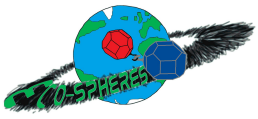
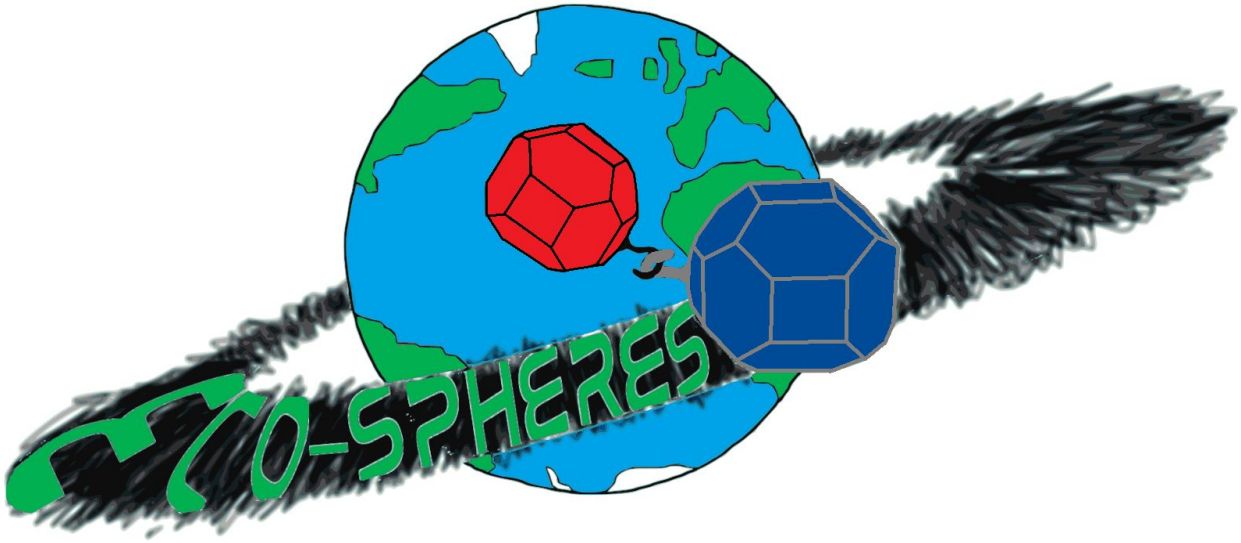


ZERO ROBOTICS HIGH SCHOOL 2018

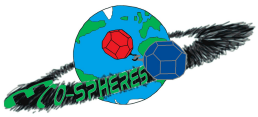
ZERO ROBOTICS HIGH SCHOOL 2018



Championship Tournament

January 28, 2019

Version 1.0



ZERO ROBOTICS HIGH SCHOOL 2018

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Welcome

Dear Zero Robotics Teams,

Congrats on making it to the finals and Welcome to Boston! We are thrilled that you are here with us for the 2018 Zero Robotics championship event! We hope this trip will be exciting and educational.

During this event, you will have the opportunity to tour the various facilities at MIT and participate in a live test session with astronaut **Anne McClain and** cosmonaut **Oleg Kononenko** as they run your algorithms on the SPHERES test bed on the ISS. You will also get to meet in person at MIT astronaut **Cady Coleman** and VP of Airbus DS Space Systems **Hans-Juergen Zachrau**. To ensure that the entire trip runs smoothly, we ask that you adhere to the following code of conduct.

Code of Conduct

- Borrowing from the excellent credo of *FIRST* Robotics, please exhibit "Gracious Professionalism™" at all times.
- In that spirit, refrain from the use of profane, insulting, harassing or otherwise offensive language, especially during the competition.
- Students should make sure their chaperones and/or advisors know where they are, who is with them and when they will return when leaving the general area of the event.

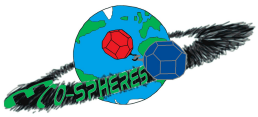
Contact Information

This event is being organized by the Zero Robotics team. Please don't hesitate to contact the following members of the ZR team if you have any questions or comments during your stay here.

