

ISSET PRESENTS

# MISSION

DISCOVERY



## // MISSION DISCOVERY

Work with astronauts to get  
your ideas into space



Launch of SpaceX's Falcon 9 rocket, carrying Mission Discovery experiments to the Space Station.

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*It was great to learn from such inspirational astronauts and experts through Mission Discovery, I had a fantastic time.*



- Emily Yeomans, Mission Discovery Student



## // INTRODUCTION TO ISSET

- The International Space School Educational Trust (ISSET) works in partnership with some of the world's leading space organisations to deliver unique learning opportunities for students. Each of our programmes offer something unique, whether it be international learning at NASA Space Centres or the Yuri Gagarin Cosmonaut Training Centre or our Mission Discovery challenge where students get the opportunity to send their experiment to the International Space Station.
- ISSET has worked with some of the biggest names in human space exploration, including NASA Administrator Charlie Bolden and astronaut Chris Hadfield, with over 10 astronauts such as Michael Foale CBE and Scott Kelly having participated in Mission Discovery programmes.

“This was one of the most enjoyable experiences of my life. I'm so glad I got to meet some incredibly inspirational people.”

Sobia Kazmi, 15, Mission Discovery Participant

# // A TYPICAL TEAM

Mission Discovery introduces you to the highest level of NASA Leadership, Space Exploration and Scientific Research.



**Mike Foale - Astronaut, Astrophysicist & ISS Commander**

Mike was the first British-born NASA Astronaut and has been into space on 6 missions. His experience includes; being Commander of the International Space Station, bringing the Hubble Space Telescope back to life and having a major role in saving the Russian 'Mir' Space Station as it tumbled out of control around the Earth, following the only collision in outer-space. He has had a range of senior roles in NASA that include having been the Deputy Administrator at NASA HQ, Chief of the Astronaut Office Expedition Corps & Assistant Director of the Johnson Space Centre. Mike held the record for the number of days spent in space.



**Sarah Murray - Assistant Chief of EVA, Robotics & Crew Systems**

Sarah is the Council Executive for NASA's Mission Support Council & Partnership Council at NASA HQ. Working with NASA's Deputy Administrator and Deputy Associate Administrator, she is responsible for facilitating NASA's governance process across NASA centres throughout the US. She has also served as Assistant Division Chief for EVA, Robotics and Crew Systems where she was responsible for the Neutral Buoyancy Laboratory Space Walking training facility. She has held roles in Astronaut Training and Mission Control. She has been Deputy Chief of Space Flight Training Management where she was the Chair of the International Training Control Board, responsible for training astronauts and cosmonauts.



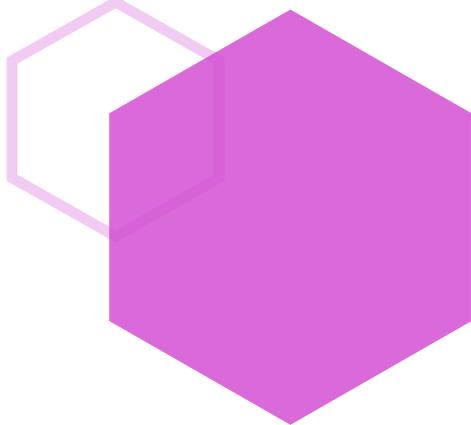
**Chris Barber - Space Educationalist**

Founder of the International Space School Educational Trust (ISSET). ISSET has been developed to be the UK's most exciting space educational organization, running programs in the UK, USA, China, Arctic and India. Chris has had extensive careers in both finance and education. He is also a Leadership and Organizational Improvement Consultant.



**Dr. Julie Keeble - Lecturer of Pharmacology**

Julie is a lecturer in the Institute of Pharmaceutical Science at King's and is a jointly affiliated with of the Centre for Human & Aerospace Physiological Sciences. Her research focuses on the role of sensory nerves, pain, inflammation and thermoregulation. Julie is also ISSET's Chief Scientist and is responsible for ensuring that all winning Mission Discovery experiments are launched to the International Space Station.



