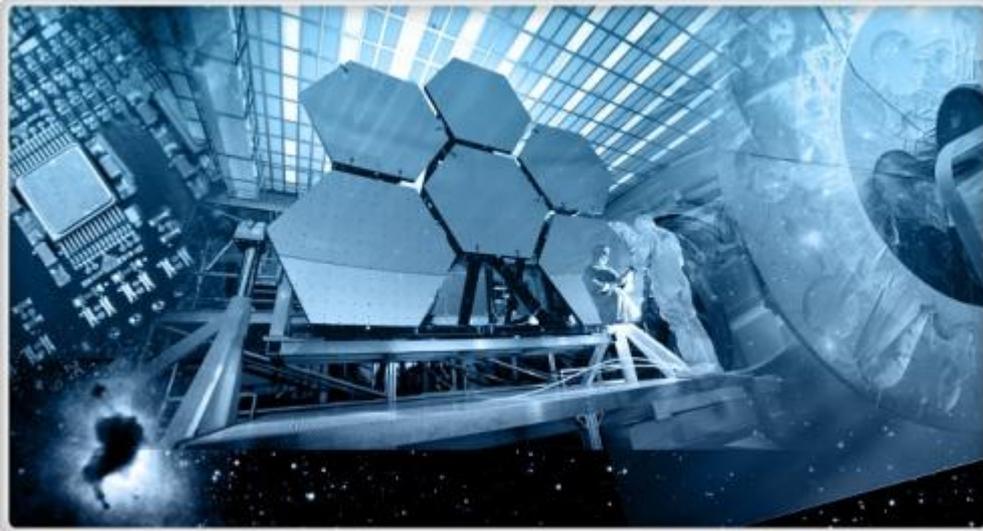




PRESENTATION ON
**SINGAPORE SPACE & TECHNOLOGY
ASSOCIATION (SSTA)**

Lynette Tan, Director



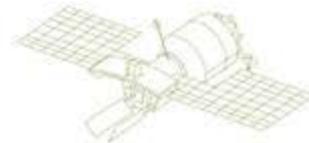


- ✓ **SSTA OVERVIEW**
- ✓ **SSTA'S ADVISORY COUNCIL**
- ✓ **INDUSTRY DEVELOPMENT**
 - ✓ **GLOBAL SPACE & TECHNOLOGY CONVENTION**
 - ✓ **PARTNERSHIPS**
- ✓ **OUTREACH**



Singapore Space and Technology Association

- ✓ A non-profit association, focused on developing Singapore's space and related high technology industries.
- ✓ Serves as a neutral platform to facilitate information and communication for industry (B2B), government and academia.
- ✓ Spearheads initiatives that advances Singapore's space ecosystem
- ✓ Drives educational and outreach programs to encourage careers in space and high-technology engineering fields.



SSTA's ADVISORY BOARD



Prof Lui Pao Chuen

Advisor, National Research
Foundation, Former Chief
Defence Scientist, MINDEF



Mr. Cheong Chee Hoo

Deputy CEO, DSO National
Laboratories



Mr. Tan Chee Seng

Head, Systems & Capability
Group, Future Systems &
Technology Directorate,
Ministry of Defence



Mr. Tan Kah Han

Director, Airworthiness /
Flight Ops, CAAS



Mr. Pek Beng Tit

Director, Air Systems ,
Defence Science &
Technology Agency (DSTA)



Mr. John Lu

Director, Manufacturing &
Engineering (Industry
Development Group), SPRING
Singapore



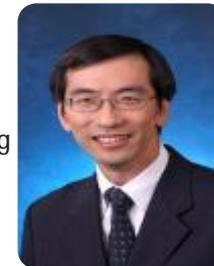
Mr. Tang Kum Chuen

President, Communications & Sensors
Group, ST Electronics, and President,
ST Electronics (Satcom & Sensor
Systems)



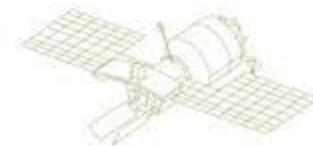
Mr. Kwoh Leong Keong

Director, Centre for Remote
Imaging, Sensing and Processing
(CRISP)



