


ASTR 4800 - Space Science: Practice & Policy
 Today: **Beginnings of the Space Race – America Before Sputnik**

- HW #1 due on Monday, Sep. 12.
- Read:
 - Chapter 2 in *Beyond Sputnik*;
 - McDougall, Chapter 6; and
 - [Science: The Endless Frontier](#) by V. Bush (web article)



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1

NASA and China are eyeing the same landing sites near the lunar south pole
 Presenter: Ella Ho

Article by Andrew Jones — August 31, 2022
<https://space.com/nasa-and-china-are-eyeing-the-same-landing-sites-near-the-lunar-south-pole/>



- The New Space Race?
- Chang-e 7 (2024) and Artemis 3 (2025) are both looking at very similar Southern Lunar sites.
- The US and China have not discussed plans to coordinate efforts since the last Civil Space Dialogue being in 2017 under the Obama administration.

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2

How did Russian paranoia & the need to catch up drive rocket technology development?


- Tension between “borrowing” and developing technology
- Lack of competitive stimulus
- Risks of failure
- Scarcity of skilled labor
- Organization separation of R&D and production

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3

Class Exercise

The Founders of the U.S. government drafted a Constitution to limit & balance federal power. Is this consistent with a large space program?



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4

A Space Program in a Jeffersonian Federal Government?

- Contrast U.S. approach to R&D to that of Soviets.
- Technology as a means to serve higher values?
- Role of Presidents to keep a lid on spending.



Jefferson



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5

Franklin Roosevelt
 (1882-1945)



1933



1942



1940

Roosevelt changed fundamental view of the size, scope, and services provided by the Federal Government

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6

Contrast in Size of Research in Federal Budget in 1933 versus 2022

- Only \$6 million spent in 1933 on research. Let's inflate this to 2022 \$ using [Consumer Price Index calculator](#)
=>\$138 M.
- This number grew to \$1.59 billion by 1945 (\$26.5 B in FY22 dollars).
- Using AAAS analysis, today's total R&D Federal budget is ≈\$140 B (but decreased by 15% from 2008-2018).
- What happened and why?

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7

Robert Goddard

(1882-1945)

No sponsors for rocketry in the U.S. before WWII!





1926 in Roswell, NM




The NY Times in 1919 said "Professor Goddard does not know the relation of action & reaction, and of the need to have something better than a vacuum again which to react". The day after Apollo 11 launched in 1969, the Times issued a correction "Further investigations have confirmed...that a rocket can function in a vacuum. The Times regrets the error!"

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8

J. Robert Oppenheimer & the Atomic Bomb

It all changed after the Manhattan Project!

(1904-1967)

"I am death, destroyer of worlds" (from Bhagavad-Gita)



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9

Harry Truman

(1884-1972)

Potsdam Conference 1945



- Truman opted for superiority of weapons technology to balance USSR.
- Joint Industry-Government coordination of R&D began after 1946 (Project RAND).

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10

Why was Russia viewed as technology threat to America?

- Tough Soviet rhetoric (superiority of communism, world revolution).
- Communist subversion of Poland and Eastern Europe.
- Berlin Blockade.



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