

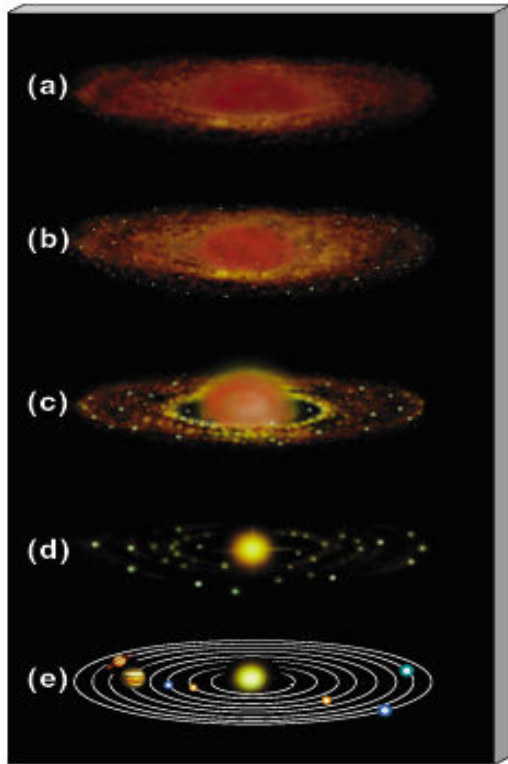


Evidence for a Large Anomalous Nuclear Explosions in Mars Past

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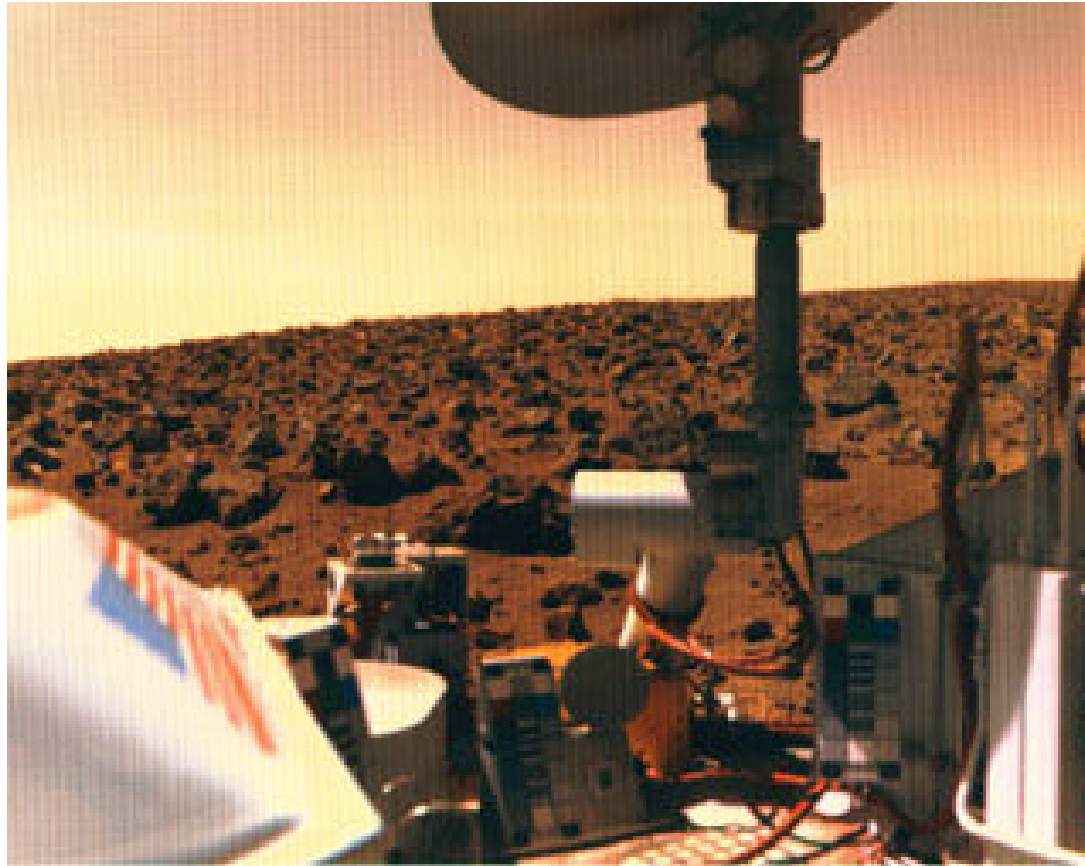
STAIF II 2014

Mars Isotopes: Baseline



We can compare Mars isotopes with those from meteorites Earth and other Planets which sampled the solar nebula

