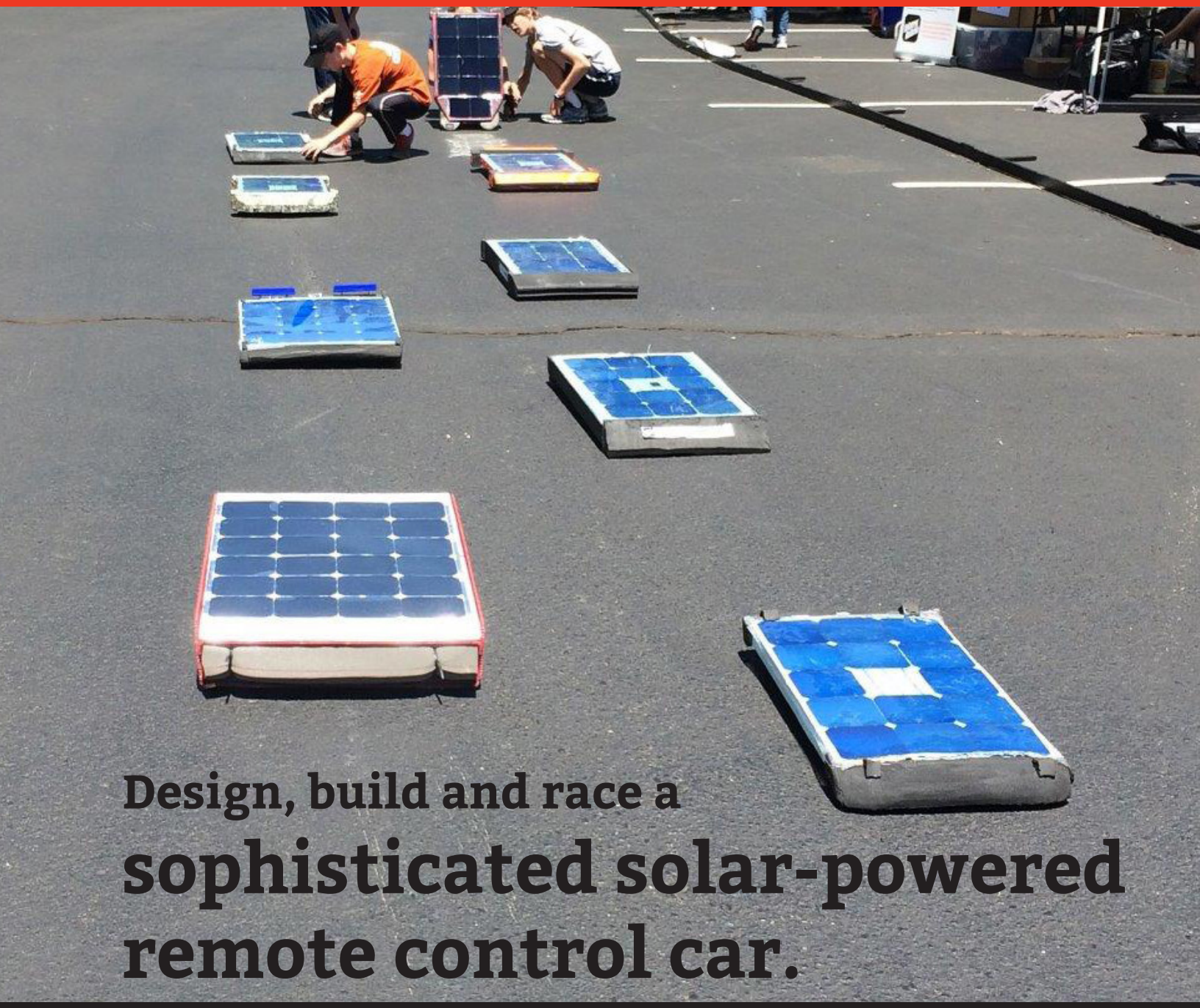
Solar Rollers™

Energyneering is coming to high schools.



Design, build and race a **sophisticated solar-powered remote control car.**

High speeds. High efficiency. High engagement.

Solar Rollers is an award-winning new competition for high school students. Working in teams, they design, build and ultimately race solar-powered remote control cars against other school teams. The cars hit speeds in excess of 25 MPH and students are drawn deeply into hands-on work with a complete energy system.

Join the race to educate students about energy.