Wendy Feenstra	wfeenstra@aurora.aero	(617) 835-6719
Katie Magrane	Katie@massilc.com	(617) 908-7408

Once again, we hope you enjoy your visit.

The SPHERES Zero Robotics Team



ZERO ROBOTICS HIGH SCHOOL 2018

Schedule

All times are Eastern Time (MIT Local time) and 24-hour clock.

Sunday, 2019-Jan-27

Time	Event	Location
Any	Teams arrive.	Cambridge, MA
12:00-14:00	SSL tours -part 1 (See email for schedule of tours) Tours provided in 20-minute time slots	37-372
15:00-16:30	MIT Official Tours	Leave from Lobby 7
17:40-19:00	SSL tours -part 2 (See email for schedule of tours) Tours provided in 20-minute time slots	37-372
19:30-21:30	Dessert Reception (dessert avail starting at 19:30, ceremony begins approx. 20:15)	N51-MIT Museum

Monday, 2019-Jan-28

Time	Event	Location
06:45-07:15	Arrival – (doors close at 07:15)	26-100
07:15-09:00	Welcome and Special Guest Speakers	26-100
09:00-1300	ISS Finals live from station*	26-100
13:00-13:15	Closing Remarks	26-100
13:15-15:00	Luncheon and Awards Ceremony	Hangar building 33

NOTES:

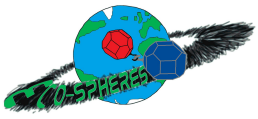
* Times for activities aboard the ISS are approximate.

MIT Map

Buildings locations are shown on the map below. Link to interactive map: https://tinyurl.com/ybxqrbmx

All rooms in MIT are numbered in the format Building-FloorRoom. For example, 26-100 corresponds to Building 26, Floor 1, Room 100.

Sunday: MIT Tours: Lobby 7; SSL Tours: 37-372; 10th Anniversary Dessert Reception: MIT Museum: N51
Monday: ISS Finals: 26-100; Luncheon/Awards Ceremony:: Hangar, building 33;



ZERO ROBOTICS HIGH SCHOOL 2018

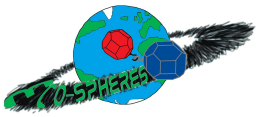
ISS Finalists (in seeding order)

Alliance / Teams	School/Organization	City/State	Country
Alliance 1 ARKESSLER			
Space Hunters	I.T.I. "L. Da Vinci"	Trapani	Italy
Tachyons	Saratoga High School	Saratoga, CA	United States
Jesuit High School	Jesuit High School	Portland, OR	United States
Alliance 2: BeachQuatRebels			
Beachbotics	Hilton Head Island High School	Hilton Head, SC	United States
ASP Rebel Alliance	American School of Paris	Paris	France
Quaternion	Colegiul National "Gheorghe Lazar"	Sibiu	Romania
Alliance 3: Hit or Miss			
Proof Robotics	Proof School	San Francisco, CA	United States
Crab Nebula	Liceo Cecioni	Livorno	Italy
Rock Rovers	Council Rock High School South	Holland, PA	United States
Alliance 4: Pinball Cap			
ZeroZeroPinin	ITIS G.B. Pininfarina	Moncalieri	Italy
BCA BALLers	Bergen County Academies	Hackensack, NJ	United States
Captcha Solvers	Colegiul National "Ienachita Vacarescu"	Targoviste	Romania
Alliance 5: CaptainHook			
Spherobotics	Staufer-Gymnasium Waiblingen	Waiblingen	Germany
SPATAR	Gosford High School	Gosford	Australia
Shootin' stars	I.I.S. FERMI-SACCONI-CECI	Ascoli Piceno	Italy
Alliance 6: Milk and CEReal			
Cassiopeia	Grigore Moisil Theoretical Highschool	Timisoara	Romania
—ëÿëBäii—	Hershey High School	Hershey, PA	United States
ROBOMIA	Somerset Community Team	Somerset, NJ	United States
Alliance 7: Pizza&Bacon			
ZRighi	ITI "Augusto Righi"	Napoli	Italy
BACON	Charlottesville High School	Charlottesville, VA	United States
Team Kuhlschrank	Pope John XXIII H.S.	Sparta, NJ	United States
Alliance 8: Apollo 1			
Zero Robotics Zero Skill	Heinrich Hertz Gymnasium	Berlin	Germany
Trinity Infinity	Trinity College	Melbourne	Australia
Orion	Geitonas School	Vari	Greece
Alliance 9: T.E.A. (Towing an Endangered Alliance)			
SetFermiForce	Liceo Scientifico Statale "E.Fermi"	Padova	Italy
Waherl	Tech for kids club	Portland, OR	United States
heRObotics	Liceul Pedagogic "Carmen Sylva"	Timisoara	Romania
Alliance 10: O.M.N.I Alliance (One Model, Numerous Identities)			
Unusual Programmers (U.P.)	LSS Enrico Fermi	Padova	Italy
0.0f Robotics	Farmingdale High School	Farmingdale, NY	United States
IRON TEAM Santhia	ITIS "G. GALILEI"	SANTHIA'	Italy
Alliance 11: SailingQuarks^2			
Zagle	Zagle School	Warsaw	Poland
The Quark Charm	Storming Robots	Branchburg, NJ	United States
Squares	Escola Secundária Jerónimo Emiliano de Andrade	Angra do Heroísmo	Portugal