Mr. Sia Kheng Yok

Programme Director,
Economic Development Board





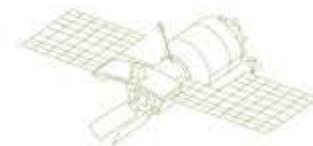
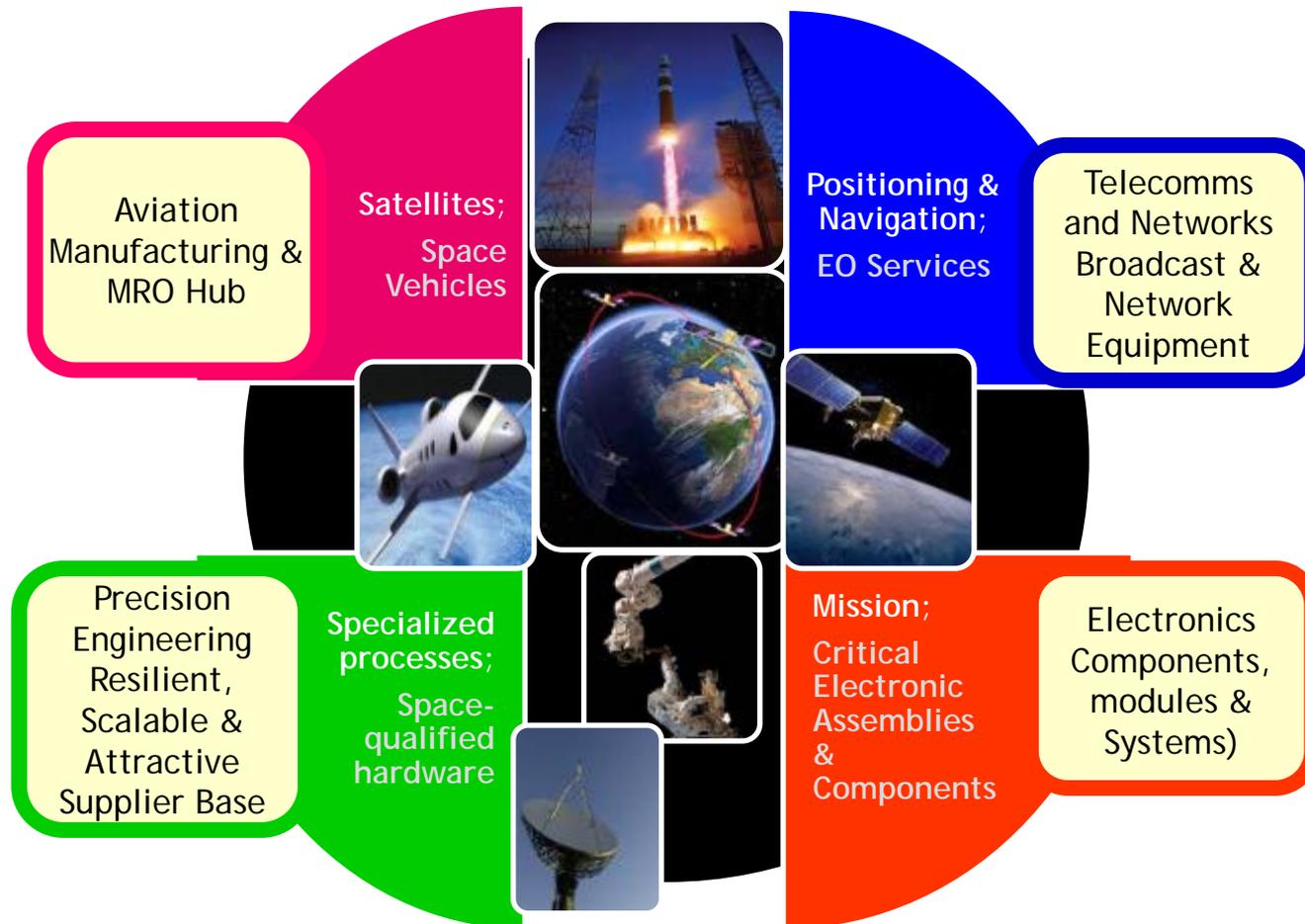
Corporate Members



SSTA is Singapore's lead space industry development association



EXTENDING OUR CURRENT CAPABILITIES TO PLAY IN THE SPACE ARENA



GSTC PARTNERS & SPONSORS 2015

"Pan-Asia Satellite Solutions"

GLOBAL SPACE TECHNOLOGY CONVENTION (GSTC) 2015

BE ENGAGED BE PRESENT

DATE: 11th - 13th FEBRUARY 2015
VENUE: SINGAPORE

KEY DIALOGUES INCLUDE:	TECHNICAL SESSIONS:
INDUSTRY CHIEFS	SATELLITE SERVICES AND
DEFENCE & SECURITY	SATELLITE NAVIGATION POSITIONING
SPACE AGENCY	NANO SATELLITE TECHNOLOGY AND
NEW SATCOM NEEDS	APPLICATIONS
	SMALL AND MICRO-SATELLITE
	AND ITS TECHNOLOGIES
	EARTH OBSERVATIONS TECHNOLOGIES

