



2007

THE LOS ALTOS ACADEMY OF ENGINEERING

SPONSORSHIP PACKET

BUILDING A CLEANER, MORE FUEL EFFICIENT TOMORROW



Dear Sponsor,

The Los Altos Academy of Engineering (LAAE) has been building and racing alternative energy vehicles since 1989. Since then, the technology used and race guidelines have changed, yet LAAE has been able to adapt, design, build, and race vehicles alongside many prestigious universities. LAAE is significantly unique because of its dedicated high school students. Through all of the projects LAAE develops, students involved gain valuable hands-on experience that is unavailable at any other high school in the United States. Students are able to gain electrical, mechanical, composite, design, and public relation skills through our program.

In order to turn our vision into reality, we rely on the help and generosity of corporate partners and sponsors who understand and encourage our aspirations to implement the concepts learned in the traditional classroom setting. Your support will directly contribute to the success of our program. The building of energy efficient, clean air vehicles requires cash and in-kind gift donations to be successful and to achieve our program's goals. Although the experience for the high school students is invaluable, sponsors benefit as well. Sponsors are promoted extensively by media publicity and coverage, not only in our local community but globally as well. The LAAE is a one-of-a-kind educational and career preparatory program to promote alternative energy.

This sponsorship packet describes who we are and what we do, as well as the assistance we seek in achieving our goals. We hope that you can share our vision and support us in turning our goal into reality.

Sincerely,



Los Altos Academy of Engineering

HISTORY

The Los Altos Academy of Engineering (LAAE) is an unique high school program that was founded in 1989 by Mr. Robert Franz at Los Altos High School. The mission of LAAE is to establish effective opportunities in mathematics, science, computer science, and mechanical or electrical engineering for students who demonstrate an early interest in these technical career areas. LAAE is currently a joint venture between the Hacienda La Puente Unified School District and the La Puente Valley Regional Occupation Program. Many of the projects adopted by the LAAE are highly complex and always involve high school students.

Since the time of its establishment, the LAAE has had great success in its numerous intricate projects. The LAAE has participated in many solar vehicle challenges, both domestic and abroad. In 1996, the student-built Solar Shadow I competed in the World Solar Challenge in Australia and was the only high school team in the competition to finish the race. In 2001, students built and raced another solar car, Solar Shadow II, in a cross-country race, the American Solar Challenge. Besides being the only high school that entered the race from Chicago to Los Angeles, LAAE finished 22 out of 30.

Besides participating in solar car challenges, LAAE has also taken on many other diverse projects and competitions. The LAAE Botball team has received much prestigious recognition. In 2005, the Botball team placed 1st in regional competition and went on to place 3rd in national competition. The most successful project of all is the Build Your Dream Vehicle (BYDV) competition. The LAAE BYDV team defeated 320 other entries and became the only high school to win back-to-back national championships in 2005 and 2006, a tremendous accomplishment. The most sophisticated and complex project that the LAAE has undertaken is the hydrogen fuel cell vehicle, *Infusion*. The first step of this great endeavor was made in 2001 when ambitious students designed an aerodynamic tear-drop shaped vehicle. The car is now fully completed and can operate on hydrogen.

The LAAE has many ambitious goals and new projects each year. This will be the first year that the LAAE will compete in the Defense Advanced Research Projects Agency (DARPA) Urban Challenge, which was initiated by LAAE alumni who have come back to mentor and lead current students. The DARPA Urban Challenge is a very sophisticated competition comprised of top colleges from across the nation, and the LAAE will be one of two high school teams participating. With all these projects, LAAE takes another step toward building a cleaner, more fuel efficient tomorrow.

VEHICLES



Speed Racer

- ◆ First electrathon vehicle
- ◆ Competed in Solar Electric 500

1993

Cool Runnings

- ◆ First solar vehicle
- ◆ Received First Place in the first Winston Solar Challenge

1995



Solar Shadow

- ◆ Completed the World Solar Challenge in Australia
- ◆ Received First Place in the Winston Solar Challenge.