Alliance 12: Naughty Dark Spaghetti			
The Dark Team of LSA	IIS "Avogadro" - Liceo Scientifico	Vercelli	Italy
Stuy-Naught	Stuyvesant High School	New York, NY	United States
Spaghetti Code	Cedarburg High School	Cedarburg, WI	United States
Alliance 13 Approximate Prism International Park			
Proxima Centauri	Liceo scientifico F. Cecioni	Livorno	Italy
PR1SM5	Princeton International School of Mathematics and Science	Princeton, NJ	United States
Clements Rangers	Clements High School	Sugar Land, TX	United States
Alliance 14: A.I.R Alliance			
Sigma Seven	Colegiul National Banatean	Timisoara	Romania
Potomac Space Force	The Potomac School	McLean	VA
Vallaurobotics	IIS Giancarlo Vallauri	Fossano	Italy

Virtual Finalists (in seeding order)

Alliance / Teams	School/Organization	City/State	Country
Alliance 1: A.S.P.			
Sun Eaters	International Computer High School of Bucharest	Bucharest	Romania
Space Phoenix	International Academy	Bloomfield Hills, MI	United States
TIMTRON	Grigore Moisil Theoretical Highschool	Timisoara	Romania
Alliance 2: Gucci Coders Party			
House of Coders	Liceo Scientifico Francesco Vercelli	Asti	Italy
Gucci Ganghis Khan	Winston Churchill High School	Potomac, MD	United States
LSA Tea Party	IIS Avogadro - Liceo Scientifico	Vercelli	Italy
Alliance 3: NoSleepGang			
Valak	Colegiul National "Octavian Goga" Sibiu	Sibiu	Romania
SpaceXD	Parramatta High School	Parramatta	Australia
Scholar Spacemen	Sydney Boys High School	Sydney	Australia



ZERO ROBOTICS HIGH SCHOOL 2018

ECO-SPHERES Game Description

Evade, Capture, deOrbit space debris Spheres Program

This year's game called ECO-SPHERES centers around removal of space debris from Low Earth Orbit. Students have been challenged with the unprecedented task of successfully hooking two satellites together in microgravity. Students must command their satellite to navigate to a disabled space debris removal satellite, hook onto it and tow it safety. The goal of the game is to complete these tasks in the shortest amount of time.

In order to be victorious in the simulation competition students had to be careful to avoid their own collisions with space debris to avoid thruster damage. The Debris phase will not exist in the ISS Finals, however, the ISS Finals will have an aspect of the "debris" phase of the game: Each Alliance will start with the Thruster Health as determined by the average of their 10 games that they qualified for ISS.

During the on-orbit competition the SPHERES will be configured with hooks that were 3D printed on the ISS. The teams that participate in the ZR HS2018 ISS Finals will be conducting "hooking in space" for the first time ever aboard the ISS with SPHERES.