Viking Lander 1976



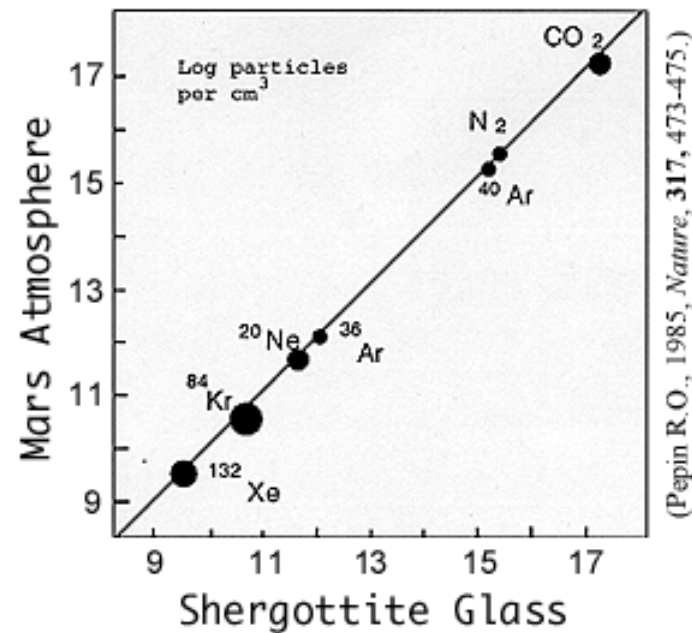
Mars Noble gas isotopes, especially Xenon and Krypton are exotic

Mars Meteorites



Mars meteorites were identified as Martian because of trapped Mars atmosphere-because of its exotic isotopic signature

Mars atmosphere found in Mars Meteorites



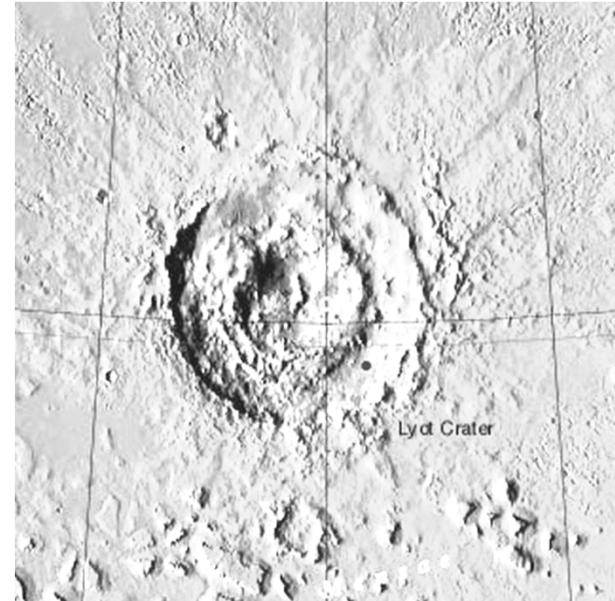
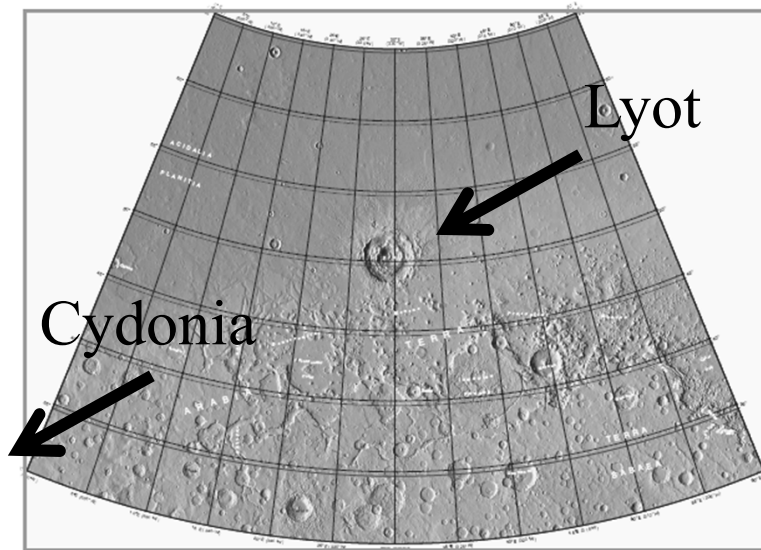
Agenda

- Introduction: Mars was disaster prone
- Mars Xenon Anomaly
- Mars Krypton- the neutron paradox
- Mars Thorium and Uranium paradox
- Hypothesis: Nuclear Weapon Detonations Over Mare Acidalium and Utopia Planum
- Correlation with Cydonia and Galaxias Archeological sites
- Summary

Mars as a Disaster-Prone Planet

- Mars was apparently Earthlike for most of its history with an ocean and persistent greenhouse like on Venus
- Then, ~0.5 Billion years ago Mars suffered a Chixulube-size impact formed the Lyot Impact Basin and apparently collapsed Mars climate and dried up its oceans
- Then, after some indeterminate period Mars suffered a bizarre nuclear disaster