PLATINUM SPONSORS



GOLD SPONSORS



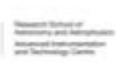
SILVER SPONSORS



BRONZE SPONSORS

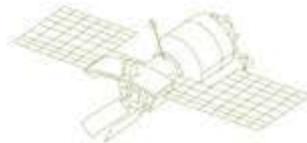
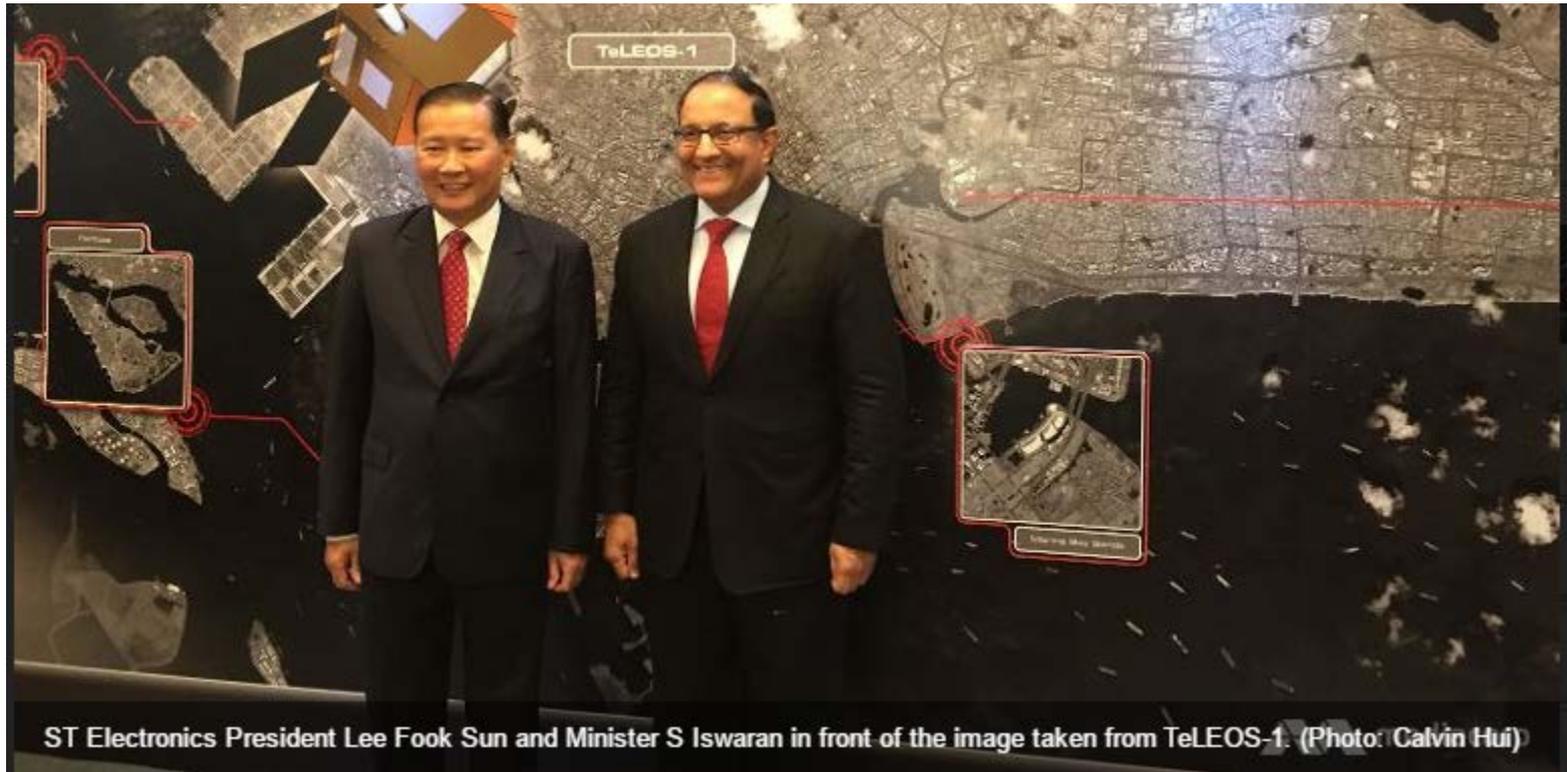


