





- The UAE is one of the most ambitious countries in space and is a major player in the Gulf and Arab World
- The UAE is very active and is developing:
 - Interplanetary missions
 - Geostationary satellite communications
 - Remote sensing missions
 - Educational missions
- The UAE is developing the infrastructure necessary to have a sustainable space programme in the country

- The UAE space programme is diverse and includes:

Government:



Commercial/Private:



Universities:

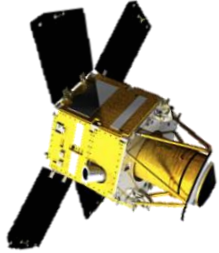


جامعة الإمارات العربية المتحدة
United Arab Emirates University



- Emirates Institution for Advanced Science and Technology (EIAST) was established in February 2006.
- On April 18th, 2015: a decree has been issued to incorporate EIAST in the newly established:

Mohamed Bin Rashid Space Center (MBRSC)



مؤسسة الإمارات للعلوم
والتقنية المتقدمة
EIAST



مركز محمد بن راشد
للفضاء
MOHAMMED BIN RASHID SPACE CENTRE

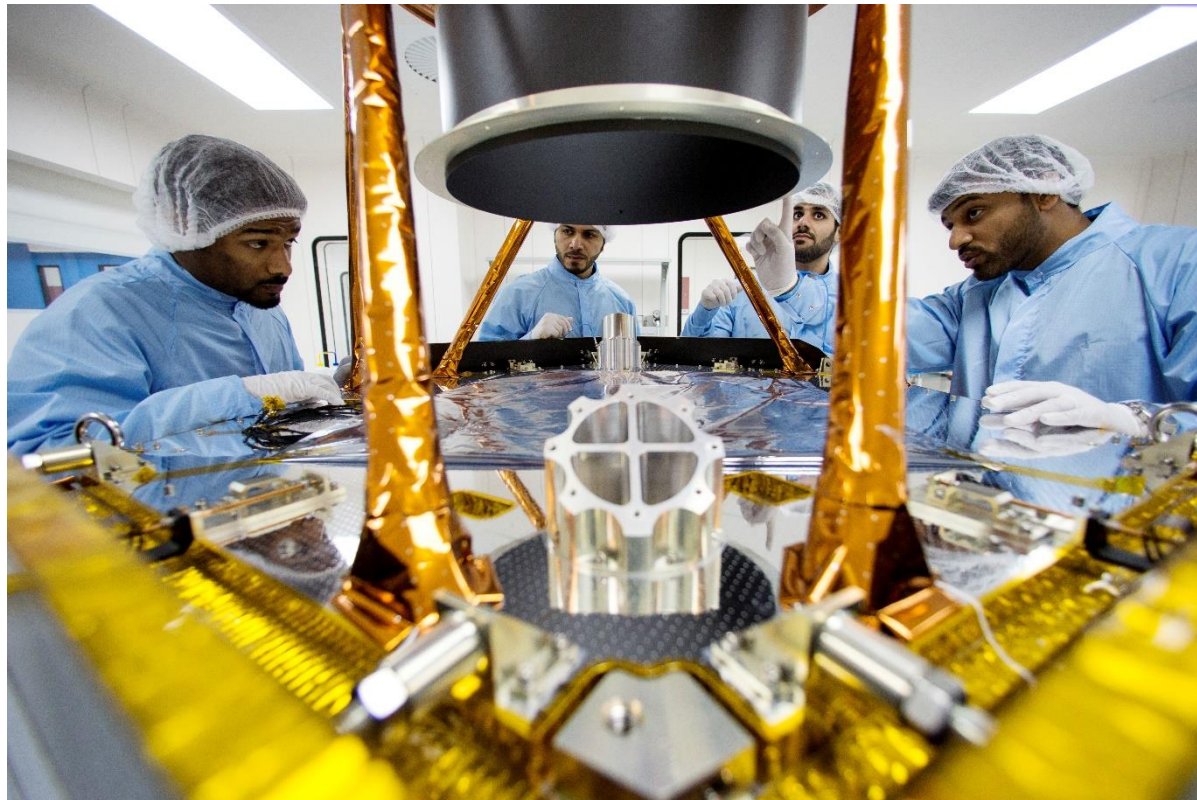
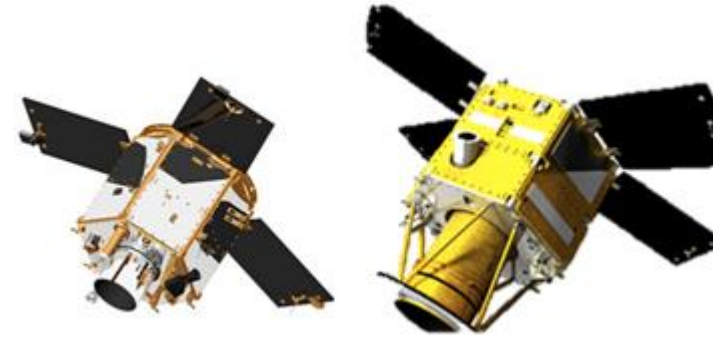


