SOLARING UP THE MIDWEST

1700+ Miles

All Solar

7 States

8 Days

Start
Austin, TX

Weatherford, TX

Overland Park, KS

Wichita, KS

Norman, OK

La Crosse, WI

Ames, IA

Minneapolis, MN

Race Schedule

Austin, TX Starting Line
Mon, July 21 at UT Austin

Weatherford, TX Check Point
Mon, July 21 at Weatherford College

Norman, OK Stage Stop
Tue-Wed, July 22-23 at University of Oklahoma

Wichita, KS Check Point
Wed, July 23 at Wichita Aviation Museum

Overland Park, KS Stage Stop
Thu-Fri, July 24-25 at Black & Veatch

Omaha, NE Stage Stop
Fri-Sat, July 25-26 at HDR

Ames, IA Check Point
Sat, July 26 at Iowa State University

La Crosse, WI Stage Stop
Sun-Mon, July 27-28 at Western Technical College

Minneapolis, MN Finish Line
Mon, July 28 at University of Minnesota

2014

AmericanSolarChallenge.org facebook.com/AmericanSolarChallenge twitter.com/ASC_SolarRacing
Scrutineering
July 14-16 – Circuit of The Americas

After months of designing and building, teams arrive with their solar cars for scrutineering. For three days, the solar cars will undergo a series of inspections covering all aspects of the car: mechanical, electrical, body and sizing, and dynamic testing. Inspectors make sure the solar cars are built in alignment with the regulations and have all required safety features.

Scrutineering also tests the abilities of the drivers. All drivers must pass the egress test, which requires drivers to get out of the car unassisted in 10 seconds or less. Drivers are randomly selected to complete the dynamics tests, which are as much about testing the car’s braking, turning, and stability as about testing the experience of the drivers. Teams must pass all inspection stations prior to racing.

Qualifying: FSGP
July 17-19 – Circuit of The Americas

The order that teams complete Scrutineering is the same order that they start in the Formula Sun Grand Prix (FSGP) qualifier. This is a three day track race where the team with the most completed laps wins. In order to qualify for the cross country road race, the solar car must complete a minimum number of laps during FSGP with each of their drivers. The tight turns test the car’s stability as well as driver skill. Only cars (and drivers) that prove reliable and safe on the track are permitted to participate in the ASC on-road event. The starting order for ASC is determined by the number of laps driven during FSGP.

Racing: ASC
July 21-28 – TX to MN

The teams that qualify for the American Solar Challenge (ASC) road race have already completed quite a challenge. Crossing 7 states in 8 days will determine the winner by the team that completes the route in the lowest overall elapsed time. Teams race during the day from 9am – 6pm following a detailed route book with step-by-step directions. Each solar car is escorted by lead and chase vehicles that carry the other team members and equipment for roadside repairs.

For two hours in the morning and evening, teams are able to charge their batteries using the solar car’s array. Teams angle the solar array toward the sun for maximum exposure. During these non-racing hours, teams can perform maintenance on the car, check the weather, determine their strategy for the next day, and hopefully get some sleep!
How do solar cars work?
Solar cars are very similar to electric vehicles, except that they utilize energy straight from the sun as opposed to a battery charger. Solar cells on the car convert sunlight into electricity, which in turn powers an electric motor.

Why do they look so different?
Conventional passenger cars spend more than 85% of their energy overcoming air resistance, known as aerodynamic drag. Solar cars are designed to minimize the energy lost to drag, while also optimizing solar array area. This results in some unique shapes.

How fast can they go?
Teams must obey posted speed limits, and regulations limit them to 65 mph. During testing, solar cars have been clocked at over 100 mph.

Do the cars have air conditioning?
Though teams are required to provide driver ventilation, these are racing vehicles. Air conditioning, power windows, and other creature comforts would only consume electricity without improving the car’s performance.

What about those not-so-sunny days?
Solar cars carry batteries that can be charged using the solar cells. When facing clouds or needing extra power, the cars use this stored energy.

Do solar cars have engines?
Instead of an internal combustion engine, most cars use a small electric motor mounted inside one of the wheels. Motor efficiency is typically over 90% and the peak power rating is typically less than 10hp.

Can I buy a solar car?
These solar cars are built specifically for racing and demonstration. They are not suitable for the general public. However, there are a number of electric, hybrid, and alternative fuel vehicles on the market and in use today.
Thank You!

