How COVID-19 is affecting the New Space and How engineering education can be realized in difficult time?

Jyh-Ching Juang
Department of Electrical Engineering
National Cheng Kung University, Taiwan

UNISEC TAIWAN
University Space Engineering Consortium

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- Space engineering: resilence and sustanability as COVID-19 spreads
- Engineering education
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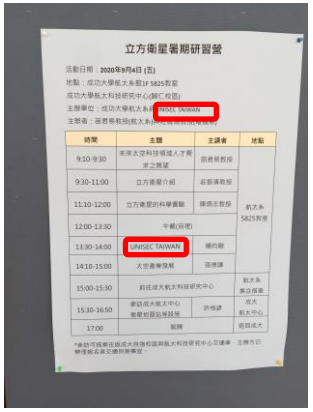
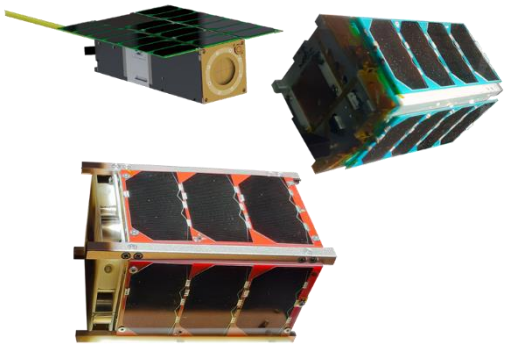
UNISEC-Taiwan in 2020

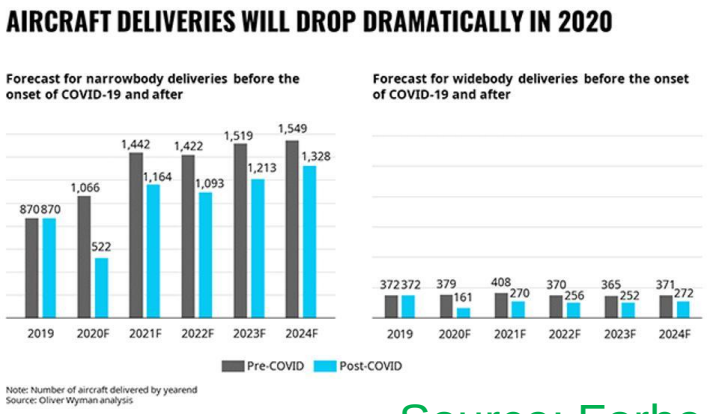
- Member universities
  - National Cheng Kung University
  - National Central University
  - Tamkang University
- Activities
  - Three CubeSats are planned to be launched in Dec.
  - One summer camp in Sep.
    - CubeSat training
    - 50+ students



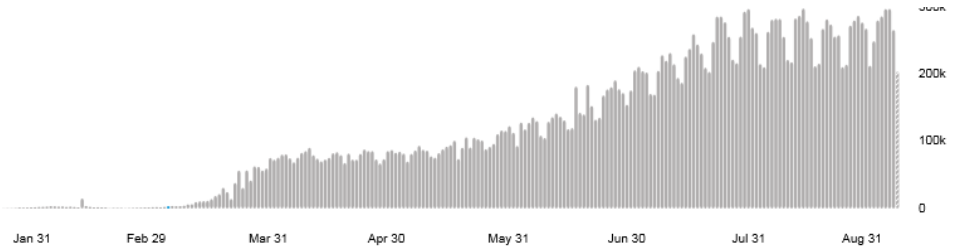


COVID-19

- According to World Health Organization (WHO)
  - *Globally, as of 1:52pm CEST, 8 September 2020, there have been 27,236,916 confirmed cases of COVID-19, including 891,031 deaths, reported to WHO.*
- Impacts: huge