Participating Companies



GSTC 2015 MOMENTS @ THE CONFERENCE





Facilities for Assembly, Integration & Testing



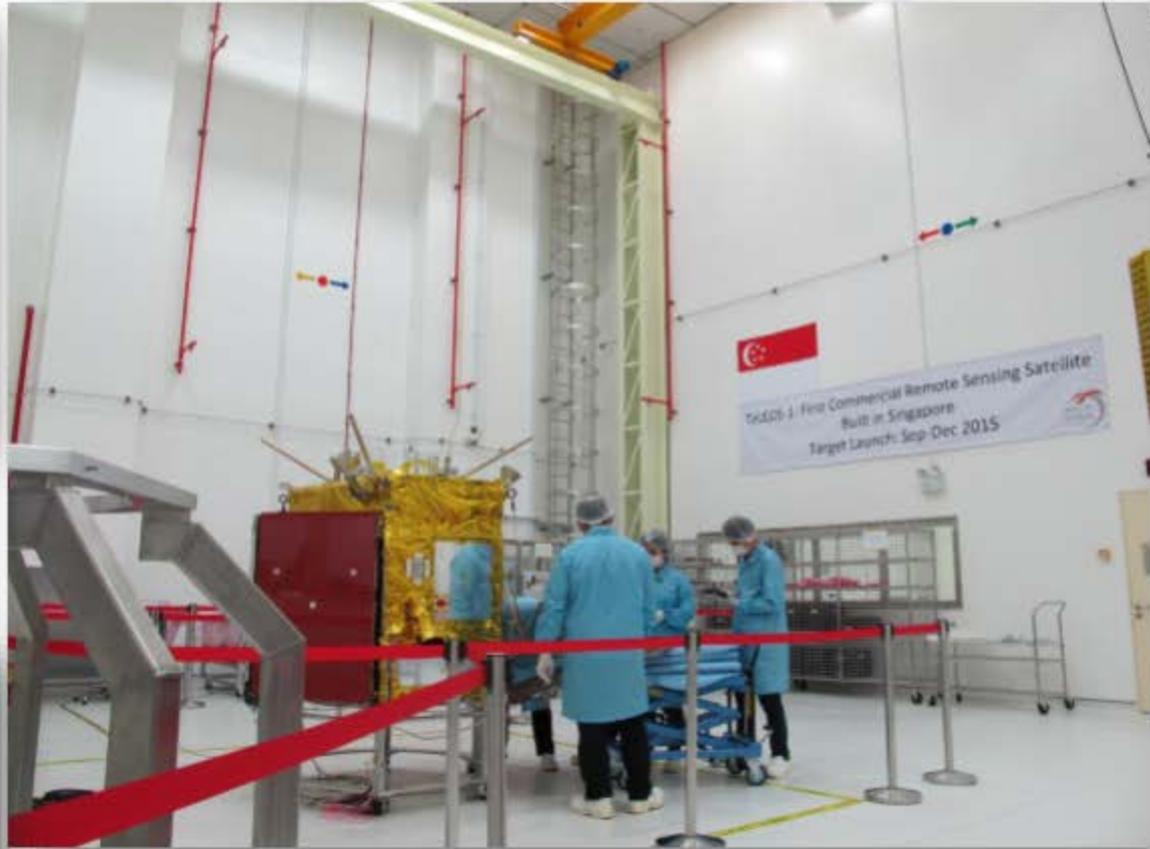
Thermal Vacuum & Bake-out Chambers



ESS Chamber



Shaker



High-Bay Assembly, Integration & Test (AIT) Clean Room



International Outreach and Partnerships



SSTA invited by ISTA DG to join in 2011. At the official inauguration in the HQ in the Hague Director-General Ronald Heister requested SSTA consider being on their Advisory Board and Asia Rep.



SSTA has been engaging the UN Space Office on issues pertaining to space law, regulation and representation at UN-specific space events.



SSTA is a formal member of the KIBO - Asian Beneficial Collaboration (ABC) working group. Through SSTA, Singapore can submit education (and eventually commercial) experiments on board Int'l Space Station.



SSTA sits on the APRSAF Executive Committee. SSTA has been recognized by the Japan Space Agency JAXA as a key regional partner pertaining to space activity.



SSTA sits on 2 committees at the International Astronautical Federation, the largest trade body of space agencies, industry and academia.



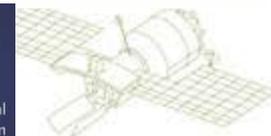
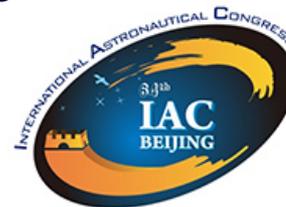
SSTA has signed an MoU with China's GLAC (GNSS-LBS Trade Association) to grow upstream and downstream commercial satellite partnerships between both country membership bases.

SSTA Public Relations and Outreach

- Quarterly networking sessions for current and potential corporate members
 - Includes local and foreign space industry players based in Singapore
- Bi-annual Corporate partners dialogue
 - Round table discussion for expansion, development and support on SSTA's initiatives
- Involvement in major Space conventions and Air shows regionally and globally
 - Gain mindshare and actively cultivate foreign agencies and entities to enhance stronger presence in Singapore



