

# → TEAMS

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[www.americansolarchallenge.org](http://www.americansolarchallenge.org)

NY → MN | JULY 14-21  
2012

Rochester, NY  
Erie, PA  
Mansfield, OH  
Ann Arbor, MI  
Kalamazoo, MI  
Normal, IL  
Verona, WI  
La Crosse, WI  
St. Paul, MN

## → Who We Are

The Innovators Educational Foundation (IEF) is a non-profit 501c3 organization, which hosts two events for solar car teams: Formula Sun Grand Prix, a track event, and the American Solar Challenge, a cross-country road event.

A core group of dedicated volunteers, mostly former competitors, provide the engine for IEF. They know first-hand the value of a hands-on, multidisciplinary, innovative project to the education experience. In addition to experiential learning, these 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 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

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# Drive & Determination

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## Welcome to the 2012 American Solar Challenge!



Covering 1600+ miles from New York to Minnesota powered by the sun, the American Solar Challenge (ASC) is a unique competition which promotes educational excellence and engineering creativity. Each team designs and builds a solar-powered vehicle within a set of regulations. These vehicles undergo a series of inspections as well as a track qualifier to prove their roadworthiness to participate in the cross-country event.



Once teams leave the start line in Rochester, NY on July 14, teams follow a pre-defined route, taking them across 8 states in 8 days to finish on July 21 in St. Paul, MN. The route is broken into a series of stages with mandatory stops along the way to interact with the public and media as well as check-in with event staff for timing purposes and updates.

Teams will face hilly terrain, normal traffic conditions, and unpredictable weather all while carefully managing their power. Winning this brain sport is a combination of a reliable car, efficient driving, and a good strategy. Meet the teams who are up for the challenge!



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### Illinois State University

**Welcomes**

### The 2012 American Solar Challenge

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The Department of Physics, Facilities Management, Caterpillar Inc., and Parking and Transportation

### More than just Engineering



The challenge of ASC begins long before the solar cars hit the road. A solar car team really acts as a small business – attracting sponsors, managing public relations, developing and executing a two-year plan, and producing a solar car. While most teams have engineers, you will also find majors in business, marketing, and other fields. The solar car team multidisciplinary experience serves these students well as they graduate and prepare for their careers.





# → → → The 2012 Rayce Season

## → Scrutineering

July 6-9 | Monticello Motor Club

After months of designing and building, teams arrive for scrutineering. For four 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 stations prior to competing.

Teams must successfully participate in Formula Sun Grand Prix (FSGP), a 3-day track race, where the most laps completed wins. For qualifying purposes, teams are required to complete a minimum number of laps. The tight turns test the car's stability and driver's skill. Only cars (and drivers) that prove reliable and safe on the track are permitted to participate in the ASC on-road event.

## → Qualifying

July 10-12 | Monticello Motor Club



## → Raycing

July 14-21 | NY → MN

The teams that make it into ASC have already completed quite a challenge. Crossing 8 states in 8 days will determine the winner by the team that completes the route in the lowest overall elapsed time. Teams rayce 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-raycing hours, teams can perform maintenance on the car, check the weather, determine their strategy for the next day, and hopefully get some sleep!



## → Enthusiasm



## → Sportsmanship



## → Dedication



## → Teamwork



## → Outreach

7:00 AM

Batteries are released from impound and morning charge time begins.

9:00 AM

Wait for the green flag to drop. Teams are released in 1-minute intervals.

The Next 9 Hours...

Drive.

As needed, stop to charge, fix a flat, or change 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 fuel 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 raycing day ends and evening charging time begins. Teams have a 45-minute grace period 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 (minus 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.

