

EGR 304 Embedded Microcontroller Systems Spring, 2020

Friday, March 20, 2020

A virtual live classroom practice meeting in preparation for resuming class on Monday
Including an overview of the 2020 IEEE Aerospace Conference

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Take-away point #1

Militarization of Space.

Global Positioning System

Antisatellite missiles—but resulting space debris harms everyone

Difficult to distinguish scientific work from military work done in space.
Space stations especially offer opportunities for both.

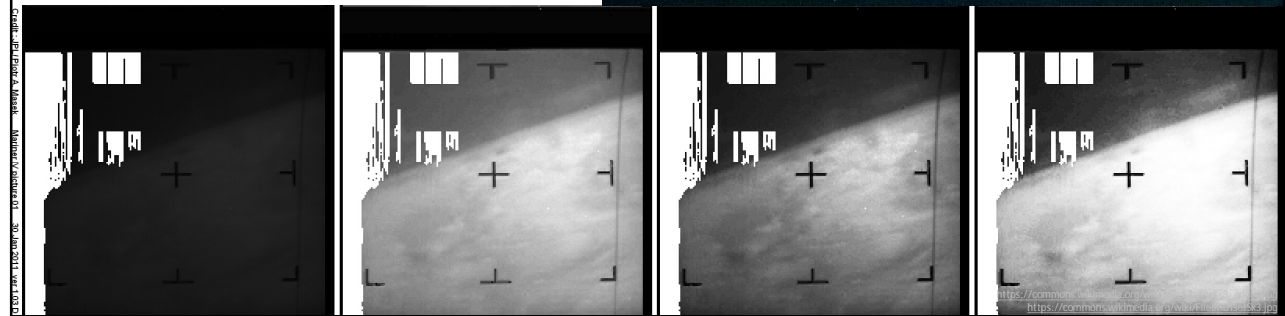


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Take-away point #2

There is a race to Mars in progress.

The first ever flyby of Mars: Mariner 4 from NASA,
Launched November 28, 1960
About a 5-year trip to Mars
Flyby on July 14, 15, 1965.



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Take-away point #2

There is a race to Mars in progress.

There have been many successful missions since Mariner 4

See table of artificial objects on Mars

https://en.wikipedia.org/wiki/List_of_artificial_objects_on_Mars

The moon is seen as a way station to Mars

<https://www.youtube.com/watch?v=vl6jn-DdafM>

Optimism abounds.

NASA contracts with private industry, e.g.

Elon Musk's SpaceX

<https://www.youtube.com/watch?v=jmc7aUVKCMA>



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Take-away point #3

NASA has several programs of significance in progress. Artemis an example



Artemis (follow on to Apollo) has two main sub-goals:

Lunar Surface Innovation Initiative

Utilize the Moon's resources

Test excavating and construction equipment

Develop long-term reliable life support

Practice for longer missions

Landers on Mars—Rovers—Sample return-to-Earth



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Take-away point #3

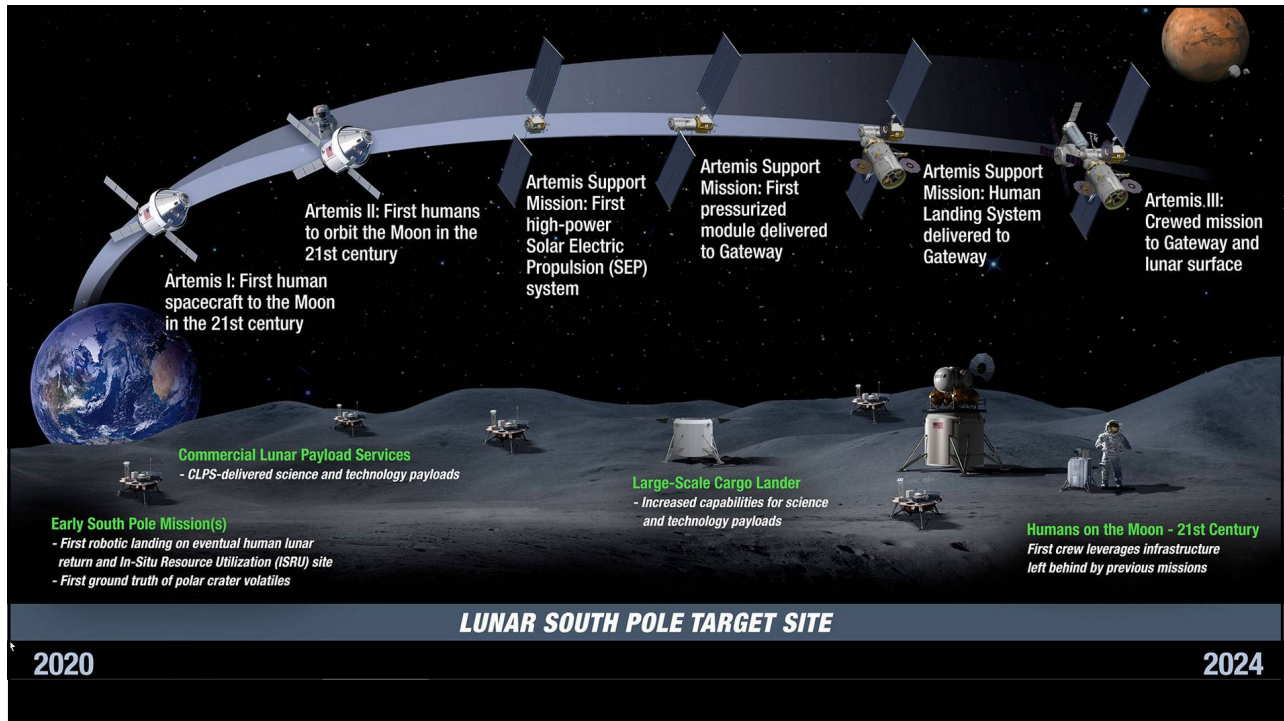
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Five billion dollars per year
 --From venture capitalists in the U.S.
 --Hoping to win NASA and other government contracts
 NASA is a funnel that directs taxpayer money to aerospace companies that will develop its projects.



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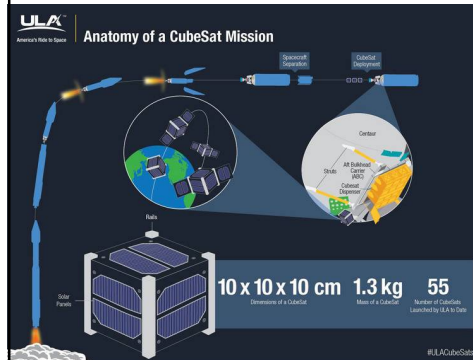


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Take-away point #4

CubeSat

CubeSat:
Affordable access to space for universities
There are a bunch of Arduinos and
Raspberry Pis in space!



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Take-away point #5

Science Isn't Fiction

Tractor beams!

"Physicists say they are close to showing it is possible to capture, hold, push and pull objects using beams of light over distances of up to 0.4 inches (1cm)."

<https://www.youtube.com/watch?v=fhq4Ld8ZMTU>

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