# // ADDITIONAL TEAM MEMBERS



**Scott Kelly**  
—  
Astronaut & ISS  
Commander



**Steve Swanson**  
—  
Astronaut & ISS  
Commander



**Ken Ham**  
—  
NASA Astronaut & Space  
Shuttle Commander



**Nicole Stott**  
—  
Astronaut



**Jay Honeycutt**  
—  
Former Director of  
Kennedy Space Centre



**Prof. Steve Harridge**  
—  
Professor of Human  
and Applied  
Physiology



**Prof. James Tour**  
—  
Award-Winning  
Nanotechnologist at  
Rice University



**Stephen Bowen**  
—  
Astronaut



## // OVERVIEW

ISSET's Mission Discovery programme is a great opportunity for students to do something extraordinary.

Students of all ages carry out scientific research with NASA Astronauts, rocket scientists and NASA personnel, usually for a week.

Students work in teams and present an idea for their own scientific experiment; the best idea will be launched into space and carried out by Astronauts aboard the International Space Station.

With help from brilliant NASA role models, Astronauts, elite NASA

personnel, scientists and engineers; students learn about space, STEM and how to acquire the NASA 'You can do it!' spirit through a variety of exhilarating hands-on activities, based on themes such as:

- NASA leadership and team building
- How space exploration benefits life on Earth
- Experiencing the environment of space
- Looking at different kinds of experiment and what makes them great
- How you succeed in your dreams and ambitions



*King's College London,  
Imperial College London,  
Cranfield University,  
Rhondda Valley,  
Caerphilly,*

*Merthyr Tydfil,  
UWS Renfrewshire,  
Ayrshire College,  
Delhi,  
Gurgaon,*

*Kentucky Science Centre,  
Valparaiso University,  
Embry-Riddle Aeronautical University,  
University of Adelaide*

## // PROGRAMME LOCATION

Mission Discovery is an international event, so far we have hosted the programme in England, Scotland, Wales, North America, India and Australia.

ISSET is looking to partner with organisations to provide further opportunities for students to be inspired, achieve their dreams and leave the programme

with the feeling that they can achieve. Students are amazed that they can have the incredible opportunity of sending their experiment to the International Space Station, which represents the pinnacle of human achievement!

**Off the Earth:** Of course the final destination for the Mission Discovery Experiments is 240 miles above Earth and traveling at 17,500mph - the International Space Station (ISS). A record number of Mission Discovery experiments have been carried out on the ISS.



# // EXAMPLE OVERVIEW ITINERARY

## DAY 1 - NASA team building and leadership

### **Activity, Welcome**

**Introduction to NASA team building**

**Team building and leadership activities**

**Video conference with world famous scientists**

**Astronaut presentation on fulfilling your dreams and travelling in space**

**Astronaut views on the best space experiments that they have seen and why**

## DAY 2 - Introduction to your design brief

### **Activity, Welcome**

**Becoming an astronaut and the story of a space mission**

**Final team building activity**

**Design Brief - General overview for students about formulating ideas for their experiment**

**Investigate experiment idea in teams**

**The human body and pharmacology in space**

**Investigate experiment idea in teams**

Throughout the programme, students have the opportunity to meet our team members both formally whilst in their working groups and informally as individuals. All students have the chance to have their photo taken with the astronaut and their team members.

*\*There will also be appropriate breaks throughout the day including a lunch break*

## **| DAY 3 - Budgeting, planning and experiment design**

### **Activity, Welcome, Budgeting & Planning Skills**

**The International Space Station environment, ISS experiments and the story of a Space Station expedition**

**Experiment work in teams**

**Videoconference - Details of space experiment requirements**

**Experiment work in teams**

## **| DAY 4 - Finalise experiments and presentations**

### **Activity, Welcome**

**Experiment work in teams**

**Astronaut presentation on the Earth from space**

**Experiment work in teams**

**Improve your presentation skills**

**Finalise design and presentation in teams**

## **| DAY 5 - Presentations and judging**

### **Activity, Final tips and Advice**

**Teams final preparation**

**First round of judging**

**Finalists announced & Mission Completion certificates awarded**

**Presentations from the finalists to all participants and judges' selection of the best experiment, with the winner announced**



## // PREVIOUS EXPERIMENTS

ISSET has sent a record number of experiments to the ISS. These include; work on Genetics, Alzheimer's disease and Parkinson's disease.

Mission Discovery experiments receive national media coverage. Students have appeared in international press, on NASA TV, BBC Breakfast, Channel 4 and ITV News and more.

One of Mission Discovery experiments successfully investigated whether Daphnia (water fleas) will reproduce in space. Daphnia have a more complex DNA than human beings. This experiment has paved the way for further genetic research in space.