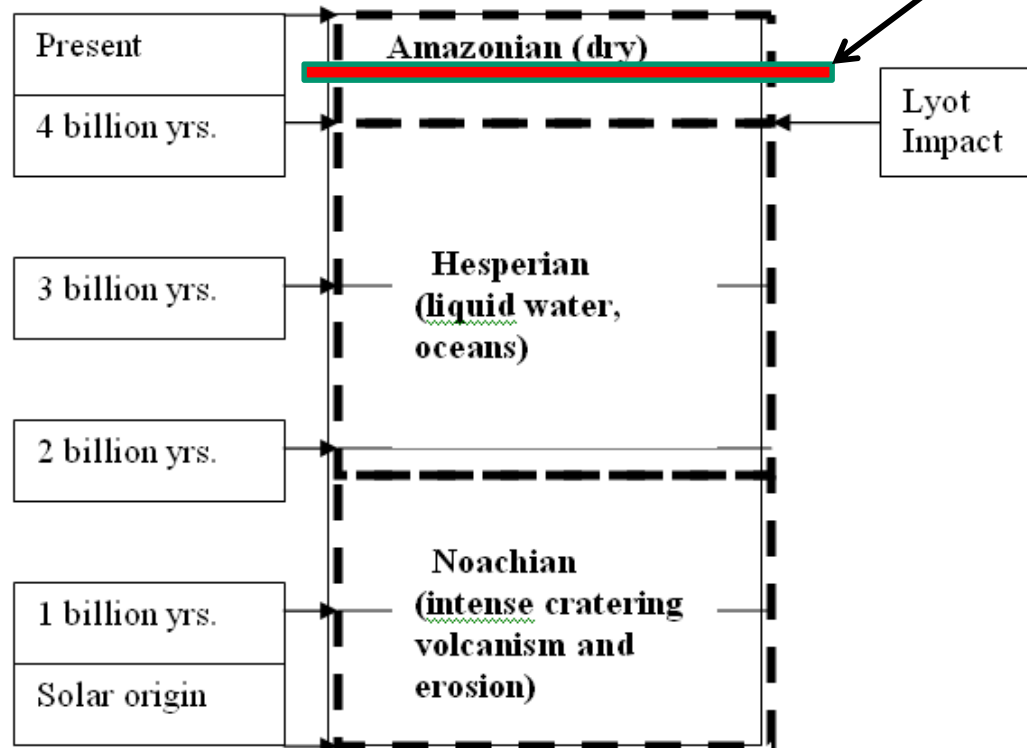
Lyot Impact



Lyot impact occurred late in Mars history near Cydonia Mensa and appears to have collapsed Mars climate

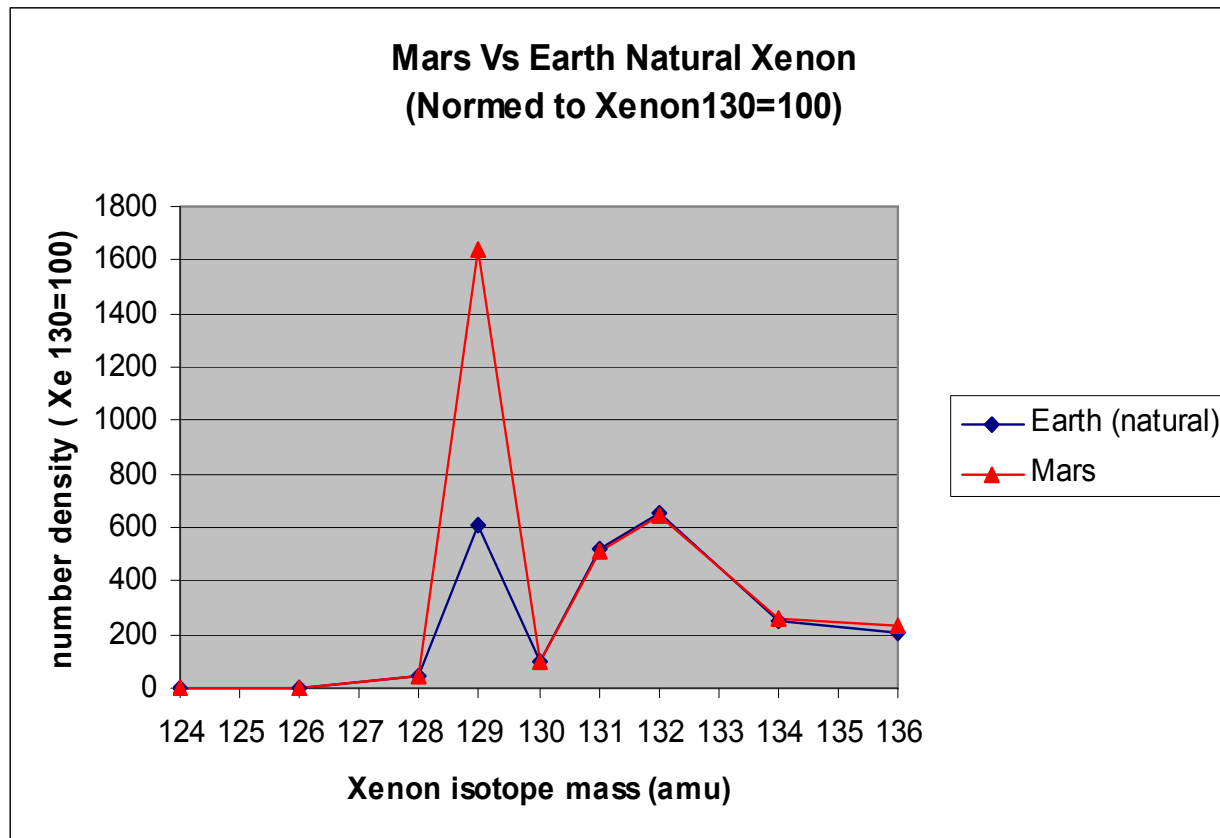
Mars Approximate Chronology

Nuclear explosions
4.2 Billion years ?

