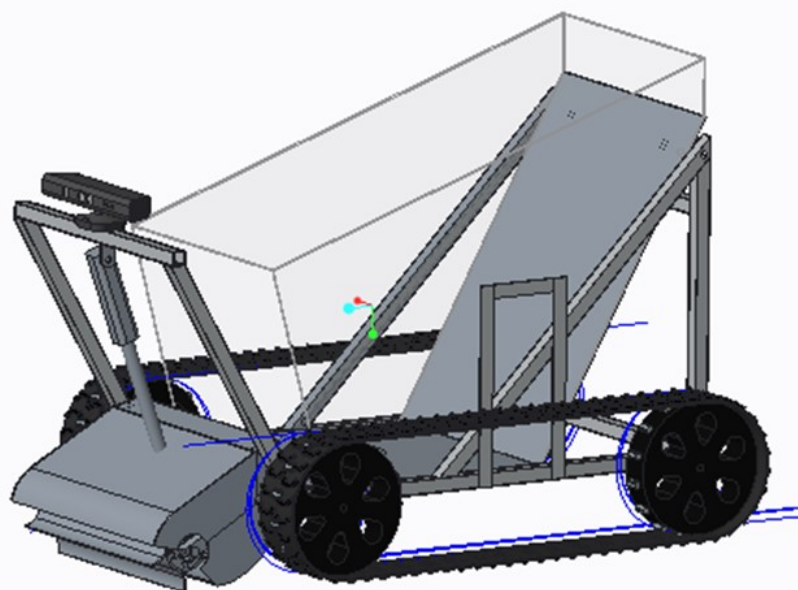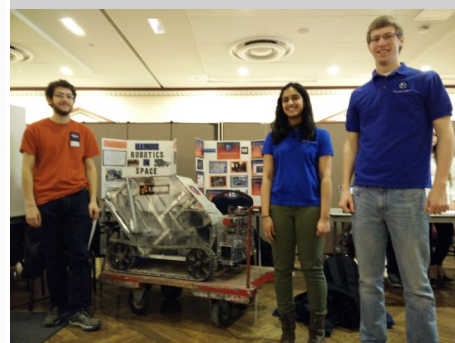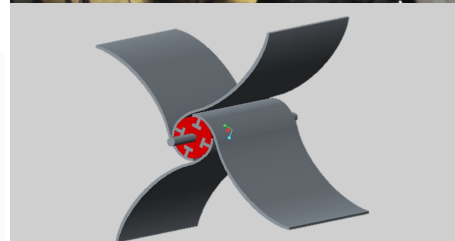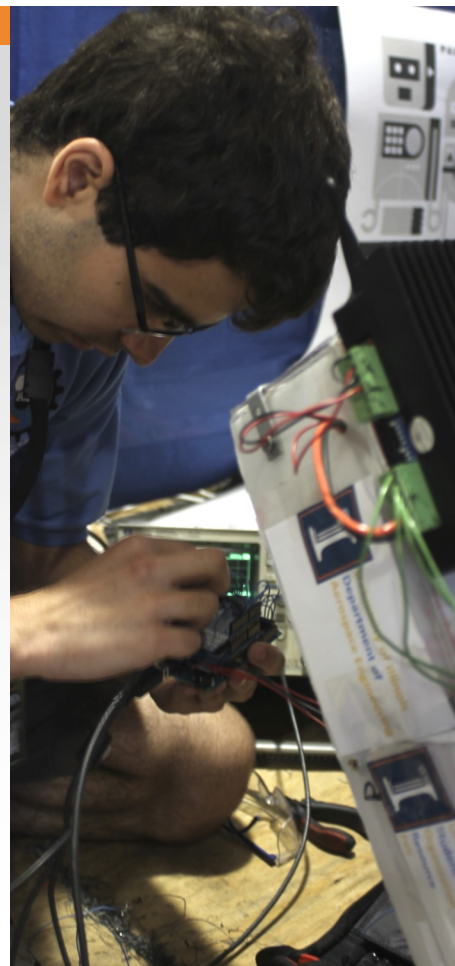# Illinois Robotics in Space

2014 - 2015 Sponsor Packet

An early CAD model of this year's robot

Contact: iris.uiuc@gmail.com

Dear Potential Sponsor:

We would like to invite you to sponsor Illinois Robotics in Space (IRIS), a student group from the University of Illinois at Urbana-Champaign that participates in the NASA's annual Robotic Mining Competition. This year, 30 – 40 talented students from many different majors are designing and building a future-sighted autonomous robot. Join us in our goal of placing first amongst over 50 national teams as Illinois Robotics in Space provides an unparalleled hands-on experience.

