



Innovación Tecnológica: Beneficios para la Humanidad

Expo-Ciencias Latinoamericana

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Mission Operations Integration

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Educación e Investigaciones

Experiencia Laboral

Tecnologías y cómo pueden participar

Agenda

- Satellite Applications
- Microgravity Countermeasures
- ISS – National Laboratory
- Lunar/Mars Structures
- Analog Missions
- Robotics
- Lifecycle Systems Engineering-HSI
- Planetary Defense
- Paper on SASA



Satellite Applications

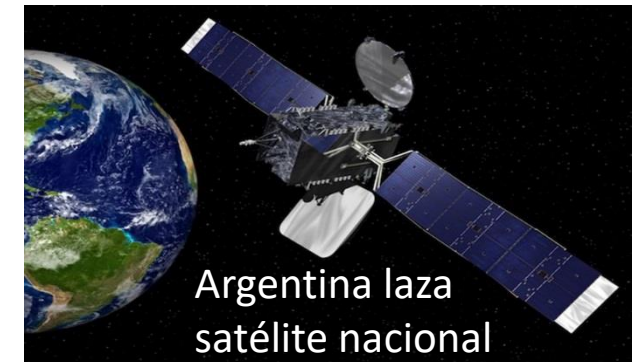




Table 1

Satellites and leading institutions in South American countries.

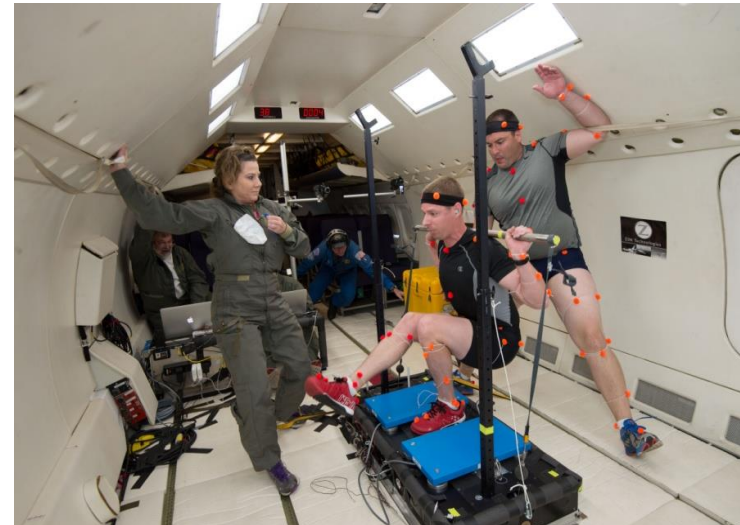
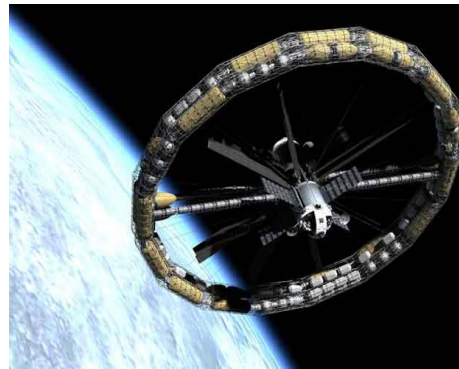
		Dedicated Institution	Satellites	Ground Segment	Launcher/Sounding Rocket	Launch Sites/Integration Facilities
Argentina	Historic	CNIE(1960–1961)	7		20	
	Current (Planned)	CONAE(1991)	2(8)	6(1)	0(1)	1
Bolivia	Historic					
	Current (Planned)	ABE(2010)	1(1)	2	0	0
Brazil	Historic	GOCNAE(1961)	12			
	Current (Planned)	AEB(1994)	3(9)	3	1(1)/6	2/1
Chile	Historic	ACE(2001)				
	Current (Planned)	Consejo de Ministros(2013)	2(1)	1	0	0
Colombia	Historic					
	Current (Planned)	CCE (2006)	1(1)	0	0	0
Ecuador	Historic	CLISREN(1982)				
	Current (Planned)	IEE(2012), EXA(2007, civil)	2	1	0	1
Guayana	Historic	–				
	Current (Planned)	–	0	0	0	0
Paraguay	Historic					
	Current (Planned)	AEP(2014)	0	0	0	0
Peru	Historic					
	Current (Planned)	CONIDA(1974)	4	1	2	1/0
Suriname	Historic	–				
	Current (Planned)	–	0	0	0	0
Uruguay	Historic					
	Current (Planned)	FAU	1	1	0	0
Venezuela	Historic					
	Current (Planned)	ABAE(2005)	2	2	0	0/(1)

