



ASTR 4800 - Space Science: Practice & Policy
 Today: **What did we learn from Apollo?**

–Next class: *The Origin & Evolution of the Moon* – guest lecture by Dr. Bill Bottke. Reading is on class webpage.

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1

Space in the News

Artemis 1 Launch Plans Slip Again
 Haley Smallwood

NASA is, again, pushing back the Artemis launch attempt due to more time needed for tank testing. Now, the earliest launch date has been pushed from September 23rd, to September 27th.

Class Question:
 In class, we have discussed the amount of money being poured into these projects and the different stake holders at play – while on one hand, continuously pushing back the launch date to ensure safety and success is very important, however, what are some of the negative reactions or perceptions that stakeholders may have towards NASA? Does this ruin their credibility? Does this foster doubt in the program?



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2

Science from Apollo: A new model for the formation of the Moon

- Moon formed from a collision between a proto-Earth and a Mars-sized body.
- What did Apollo add to this model?
 - Center of mass of Moon is offset from geometrical center.
 - Thicker crust on lunar farside.
 - Moon is geochemically different from Earth (more volatiles).

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3

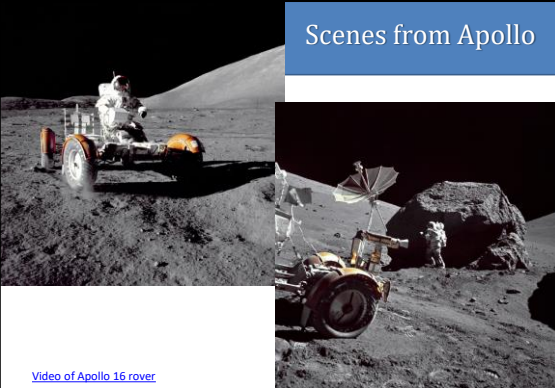
The Two Faces of the Moon

Near Side of the Moon	Far Side of the Moon
	

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4

Scenes from Apollo



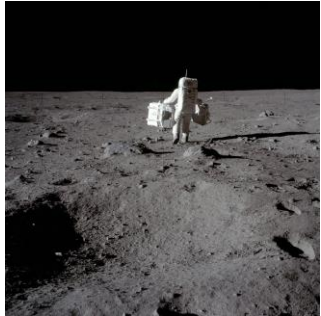
[Video of Apollo 16 rover](#)

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6

Class Exercise

List one reason why you believe Apollo was a success and one reason that it did not fully succeed.



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7

Was Apollo a Success?

YES	NO
First to the Moon	Didn't stay on Moon
Much new technology	Few real spin-offs
Systems Engineering approach to large problems	Didn't translate to solving other problems (e.g., Vietnam, poverty)
Boosted confidence in US	Discouraged by failure to translate
International partnerships	Suspensions from USSR & Europe
Exciting initially	Boring TV by Apollo 17

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9

The Military in Space During Apollo

- Passive military satellites. Active weapons would destabilize international situation (Outer Space Treaty of 1967).
- Prevent technological surprise.
- No manned military flights.



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10

Space Diplomacy in 1960's & 1970's

- Protection of US military space programs.
- Cooperation with USSR on arms controls and space science.
- Cooperation & competition with Europeans.
- Fleet of communication satellites.



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11

Why were last 3 Apollo flights scrubbed to focus on Shuttle? Long term impacts?

- Frustration with Vietnam and economy, Arab oil crisis, etc. in the 1970's.
- Was space race relevant any longer in the 1970's?
- Dream of low-cost, fully-reusable Space Shuttle.
- US abandoned manned space flight for a decade, although kept an active science program (e.g., Voyager, Viking programs).



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Liftoff of Apollo 17 from Moon

12