house before being sent out to be 3D printed by one of our current sponsors. We use 403 LiFePO4 battery cells arranged into 16 modules spot-welded and assembled in house.

### HOMEGROWN CODE

Our team designed the embedded systems to operate the electrical systems of the car such as the battery protection system, lights, sensors, and more. Our software team developed applications to collect, display, and analyze telemetry on both the driver and engineering dashboards.

# PAST COMPETITIONS AND VEHICLES



## POD I

- Design/Competition cycle: Fall 2015 - January 2017
- Magnetic levitation and propulsion via Halbach wheels
- Electric drum brakes with racing tires to stay on the rail
- Won the SpaceX Innovation Award



## POD II

- Design/Competition cycle: January 2017 - August 2017
- Cold gas thruster propulsion system
- Pneumatically actuated braking
- Won the SpaceX Innovation Award



## POD III

- Design/Competition cycle: September 2017 - July 2018
- Electric motor and timing belt propulsion system
- Compact stability system
- Chosen to present at the competition by SpaceX



## POD IV

- Design/Competition cycle: September 2018 - July 2019
- Direct drive propulsion system with in-hub motor
- Simple, optimized composite chassis with composite shell
- Chosen to present at competition by SpaceX



## POD V

- Design Cycle: Fall 2019 - Spring 2021
- Direct drive propulsion system with in hub motor
- Eliminated atmospheric pressure vessel
- Electrical architecture upgrade
- New 2.4 kWh battery pack
- Integrated PCB for high voltage pre-charge and control
- Central avionics PCB for majority of pod functions
- Distributed braking PCB's with serial communication for simplified harnessing
- Improved suspension system



# OUR PACKAGES AND PERKS

Perks and Rewards	Gold Tier (\$20000+)	Silver Tier (\$10000+)	Bronze tier (\$2500+)
<i>Sponsor Logo On Helios</i>	Largest Logo	Medium Size Logo	Smallest Logo
<i>Sponsor Logo on Uniforms</i>	Biggest on back of uniform	Bigger on back of the uniform	Smaller on back of the uniform
<i>Company Showcase of Helios*</i>	✓		
<i>Exclusive Recruiting event with Badgerloop Members</i>	✓	✓	
<i>Design Review Day</i>	✓	✓	
<i>Resume Packet of all badgerloop Members</i>	✓	✓	✓
<i>Monthly newsletter</i>	✓	✓	✓
<i>Reveal Event invitation</i>	✓	✓	✓
<i>Social Media Shout Out</i>	✓	✓	✓

\*THE SPONSOR WILL BE RESPONSIBLE FOR THE TRANSPORTATION COSTS OF THE SOLAR CAR TO AND FROM THE SHOWCASE SITE.

NOTE: THESE TIERS ARE STRICTLY FOR MONETARY BENEFITS. SEE BELOW FOR CASE-BY-CASE HANDLING OF VALUE OF MATERIAL OR SOFTWARE DONATIONS MADE TO BADGER SOLAR RACING.



# TAX EXEMPT DONATIONS



## MONETARY

### BY CHECK

Checks should be payable to "UW Foundation," with "Badgerloop Fund" in the memo line. Please include a letter stating gift amount, intended purpose, and contact information.

**UW FOUNDATION C/O  
BRAD GREEN  
1848 UNIVERSITY AVE  
MADISON, WI 53726**

### ONLINE

Make a private donation online to Badgerloop by visiting the link below. Online giving is also tax-exempt.

**[HTTPS://SECURE.SUPPORT.UW.ORG/GIVE/](https://secure.support.uw.org/give/)**

## MATERIAL

Material donations will be appraised using your company's appraisal of the MSRP of material or amount of material bought at discount by us from your company among other factors, any further discussions or questions can be answered by Minghua Zhang, our operations director.



THANK YOU

# CONNECT WITH US



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