



NASA Johnson Space Center Engineering School 2010



Young Astronauts Australia in partnership with NASA Space Center Houston
Invites

Australian Science students who are thinking of following a career in either science, technology or engineering to apply for this NASA Space Engineering course to be conducted at NASA's Johnson Space Center Houston from April 3rd to April 14th 2010.

This prestigious course is open to Australian secondary school students in years 10 and 11. A limited number of places are available, with teachers and students being selected from all states and territories.

On completion of the course students will receive their graduation certificate which will be of great value when they seek employment in the coming years, students will also be given an insight into future job opportunities that are available working within NASA. Students will attend a formal graduation dinner where graduation certificates and major individual and team awards will be presented. Students will also be receiving a letter of reference and a graduation shirt. The graduation dinner will be attended by leading NASA personnel including Astronauts, Scientists, Engineers and Education officers.

Included in the program is a visit to the Challenger Learning Center and Observatory where students will take part in a mission control program and witness the Northern hemisphere night sky. Parents will be able to witness all the day to day activities by visiting a special website that will have updated images of student activities posted on the site each evening.

The duration of the program is 11 days departing Sydney on the 3rd of April and returning to Sydney on the 14th of April 2010.

THE PROGRAM AND PROJECTS

Students in Space Center Houston's Space School will be on a 5 day engineering mission to land a rover on the surface of Mars. They will analyse rock samples with a Reflectance Spectrometer, loft a rock sample into Martian orbit, and return it back to Earth in a rocket of their own design.

All the time, working within a NASA budget, knowing that funds or supplies for their projects may be decreased at anytime due to budget cuts, safety regulations, or any other excuse the staff may give to make the experience truly dynamic and representative of the real NASA world.

MISSION; Teamwork, Problem Solving, Fiscal Responsibility, Communication and Adaptation to Unexpected Problems.

DESIGN, BUILD AND LAUNCH A ROCKET

Students will engineer a rocket of their own design, including deciding which rocket parts are needed and what they can afford given their own NASA project. Rockets will be launched at NASA's Johnson Space Center (weather permitting).

BUILD A ROBOTIC MARS ROVER

Given a set of parameters and tasks each rover must accomplish on Mars, students must decide how to create a robotic rover. They start with price lists for supplies and given varying criteria, students design, build and test their rover. Teams put their rovers to the test on a Martian landscape competition to locate and retrieve the Martian rocks most valuable to NASA.

ENGINEER A ROVER LANDER

During this phase of the mission, teams must design and create a Lander which will safely protect its rover payload from the impact of landing on the Martian surface. Payload protection is critical as the success of the rover mission cannot be accomplished if the rover is damaged before it is able to explore Mars. Working within a budget, students must ensure their cargo can withstand the impact of a 3 story drop; as well as, reach a predetermined landing site.

LOFTING INTO SPACE

Students will engineer an apparatus capable of carrying all of its rocket pieces safely upwards 2 stories at a 60 degree angle of ascent. Within a budget, students will design and redesign an ascent vehicle methodically and with considerable problem solving.

STUDENT PRESENTATIONS

Given information about specific topics, all groups must present the necessary information to accomplish their rocket, rover, landing and lofting projects. Each team will have different, but vital pieces of information which must be shared with all groups in order to ensure success. Since teams do not have the same information, communication is critical! Space Center Houston administration and all teams evaluate presentations for style and content knowledge.

WOW! NASA TOURS

Several tours are given at Johnson Space Center, highlighting both Mars and project related themes. See historic Mission Control Centers and the Space Station Mock-up Facility with its life-sized models of the International Space Station and Space Shuttle. Visit the Neutral Buoyancy Laboratory where astronauts train for Extravehicular Activities (EVA) in simulated micro gravity. See up close the rockets used in the early space program, as well as experimental X-vehicles.

TALK TO NASA EXPERTS

Hear a wide variety of presentations by NASA personnel who are really making space exploration happen. Topics may include: Space Exploration, Rocket Propulsion, Mission Control, the Space Program, the International Space Station, Space Shuttle, Robotics or Space Physiology.

NASA ASTRONAUT PRESENTATIONS

You will be experiencing NASA Astronaut presentations where Students will also have personal photo and autograph opportunities.

CHALLENGER MISSION CONTROL CENTRE AND GEORGE OBSERVATORY

Challenger Learning Centres offer realistic mock-ups of Mission Control and an orbiting space station. Students join teams at computer consoles or onboard the orbiting space lab, rev up their imaginations, and work together toward the mission's goal, whether it is the launching of a probe or the interception of a comet. These activities are enhanced during this visit with an observing session at George Observatory. A very large telescope and expert guides show students the wonders of the northern sky.

Other Information

Cost of the course: \$5700 AUS (payment is via a progressive payment system)
Cost Includes: Return international airfare from Sydney to Houston (departure tax not included)
All course activities
Workshop material
Challenger Mission control Centre
Astronaut presentation
Scuba diving
Accommodation
All ground transportation and transfers (Houston)
VIP Graduation Dinner
Graduation Certificate
Two meals per day (breakfast and dinner)
Admission to all selected outside activities
Graduation T/shirt

Please note: accommodation and flight details will be confirmed closer to departure date. Cost may vary dependant on the value of the USA dollar and airline increases at time of departure.