51st INTERNATIONAL
PARIS AIR SHOW
LE BOURGET





SSTA EDUCATION INITIATIVES

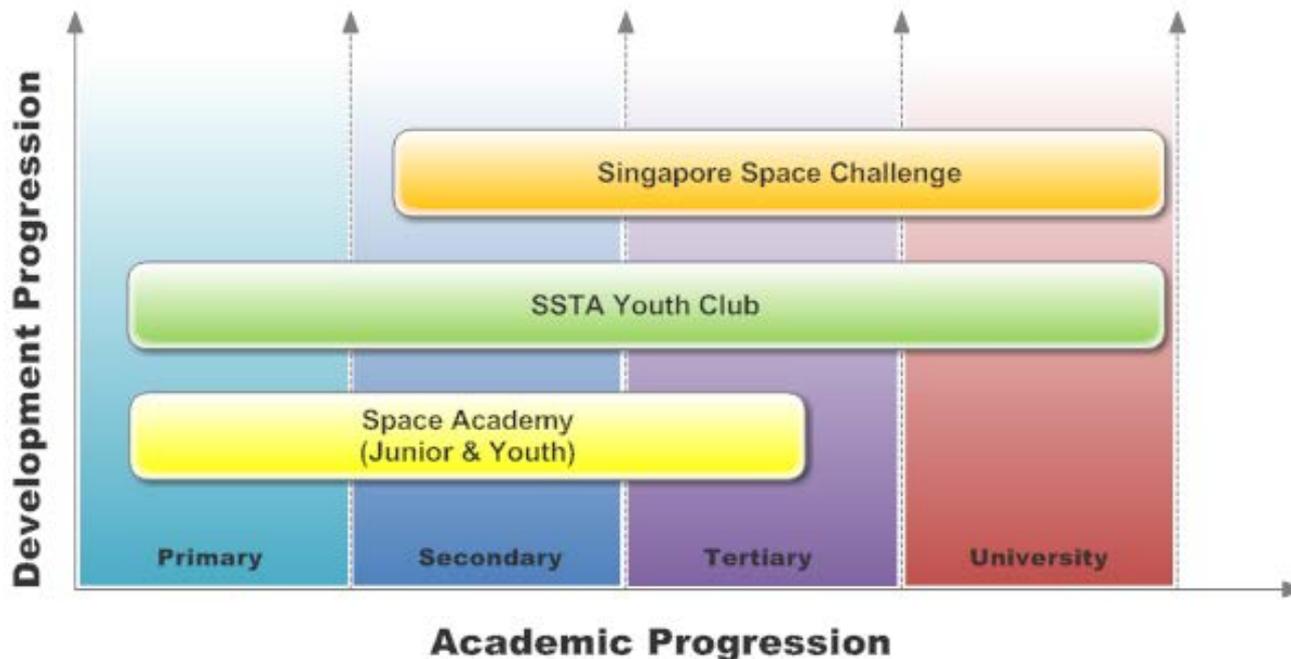
***LOCOMOTIVE FOR SCIENCE &
ENGINEERING INTERESTS AMONGST***

YOUTH



SSTA EDUCATION INITIATIVES - LOCOMOTIVE FOR SCIENCE & ENGINEERING INTERESTS AMONGST YOUTH

- SSTA leverages on its educational initiatives to build ties with overseas agencies
- Space is a subject that spurs our youth to embrace the engineering and sciences
- Reaching out to over 100 schools and institutions and growing





Competition Categories

Unmanned Systems

- Drones, or unmanned aerial vehicles (UAVs), are evolving rapidly, with innovative uses beyond military, such as in law enforcement, journalism and even dining services. What will be applications Singapore can leverage UAVs with satellite tracking systems?



Space & Medical Science

- Astronauts who spent more than a total of a month in space experienced a variety of issues in the optic nerves and eyeball. Can you develop a new method or technology that will help lessen this acute medical issue?



Satellite Systems

- LTA's recent press release on the potential implementation of a satellite based ERP system is a step into the future. Could a similar satellite system be leveraged on to augment our air traffic control network, providing better detection, response and coordination in the wake of recent air disasters?



Prof. Lui Pao Chuen, Chairman SSTA and Advisor NRF, addressing the audience at the award ceremony 2009



RADM Harris Chan, our Guest-of-Honor for the Awards Ceremony 2015 with the 1st Runner Up from NUS



Prof. Lui, Mr. Quek Gim Pew, DSO Chief Executive and Mr. Matthew Halferty, AGI viewing participants' Projects at the SSC exhibition showcase



Singapore Space Challenge In The Press

Space race

Seven engineering students from India and Sri Lanka win second prize in the Singapore Space Challenge

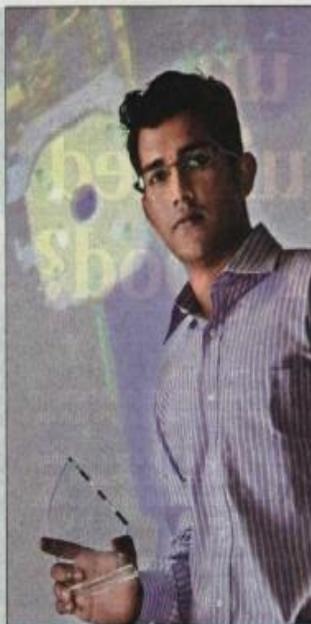
SHEELA NARAYANAN

THEY knew very little about space – other than what Star Trek and all the other science fiction movies told them – and even less about space science.

But when the advertisement for the Singapore Space Challenge popped up around campus last September to design a satellite, Nanyang Technological University (NTU) engineering student, Chandrasekar Sureshkumar persuaded his six friends – all engineering students from India and Sri Lanka – to form a group and submit their proposal.

The 23-year-old electrical and electronic engineering student said: "Most of the group members thought it would be stressful as we would have to do this on top of our studies. But I thought the competition would be a good stepping stone to learn about space science."

So they plundered textbooks and even had one of



Mr Chandrasekar picking up the second place trophy on behalf of his team members with an image of their satellite design behind him.
PHOTO: SINGAPORE SPACE CHALLENGE

their lecturers take time out of his busy schedule to give them a private tutorial on space science. And since most of them were working at their respective internships in December, they burnt the midnight oil daily, worked through their weekends and skipped their annual trips back home, to finish their submission.

Organised by the Singapore Space and Technology Association and the Centre for Research in Satellite Technologies at NTU, the competition had teams from various institutions design a satellite or system of satellites for launch into Low Earth Orbit.