ISS Game Parameters

To improve the possibility of hooking on ISS the initial positions of the SPHERES were modified as follows

Blue SPHERES initial position: x=0.0m; y= 0.15m, z=0.0m

Red SPHERES initial position:

- During the First Round: Red SPHERES will move to a random location in the y=-0.5m plane on the end of a cone with a radius = 0.05m and remains stationary. The pointing angle offset is 5 degrees instead of the one used in simulation.
- During the Champion Round: Red SPHERES will be rotating continuously at x=0.0m, y=-0.5m, z=0.0m. The Blue SPHERES must hook to a moving target.

ISS Scoring:
In addition to the regular time dependent scoring and bonuses implemented in the simulation game, bonuses and penalties will be tallied by observation during the competition and added to the score.

Bonus:
Motion that could have resulted in hooking (correct trajectory) will get a bonus for each clear and distinctive attempt including:

- Swings: attempts to hook but doesn't actually make contact = 1 pt
- Hits: attempts and makes contact, but no actual hooking = 2 pts

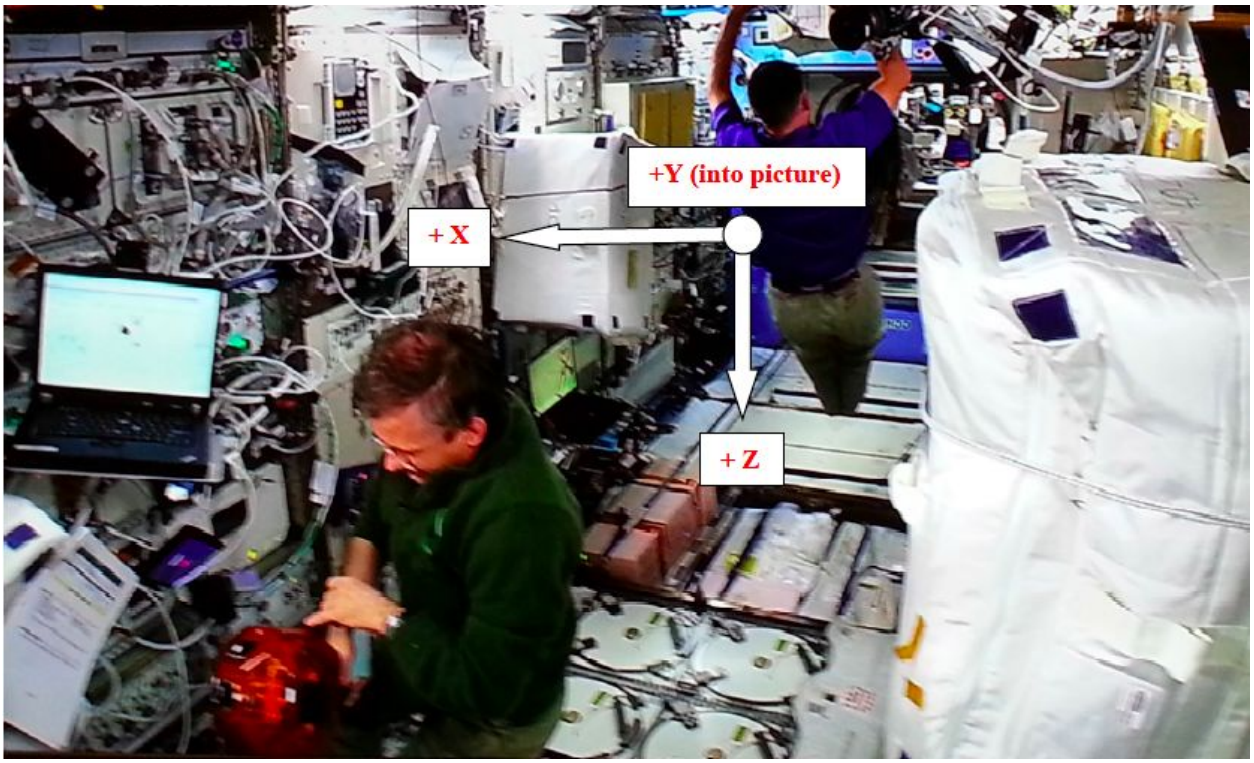
Penalties:

Motion resulting in a collision that would not have resulted in hooking will be penalized including:

- Hook to Hook (from wrong side of hook)= -0.5pt
- Hook to Satellite =-1.0pt
- Satellite to Satellite =-2.0 pts

ISS Coordinate System

This view shows the Japanese Experiment Module (JEM) looking along the +Y axis of the game.