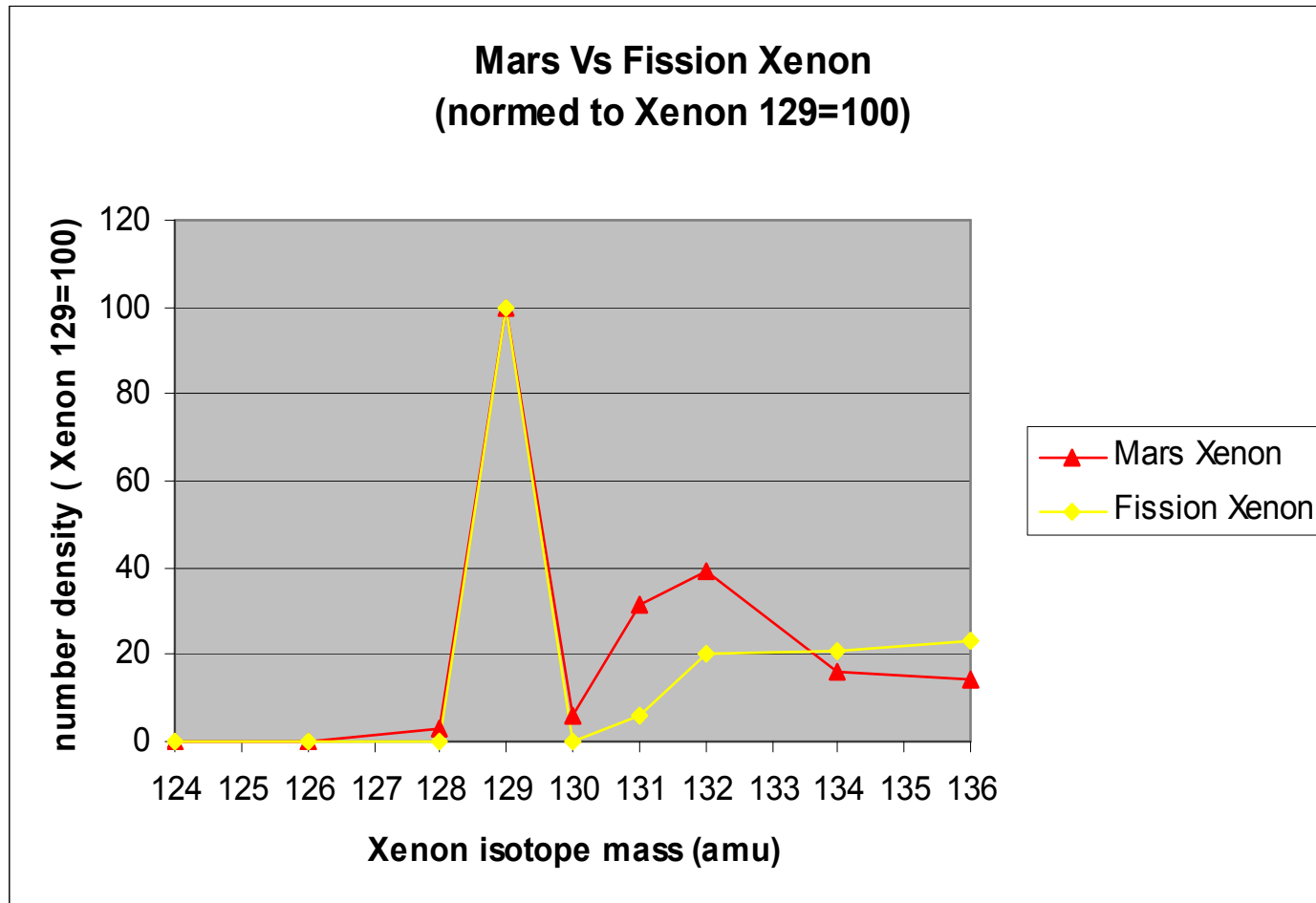


Mars Isotope Anomalies

Mars Versus Earth Xenon



Mars Versus Earth Fission Xenon



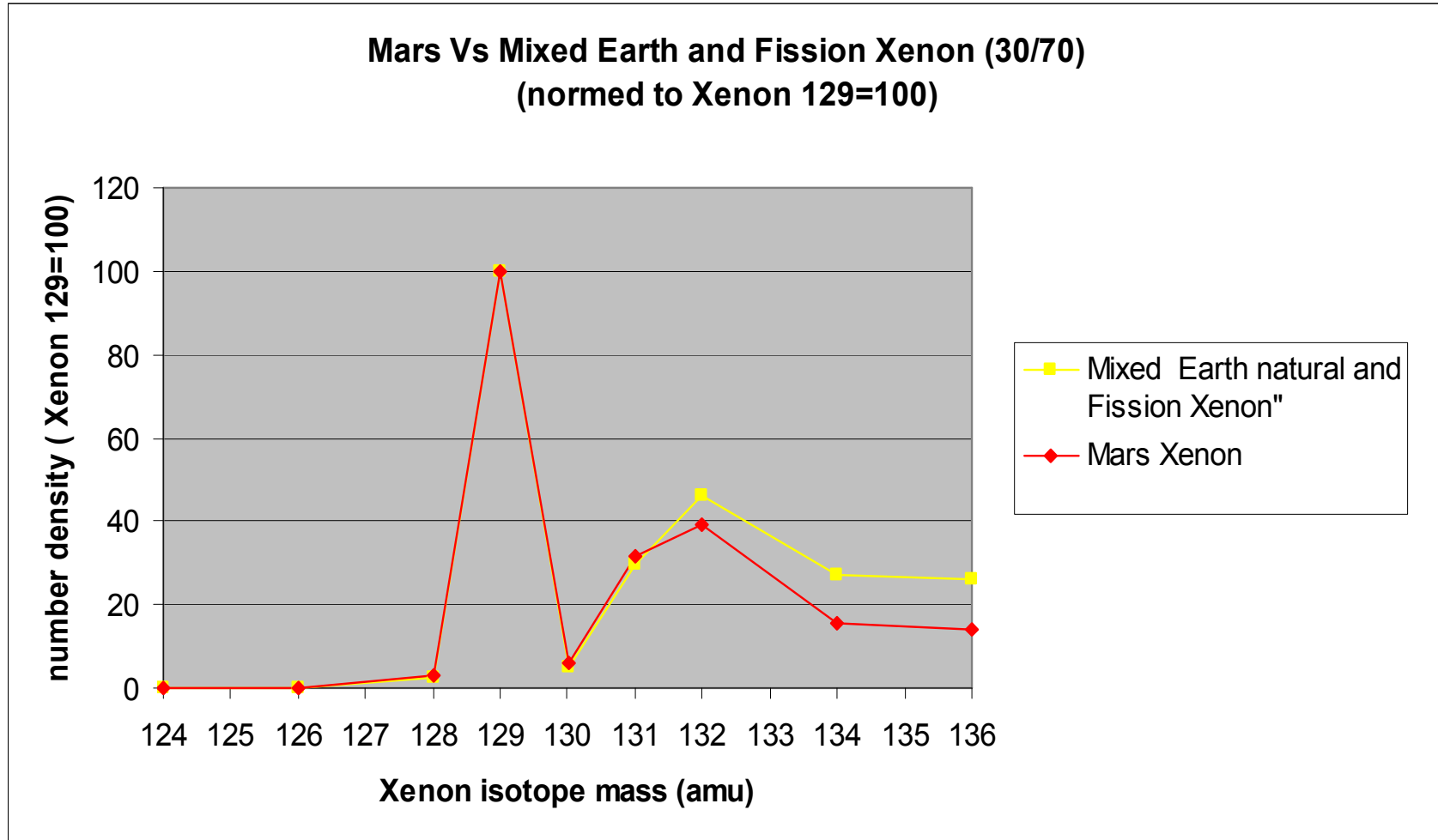
Earth Fission Xe Due to H-Bomb Testing

Xenon Isotope Abundance Normalized to ¹³⁰ Xe Abundance									
Inventory	¹²⁴ Xe	¹²⁶ Xe	¹²⁸ Xe	¹²⁹ Xe	¹³⁰ Xe	¹³¹ Xe	¹³² Xe	¹³⁴ Xe	¹³⁶ Xe
Earth	2.337	2.180	47.146	649.58	≡100	521.27	660.68	256.28	217.63
Earth w/o NT	2.337	2.180	47.146	605.3	≡100	518.73	651.8	247.0	207.5
Earth Δ	0.00	0.00	0.00	44.28	0	2.54	8.88	9.28	10.13
Mars	2.45	2.12	47.67	1640.0	≡100	514.7	646.0	258.7	229.4