Source: Forbes

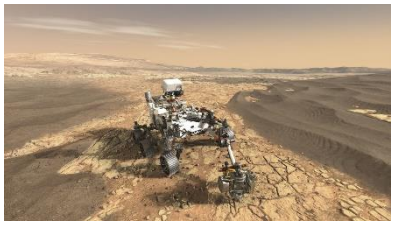


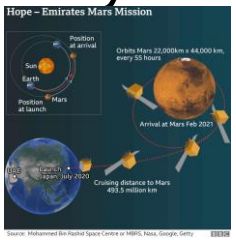
Source: WHO

- A joke:
  - COVID-19 creates Space Engineers

Space in 2020

- In 2020, space activities proceed even being affected by COVID-19
  - Mars missions
    - UAE, China, USA
  - Global navigation satellite systems
    - Beidou becomes operational
  - Starlink constellation
    - Continue to build up
  - SpaceX first manned mission to International Space Station (Crew Dragon)
  - Vega launch
    - 53 satellites





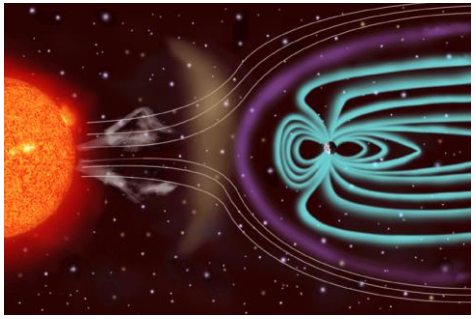
Source: NASA, CNSA, UAESA

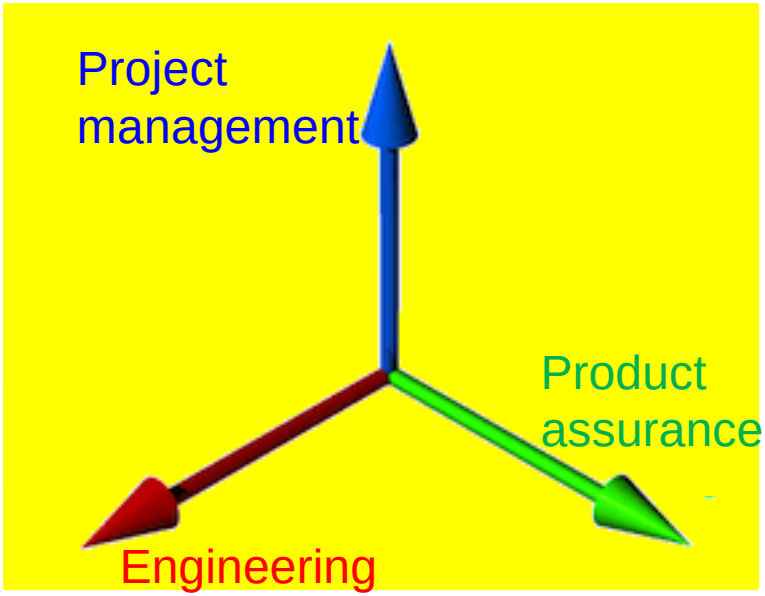
Source: SpaceX

- In comparison with other business sectors, space business appears to be robust and resilient. Why?

Three Pillars in Space Engineering

- Space engineering: a challenge is to design a system that is operational in *another* environment.
- Three pillars
  - Project management
  - System engineering
  - Product assurance
- Product Assurance
  - Not just do it, do it right
  - Quality assurance
  - Risk management
  - Critical item control
  - Safety
- We anticipate risks and prepare for foreseeable and unthinkable factors.





Post COVID-19 Era

- Recommendations from KPMG
  - Work across multiple time horizons in strategic planning and risk management.
  - Put emphasis on long-term competitiveness of the company in investor engagements.
  - Integrate interests of key stakeholders in key decision-making processes.
  - Align all COVID-19 responses with the corporate purpose and values.
  - Assess the ability to enhance the resilience of the company

Déjà vu ?

- Space system engineering appears to be the solution or, at least, we have been trained to think along this direction and embedded crisis management and response into our DNA.

Space Engineering Education

- UNISEC Vision 2030
  - Training program
  - Forum, conferences, technical competitions
  - Debris awareness and solutions
  - Support global space projects initiated by member universities
- Training, hands-on project, and team-work/discussions which are essential in a university space program are affected as COVID-19 spreads.
  - Go virtual
- Positive thinking
  - Better documentation skills
  - More thoughful planning

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