1996

Light Speed I

- ◆ Set a national speed record of 100 km in 2:21 hrs at Solar BikeRayce USA

1998



VEHICLES



High Voltage

- ♦ Most intricate paint job
- ♦ Competed in Pentad Nationals Cal State Dominguez Hills Velodrome

2000

Light Speed II

- ♦ Most efficient solar vehicle utilizing an exclusive wheel motor
- ♦ Average speed of 42 MPH

2000



Solar Shadow II & III

- ♦ Only high school built vehicle completing the American Solar Challenge
- ♦ Competed in the Solar BikeRayce

2001

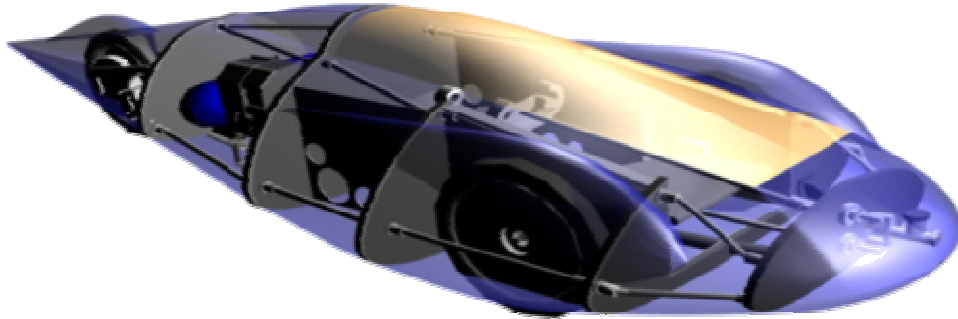
Light Speed III

- ♦ Won national championship in Solar BikeRayce

2003



FUEL CELL VEHICLE



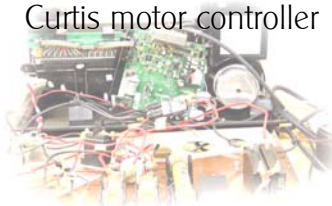
Composites

- ◆ Constructed at Cerritos College
- ◆ Wet lay-up used for bottom half of body
- ◆ Infusion impregnation used for top half for extremely light and strong body
- ◆ Took two years and four attempts to get body that met weight and structural standards



Electrical

- ◆ Four main components: fuel cell, batteries, motors, motor controller
- ◆ Ballard fuel cell used with back-up system of 24v battery pack
- ◆ Outputs 400 watts
- ◆ Connected to 1.2 horsepower Scott motor, which is hooked to a Curtis motor controller



Mechanical

- ◆ Three-wheeled vehicle
- ◆ Carbon-steel chassis
- ◆ Aluminum and Nomex honeycomb composite bulkheads
- ◆ Front suspension consists of dual A-arms wrapped around torsion bars
- ◆ Rear suspension is a swing-arm and single bicycle damper
- ◆ Rear wheel driven by belt from motor



Infusion, first designed and developed in 2001, is a one of a kind, student designed and built hydrogen fuel cell vehicle. With a goal of being able to travel 40 miles per hour for one hour continuously driven by one student, Infusion is the first hydrogen fuel cell vehicle built by high school students in the United States. Infusion uses a complex system of regulators and valves to store ultra-pure hydrogen to run a Ballard fuel cell. The hydrogen in the vehicle is stored in metal-hydride tanks which contain pellets that react with hydrogen gas. Three metal-hydride tanks are used in Infusion. The tanks store hydrogen as a semi-solid slush at a low pressure. That allows students to fill the tanks on site. Another distinct feature of the car, besides the use of hydrogen fuel cell technology, is the body, which resembles the shape of a teardrop in order to minimize air resistance. Other elements of the vehicle, including the sheet aluminum cockpit and torsion bar suspension, produce an interesting mix of cutting-edge technology and time-tested machining methodology in Infusion.

PROJECTS

Botball

This is a program that allows students to plan, build, and program robots to do various tasks autonomously. There is a national competition that takes place every year in July in various cities around the country after the Regional competitions. The LAEE Botball team has been very successful in this competition, sweeping the Regional competition two years in a row, and third and fifth place in nationals for the past two years.



Build Your Dream Vehicle

The LAEE has a long standing history of participating in the Build Your Dream Vehicle Competition. From 1996 to the present, LAEE has had a legacy of success in this competition. The Los Altos Build Your Dream Vehicle teams, such as team Dynamic Innovations, have accumulated thousands of dollars in awards from this program which requires teams to form a pseudo-car company as well as create and market their very own dream car.

Shell Eco-Marathon

This is an alternative energy race held by Shell Corporation which focuses on efficiency rather than the traditional distance or time. Participants are evaluated on how far their vehicles can go using the least amount of fuel. After years of being held in Europe, the 2007 challenge will be the first time the race has been held in America. The race will be held at the California Speedway in Fontana from April 12 - 15, 2007. The LAEE will enter its fuel cell car, *Infusion*.