The aerospace engineering and electrical and computer engineering programs at the University of Illinois are ranked among the top ten and five in the nation, respectively. Sponsoring IRIS will give you the ability to get involved with these world-renowned students. You will also have the opportunity to:

- Gain access to resumes and establish personal relationships with students
- Expose your company and brand to members and the general student body via our many open events, tutorials, and workshops

Your support will directly benefit all of our members, current and future, as we scale our organization beyond our aerospace engineering roots. Enclosed you will find information about IRIS, NASA's competition, and our sponsorship tier list detailing how you can contribute. If you have any questions, please do not hesitate to contact us at iris.uiuc@gmail.com.
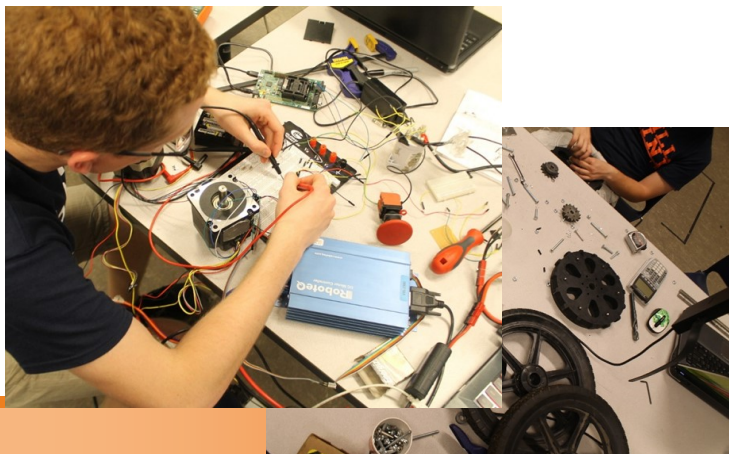
Thank you,

Adana Pappas

Adana Pappas, President
Senior, Aerospace Engineering
anpappa2@illinois.edu

Christina Choi

Christina Choi, Communications Director
Freshman, Electrical Engineering
cchoi18@illinois.edu

Sponsorship Tiers

Donations are tax-deductible. Contact for details.

	PARTNER	GOLD	STELLAR
	Up to $499	$500 - $2499	$2500 and Above

General

	PARTNER	GOLD	STELLAR
Receive semi-annual newsletter	●	●	●

Recruiting

	PARTNER	GOLD	STELLAR
Distribution of Recruiting Information	●	●	●
Access to Resumes		●	●
Company Info Session or Tech Talk		●	●

Branding

	PARTNER	GOLD	STELLAR
Company Logo on Sponsor Page	●	●	
Front-page Logo		●	●
Company Logo on all Team Promotional Materials			●
Company Logo on Robot at NASA Competition	Tier 1 Location/Size	Tier 2 Location/Size	Tier 3 Location/Size

*IRIS hosting current gold sponsor **Rockwell Collins** for a tech talk before a career fair.*

2014-2015 Expenses

Example Parts:	Cost	Parts:	Cost
Drive Motors	$768.00	Wire crimper	$19.97
Gearbox	$646.00	90° Angles aluminum rod	$18.97
Linear Servo	$299.00	Inside L Brackets	$18.90
Paddle Blades	$280.00	RF Receiver	$18.06
Solenoid	$150.00	Resistors	$15.00
Impact-Resistant Polycarbonate	$144.98	Capacitors	$15.00
PCBs	$100.00	Zinc Plated hex bolt	$14.87
PCBs	$100.00	T Brackets	$14.70
Wheels	$100.00	Sprocket	$14.19
Aluminum Rectangular Tube	$97.78	Heat shrink tube	$13.98
Drive Sprocket	$80.00	RF Transmitter	$13.38
Wireless Access Point	$72.00	Slide potentiometer	$13.13
Chain Shielding	$60.00	Chain	$12.38
Battery	$59.99	Rubber Tubing	$11.99
Core	$50.00	Digital signal controller	$11.28
Battery Charger	$34.99	Linear Servo Mounting Bracket	$10.99
Load sensor	$30.60	30 degree open angle bracket	$10.95
Collection Sprocket	$30.00	45 degree brackets	$10.25
Wire stripper	$29.32	zinc plated hex bolt	$9.57
Heat shrink tube	$27.50	Hex nuts	$9.05
Aluminum Plate	$25.99	Switching regulators	$9.00
Collection Arm Shielding	$23.97	Power FETs	$6.00
Heat gun	$21.99	Instrumentation Amplifier	$5.95
E-box	$20.00	Power Over Ethernet (POE) injector	$4.00
Diodes	$20.00	Inductors	$3.00
Preliminary Parts Sub-Total		**$**	**3,576.67**