Living the ASC Life ← ← ←





→ → → [www.americansolarchallenge.org](http://www.americansolarchallenge.org)

2012

→ → → 8 STATES  
8 DAYS  
**ALL SOLAR**

FINISH ←  
St. Paul, MN

La Crosse, WI

Verona, WI

Kalamazoo, MI

Normal, IL

Ann Arbor, MI

Mansfield, OH

Erie, PA

START ←  
Rochester, NY

START → **Rochester, NY** Sat, Jul 14 @ Rochester Institute of Technology

STAGE POINT → **Erie, PA** Sat-Sun, Jul 14-15 @ Tom Ridge Environmental Center

CHECKPOINT → **Mansfield, OH** Sun, Jul 15 @ The Ohio State University at Mansfield

STAGE POINT → **Ann Arbor, MI** Mon, Jul 16 @ University of Michigan  
Tue, Jul 17 @ Black & Veatch

CHECKPOINT → **Kalamazoo, MI** Tue, Jul 17 @ Western Michigan University

STAGE POINT → **Normal, IL** Wed-Thu, Jul 18-19 @ Illinois State University

CHECKPOINT → **Verona, WI** Thu, Jul 19 @ Reddan Soccer Park

STAGE POINT → **La Crosse, WI** Fri-Sat, Jul 20-21 @ Western Technical College

FINISH → **St. Paul, MN** Sat, Jul 21 @ Minnesota State Capitol



SCRUTINEERING → Fri-Mon, Jul 6-9

FORMULA SUN GRAND PRIX → Tue-Thu, Jul 10-12

@ Monticello Motor Club, **Monticello, NY**

**INNOVATORS EDUCATIONAL FOUNDATION** thanks the following **SPONSORS** and **STAGE/CHECKPOINT HOSTS**



WESTERN MICHIGAN UNIVERSITY




Caterpillar | Missouri S&T




→ MEET THE TEAMS

University of Michigan

#2 Quantum		
Weight	145 kg	
Array	SunPower, 1400 W	
Batteries	Li Ion, 5.0 kWh	
Motor	CSIRO	
Wheels	3 Al 16"	
Chassis	Carbon Fiber Monocoque	



Michigan State University

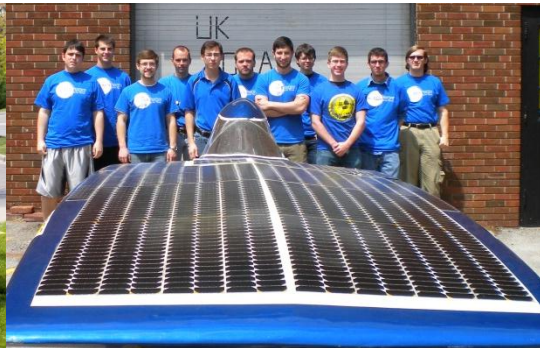
#13 Archidamus I		
Weight	275 kg	
Array	Evergreen Solar, 1173 W	
Batteries	Lead Acid, 4.1 kWh	
Motor	NGM SCM150	
Wheels	3 Ecopia EP80	
Chassis	Steel Tubing	

→ 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.

University of Kentucky

#3 Gato del Sol IV		
Weight	204 kg	
Array	Emcore, 1500 W	
Batteries	LiFePO4, 3.7 kWh	
Motor	NGM	
Wheels	3 Custom Al 7050 Alloy	
Chassis	Al Tubular Space Frame	

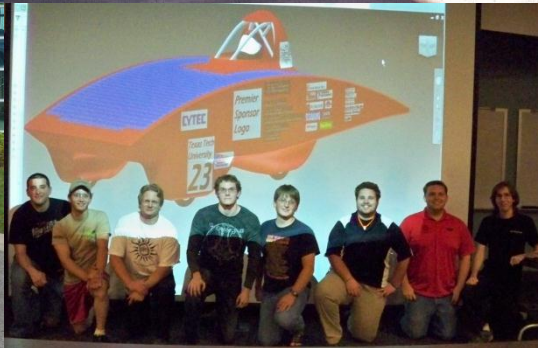


Western Michigan


#20 Sunseeker 12		
Weight	275 kg	
Array	SunPower, 1200 W	
Batteries	Li Polymer, 4.4 kWh	
Motor	CSIRO	
Wheels	3 GH Craft Carbon Fiber 14"	
Chassis	Carbon Fiber Monocoque	