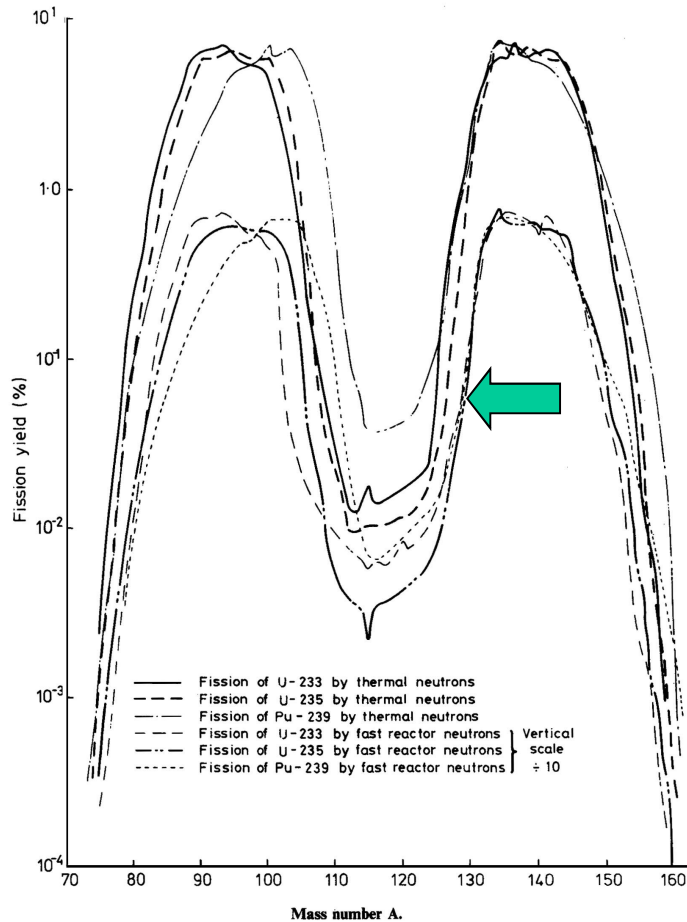


Hydrogen bombs are boosted by fission of a uranium or thorium casing ~50% of yield is fission. This creates xenon isotopes.