Other Future Expenditures			Estimated Cost
Manufacturing Costs, Additional Parts, and Tools (laser cutting, mill, drill press, CNC, 3D Printing, etc.)		**$**	**3,000.00**
Transportation of Robot and Core Team (for ~10 people; From Champaign, IL to Kennedy Space Center, FL)		$	3,500.00
Lodging and Other Travel Costs (for ~10 people; 5-day competition)		$	1,000.00
Educational Outreach (Materials used in workshops for local middle and high school students)		**$**	**1,000.00**
Sub-Total		**$**	**8,500.00**

**Grand Total**   **$ 12,076.67**

IRIS-V Schedule:

Fall 2014: Design it!
- Sept 20:   Systems Definition Review (SDR)
- Oct 18:   Preliminary Design Review (PDR)
- Oct-Nov: Detailed Design
- Dec 06:   Critical Design Review (CDR)

Spring 2015: Build it!
- Jan-Mar: Manufacturing
- Mar 5:   Final Design Review (FDR)
- Mar-Apr: Integration and Testing
- Apr 13:   Systems Engineering and Ed Out Paper
- **May 18-22: Competition at Kennedy Space Center, FL.**
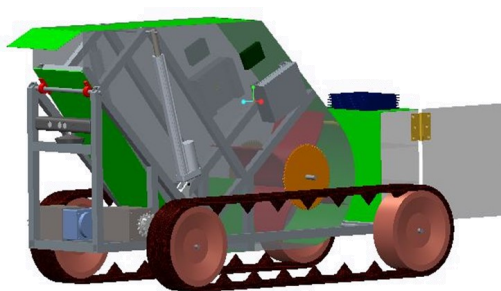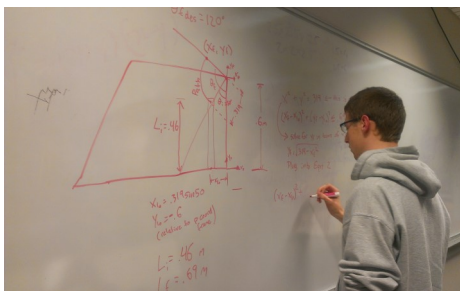
IRIS-4 (2013-2014)

Student Experiences in IRIS

Due to the complexity of constructing a robot with a variety of subsystems, we choose to follow a *systems engineering approach*, widely used in industry. This encourages all of our members to learn how an entire system comes together. Each member will have his or her specific technical tasks, such as constructing the chassis or soldering a circuit, and then see exactly how their contribution is integrated with the other subsystems.

We have four sub-teams - Mechanical, Autonomous, Electrical and Systems. In addition to our sub-teams meeting weekly, we have weekly working meetings where the sub-teams are able to integrate their efforts and collaborate.

We encourage our members to develop their leadership and technical skills and we provide many opportunities to demonstrate and hone those skills. During team-wide design reviews, members strengthen their presentation skills by explaining their individual contributions to the rest of the team. This teaches them effective communication and collaboration. Additionally, IRIS holds student-led tutorials aimed at helping our less experienced members advance their technical skills. Past tutorials have included interactive presentations on tools such as Creo, EagleCAD and Git. These have been open to all university students. We have held a Career Fair Workshop, and the team's Educational Outreach team has held workshops for local students and volunteered for local First Lego League events.

Students in Illinois Robotics in Space engage in community outreach. Coordinated by a modular "Educational Outreach" department, IRIS holds workshops, tutorials, and other events for students of all ages, from middle and high school to other university students.

IRIS members frequently volunteer for local *First Lego League* competitions and

About IRIS

Founded in 2009, Illinois Robotics in Space provides an opportunity for all students, regardless of major, to develop innovative robotic systems in a peer-based learning environment. This fosters systems thinking and collaboration through development, manufacturing, and operation of complex, space-oriented robots.

Due to the nature of our competition and the complexity of IRIS's project, we structure our design and build process similar to NASA missions. This means we have near-monthly design reviews and a strict timeline. This pushes us to effectively document our design process, which aids future IRIS members.

IRIS's hands-on learning environment extends into the local community through educational outreach projects and demonstrations that promote Science, Technology, Engineering, and Mathematics and inspire the next generation of students about robotics and space exploration.

In both 2012 and 2014, IRIS placed 3rd place for our Systems Engineering paper.

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