The satellites must be able to monitor the seaways around Singapore and neighbouring countries, pick up distress signals to help search and rescue operations and monitor pirate activities in the region. Teams had to submit a detailed mission paper and computer simulation of the satellite system for the competition.

Mr Chandrasekar's team may not have won – it was pipped into second place by NUS High School which took the top prize of \$10,000 – but they are not disheartened.

"We didn't think about going into it to win, though that would have been good. We learnt a lot from the competition – we went from knowing nothing about space science to coming up with a satellite design," he said.

In its second year, the competition saw a jump in the number of applications from the various junior colleges, polytechnics and universities – from eight to 22.

Professor Lui Pao Chuen, adviser to the National Research Foundation who presented the prizes to the top three teams on June 25, said: "Designing a satellite system is a complicated process and no small feat, especially since the students had to manage the demands of this project over and above their regular school work."

"I was very impressed with the detailed work and strong display of innovation and creative thinking."

➔ sheela@sph.com.sg

Pirate-tracking system wins prize

BY CHANG AI-LIEN
SCIENCE CORRESPONDENT

A TEAM of students has designed a satellite system which provides an eye in the sky to identify and track pirate ships.

The four NUS High School of Mathematics and Science students came up tops in this year's Singapore Space Challenge, winning \$10,000 for their effort.

The competition – open to students aged 15 and above – aims to get more students interested in space-related activities, as well as educate people about space

technology. It was organised by the non-profit group Singapore Space and Technology Association (SSTA), in partnership with the Centre for Research in Satellite Technologies at Nanyang Technological University.

This year, the teams had to design satellites which could keep an eye on seaways around Singapore and neighbouring countries, pick up distress signals for search and rescue operations and monitor pirate activities.

Members of the winning team started work on the project in January.

They often worked through the night to familiarise themselves with designing and conceptualising satellites, said team member Ong Hao Yi, 18.

The three satellites – a master satellite and two revolving micro-satellites – work together to create a three-dimensional image of each ship, rather than the two-dimensional images available now, he explained.

By setting up a communication network with legitimate vessels plying the waters, the system was able to pinpoint pirate ships – and could even provide their dimensions.

SSTA president Jonathan Hung said: "With the Singapore Space Challenge, we hope to generate a better understanding of the relevance of space technology in everyday life."

"It's not just about launching astronauts into space on missions."

In fact, space technology has applications in many industries, including communications, oil and gas, defence, transport and logistics, he said.

This year's competition, for example, highlighted how the field was critical in supporting marine operations and security.

This is the second year that the competition was held. The 22 teams taking part included those from tertiary institutions, junior colleges and high schools.

Registration for Singapore Space Challenge 2010 will open next month.

Those interested can look up <http://www.space.org.sg/> for details.

Singapore Space Challenge

Site Visit

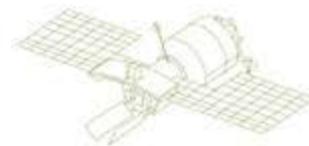


**EADS SITE VISIT @
SELETAR AEROSPACE PARK
21ST DECEMBER 2010**

Lectures



**Singapore Space Challenge 2011
AGI- STK Software Training
25-26th November**





SPACE ACADEMY SINGAPORE INAUGURATION CEREMONY 2010



Witnesses from L-R, standing: Prof. Lui Pao Chuen, Advisor, MFA, NRF and SSTA; Mr. Quek Tong Boon, Chief Defence Scientist; Mr. S Iswaran, Minister for Trade and Industry (Industry); Mr. Todd May, Special Asst. to Director, Marshall SpaceFlight Centre, NASA; Mr. Quek Gim Pew, CE, DSO National Laboratories; Mr. Tan Peng Yam, CEO, DSTA; COL Martin France, Head of Astronautics Department, USAFA

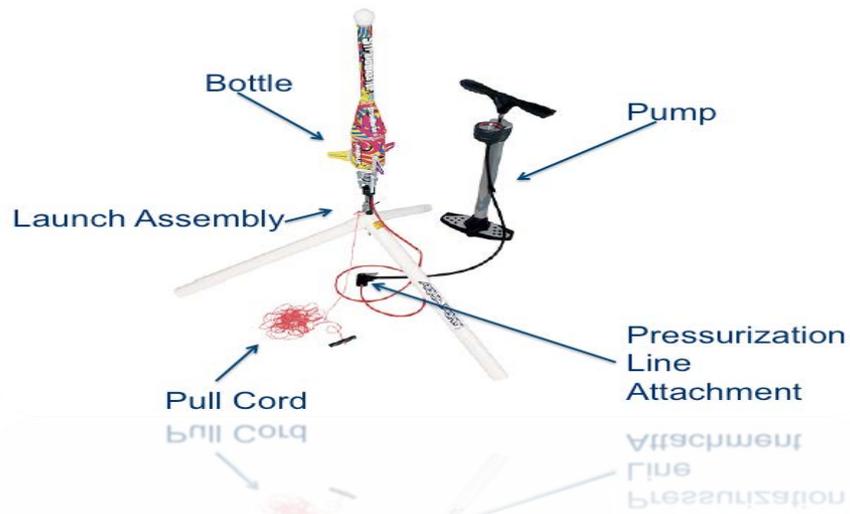


Rocket Propulsion

- Learn the theory, history and modern approaches to rocket propulsion and rocket design
- Hands-on! Working as a team to build high-pressure water-rockets and evaluate your design through a flight test
- Systematic review of activity: Compare computer simulation results, analysis, and flight data