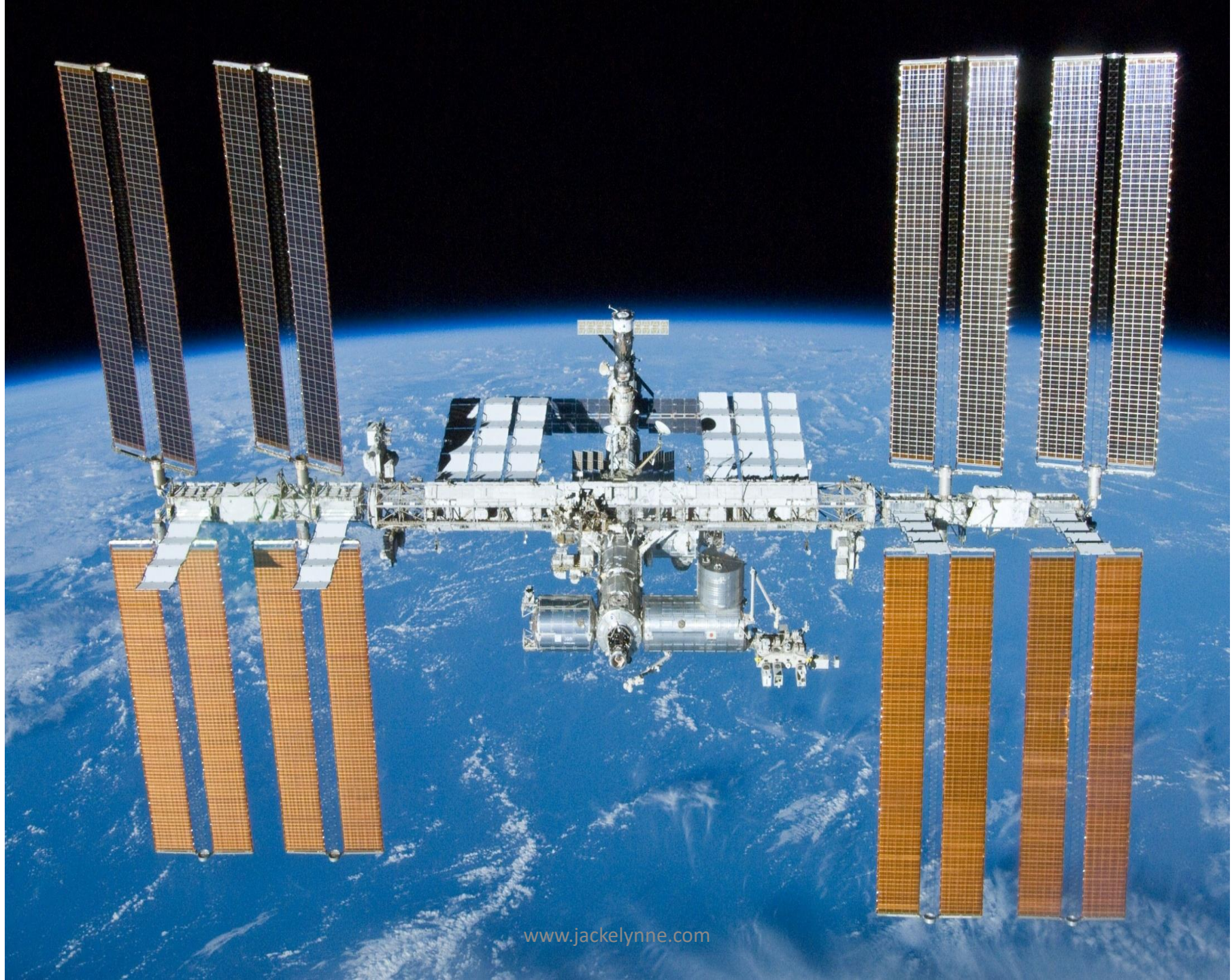
[Exploring opportunities and challenges for establishing a South American Space Agency](#)

Silva-Martinez, J., Aguilar, A., Sarli, B., Pardo, M., Sorice, A., Genaro, G., Ojeda, O. (2018). "Exploring opportunities and challenges for establishing a South American Space Agency", Acta Astronautica Journal, March 2018, Published by Elsevier.