Zero Emissions Vehicle Challenge

This project provides students with the opportunity to demonstrate their projects in a competitive environment by building their own pollution control vehicles which emit innocuous wastes into the atmosphere. With the \$63,000 received from the AQMD, LAEE is proud to host this year's ZEV challenge. ISAAQ will distribute the funding to at least fifteen different high schools. First year contenders will receive a funding of \$1,500 each to allow the purchase of major equipment. Second year participants schools will receive \$500 each for making refinements to their vehicles. With at least fifteen schools competing this year, we hope for a great participation and a successful race.

PROJECTS

DARPA Urban Challenge

The Defense Advanced Research Projects Agency (DARPA) is the central development organization for the Department of Defense. The DARPA Urban Challenge is an annual competition where autonomous vehicles safely execute missions in a complex urban environment with moving traffic. This challenge allows students to overcome technical challenges and understand how autonomous vehicles work.



Middle School Robotics

This is an annual competition sponsored by the LAAE. It is an extension of the robotics division of the academy that reaches out to middle schools and gives them an experience similar to that of botball. Like botball, the middle school teams get Lego kits that they use to build and program robots to compete. Currently, middle school robotics is extended to all of the middle schools in the HLPUSD, and LAAE is planning on extending participation to the Basset School District.

Solar Boat

The goal of the Los Altos Solar Boat team is to build the lightest, fastest electric and solar powered boat to compete in the Solar Cup Competition every year. The project is sponsored by the Metropolitan Water District of Southern California, along with its member cities and water agencies. By competing in the Solar Cup, the team learns about responsibility, teamwork, problem solving, and sportsmanship, along with mechanical and electrical skills. The Solar Cup begins with the sign-ups in December, and includes a boat-building event and several workshops focusing on technical aspects such as drive trains, electrical systems, solar panels and steering systems. The team is also required to meet deadlines for submitting illustrated reports on these systems. This program is meant to provide hands-on experience for young adults to better prepare them for future related occupations.

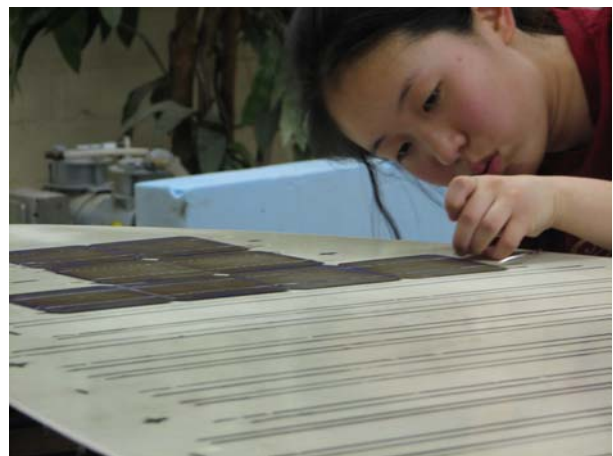
WHY SHOULD YOU HELP ?

The number of projects and competitions that the LAAE is involved in requires significant funding. Some of our competitions, such as Solar Boat, are fully sponsored. Other projects such as Infusion and Botball, are not fully sponsored; therefore, LAAE must raise funds to purchase the needed equipment and materials to allow our students to participate in a tradition of excellence. You can be a part of this great program by helping us achieve our goals. The following is a list of several activities that the LAAE will participate in this year that will have media coverage:

- DARPA Urban Challenge
- Shell Eco-Challenge
- Infusion Roll-Out
- Solar Boat
- Engineering Week
- ZEV Challenge

In order to continue our mission, LAAE continually seeks support through corporate sponsorships, resource sharing, and individual donations. Even with dedicated students, great designs, and years of history, our success can only be continued with your help, either through monetary or in-kind gift donations.

By sponsoring LAAE, you or your corporation will gain valuable visibility while making a tax-deductible contribution to a team committed to promoting environmental awareness and superior engineering. We look forward to working with you in the future!



SPONSORSHIP LEVELS

To distinguish your contribution, LAAE has established sponsorship rewards and incentives, described in the chart below.

BENEFITS	\$50 (Bronze)	\$100 (Silver)	\$250 (Gold)	\$500 (Platinum)	\$1000 (Diamond)	\$5000 + (Title sponsor)
Team T-shirts	x	x	x	x	x	x
Recognition on program website		x	x	x	x	x
Recognition on program brochures			x	x	x	x
Commemorative picture frame.			x	x	x	x
Two tickets to annual Open House				x	x	x
Thank you plaques presented to Sponsors.				x	x	x
Mention of Sponsor in Newsletters.				x	x	x
Media Event Privileges (Per sponsors' request).					x	x
Sponsors name on one vehicle/project.						x

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