- Main Goal:

“Nationalize the development of space systems and contribute to the field internationally”

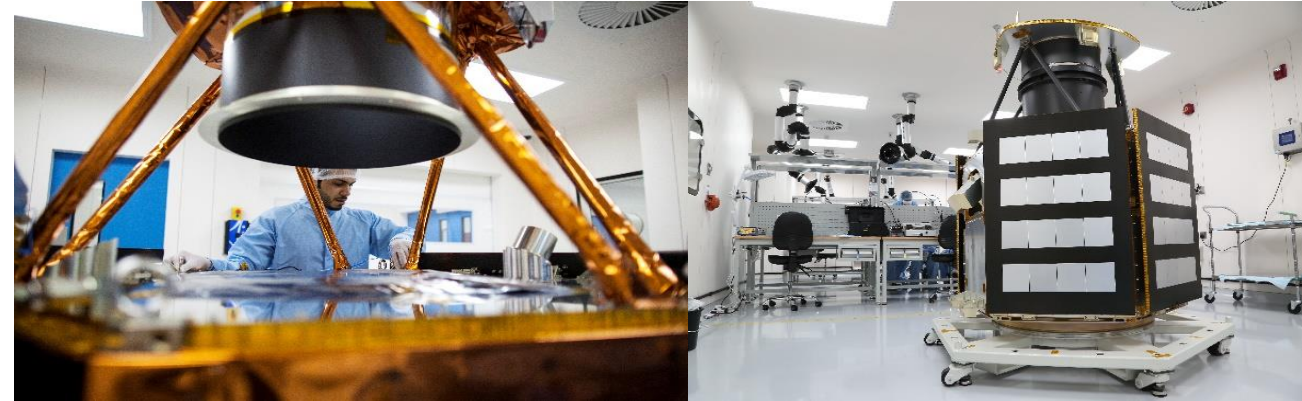
Main Objectives:

- Tech and Know-How Transfer for satellite Development
- Continuous Manpower Development
- Meeting the continuous need of spatial information and EO data of the UAE