Mars Versus Earth Mixed Xenon

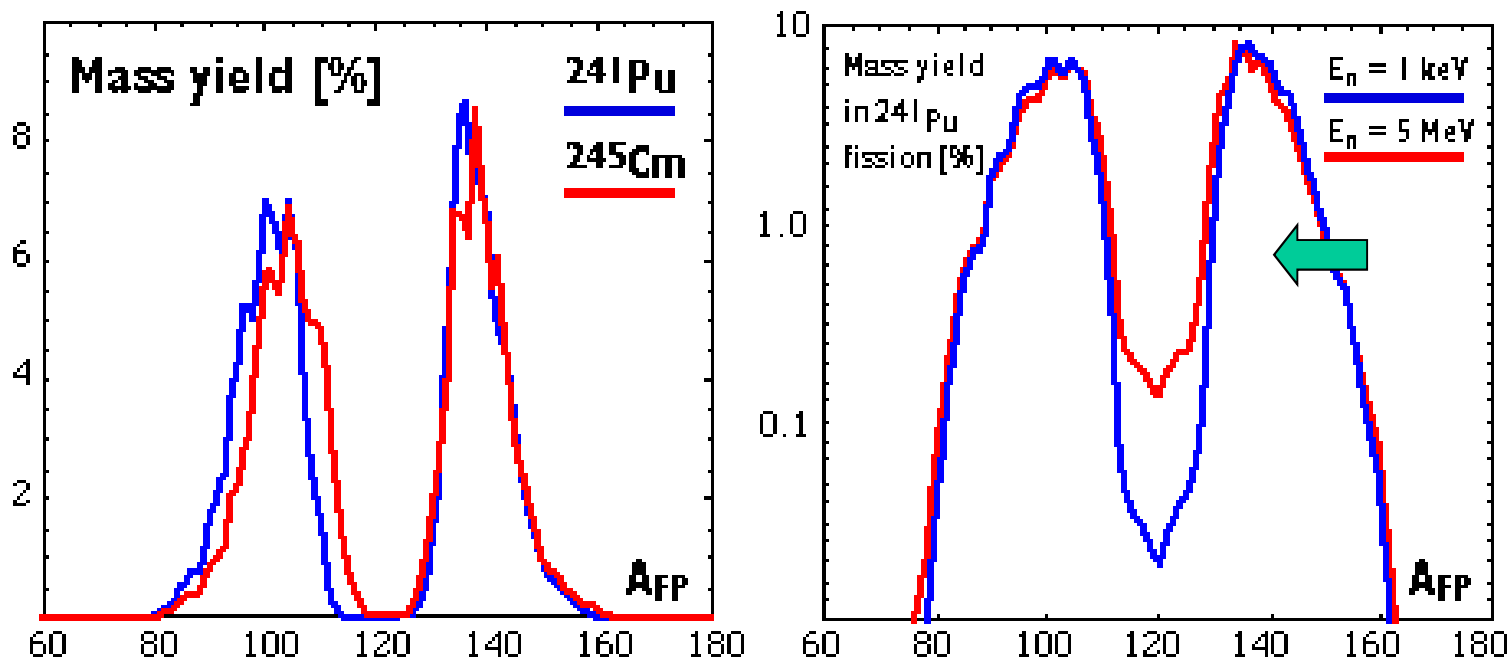


Fission Yield vs Neutron Energy



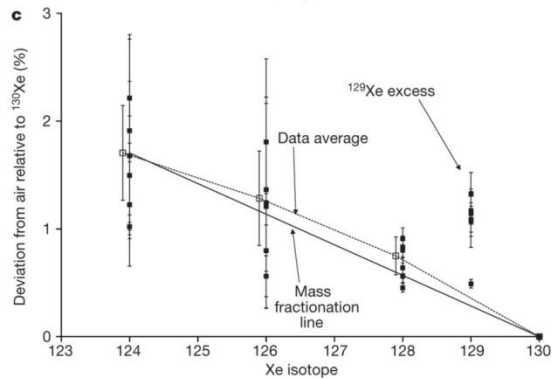
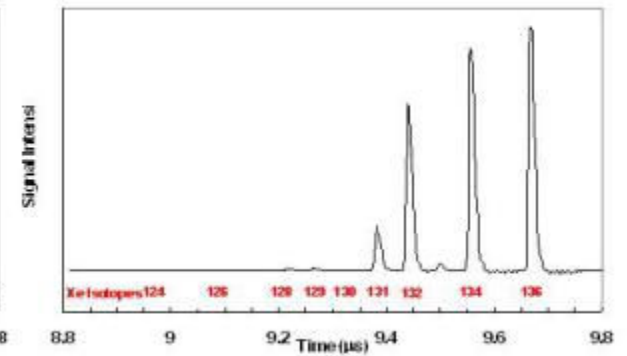
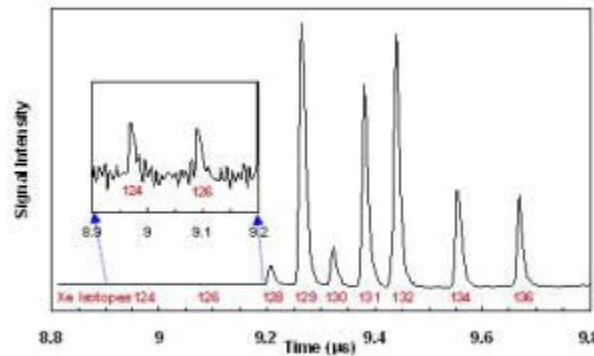
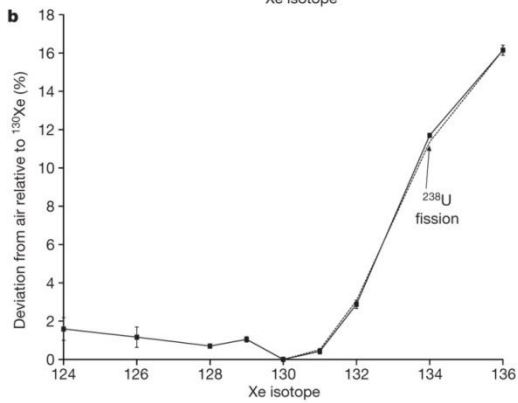