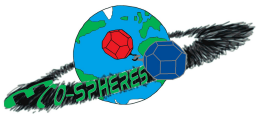
ISS Test Session & Rules

Running a live competition with robots in space presents a number of real-world challenges that factor into the rules of the competition. Among many items, the satellites use battery packs and CO_2 tanks that can be exhausted in the middle of a match and the competition must fit in the allocated time. This section establishes several guidelines the Zero Robotics team intends to follow during the competition. Keep in mind, as in any refereed competition, additional real-time judgments may be required. Please respect these decisions and consider them final.

Above all, the final competition is a demonstration all the hard work teams have put forward to make it to the ISS. The ZR staff's highest priority will be making sure every alliance has a chance to run on the satellites. It is also expected that the competition will have several "Loss of Signal" (LOS) periods where the live feed will be unavailable. We will attempt to make sure all teams get to see a live match of their player, but finishing the competition will take priority.

To summarize, time priority will be allocated to:

1) Running all submissions aboard the ISS at least once
2) Completing the tournament bracket
3) Running all submissions during live video



Competition Format

The alliances are divided into 2 Groups, Group A and Group B, due to code size constraints on the SPHERES.

ISS Finalist alliances will compete in reverse ranking order as follows:

- Each team in Group A will attempt hooking in succession. This will repeated a second time. The scores for both attempts will be added to give a total score.
- The same process will be repeated for Group B.
- 2-4 of the overall top scoring ISS Finalist Alliances from either Group A or Group B will advance to the Champion round.

The Virtual Finalist code is included as part of Group B. Before the ISS Finalist Champion round the Virtual Finalists will compete as described above with one run each. The highest scoring Virtual team will become the Champion of the Virtual Finals.

Group C will include the teams who advance to the Champion round. Each team will have one attempt to hook. The top scoring team from the Champion round will become the ISS Finals Champion.

Definition: *Successful Match*

- Both satellites move correctly to initial positions
- Both satellites have normal motion throughout the test
- Both satellites return a valid score
- Neither satellite expends its CO_2 tank during a test run

Definition: *Simulated Match*

In advance of the competition, the ZR Team will run a simulated round robin competition between all participating teams. The results from matches in this competition will be used in place of ISS tests if necessary (see below.) The results of a simulated match will only be announced if they are used in the live competition.

Scoring Matches

The goal of the 2018 ISS Finals is to run up to two valid matches for each team if possible. The validity and scoring of matches is defined as:

	Defined As	Scored As
Valid	• Blue satellite returns a valid test result (11-239, with correct team number) • Red satellite holds in place during hooking attempt	satellite test return score + bonus points - penalties *(see section above)*
Invalid	• Either satellite runs out of actual fuel • Either satellite resets (returns 255) • Red drifts over ½ a satellite radius during hooking attempt	Not scored. Will re-run each team once each run thru of the group.

Test Result Guide and Brackets

Each satellite will return a test result number at the completion of each test. As in the simulation, these numbers will indicate the result of each race. The crew will use the communications loops to call down these values during the session.

Test Result #	Test Outcome	Action
11-239	Valid score values	
255	Satellite reset	Rerun race

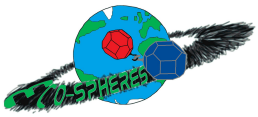
When a score of a match is read from the ISS the score encodes the team number as well as the score for the match.

Team number = (Test Result Number % 10)

Score = (Test Result Number / 10)

(i.e. if the score read from the ISS is 123 then Team number is =3 and the Score is = 12)

A blank bracket listing has been provided in the pages below to fill in during the event. You may also view the bracket on one of the projector screens in the auditorium.