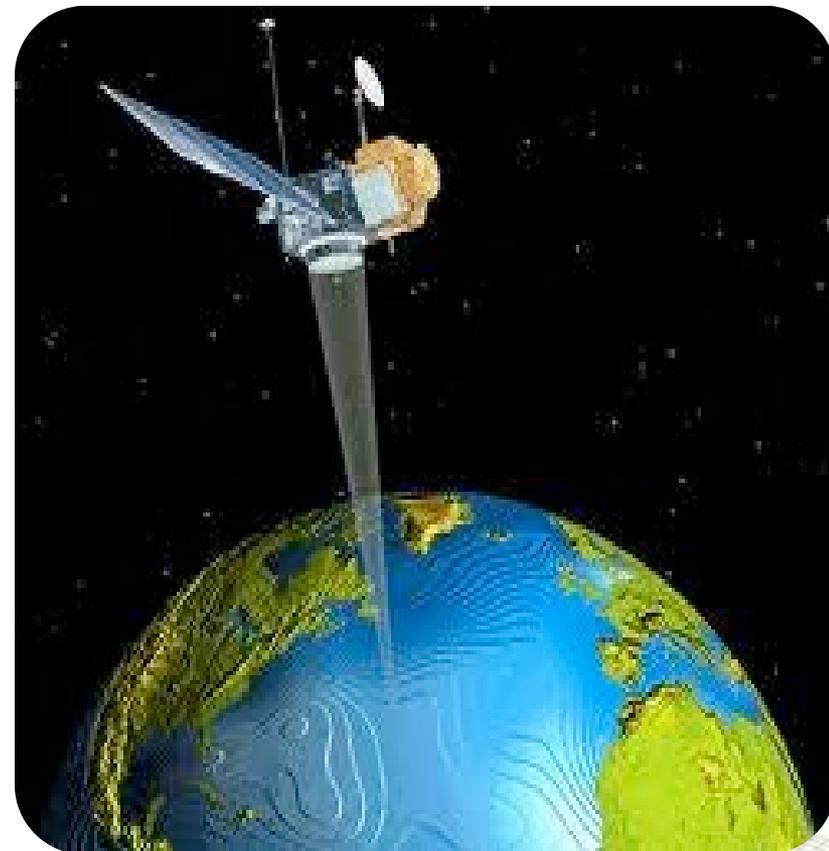
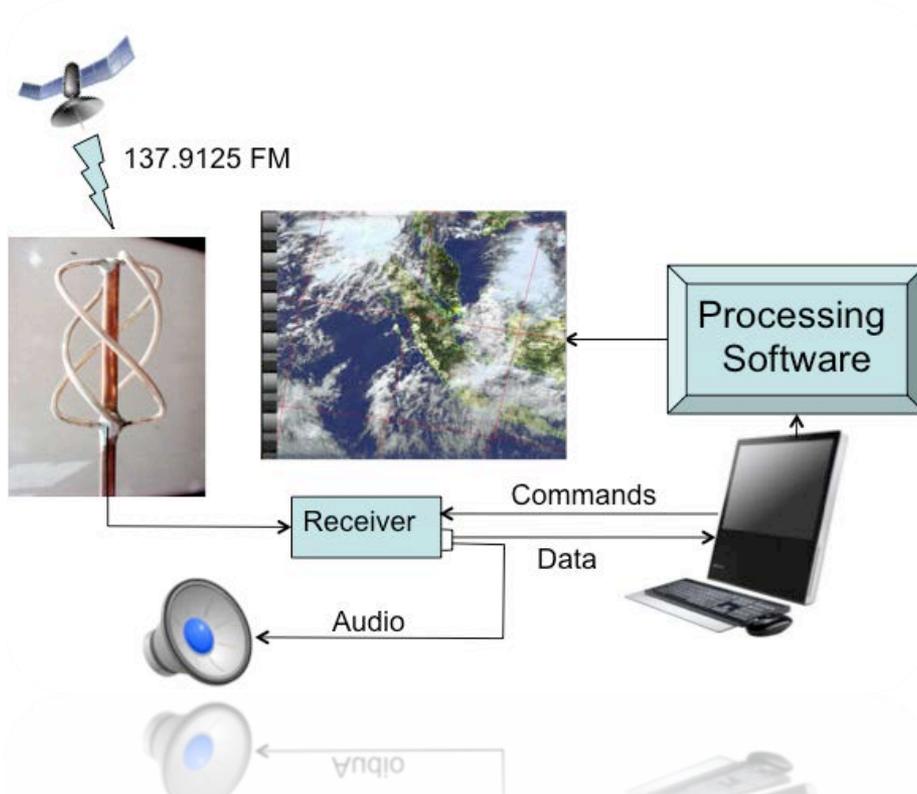
$$x_p = c \frac{t_p}{\zeta} \left[(1 - \zeta) [\ln(1 - \zeta) - 1] + 1 \right] - \frac{gt_p^2}{2}$$