**The SpaceX Dragon capsule containing winning experiments on its way to the Space Station**



Another experiment investigated the effectiveness of antibiotics in space. The results demonstrated that antibiotics are more effective in microgravity compared to on Earth.

The experiments will be carried out by the astronaut crew aboard the International Space Station at that time.

We have been lucky enough to have previous experiments conducted by astronauts Tim Peake, Scott Kelly and Jeff Williams to name a few.



**Astronaut Koichi Wakata performing a Mission Discovery experiment aboard the ISS.**



## // ROLE OF THE HOST

### **Mission Discovery host requirements**

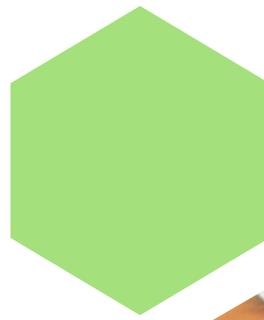
- A Lecture theatre or adequate hall for daily presentations fitted with a projector, microphone & AV.
- Green Room for ISSET staff to conduct work behind the scenes.
- Work space with seating & desks for team work daily breakout sessions

- Additional spaces fitted with a projector & AV for first round of judging on the final day.
- Management of application and selection of attendees

### **Additional support**

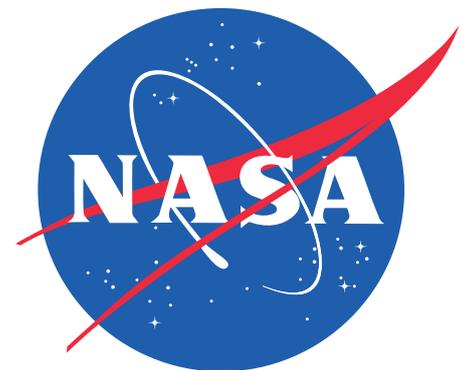
- Liaison to provide mentors to help and guide the student teams
- Mission Discovery invites the host to provide judges to join our team on the final day

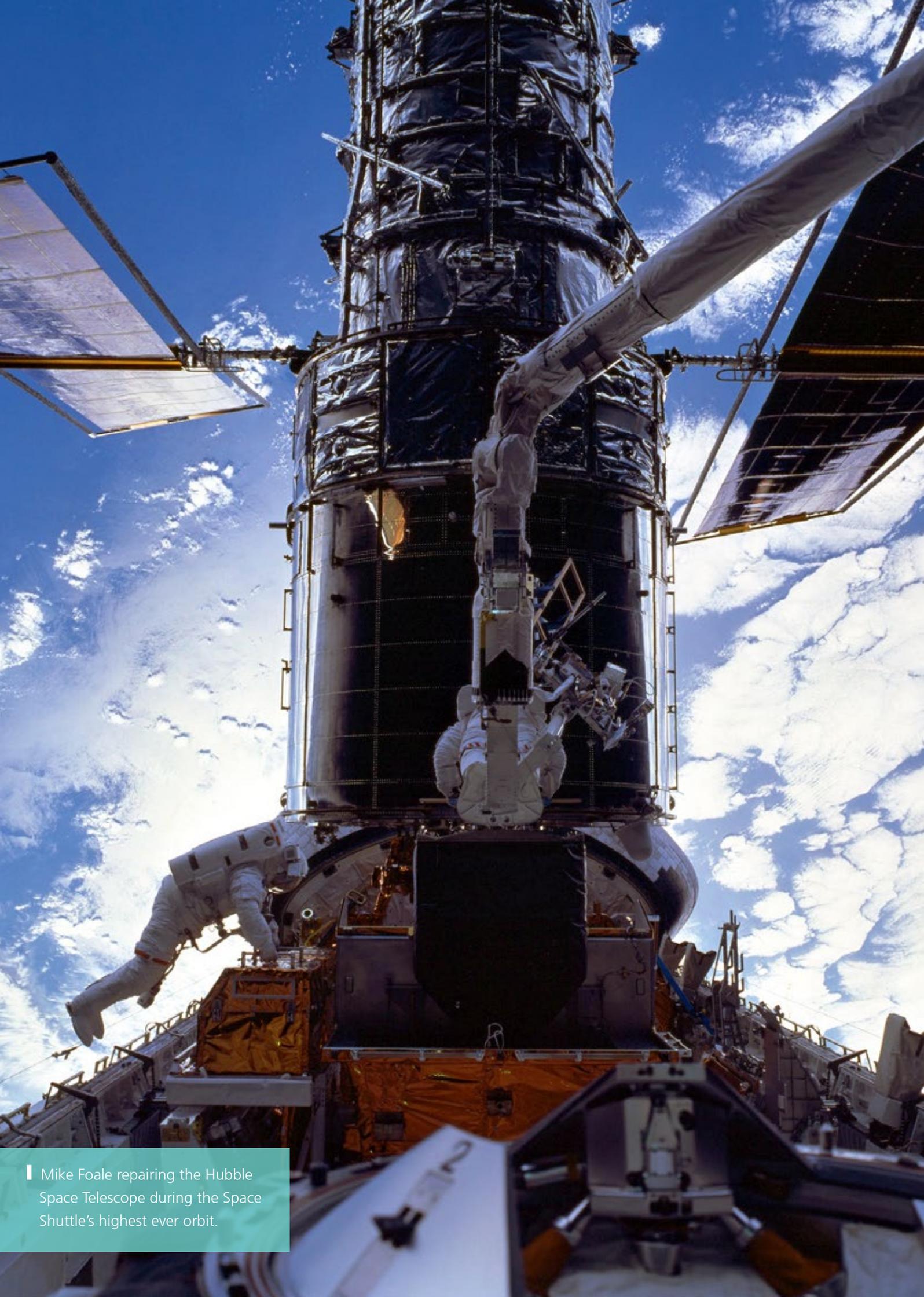
- Hosts are welcome to source additional sponsors for the event.
- Securing of Sponsorship if required
- Promotion and Marketing