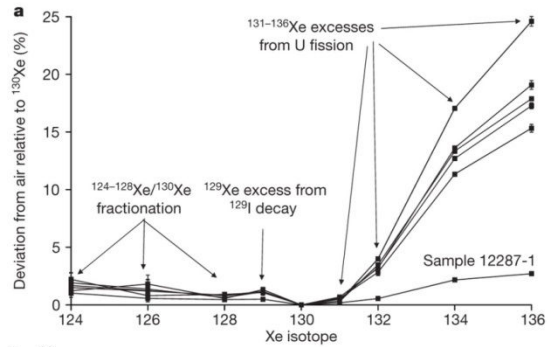
Iodine 129 decays to Xenon 129 in 17 Million years, normal lowneutron energy creates little Xe 129

Fission Yield vs Neutron Energy



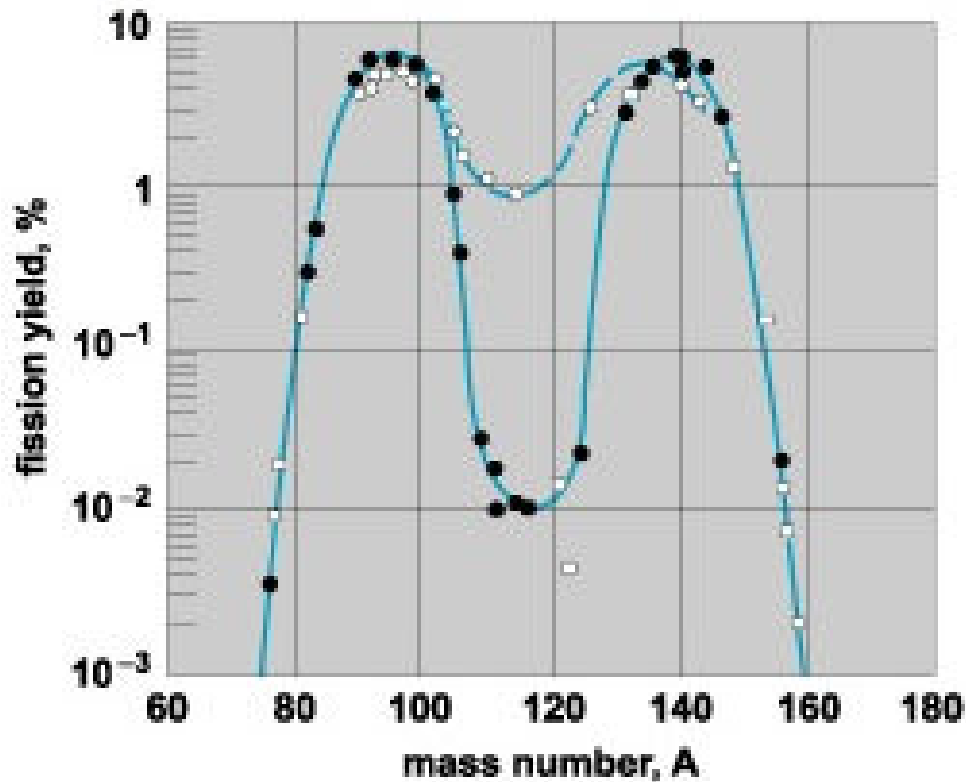
Xe 129 production
enhanced by higher neutron
energy

