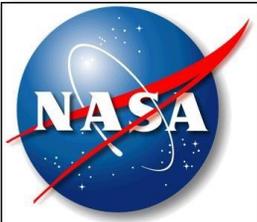


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 Today: **The Birth of NASA**

- Reading for *Krushchev & USSR Space Policy*: Part IV of McDougall.
- Solutions for Homework #1 are posted on class website for Sep. 12.




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1

Trinity Site, White Sands, March 2022



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2

Space in the News: NASA to crash \$330M spacecraft into asteroid to see if impact can alter course
 Presented by Garrett Lycett



DART
 Double Asteroid DART Impact Mission

Why throw a spacecraft at an asteroid when we can use mathematical models to predict the deflection?

1. Crash into asteroid
2. Observe the deflection
3. Here follows up to observe crater
4. ???
5. Save the world

Earth-based observations

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3

Dwight Eisenhower
 (1890-1969)




Investment in a vigorous economy
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4

Why did Truman & Eisenhower let rocket/ICBM technology lag?

- Assumption of U.S. superiority in bombers.
- Need to invest first in building a vigorous economy.
- Developing missile threat from USSR finally convinced Truman and then Eisenhower to invest in missile technology.



Clip from *The Day the Earth Stood Still*

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5



6

USSR Sputnik 1 Satellite

(launched October 4, 1957)



184 pounds.
58 cm diameter sphere.
2.5 meter-long antennas.



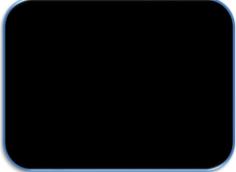
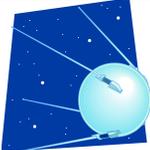



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7

How did the launch of Sputnik kick-start federal investment in science R&D?

- Public outcry & concern that U.S. had fallen behind in technology to Russians.
 - “defeat of the U.S.” according to *Life* magazine.
 - “Russians in control of outer space”
- Eisenhower named the 1st ever Presidential Science Advisor (James R. Killian, MIT).
- But, Eisenhower was slow to react => wanted limited gov’t.

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8

Lyndon B. Johnson

(1908-1973)




Running for the Senate in 1948 As 36th President

As Senate Majority Leader, Johnson began Senate hearings on satellite & missile programs

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9

The National Aeronautics and Space Act of 1958 : Objectives of NASA

- (1) Expansion of human knowledge of the Earth and ... atmosphere and space.
- (2) Improvement of ... aeronautical and space vehicles.
- (3) Development/operation of vehicles carrying instruments & living organisms through space.
- (4) Establishment of long-range studies of utilization of aeronautical and space activities.
- (5) Preservation United States as a leader in aeronautical and space science and technology.
- (6) **Making available discoveries that have military value or significance.**
- (7) Cooperation by United States with other nations in peaceful application of the results thereof.
- (8) Most effective utilization of the scientific & engineering resources of the United States, ... avoid unnecessary duplication of effort, facilities, and equipment.
- (9) Preservation of United States preeminent position in aeronautics & space through research and technology development.

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10

Vanguard Launch History

Embarrassing early failures but eventual success.

Explosion of Vanguard At Cape Canaveral On Dec. 6, 1957



The Vanguard rocket launched 3 satellites out of 11 launch attempts:

- Vanguard TV3 - December 6, 1957 - Failed to orbit 1.36 kg (3 lb) satellite
- Vanguard TV3 Backup - February 5, 1958 - Failed to orbit 1.36 kg (3 lb) satellite
- **Vanguard 1 - March 17, 1958 - Orbits 1.47 kg (3.25 lb) satellite**
- Vanguard TV5 - April 28, 1958 - Failed to orbit 9.98 kg (22 lb) satellite
- Vanguard SLV 1 - May 27, 1958 - Failed to orbit 9.98 kg (22 lb) satellite
- Vanguard SLV 2 - June 26, 1958 - Failed to orbit 9.98 kg (22 lb) satellite
- Vanguard SLV 3 - September 26, 1958 - Failed to orbit 9.98 kg (22 lb) satellite
- Vanguard SLV 5 - April 13, 1959 - Failed to orbit 10.3 kg (22 lb 11 oz) satellite
- **Vanguard 2 - February 17, 1959 - Orbits 9.8 kg (21 lb 10 oz) satellite**
- Vanguard SLV 6 - June 22, 1959 - Failed to orbit 10.3 kg (22 lb 11 oz) satellite
- **Vanguard 3 - September 18, 1959 - Orbits 22.7 kg (50 lb) satellite**

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11

Mercury 7 Astronauts

Selected April, 1959



- [M. Scott Carpenter - Mercury-Atlas 7](#) (deceased, Boulder native!)
- [L. Gordon Cooper - Mercury-Atlas 9, Gemini 5](#) (deceased)
- [John H. Glenn Jr. - Mercury-Atlas 6, STS-95](#) (deceased)
- [Virgil I. "Gus" Grissom - Mercury-Redstone 4, Gemini 3, Apollo 1](#) (deceased)
- [Walter M. Schirra - Mercury-Atlas 8, Gemini 6A, Apollo 7](#) (deceased)
- [Alan B. Shepard - Mercury-Redstone 3, Apollo 14](#) (deceased)
- [Donald K. "Deke" Slayton - Apollo-Soyuz Test Project](#) (deceased)

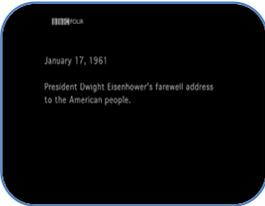
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12

Eisenhower's Farewell Address

January 17, 1961

- "Need to maintain *balance* in & among national programs, public vs. private, cost & advantages, necessary vs. comfortable."
- Threats to the nation:
 - Guard against "unwarranted influence" by the "military-industrial complex".
 - Increasing share of research by federal gov't.
 - Danger of becoming "captive of the scientific-technological elite".



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