For Supporting The 2014 Formula Sun Grand Prix

July 17 - 19
University of Florida: Solar Gators
Sol Power – #21

$L \times W \times H$: 5.00m x 1.80m x 1.8m
Weight: 318kg
Array: 990W SunPower Mono-Si
Pack: 3.65kWh LiFePO4
Motor: 7.5kW Perm Brushed
Wheels: Three 14" NGM Style Rims
Chassis: Al Space Frame

Principia College
Ra 9 – #32

$L \times W \times H$: 4.40m x 1.75m x 1.20m
Weight: 226kg
Array: 1200W SunPower Mono-Si
Pack: 4.7kWh Li-Po
Motor: Mitsuba
Wheels: Four 16" Carbon Fiber Rims
Chassis: 4130 Chromoly Space Frame

University of Minnesota
Centaurus III – #35

$L \times W \times H$: 5.00m x 1.80m x 1.10m
Weight: 175kg
Array: 1200W SunPower Mono-Si
Pack: 5kWh Li-Po
Motor: Custom PM AC
Wheels: Three 16" Rims - Dunlap
Chassis: Fiberglass Monocoque

Missouri S&T
Solar Miner VIII – #42

$L \times W \times H$: 4.62m x 1.57m x 1.09m
Weight: 159kg
Array: 1124W SunPower Mono-Si
Pack: 3.7kWh Li-Po
Motor: 7.5kW NGM SCM150
Wheels: Three 14" NGM Style Rims
Chassis: 4130 Chromoly Space Frame

Georgia Tech: Solar Jackets
Endeavour – #49

$L \times W \times H$: 4.80m x 1.80m x 1.22m
Weight: 273kg
Array: 1000W Sunvia Mono-Si
Pack: LiFePO4
Motor: 7.5kW NGM SCM150
Wheels: Three 14" Al Rims
Chassis: 4130 Chromoly Space Frame

Polytechnique Montreal: Esteban
Esteban VII – #55

$L \times W \times H$: 4.95m x 1.75m x 1.01m
Weight: 240kg
Array: 1350W SunPower Mono-Si
Pack: 3.24kWh Li-Po
Motor: Dual 1kW Mitsuba M1096-II
Wheels: Three 16" Mitsuba M1096-II
Chassis: Carbon Fiber Monocoque

Southern Illinois University: SIUE
Black Nova – #57

$L \times W \times H$: N/A
Weight: 192kg
Array: 1000W SunPower Mono-Si
Pack: 4kWh Li-Ion
Motor: 7.5kW NGM SCM150
Wheels: Three 16" NGM Style Rims
Chassis: Tempered Al Space Frame

Qazvin Islamic Azad: QIAU HAVIN
HAVIN 2 – #73

$L \times W \times H$: 4.50m x 1.80m x 1.10m
Weight: 240kg
Array: 1200W SunPower Mono-Si
Pack: 5kWh Li-Ion
Motor: Dual 1.8kW CSIRO
Wheels: Four 16" Rims
Chassis: Carbon Fiber Monocoque

ETS Quebec: Eclipse
Eclipse 8 – #92

$L \times W \times H$: 4.49m x 1.77m x 1.14m
Weight: 205kg
Array: 1200W SunPower Mono-Si
Pack: 5.07kWh Li-Po
Motor: 1.8kW CSIRO
Wheels: Three 14" Rims
Chassis: 4130 Chromoly Space Frame
<table>
<thead>
<tr>
<th>Institution</th>
<th>Model</th>
<th>Year</th>
<th>L x W x H:</th>
<th>Weight:</th>
<th>Array:</th>
<th>Pack:</th>
<th>Motor:</th>
<th>Wheels:</th>
<th>Chassis:</th>
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<td>Western University: SunStang</td>
<td>SunStang 2014</td>
<td>#96</td>
<td>4.60m x 1.80m x 1.40m</td>
<td>N/A</td>
<td>1200W SunPower Mono-Si</td>
<td>3.85kWh Li-Po</td>
<td>1.8kW CSIRO</td>
<td>Three 16&quot; Rims - 42J Moped</td>
<td>4130 Chromoly Space Frame</td>
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<td>McMaster University</td>
<td>Spitfire – #116</td>
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<td>5.00m x 1.80m x 1.40m</td>
<td>250kg</td>
<td>1200W SunPower Mono-Si</td>
<td>3.85kWh Li-Po</td>
<td>5kW Mitsuba M2096-II</td>
<td>Three 16&quot; Rims - Dunlap</td>
<td>6061-T6 Al Space Frame</td>
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<td>MIT</td>
<td>Valkyrie – #179</td>
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<td>4.98m x 1.78m x 1.00m</td>
<td>160kg</td>
<td>1200W SunPower Mono-Si</td>
<td>5kWh Li-Ion</td>
<td>Mitsuba</td>
<td>Three 16&quot; Rims - Michelin</td>
<td>Carbon Semi Monocoque</td>
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<td>Oregon State</td>
<td>Phoenix – #256</td>
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<td>4.97m x 1.79m x 0.96m</td>
<td>220kg</td>
<td>1200W SunPower Mono-Si</td>
<td>3.94kWh LiFePO4</td>
<td>7.5kW NGM SCM150</td>
<td>Three 14&quot; Custom Rims</td>
<td>Titanium Space Frame</td>
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<tr>
<td>Puerto Rico Mayaguez: SERRT</td>
<td>El Wanabí – #787</td>
<td></td>
<td>4.42m x 1.65m x 1.00m</td>
<td>165kg</td>
<td>1232W SunPower Mono-Si</td>
<td>3.86kWh Li-Ion</td>
<td>7.5kW NGM SCM150</td>
<td>Four 14&quot; Spoked Rims</td>
<td>Carbon Fiber Monocoque</td>
</tr>
</tbody>
</table>
Batteries are released from the evening impound and the morning solar charging session begins. Wait for the green flag to drop. Teams are released onto the race route in 1-minute intervals. Drive. As necessary, stop in a sunny spot to charge, fix a flat tire, or switch drivers. Then get back to driving. There is no lunch break. Arrive at a Checkpoint. The team jumps out of the support vehicles and points the solar array towards the sun. Drivers of support vehicles go off to find the nearest fueling station. Observers are swapped, route updates are given, and the public gathers around to see the cars. After staying the allotted time, the solar car is off again.