Competition Brackets

ISS Finalists: Group A

Alliance	Run 1 Test Score	Run 1 Bonus/ Penalty	Run 2 Test Score	Run 2 Bonus/ Penalty	Highest Total Score
1. A.I.R Alliance					
2. Approximate Prism International Park					
3. Naughty Dark Spaghetti					
4. SailingQuarks^2					
5. O.M.N.I Alliance (One Model, Numerous Identities)					
6. T.E.A. (Towing an Endangered Alliance)					
7. Apollo 1					

ISS Finalists: Group B

Alliance	Run 1 Test Score	Run 1 Bonus/ Penalty	Run 2 Test Score	Run 2 Bonus/ Penalty	Highest Total Score
1. Pizza&Bacon					
2. Milk and CEReal					
3. CaptainHook					
4. Pinball Cap					
5. Hit or Miss					
6. BeachQuatRebels					
7. ARKESSLER					

Group B, continued
Virtual Finalists

Alliance	Run 1 Test Score	Run 1 Bonus/ Penalty	Total
8. A.S.P.			
9. Gucci Coders Party			
10. NoSleepGang			

Zero Robotics Virtual Finals 2018 Champion:
Zero Robotics Virtual Finals 2018 2nd place:

Group C: ISS Finalists Championship Round

Alliance	Run 1 Test Score	Run 1 Bonus/ Penalty	Total
TBD Alliance			
TBD Alliance			
TBD Alliance			
TBD Alliance			

Zero Robotics ISS Finals 2018 Champion:
Zero Robotics ISS Finals 2018 2nd Place:

Guest Speakers

Guest Speaker: Hans-Juergen Zachrau

Mr. Hans-Jürgen Zachrau serves as a Senior manager and Vice President of Airbus DS Space Systems, Inc. based in Houston, Texas, and provides more than 30 years of experience in manned spaceflight, based on a wealth of US and European space program support background. He started his aerospace career over 30 years ago in Bremen, Germany. His involvements span from development, integration and operation of space systems and scientific payloads within the Spacelab, Space Shuttle, and the International Space Station (ISS) programs. He has been frequently assigned to major integration and operations sites across Europe and the United States, and is dedicated to transatlantic cooperation in international projects.

In 1998, Mr. Zachrau came to the US to head up Airbus DS Space Systems' Integrated Cargo Carrier program, providing external spare components to the International Space Station. Mr. Zachrau played a substantial role in coordinating the international team that delivered the European-built Columbus Laboratory module to the ISS. His extensive knowledge of the technical, procedural and operational aspects of the ISS and Space Shuttle and his background and training in Europe are an important bridge facilitating American and European cooperation in space. Recently he developed and managed several small payloads for the ISS National Lab, including two payloads utilizing the SPHERES.

Mr. Zachrau is an Electrical Engineer having attended University of Applied Science in Bremen, and earned a Technical Business Administrator certificate from the Angestelltenkammer Bremen.

Guest Speaker: Catherine "Cady" Coleman

NASA ASTRONAUT (FORMER)
Twitter: @Astro_Cady

Born December 14, 1960, in Charleston, South Carolina. Married to glass artist Josh Simpson. She enjoys flying, scuba diving, sports and music. As an undergraduate, she competed in intercollegiate athletics on MIT's crew team. Coleman was commissioned as a second lieutenant in the U.S. Air Force in 1983 and began graduate work at the University of Massachusetts completing her doctorate in polymer science and engineering in 1991. Coleman was selected by NASA in March 1992 and reported to the Johnson Space Center in August 1992. She served in the Astronaut Office Mission Support Branch, in the Shuttle Avionics Integration Laboratory, as the special assistant to the Center Director, Johnson Space Center and in the Astronaut Office Payloads and Habitability Branch, working with experiment designers to ensure that payloads can be operated successfully in the microgravity environment of low Earth orbit. As the lead astronaut for long-term habitability issues, she led the effort to label the Russian segments of the International Space Station in English and also tracked issues, such as acoustics and living accommodations aboard the station. She served as a CAPCOM in mission control for both the space shuttle and space station for a number of years. She represented the astronaut office on the Tile Repair Team for NASA's Return to Flight after the

Columbia accident. Coleman also served as the Chief of Robotics for the Astronaut Office, tasked with overseeing astronaut robotics training and the integration of crew interfaces into new robotics systems. Coleman led supply ship operations for the Astronaut Office and pioneered efforts to integrate supply operations across NASA and the international and commercial and partners, including Space X, Orbital ATK. As her final assignment at NASA, Coleman led open-innovation and public-private partnership efforts for the Office of the Chief Technologist at NASA Headquarters. In all Coleman has logged more than 4,330 hours in space aboard the Space Shuttle Columbia and the International Space Station.