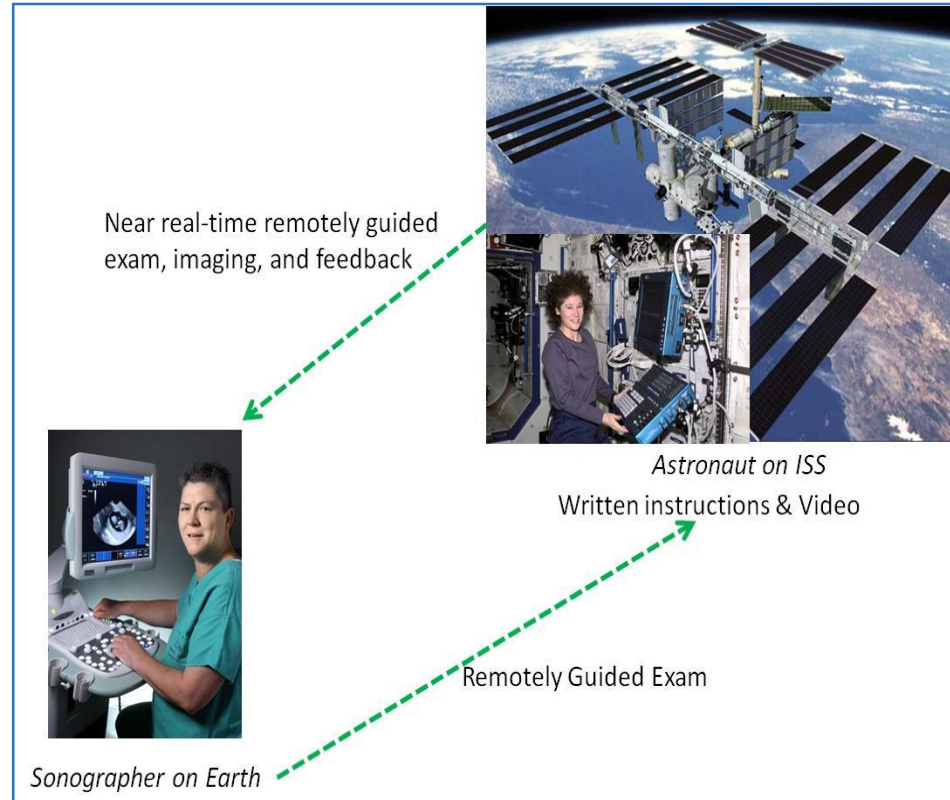
Microgravity Countermeasures

- Bone-Mechanics
Crystallization rates for
subculture of cells
- Bone-loss: Osteoporosis
- Telemedicine
- Artificial Gravity