MIT


#4 Chopper del Sol		
Weight	158 kg	
Array	SunPower, 1300 W	
Batteries	Li Ion, 4.8 kWh	
Motor	NGM SCM150	
Wheels	3 GH Craft CF Composite 16"	
Chassis	4130 Steel Tubing	



Texas Tech


#23 Raider 1		
Weight	283 kg	
Array	Evergreen, 1000 W	
Batteries	LiFePO4, 2.9 kWh	
Motor	NuGen SCM 150	
Wheels	3 Al 14"	
Chassis	Al Tubular Space Frame	

Illinois State University

#5 Mercury 4		
Weight	204 kg	
Array	SunPower, 1300 W	
Batteries	NiMH, 3.8 kWh	
Motor	Powertec 11 HP AC motor	
Wheels	3 Bridgestone Ecopia ep80	
Chassis	4130 Steel Tubing	



New Paltz

#28 SunHawk III		
Weight	225 kg	
Array	SunPower, 1267 W	
Batteries	LiFePO4, 3.7 kWh	
Motor	Enertrac MHM-602/604	
Wheels	3 NGM (front), spoke (rear)	
Chassis	Al Tubular Space Frame	


→ 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 car uses this stored energy.

Iowa State University


#9 PrISUm 11		
Weight	220 kg	
Array	SunPower, 1200 W	
Batteries	Li Ion, 3.5 kWh	
Motor	NuGen SCM 150	
Wheels	3 Custom 7050-T7451 Al 14"	
Chassis	Al Tubular Space Frame	

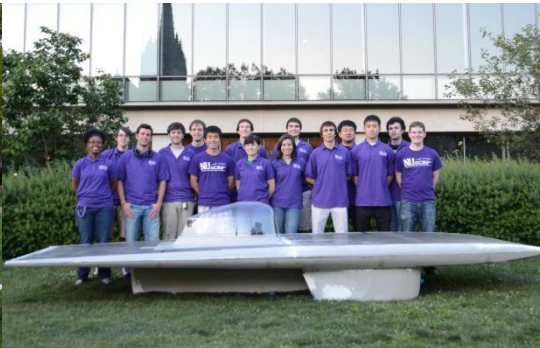


Principia College


#32 Ra 7s		
Weight	160 kg	
Array	SunPower, 1000 W	
Batteries	Li Polymer, 4 kWh	
Motor	NuGen SCM 150	
Wheels	3 Al 14"	
Chassis	Al Tubular Space Frame	

Northwestern University

#11 SC6		
Weight	170 kg	
Array	SunPower, 1337 W	
Batteries	Li Ion, 4.4 kWh	
Motor	NGM SCM-150-08	
Wheels	3 GH Craft Carbon Fiber 14"	
Chassis	Carbon Fiber Monocoque	



University of Minnesota

#35 Centaurus III		
Weight	180 kg	
Array	SunPower, 1325 W	
Batteries	Li Ion, 4.9 kWh	
Motor	NGM or Custom	
Wheels	3 Custom 16"	
Chassis	Fiberlam Panel	

← SOLAR CAR FAQs

→ 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%.

→ Can I buy a solar car?

These solar cars are built specifically for these events and are not suitable for the general public. However, there are several hybrid electric and alternative fuel vehicles on the market and in use today.