- STS-73 Columbia (October 20 to November 5, 1995) was the second United States Microgravity Laboratory mission. *Duration: 15 days, 21 hours, 52 minutes and 21 seconds.*
- STS-93 Columbia (July 22-27, 1999) was a 5-day mission during which Coleman was the lead mission specialist for the deployment of the Chandra X-Ray Observatory. The telescope has enabled scientists to study exotic phenomena such as exploding stars, quasars and black holes. *Duration: 118 hours and 50 minutes.*
- Expedition 26/27 to the International Space Station: On Coleman served as a flight engineer aboard the Russian Soyuz TMA-20 spacecraft for launch and landing Coleman was the lead robotic arm operator for the capture of Kounatori, performing the second-ever free flyer robotic capture aboard the ISS. *Duration: 159 days*
- Expedition 26/27 hosted a record number of visiting vehicles to the ISS: A total of two space shuttle missions (STS-133 and STS-134), three Russian Progress supply ships, the second Automated Transfer Vehicle from the European Space agency “Johannes Keppler” and the second Japanese supply ship “Kounatori. *Duration: 159 days*

Special Guest: Jeffrey A. Hoffman (Ph.D.)

NASA ASTRONAUT (FORMER)
Twitter: @MITAeroAstro

Jeffrey Alan Hoffman, Ph.D. is an American former NASA astronaut and currently a professor of aeronautics and astronautics at MIT. Hoffman made five flights as a space shuttle astronaut, including the first mission to repair the Hubble Space Telescope in 1993, when the orbiting telescope's flawed optical system was corrected. Trained as an astrophysicist, he also flew on 1990 Spacelab shuttle mission thatfeatured the ASTRO-1 ultraviolet astronomical observatory in the shuttle's payload bay. With the completion of his fifth space flight, Dr. Hoffman has logged more than 1,211 hours and 21.5 million miles in space. He was also the first Jewish male astronaut. Professor Hoffman is interested in the future of human spaceflight and in the use of the International Space Station as a testbed for future aerospace technology. He is co-director, human systems lab at MIT which is a research group within the MIT Department of Aeronautics and Astronautics. Dr. Hoffman is interested in the future of human spaceflight and in the use of the International Space Station as a testbed for future aerospace technology. Hoffman was most recently appointed as a Development Specialist for the Translational Research Institute charged with leading a national effort to translating cutting-edge, emerging terrestrial research into applied space flight, human risk mitigation strategies for exploration missions. Hoffman was instrumental in the formation of the Middle School Zero Robotics Competition in 2010. Away from MIT, he enjoys skiing, sailing, hiking, bicycling, skating, and music. Learn more about Dr. Hoffman by visiting https://en.wikipedia.org/wiki/Jeffrey_A._Hoffman. #HubbleRepairMan

2019 LIFE SPHERES International Space Station Referees

Oleg Dmitrievich Kononenko – Commander

(Russian: Олег Дмитриевич Кононенко)

Russian Cosmonaut

Born: Chardzhou, Turkmen SSR

Interests: Oleg enjoys reading and team sports

Bio: http://www.gctc.ru/main.php?id=3304

Oleg Kononenko Kononenko graduated from the N. E. Zhukovskiy Kharkiv Aviation Institute in 1988 as a mechanical engineer. After graduation, Kononenko worked at the Russian Space Agency's Central Specialized Design Bureau TsSKB-Progress in Kuybishev. His responsibilities included system design, analysis, and development of spacecraft electrical power systems. He was appointed Candidate Test Cosmonaut candidate in 1996. He has flown to the International Space Station four times, as a flight engineer for Expedition 17 aboard Soyuz TMA-12, as a flight engineer on Expedition 30 and commander of Expedition 31 aboard Soyuz TMA-03M, as a flight engineer on Expedition 44 and Expedition 45 aboard Soyuz TMA-17M and now as Commander of Expedition 58 and Expedition 59. Kononenko has conducted 3 spacewalks totalling 18 hr 31 minutes and accumulated over 533 days in orbit during his previous flights to ISS.