Telemedicine in Space



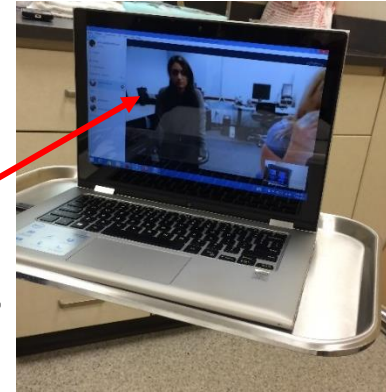
Telemedicine in Space

Remotely Guided Breast Sonography

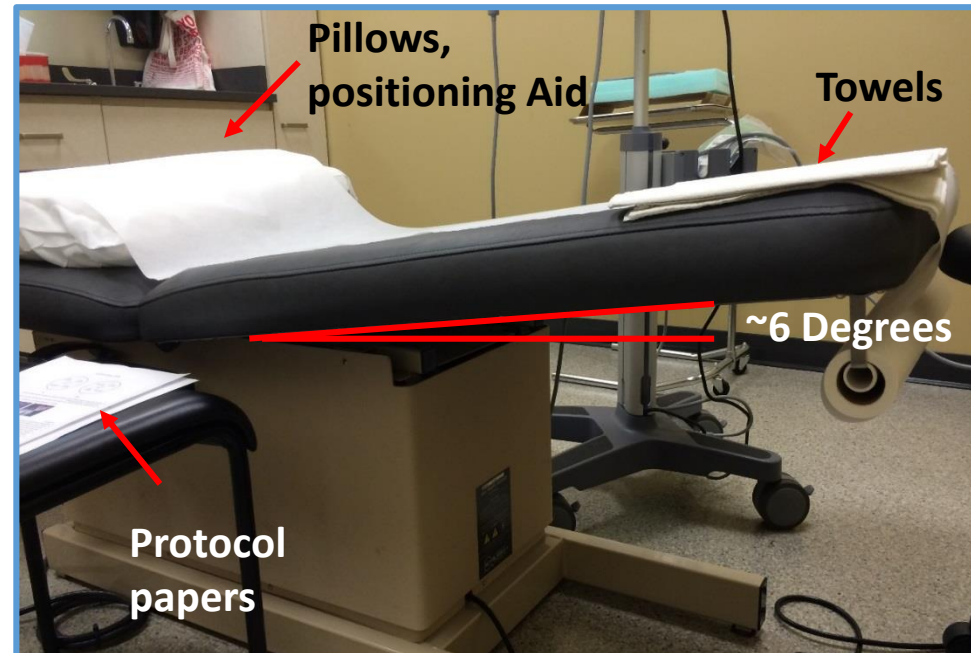
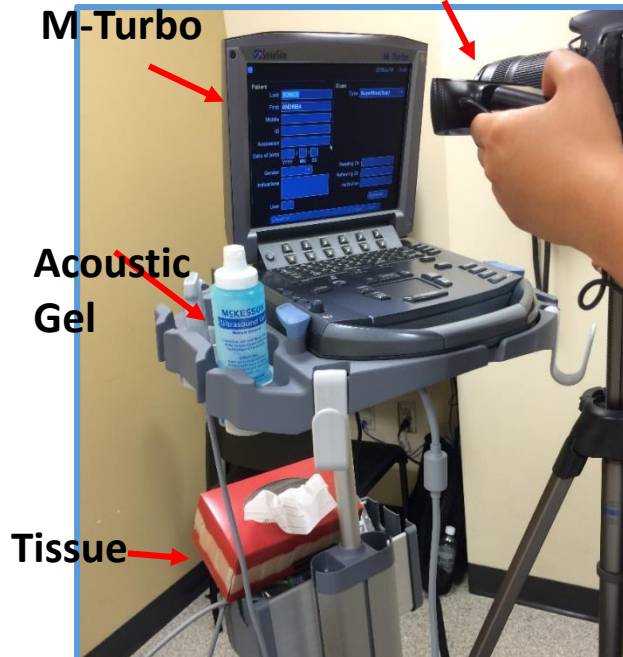
Ultrasound Machine, Sonosite M-Turbo