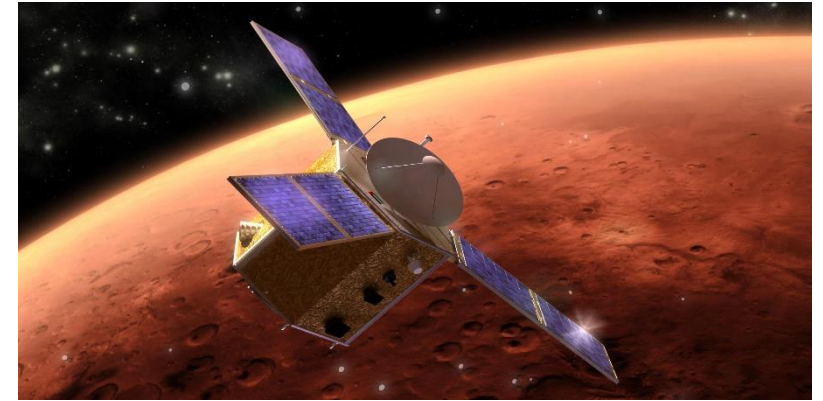
	DubaiSat-1	DubaiSat-2
Altitude (km)	680	600
Mass	~ 200 kg	< 300 Kg
Spatial Resolution	PAN 2.5m, MS 5m	PAN 1M, MS 4m
Data Quantization	8-bits	10-bits
Mass Storage	64 Gbits	256 Gbits
Imaging Modes	Single Strip	Single Strip Fast Multi-Strip Single Pass Stereo
Data Download Speed	30Mbps	160Mbps
Swath Width (km)	20	12
Launch date	29 th July 2009	21 st Nov 2013

- KhalifaSat is MBRSC's 3rd Earth Observation Satellite.
- 100 engineers working on it
- The four year programme to develop KhalifaSat began in 2013.
- 0.70 cm resolution
- Signed launch agreement with Mitsubishi Heavy Industries, Ltd (MHI); to launch KhalifaSat together with GOSAT-2 onboard H-IIA launch vehicle in Q1 2018.
- Current Status: Manufacturing Flight Model, should be completed by Q3 2017.



Emirates Mars Mission: Al-Amal Probe

- The UAE Space Agency and MBRSC signed an agreement in October 20th, 2014; to build the first Arabic-Islamic Mars space probe.
- Strategic Objective: “to build Emirati technical and intellectual capabilities in the fields of aerospace and space exploration to make use of space technology in a way that enhances the country’s development plans”
- Scientific Objective: “EMM will, for the first time, explore the dynamics in the atmosphere of Mars on a global scale. It will provide holistic, global and diurnal understanding of the atmospheric dynamics of Mars
- **Current Status:** CDR in May



Programme Partners:





- Completed Phase 1 and 2 which comprise a clean room for the manufacture of satellites, an electrical laboratory, a mechanical lab and the high-bay area.
- MBRSC Manufacturing Facility can accommodate all manufacturing activities for our earth observation satellites and the Emirates Mars Mission.
- Phase 3 will include the complete satellite testing facilities that will be operational by 2019

- What is the rationale for emerging Space Programmes, specifically the UAE?
- Why is the UAE investing over 5 billion USD in its Space Activities?
 - Economic diversity
 - Post oil economy
 - Education and outreach
 - National capability development through Technology and knowhow transfer
 - SME eco system development around government space programme
 - Manufacturing taking place in the UAE
 - Creating high tech jobs
 - National pride

- Challenges and opportunities facing new actors?
 - Challenges:
 - Technology transfer restrictions
 - Export licenses and ITAR
 - Private sector partnership – TRUE partnership, linked to the first two points
 - Space debris – more small sats, more congestions = space security and sustainability issues which can = more restrictions or resistance to these activities by emerging space players
 - Cooperation in-between emerging state actors is lacking

- Challenges and opportunities facing new actors?
 - Opportunities:
 - Successful technology transfer programmes can promote best practices in the space domain
 - Usually starting later and can learn from the success and failures that came before.
 - Cooperation can increase the benefits to all, we would be able to achieve larger more expensive projects eg ISS 2.0 with emerging nations participation
 - New space entities have many synergies with emerging government space actors and this can be an opportunity for both
 - In the UAE's case we are open to cooperate with all nations which can speed up our activities and goals

- Emerging and established actors need to agree on what constitutes acceptable behavior in space, or their combined activities may threaten the long term usage of space.
- Cooperation and partnerships are very helpful to support best practices and support the responsible use of outer space as they build trust and strong relationships
- A Question: The UAE's mars 2117 plan, could this be the start of an ISS 2.0? Could this be a partnership of all nations new and old?



Thank you!