Anne C. McClain– Flight Engineer

NASA Astronaut (Lt Col, U.S. Army)

Born: Spokane, Washington

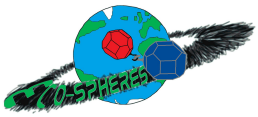
Interests: She enjoys weightlifting, rugby, golf, biking, crossfit and running

Bio: https://www.nasa.gov/astronauts/biographies/anne-c-mcclain/biography

Twitter: @AstroAnnimal

Anne C. McClain was selected by NASA in 2013. The Spokane, Washington native earned a Bachelor of Science in Mechanical/Aeronautical Engineering from West Point. A 2002 Marshall Scholar, McClain earned a Master of Science in Aerospace Engineering from the University of Bath in Bath, England and a Master of Science in International Relations from the University of Bristol in Bristol, England. Lieutenant Colonel McClain, a Senior Army Aviator, has more than 2,000 flight hours in 20 different aircraft. She is an OH-58D Kiowa Warrior pilot and instructor pilot, and a rated pilot in the C-12 Huron (King Air), UH-60 Blackhawk, and UH-72 Lakota. She is currently a part of the Expedition 58/59 crew that launched to the International Space Station in December 2018.

Current Crew on Station: Expedition 58 includes only 3 crew members including: Anne MClain, Oleg Kononenko and David Saint-Jacques. Thank you to the crew of Expedition 58 for your research and for refereeing the 2018 High School Zero Robotics Competition – ECO-SPHERES! (Learn more about the crew by visiting ww.nasa.gov)



MIT/NASA Communications During Test Sessions

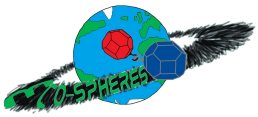
The communications flow during a SPHERES test session involves several NASA-affiliated groups all over the country. Each can see and hear the crew through audio and video downlink.

PAYCOM is located at NASA Marshall Space Flight Center in Huntsville. The Payload Operations Director (POD), also at Marshall, manages PAYCOM.

The SPHERES team is located at Ames Research Center (ARC) in Moffett Field, CA.

Acronym & Common Phrases Guide

POD	Payload Operations Director
PAYCOM	Payload Communications Officer
“SPHERES”	Call sign of the SPHERES research team at Ames
“MIT”	Call sign of the SPHERES research team at MIT
GUI	Graphical User Interface
Huntsville	Location of Payload Operations, at NASA Marshall Space Flight Center
Space to Ground	Communication loop that NASA uses to talk to ISS
SSC	Standard Station Computer (laptop)
LOS	Loss of Signal
AOS	Acquisition of Signal
JEM	Japanese Experiment Module, a.k.a Kibo



Things to see in Boston/Cambridge

Tours

Historic Freedom Trail	http://www.thefreedomtrail.org/
Boston Trolley Tours.	https://www.trolleytours.com/boston

Museums

MIT Museum	http://web.mit.edu/museum/
Museum of Science/Imax	https://www.mos.org/; https://www.mos.org/imax
Museum of Fine Arts	http://www.mfa.org/
Skywalk Observatory	http://skywalkboston.com/
Isabella Stewart Gardner Museum	https://www.gardnermuseum.org/
New England Aquarium	http://www.neaq.org

Areas

Harvard Square	Red Line, Harvard Sq. T-stop
Boston Commons	Red/Green Line, Park Street T-stop
Newbury Street	Green Line, Hynes ICA T-stop
Faneuil Hall Market Place	http://www.faneuilhallmarketplace.com/

Public Transportation

Mass Bay Transportation Authority	http://www.mbta.com/

Universities (other than MIT)

Harvard University	http://www.harvard.edu/
Boston University	http://www.bu.edu/
Berkley College of Music	https://www.berklee.edu/
Tufts University	http://www.tufts.edu/
Wellesley College	http://www.wellesley.edu/
Northeastern University	http://www.northeastern.edu/