

ASTR 4800: Space Science - Practice & Policy

- Today's Topic: *Beginnings of the Space Race – The USSR Before Sputnik*
- Homework: Part II of McDougall, Chapters 3-5 on "America Before Sputnik"
- Think about topics for class PowerPoint presentation or participating in debates.

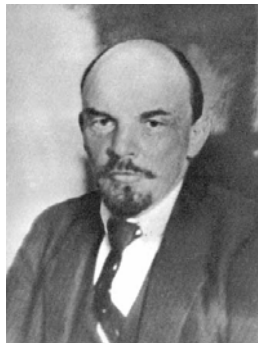


The Soviet Union after the Revolution of 1917

V. Lenin in 1918

(1870-1924)

"Dictatorship of the Proletariat"

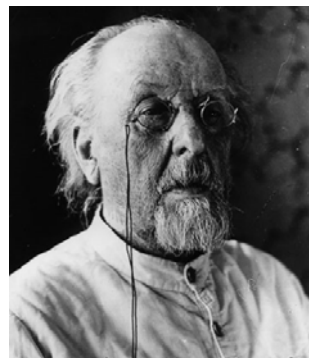


Comparison of Soviet & American Systems

Characteristic	U.S.S.R.	U.S.
Economy	Socialist/Communist	Capitalist
Political/CEO	Totalitarian/Dictator	Democracy/President
Commerce	Collectives	Private industry
Income level	Very poor	Wealthy
R&D	Little technology	Advancing after WWII
International relations	Isolationist	Isolationist

Konstantin E. Tsiolkovsky

1857-1935



- Considered the Father of human space flight.
- First academic treatise on rocketry (1903).
- Calculated escape velocity from Earth.
- Proposed multi-stage rocket
- Designs for space stations, airlocks.

How was rocketry consistent with the Bolshevik philosophy?

- Technology needed to survive and compete with the West (Lenin's lesson from WWI).
- But, Soviets were ideologically opposed to free exchange of ideas!
- Centralized R&D was seductive feature of Soviet system (command & control).

Josef Stalin (1878-1953)



1935

Stalin stifled autonomy thru terror & by training a new generation of loyalists. How was research possible in this environment?



1925



1929

Einstein's view of USSR in 1932

- "At the top there appears to be a personal struggle in which the foulest means are used by power-hungry individuals acting from purely selfish motives. At the bottom there seems to be complete suppression of individual and freedom of speech. One wonders whether life is worth living under such conditions."

The U.S.S.R. after WWII

Sergei Pavlovich Korolev (1907-1966)

Developer of Sputnik & 1st human space flight



1940's



1960's

Wernher von Braun (1912-1977)

Father of American Space Program



What was the impact of German V-2 rockets after the war?

- von Braun began the U.S. space program at White Sands, NM.
- What did the Soviets get?
- The role of Korolev.
- Military implications to deliver H-bombs via ICBMs.



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