



ZERO ROBOTICS HIGH SCHOOL 2016



ISS Finals Event *Press Release*

Contact: Alvar Saenz-Otero, MIT SPHERES Lead Scientist
zerorobotics@mit.edu / @zerorobotics

On Friday 2017-Jan-27 over 400 High School students from around the world will join in fierce competition to claim the championship spot in the Zero Robotics High School Tournament 2016 (<http://zerorobotics.mit.edu>) as robotic satellites aboard the International Space Station race using the programs the students wrote. The finalists will watch a live downlink from space as astronauts supervise the robots during the *ISS Finals Event*.

After three months of competition via online simulations, fourteen international alliances will compete through several elimination matches to determine the Zero Robotics 2016 International Champion. Each alliance consists of three different teams of High School students that joined forces in November to write the best computer programs which will run on the SPHERES Satellites (<http://ssl.mit.edu/spheres>) aboard the International Space Station.

Students will travel either to MIT in Cambridge, MA (United States) the European Space Research and Technology Centre in the Netherlands, or Abercrombie Building at the University of Sydney, Australia in order to see their program tested aboard the ISS live, with direct transmission from space, as an astronaut operates the SPHERES Satellites that will run the students' code. The locations will all be connected via teleconference.

Zero Robotics is a programming competition where students are presented with a challenge ("the game"). Two teams compete at a time to achieve the best performance in the game. The teams write all of their code via the Zero Robotics website, which has a high-fidelity simulation of the SPHERES satellites. Using the same website the students see simulated results of their code performance. The competition closely resembles the way software is written for spacecraft, requiring the students to write code that controls the satellite position and pointing, communicates with other satellites, and interprets its sensors to determine what to do next. All of these tasks are done autonomously - once the students write their code, they cannot modify it for that "run"; in the case of the ISS Finals the code cannot be changed, just like in real spacecraft!

This year's game called SPACE SPHERES centers around the idea setting up a Global Positioning System (GPS) around Mars to enable successful navigation of the *red planet*. Students are tasked to build surveying satellites to orbit Mars. The satellite pieces have already been launched into orbit and teams must collect these pieces into "assembly zones" to earn points. However, coordinates of the assembly zones are unknown until teams place their three Satellite Positioning System (SPS) devices. During the game students must also be alert to rival teams that may want the satellite pieces their team has already collected. As a tie in to the Mars theme this year students in attendance will have the opportunity to hear from a number of professionals working on current missions to Mars.

The SPHERES satellites are used by MIT, NASA, DARPA and other researchers to test maneuvers for spacecraft performing autonomous rendezvous and docking. The three satellites fly inside the station's cabin autonomously, but under the supervision of an astronaut. Each is self-contained with power, propulsion, computing and navigation equipment.

By making the benefits and resources of the space program tangible to high school students, Zero Robotics is designed to inspire future scientists and engineers. Students have the opportunity to push their limits and develop skills in science, technology, engineering and mathematics, or STEM. This program helps students build critical engineering skills, such as problem solving, design thought process, operations training, team work and presentation.

The Zero Robotics High School Tournament 2016 is sponsored by NASA, CASIS, ESA, Roscosmos and University of Sydney Australia and brought to you by the MIT Space Systems Laboratory and partners Innovation Learning Center and Aurora Flight Sciences.



ISS Finalists (in seeding order)