Launch Setup



Satellite and Communication

- Downlink data from a satellite over Singapore!
- Understand how satellite orbits affect global communications
- Learn the fundamentals of antennas and ground stations





Advanced Robotics Systems

- Moon/Mars Rover Control Mission!
- Operate robotic and explore simulated Mars terrain
- Situational awareness





28th June 2010



Beaming up starry-eyed kids

Academy offers insight into aerospace studies

By Gina Chua

AS A child growing up in the 60s, I had a dream of becoming an astronaut. I was fascinated by the idea of space exploration and the possibility of life on other planets. I was inspired by the Apollo moon landings and the Space Shuttle program. I was captivated by the stories of astronauts and the challenges of space travel. I was determined to become an astronaut and to explore the unknown.

Fast forward to the 21st century. The dream of space exploration is still alive and well. The Space Shuttle program has ended, but the dream of space exploration is still alive and well. The Space Shuttle program has ended, but the dream of space exploration is still alive and well. The Space Shuttle program has ended, but the dream of space exploration is still alive and well.

4th December 2010



Instructor Tan Heng Sun (left), 34, watching over Anglo-Chinese School (Independent) student Koh Ying Wei, 15, as he puts nuts and bolts on a plastic bowl underwater. Astronauts use this exercise to simulate making repairs in space.

Aspiring astronauts get to 'float in space'

By Lester Koo

IT WAS the equivalent of a total space immersion programme for a group of students aged between 13 and 20. Literally.

This week, 26 aspiring astronauts got to experience weightlessness while attending the Space Academy Singapore programme.

They plinked 4m into a Naval Diving Unit (NDU) pool and secured nuts and bolts onto a plastic board, guided by diving instructors from the NDU and former National Aeronautics and Space Administration engineers.

This is exactly the kind of training astronauts receive before embarking on a space repair mission. The exercise, which was part of an intensive five-day programme that ended yesterday, was held at the Ngee Ann Polytechnic under the watchful eyes of space engineers and technicians.

Organised by the Singapore Space and Technology Association (SSTA), it was the second programme of a series, through the first to simulate weightlessness. The first one was held in June.

Other activities included workshops in astronautics and satellite, launching bottle rockets and

SPACE ACADEMY MEDIA

Latest! 8th June 2011

Students design, build and launch water rockets

ALVINA SOH
alvinasoh@mediacorp.com.sg

SINGAPORE – More than 20 students had the chance to launch their own rockets in a special space training programme at Republic Polytechnic yesterday.

The Space Academy Singapore, jointly organised by the Singapore Space and Technology Association (SSTA) and United States-based aeronautical engineering company TriVector International (TVI), wants to develop interest among students in the space industry.

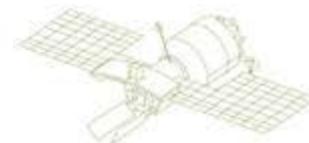
Students from various secondary schools, polytechnics and universities designed, built and launched their own water rockets with former staff from the US space agency, NASA, as teachers during an intensive five-day space training programme. The rockets make use

of pressurised water to propel them skyward.

Mr Samuel Mathews, SSTA's director, said the programme hoped to promote science and engineering in students. They were taught astronautics, rocketry and systems engineering during the programme.

He said: "They want to go into leisure or tourism, or finance and banking, because that's where the glamour is. That's where the money is. So we want to bring the students back into engineering, because that is where we feel that the whole economy can grow on because that is where you find people building things, inventing things."

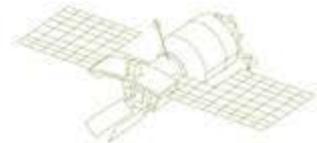
More than 100 students have participated in the programme since it started in June last year.





SAMPLE OF SUCCESSFUL TAILORED PROGRAMMES

- DSTA/DSO Young Defence Scientists Programme (YDSP)
- DSTA/DSO Young Engineers and Scientists Programme (YES)
- Learning Lab's Future Leaders Programme
- MOE (Higher Education Programme)
- Raffles Institution Customized Programme
- National Engineer's Day Student Ambassadors Programme
- National Cadet Corps Astronautics Wing Programme





Gifted Education Programme



Ms. Smrithi (right) participated in the First Space Academy Singapore when she was in RGS.

Currently studying in NTU and she is the President of SSTA Youth Club

Smrithi was awarded the Best Cadet at the inaugural Space Academy by Dr. Michael Griffin (left), former NASA Administrator

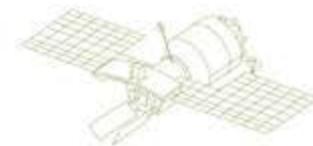




PHOTO GALLERY



Thank You



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