Program is open to a limited number of students and teachers so book your seat early to ensure your place is reserved for this unique opportunity!!!

Program Organiser is Young Astronauts Australia (ABN 47064587837)

Your Program Resident Engineer and Project Mentor: Mike Petkovic

Mike is a senior engineer in the aerospace sector with a wealth of engineering experience gained over two decades of involvement with the Australian and European space industries. Mike's speciality is in the field of assembly, integration and test of electro-optical instrumentation for both terrestrial and spaceborne applications. His achievements in this area include:

- The Endeavour Telescope (STS-42 & STS-67);
- Infrared and Visible Focal Plane Arrays for the ATSR2 (ERS2) & AATSR (Envisat) instrument (ESA earth observation missions);
- FedSat (Australia's domestic micro satellite).

His engineering skills encompass the disciplines of systems engineering and management of complex multi-disciplinary projects, as well as the development of quality management systems. Over the years, Mike has trained and mentored a number of young engineers in these areas, who have then moved on to work both domestically and internationally in space & high technology sectors. A father of one, he has a keen interest in furthering the education of our children in science and technology.

Your Program Educational leader: Mike Roach

Australia's leading and most respected space science teacher and the recipient of many National science teaching awards that includes:

- * 1992 Australian Teacher of the Year Award (International Year of Space Celebrations Washington DC USA)
- * 1993 CRA Fellowship Award
- * 1996 Shell Award for Excellence in Science Education
- * 2000 SASTA Award for Outstanding Contribution to Science Education in South Australia
- * 2001 Sir Winston Churchill Fellowship Award
- * 2005 South Australian Premiers Award for Excellence in Science Teaching
- * 2005 Australian Prime ministers Award Excellence in Secondary Science Education

Mike is also the present Treasurer of the Australian Science Teachers Association (ASTA) and director of the Center for Australian Space Education, also Founder and Chairman of the South Australian Space School. Mike for many years has demonstrated his extraordinary teaching skills in stimulating many Australian Science students to pursue careers in the fields of Space Science, Astronomy, Technology and Engineering.

Your Program Student Advisor: Jeanette Rothapfel

Head Teacher Science, Maitland High School, NSW Department of Education and Training with 39 years teaching experience.

- Recipient of an honorary Doctor of Education degree from the University of Newcastle, the Australian Space Pioneer Award and many state and national teaching awards.
- First individual outside the United States to be entrusted with a permanent loan of NASA's moon rock samples for education.
- Founder/Principal of the NSW School of Space Science held at the University of Newcastle in January each year.
- Known widely as 'Mrs Rocketfuel' in science education and conducts an educational website for students called 'Ask Mrs Rocketfuel'.
- Principal of the Australian International Space School for 7 years.
- Author of space science education teaching resources/books/curriculum resources including the national teachers' resource book written for the Australian Science Teachers Association titled 'Out of this World: Investigating Space' that was sent to every school in Australia for National Science Week, 'A Journey into Space' by Hawker Brownlow and Learning Materials Production Centre texts 'The Cosmos: Past, Present and Future' and 'Space Science'.
- Conducted educational research at the Johnson Space Centre in the Astromaterials Research and Exploration Science department 2003.
- Conducted hundreds of gifted and talented lessons and workshops for NSW students.

Your Program Coordinator: Vanessa Robson

Postal Address:

Young Astronauts Australia
P0 box 572
Winston Hills NSW 2153

Email Vanessa at

nosbor1@optusnet.com.au

APPLICATION FORM - YAA Engineering Space School 2010



Student details:

Name: _____

Address: _____

Suburb: _____ Postcode: _____

Phone: _____ Mobile: _____

Email: _____

T/shirt size (please circle): **XXL** **XL** **L** **M** **S** **XS**

Fund-raising: Do you wish to fundraise Yes / No

Health: Do you have any pre-existing conditions that require treatment. If so, please describe the condition:

Special Dietary Requirements: _____

In case of emergency please notify:

Name: _____ Parent / Guardian

Address: _____

Suburb: _____ Postcode: _____

Phone: _____ Mobile: _____

Passport Number: _____

I confirm that I have read and understood the attached terms and conditions prior to signing this program application form and agree that the terms and conditions will be binding upon me, my heirs, next of kin, administrators and successors. Further I agree that the terms and conditions shall be governed in all respects by and interpreted in accordance within the laws of NEW SOUTH WALES AUSTRALIA.

Print Name of Participant: _____

Signed Participant: _____ Date: _____

Print Name of Parent/Guardian: _____

Signed Parent / Guardian: _____ Date: _____

Progressive payments: A deposit of \$2850 must accompany this application form, and final payment of \$2850 must be received by March 12. Please make your bank cheque or money order out to Young Astronauts Space Schools Australia and forward it to: PO Box 572 WINSTON HILLS NSW 2153

School details and endorsement of applicant:

The student's Science Teacher or the Head Science Teacher is required to complete the following section. By completing this section you provide your endorsement of this student as a suitable applicant.

School name: _____

Science teacher: (name) _____ (signature) _____

Email: _____ Phone: _____