Alliance / Teams	School/Organization	City/State	Country
Alliance 1: SpaceLinguine			
ZRighi	ITI "Augusto Righi"	Napoli	Italy
OverExtendedProgramming(OEP)	Centennial High School, Peoria	AZ	USA
LSA Robotics Team	Liceo Scientifico Avogadro	Vercelli	Italy
Alliance 2: P.R.O.			
Proxima Centauri	Liceo scientifico F. Cecioni	Livorno	Italy
Rock Rovers	Council Rock High School South, Holland	PA	USA
@Override	EIB - The Victor Hugo School	Paris	France
Alliance 3: Team SANTA			
Singularity	Mission San Jose High School, Fremont	CA	USA
AachenerNerds	BWV-Aachen	Aachen	Germany
Team Appreciate (2468)	Westlake High School, Austin	TX	USA
Alliance 4: Zanneio Gunn Pointers			
Zanneio Stardust	Zanneio Model Experimental Lyceum	Piraeus	Greece
Gunn Zero Robotics	Gunn High School, Palo Alto	CA	USA
NullPointerException	Wissahickon High School, Ambler	PA	USA
Alliance 5: ProgNaughtical			
Stuy-Naught	Stuyvesant High School, New York	NY	USA
Zagle	Zagle School	Warsaw	Poland
Lville Prog	The Lawrenceville School, Lawrenceville	NJ	USA
Alliance 6: Keppler Hubble heROes			
The Mach Kepplerians	Mark Keppel High School, Alhambra	CA	USA
Hubble	I.T.I. "A. Righi" Napoli	Napoli	Italy
heRObotics	Liceul Pedagogic "Carmen Sylva"	Timisoara	Romania
Alliance 7: Wormhole			
Zero Work Ethic	Westlake High School, Westlake Village	CA	USA
Quantum Entanglement	I.I.S. Giulio Natta	Rivoli	Italy
99.95 Robotics	Fort Street High School	Sydney	Australia
Alliance 8: CrabNebulaWaherlTeamAnomaly			
Crab Nebula	Liceo Cecioni	Livorno	Italy
Waherl	Tech for kids club, Portland	OR	USA
Team Anomaly	American School of Grenoble	Grenoble	France
Alliance 9: BACON-Cranbrey Pie			
BACON	Charlottesville High School, Charlottesville	VA	USA
Vectory	James Ruse Agricultural High School	Sydney	Australia
Cranbrook School	Cranbrook School	Cranbrook	UK
Alliance 10: FermiAsteroidsCraig			
The Fermi Floating Team	Liceo Scientifico Statale "E.Fermi"	Padova	Italy
ASIJ Asteroids	American School In Japan	Tokyo	USA
Rock 'n' Robots Craig	Craig HS, Janesville	WI	USA
Alliance 11: Vinci-NCSSM-ZRM !!!			
Da Vinci Boys	ITI L. Da Vinci	Trapani	Italy
NCSSM Zero Robotics	North Carolina School of Science and Mathematics, Durham	NC	USA
ZiRconium	IIS Pacinotti-Archimede	Roma	Italy
Alliance 12: Kuhl-Wall-Knights			
Team Kuhlschrank	Pope John XXIII High School, Sparta	NJ	USA
Wall-E 4.0	I.I.S. "Verona Trento"	Messina	Italy
BB&N Knights	Buckingham Browne & Nichols, Cambridge	MA	USA
Alliance 13: CosmicSparTech			
Cosmic Vikings	Downey High School, Downey	CA	USA
Spartar	Gosford High School	Gosford	Australia
DevilTech	West Lafayette Jr/Sr High School, West Lafayette	IN	USA
Alliance 14: FlyingFalconsTheQuarkCharmCode::Space			
Flying Falcons	North Sydney Boys High School	Sydney	Australia
The Quark Charm	Storming Robots	NJ	USA
Code::Space	National College of Computer Science	Piatra-Neamt	Romania



Virtual Finalists (in seeding order)

Alliance / Teams	School/Organization	City/State	Country
Alliance 1: CYS BURGER			
Team yOb0tics!	Montclair Community, Montclair	NJ	USA
Cassiopeia	Grigore Moisil Theoretical Highschool	Timisoara	Romania
tE@m Segfault	Prospect Hill Academy, Cambridge	MA	USA
Alliance 2: Joined Unique International Coding Experts (J.U.I.C.E.)			
SetFermiForce	Liceo Scientifico Statale "E.Fermi"	Padova	Italy
Tachyons	Saratoga High School, Saratoga	CA	USA
RedShift	Barker College	Sydney	Australia



NASA Astronauts and MIT alumni Michael Fincke (left), Catherine G. Coleman (Center) and Gregory Chamitoff (right) introduce Zero Robotics in 2011



Pictures from Zero Robotics High School Tournament 2015 ISS Finals Events in Australia, US, ESA (2016-Jan-25)