ASTR 4800: Space Science - Practice & Policy

- Today's Topic: The Legacies of Apollo
- Next Class: Guest lecture by Admiral Richard Truly, Shuttle pilot, former NASA Administrator and NREL director.
- Homework: Read web articles (link on course homepage) on Truly biography and History of Space Shuttle.

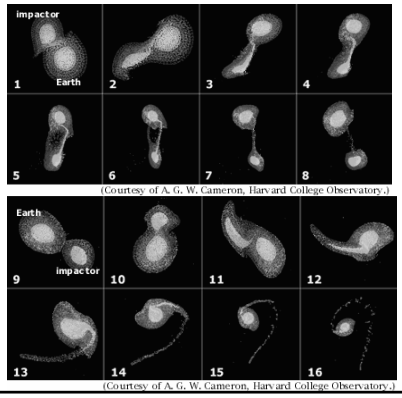
Apollo Landing Sites

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

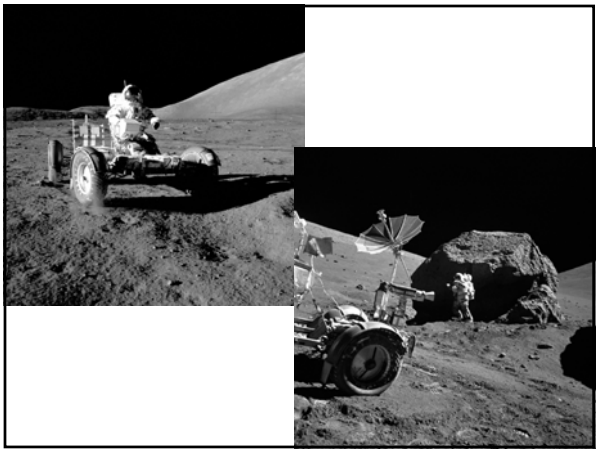
- Moon formed from a collision between a proto-Earth and a Mars-sized body.
- What did Apollo add to this model?
  - Center of mass of Moon is offset from geometrical center.
  - Thicker crust on lunar farside.
  - Moon is geochemically different from Earth (more volatiles).

Formation of the Moon via Impact

Movie



(Courtesy of A. G. W. Cameron, Harvard College Observatory.)



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	Suspicions from USSR & Europe
Exciting initially	Boring TV by Apollo 17

The Military in Space During Apollo

- Passive military satellites. Active weapons would destabilize international situation.
- Prevent technological surprise.
- No manned military flights.

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.

Why were last 2 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).