## Benefits of hosting Mission Discovery

- | Work with some of the worlds most elite individuals.
- | Promote education and inspire your local community - possibility of evening events with guest astronaut
- | Mission Discovery features heavily in national and international press and social media.
- | Mission Discovery is often mentioned on NASA's own TV channel with millions of viewers around the world.
- | Help students innovate and contribute to the benefit of mankind on and off the planet. Some of Mission Discovery students' experiments have been highly acclaimed by international scientists.
- | Be part of an endeavour which will see young leaders send an experiment to the International Space Station.





Mike Foale repairing the Hubble Space Telescope during the Space Shuttle's highest ever orbit.



## // STUDENT TESTIMONIALS

“ *Mission Discovery was a brilliant, motivational and inspiring programme that I was thrilled to be a part of. I enjoyed every aspect of the summer school, from working in teams to produce our experiments, to listening to lectures from professors at King’s College London.* ”

- Eleanor, Gumley House School, Mission Discovery participant

“ *It’s a huge deal in our lives. It’s an honour to work with all these people who have worked so hard to be where they are.* ”

- Casey Sather, Mission Discovery 2014 winner

# // ASTRONAUT TESTIMONIALS

“Mission Discovery was, by far, the most comprehensive, interesting, and educational endeavour I have been involved with.”

- Mike McCulley, Former NASA Astronaut & President of United Space Alliance

“Mission Discovery is the most complete and exciting educational programme I have worked with. I’m always excited to see where the students imagination takes them and watch them develop throughout the week. When I was young, I would have loved the chance to have an experiment flown in space.”

- Dr. Michael Foale CBE, Former Astronaut & ISS Commander

“With this programme, students are getting a rare opportunity to participate in something that is unimaginable for most young people. It will not only help them gain knowledge about space but also enhance their self- belief and capabilities.”

- Steve Swanson, Former Astronaut & ISS Commander



## // EDUCATIONALIST TESTIMONIALS

“ *Mission Discovery is the most exciting and rewarding event we are involved with. Each daily schedule is a fantastic experience for the students with contributions from astronauts other NASA personnel and top scientists. The organisation of the event is first class*

*Students working in teams, develop valuable social and leadership skills as well as benefiting from the technical knowledge and understanding. The winning team has a prize that is truly out of this world: an experiment to be carried out on the Space Station.*”

**Bernard Whittingham - Senior Educational Advisor (RCT & Cardiff)**

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“ I would just like to thank you for such a brilliant experience. The Mission Discovery programme has been one of my dreams come true! To be able to spend a week with real astronauts, getting to sit down and talk with them has been a memorable part of my life that I will never forget and will cherish forever. ”

**Stefan Bennett, 15, Mission Discovery participant**



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