Starting with a kit of cutting-edge parts and materials, and supported by an extensive online curriculum and community, teams design and build their cars from scratch. They learn to balance efficiency, durability and performance as they build team STEM skills and gain a meaningful understanding of solar energy. Students become increasingly invested as they design their chassis, select materials, program electronics, hand-solder their solar array and test and refine the car's systems.

On race day, the teams are tested in six separate competitions, including an academic panel quiz, top speed runs with and without batteries, and finally the main circuit race. For the main event, they begin with an empty battery and a 30-minute solar charging period, followed by 60 minutes of nonstop racing under continuous solar power.

May the most efficient and reliable car win!

Benefits to Students

- Apply STEM skills to a complete energy system
- Gain a deep understanding of working with photovoltaics
- Develop design skills optimizing power, energy storage and efficiency
- Refine the system over time with plenty of opportunities for success

Benefits to Teachers

- Designed by teachers for teachers
- Student-driven program that values the teacher's time
- Engage with many different learning styles
- Flexibility to run as a stand-alone club or in class.
- Can be run around robotics schedule.

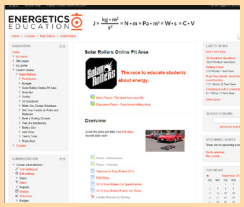
Design it. Build it.
Break it. Fix it. Race it.

Key Program Elements

Materials Kit

High school teams receive a cutting-edge raw materials kit that includes everything necessary to design and build a complete Solar Roller. Materials include a large sheet of TenCate carbon fiber for chassis fabrication, a stack of loose SunPower C60 back-contact solar cells, a high-efficiency DC brushless Castle Creations motor and speed controller, radio, closed-cell bumper foam, axles/differential, multiple gear and tire sets, suspension components, lubricants, tapes, adhesives, etc.

Online Course



The Solar Rollers Online Pit Area covers 12 broad topics from safety to construction to race day. Teams can watch videos and read articles on theory, design decisions, component configuration, construction, testing and racing. Regular updates are distributed through the course and teams can ask questions anytime. Teams can also communicate with other Solar Rollers teams throug the Online Pit Area.

Trophy Race Event

A Solar Rollers Trophy Race consists of six different competitions run from 9 am to 3 pm on race day. Trophies are awarded to overall winners as well as to the top 3 teams in each event.

- **20 Questions**: A team academic panel quiz judged by community PV, engineering and energy experts.
- **Overall Top Speed:** Radar measured top speed - with battery
- **PV-Direct Top Speed**: Top speed using direct sunlight only
- **PV-Direct Circuit Race**: Full-track race using sunlight only
- **Main Circuit Race**: Starting with discharged batteries, teams have 30 minutes to statically precharge in the sun before running a 60-minute full-track endurance race. This is the main event.
- **Fastest Lap:** The fastest single lap of the day (teams may use a non-team driver to set lap times for this category only)

- **Overall** - Teams accumulate points for placing in any of the above events. The Main Circuit Race is weighted heavily.

Prior Trophy Race Images

videos at solarrollers.org

Sign up to Solar Roll

Program Timeline 2016/17

June - October: School teams preorder a materials kit, which includes registration to the accompanying online course.

December: Teams register separately for regional Solar Rollers Trophy Races to be held at the end of the school year.

January: Teams receive a cutting-edge materials kit and gain access to the Solar Rollers Online Course. Solar Rollers staffers provide support to the teams throughout the build season.

May-June: Solar Rollers runs all-day Trophy Races for registered teams.

Prices

Materials Kit/Online Course	2500
Trophy Race Registration	500

Local sponsors often provide across-the board scholarships to reduce costs for all area teams.

Will there be Solar Rollers racing near my school?

The Solar Rollers program got started in Colorado and we are spreading out like rays from the sun. Maybe not quite that fast but you get the idea.

New races are run when an area reaches a critical mass of teams and sponsors. If you want a race in your area please get other schools, businesses and community organizations involved!

Rural teams can compete in Solar Rollers with only one annual trip to a central location. Solar Rollers fit easily in cars so traveling to a race may be an option for your team.

Contact us at info@solarrollers.org with questions about your specific area.

Can our school build a Solar Roller without racing this year?

Yes. We have many locations nationwide where Seed Teams are building the first Solar Rollers in their area. These teams can use their finished Solar Roller as a demonstration car to build interest locally and work toward their first Solar Rollers race. There are many valuable lessons to be learned from designing, building, testing and optimizing a Solar Roller with or without a final race.

Where do we sign up?

info@solarrollers.org or call 970 425 6426