## → MEET THE TEAMS

### Missouri S&T

#### #42 Solar Miner VIII



Weight	137 kg
Array	SunPower
Batteries	Li Ion Polymer, 3.7 kWh
Motor	NuGen Hub Motor
Wheels	3 NuGen AI 19"
Chassis	4130 Chromoly Steel

### Georgia Tech

#### #49 The Endeavor



Weight	230 kg
Array	Suniva, Inc.
Batteries	LiFePO4, 2.9 kWh
Motor	NGM SCM150
Wheels	3 NGM Aluminum 15"
Chassis	4130 Steel Space Frame

### Polytechnique Montréal

#### #55 Esteban



Weight	230 kg
Array	SunPower, 1326 W
Batteries	LiMnNiCoO <sub>2</sub> , 3.2 kWh
Motor	BionX, in-wheel
Wheels	3 SAVA 16"
Chassis	Carbon Fiber Monocoque



### Univ of California Berkeley

#### #254 Impulse



Weight	238 kg
Array	SunPower, 1200 W
Batteries	Li Ion, 4.8 kWh
Motor	NGM SCM-150
Wheels	3 Dunlop Solarmax D850 16"
Chassis	4130 Steel Space Frame

### Oregon State University

#### #256 Phoenix



Weight	200 kg
Array	SolarWorld, 1000 W
Batteries	LiFePO4, 4 kWh
Motor	NGM SCM 120
Wheels	3 Custom 14"
Chassis	Titanium space frame

### University of New Mexico

#### #505 Lobo del Sol



Weight	318 kg
Array	Schott Solar, 1200 W
Batteries	Lead Acid, 3.5 kWh
Motor	Vectrix
Wheels	3 Ecopia
Chassis	Al Tubular Space Frame



We are always interested in having new teams join our upcoming events. Following this event we will begin the planning for the 2013-2014 season.

- Interested in starting a team?
- Looking for a challenging competition?
- Seeking ways to get involved?

Contact us at:  
[ascinfo@americansolarchallenge.org](mailto:ascinfo@americansolarchallenge.org)

## THE WILSON CUP ←



The Wilson Cup is the traveling trophy for the American Solar Challenge. The winning team gets to take home the Wilson Cup and display it until the next ASC. On the upper base, the five bands recognize the winners of the five Sunrayce events throughout the 1990s. The lower base recognizes American Solar Challenge winners since 2001.

## In Appreciation of our Volunteers ← ← ← ←

ASC 2012 would not be possible without our dedicated volunteers. Many come back every year to continue making these events possible.

### → Rayce Officials

The green shirts identify the officials, who perform a variety of roles from inspectors to stage/checkpoint crews to our route advance team and on-road EMTs. Many are also involved in the preparations prior to the event and reviewing the technical design reports submitted by the teams.

Dan Bohachick  
Carlie Borders  
Linda Bozarth  
Brian Call  
Mike Calvelage  
Alain Chuzel  
Tyler Coffey  
Lucas Day  
Steve Day  
Dan Eberle

Caityln Eberle  
Gage Eberle  
Hannah Eberle  
Madison Eberle  
Mark Eudaly  
Sue Eudaly  
Paul Hirtz  
Landon Hirtz  
Rochelle Jarrett  
Wade Johanns

Sam Lenius  
Gail Lueck  
Steve McMullen  
Marie McMullen  
Bernie Neidert  
Dick Roberto  
Adem Rudin  
Andrew Rutgers  
Greg Thompson



### → Observers

Wearing orange shirts, observers spend a week on the road living and traveling with the teams. Their role is to ride in the chase vehicle, monitor the solar car's progress, and ensure batteries are impounded each night. Observers are the eyes and ears for the officials and get to experience first-hand the hospitality of the teams.

Susan Chiu  
Ted Correll  
Rita Crocker  
Chloe Gibbons  
Kila Henry  
Chris Mattingly  
Bill Mayberry  
Robert Rieffel

Oliver Romero Rios  
Allen Rues  
Dan Saulsberry  
Oliver Schwallenstecker  
Bill Stillwell  
Amy Sunderlin  
Louise Werner  
Alexander Wolff



**W**  
WESTERN MICHIGAN  
UNIVERSITY

## Sunseeker Solar Car Team

- SUNRAYCING SINCE 1990
- PARTICIPANT IN ALL 10 AMERICAN SOLAR CHALLENGE EVENTS
- HOST SCHOOL FOR JULY 17 CHECKPOINT

See you in Kalamazoo!