Camera for Storage data

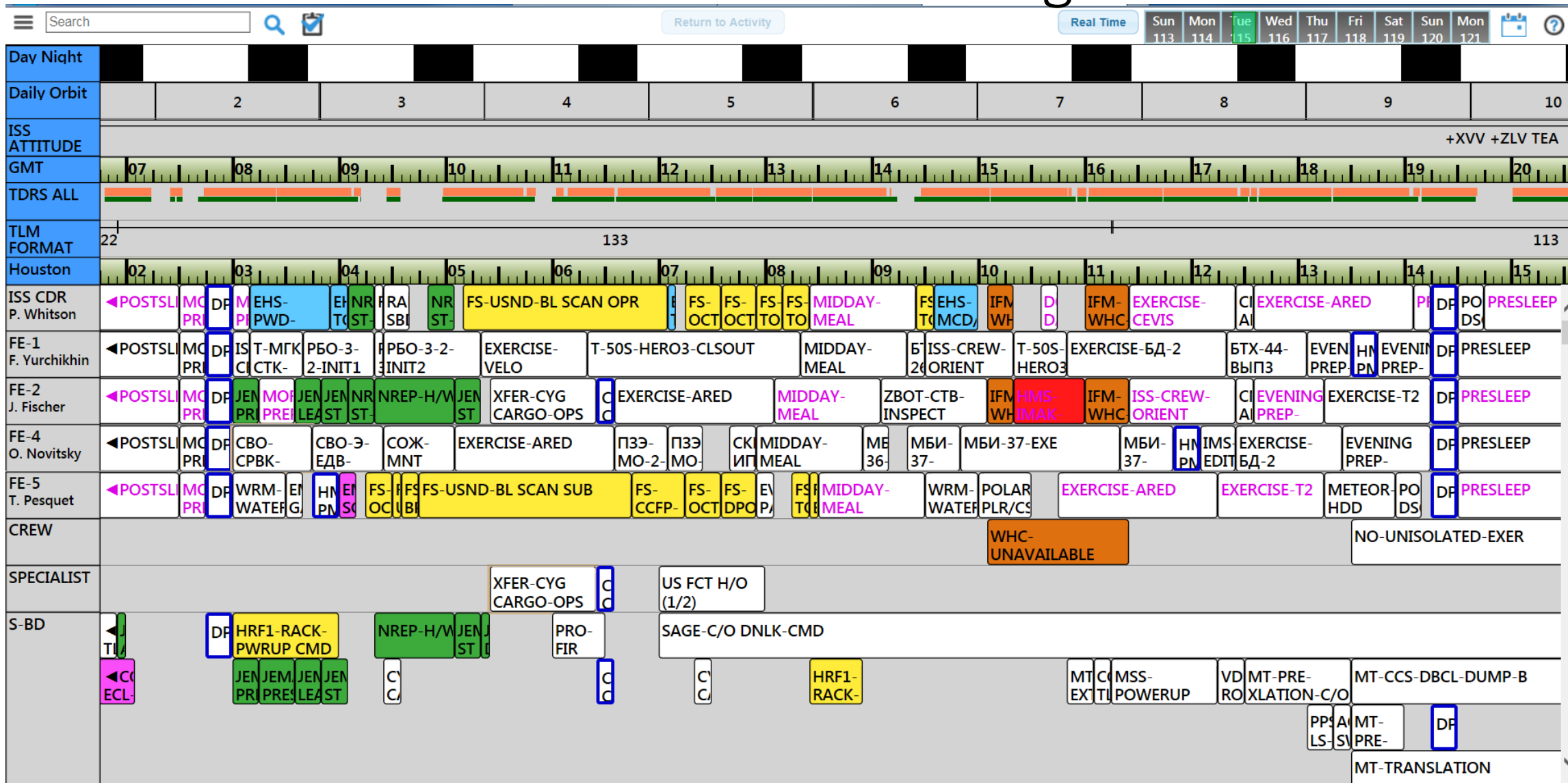
Remote Sonographer



Linear Array Probe

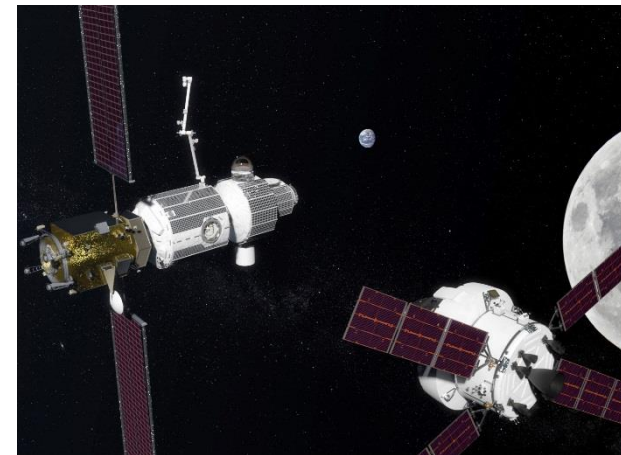
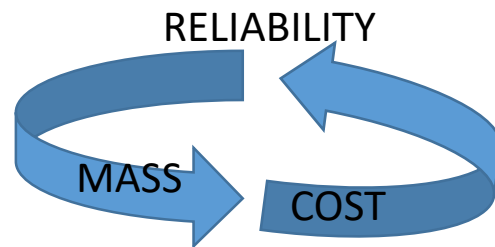
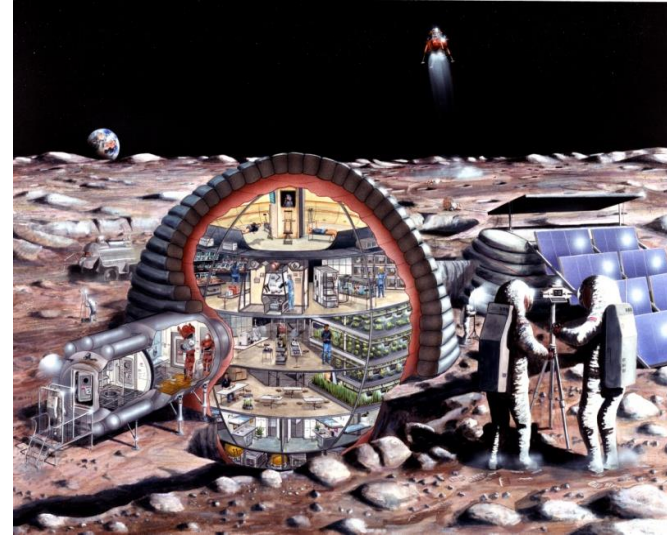