7:00 AM
Batteries are released from the evening impound and the morning solar charging session begins.

9:00 AM
Wait for the green flag to drop. Teams are released onto the race route in 1-minute intervals.

The Next 9 Hours...
Drive. As necessary, stop in a sunny spot to charge, fix a flat tire, or switch drivers. Then get back to driving. There is no lunch break. Arrive at a Checkpoint. The team jumps out of the support vehicles and points the solar array towards the sun. Drivers of support vehicles go off to find the nearest fueling station. Observers are swapped, route updates are given, and the public gathers around to see the cars. After staying the allotted time, the solar car is off again.

6:00 PM
9-hours after the green flag, the race day ends and the evening solar charging time begins. There is a 45-minute grace period for teams to find a safe place to stop.

8:00 PM
Battery are impounded with the observer and cannot be touched until battery release the next day.

Until Morning...
Work on the solar car (except batteries), find lodging, eat dinner, check the weather forecast, get ready for the next day, and hopefully get some sleep.

The Next Day...
Much the same schedule as above, except that the solar cars reach a Stage Stop where all teams will meet together for stage awards and camaraderie. A Stage Stop is an extended Checkpoint where teams will not depart on the next stage of the route until the following morning.
The University of Texas at Austin is proud to be the university host for FSGP/ASC 2014. We wish all of the teams great solar car racing.

UT ECE is pleased to recognize our supporters who help make this event possible:

Clay Cooley Nissan
Fluor
General Motors
Lockheed Martin
Plantronics
Schlumberger

Sunpower
Texas Motor Sports
Texas Solar Energy Society
Union Pacific
University Co-op
IOWA STATE UNIVERSITY
and Ames, Iowa
welcome the
2014 American Solar Challenge
host site for
July 26 Checkpoint

Bridging the gap between
idea + achievement
This is where great begins.

HDR

Western Technical College
THE ESSENTIAL EXPERIENCE

DRIVEN TO SUCCEED

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Who We Are
The Innovators Educational Foundation (IEF) is a non-profit 501(c)3 organization, which organizes collegiate level solar car competitions in America. The Formula Sun Grand Prix is our track event and the American Solar Challenge is a cross-country road event.

IEF is made up of a core group of dedicated volunteers; mostly former competitors. They know first-hand the value of this hands-on, multidisciplinary, innovative project to the education experience. In addition to experiential learning, solar car events promote energy efficiency and raise public awareness of the capabilities of solar power.

Get Involved
We appreciate your interest in the sport of solar car racing! Whether you are interested in starting a team, volunteering, or providing financial support towards the next event, we want to hear from you. We would be happy to discuss opportunities with you, your school, or your company.

Contact Us
Innovators Educational Foundation
PO Box 2368, Rolla, MO 65402
IEF@AmericanSolarChallenge.org

Teams at a Glance
#2 University of Michigan
#3 University of Kentucky
#6 UC Berkeley: CalSol
#8 UT Austin
#9 Iowa State: PrISUm
#10 Netaji Subhas Institute of Tech: NSIT
#13 Michigan State
#17 Illinois State: Mercury
#20 Western Michigan: Sunseeker
#21 University of Florida: Solar Gators
#32 Principia College
#35 University of Minnesota
#42 Missouri S&T
#49 Georgia Tech: Solar Jackets
#55 Polytechnique Montreal: Esteban
#57 Southern Illinois University: SIUE
#73 Qazvin Islamic Azad: QIAU HAVIN
#92 ETS Quebec: Eclipse
#96 Western University: SunStang
#116 McMaster University
#179 MIT
#256 Oregon State
#787 Puerto Rico Mayaguez: SERRT