Crew Autonomous Scheduling Test



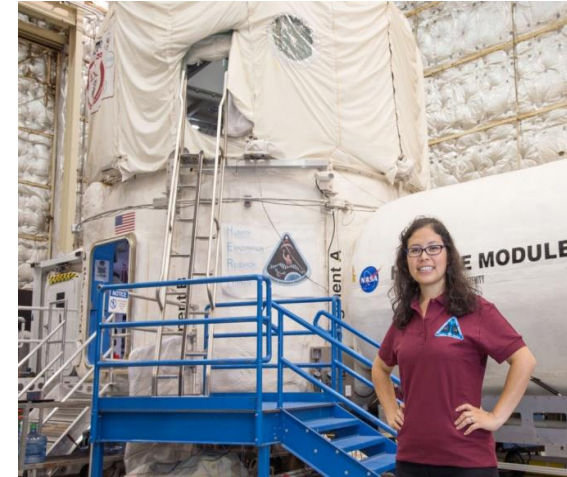
Lunar/Mars Structures & Architectures

- Risk quantification
- Trade analyses of exploration architectures
- Reliability analysis
- Proposed base concepts
- Psychological aspects



Analog Missions

- MDRS
- MOONWalk
- HERA
- NEEMO
- HI-SEAS
- Antarctic Stations



<http://www.nasa.gov/analogs>

Mockup Evaluations

- EVA suits
- Crew survivability
- Usability tests
- Human-in-the-loop tests



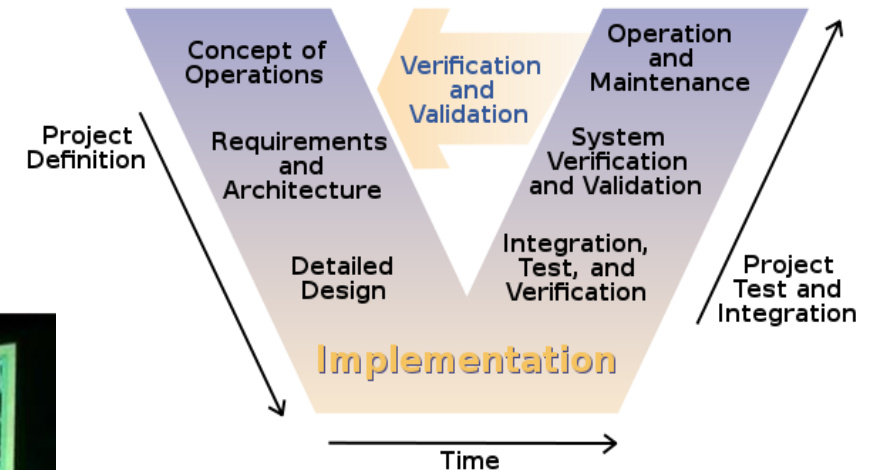
Robotics

- Exploration missions to deep-space
- ISS Robotic Arms
- UAVs
- Planetary geology
- Microbiology
- Human in the loop



Lifecycle Systems Engineering

- Collaborative Aerospace Program (SoS)
- Human Factors in Aerospace Systems
- Human Systems Integration
 - Human-computer integration
 - Human-in-the-loop evaluations
 - Human-centric design



**Technical + Management to include human considerations
to minimize human error at the operational level**

Getting more attention!

- Lunar Orbital Platform - Gateway
- Artificial Gravity
- Planetary Defense
 - Detection
 - Deflection
 - Evacuation & Rescue
 - Outreach & Education
 - Global Collaboration





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Keep Exploring!
¡ Sigan Explorando!

Thank you!
¡ Gracias !

BACK UP SLIDES







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