Thermal Fission Xenon



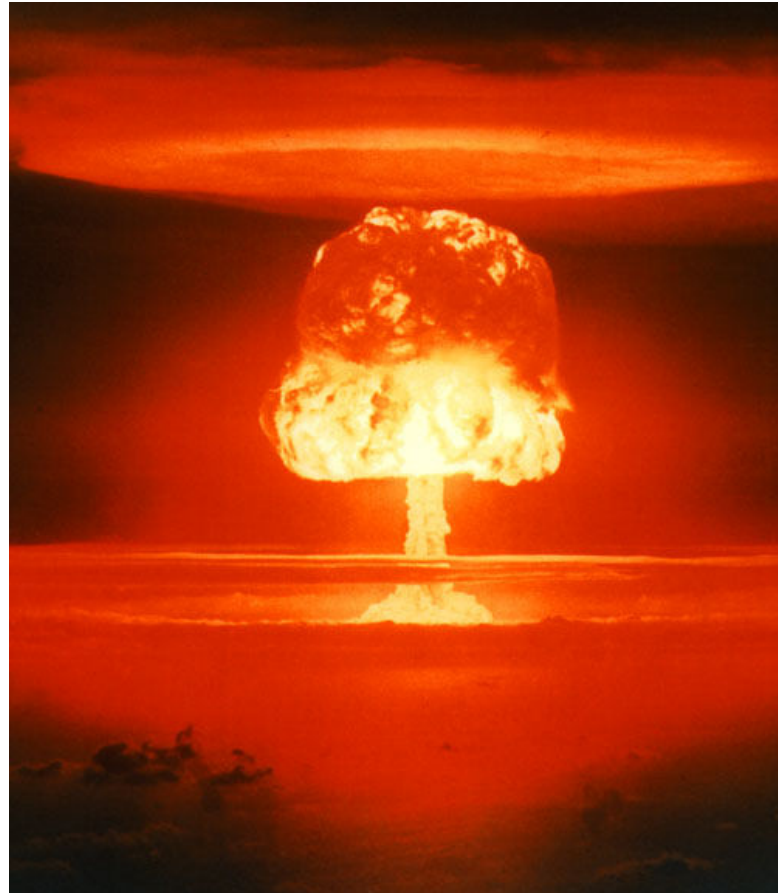
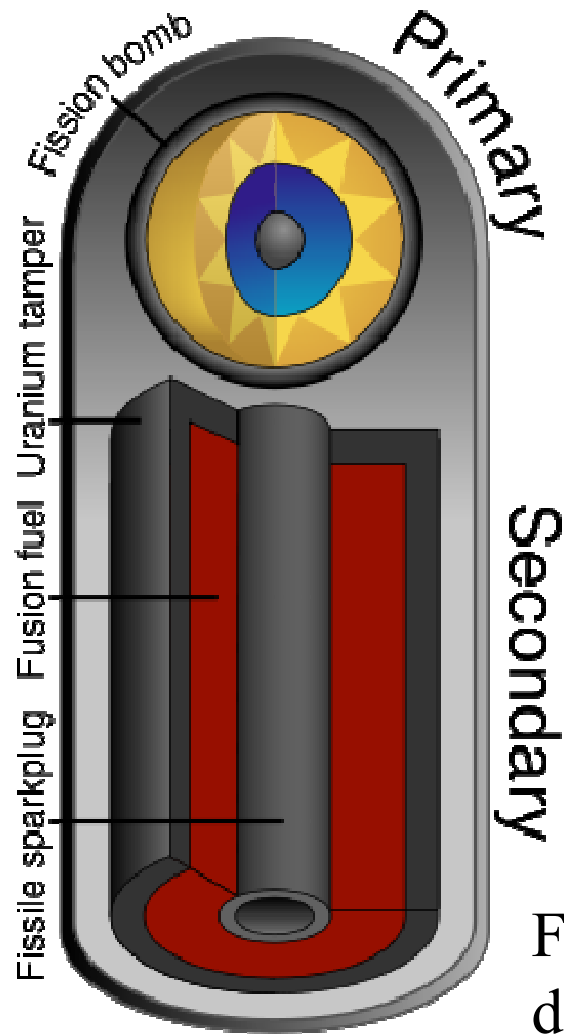
But Xe 129 is normally less than Xe 132

Fission Yield From 14 MeV Neutrons



However fission driven by 14MeV neutrons in hydrogen bomb, produces more Xe129 than other isotopes

Hydrogen Bomb Testing



Fission of Uranium-Thorium casing doubles power of Hydrogen bombs

Mars Krypton

- Mars $^{80}\text{Kr}/^{84}\text{Kr}$ is enhanced 10% over Solar nebula baseline (Earth $^{80}\text{Kr}/^{84}\text{Kr}$ ~enhanced 1%)
- ^{80}Kr believed generated by neutron capture on ^{79}Br
- Neutron fluence of $10^{15}/\text{cm}^2$ required on Mars rock

Mars Irradiation Evidence



No neutron irradiation

EETA79001_476
lithology A



EETA79001_482 Lithology B
Neutron irradiated $\sim 10^{15}/\text{cm}^2$

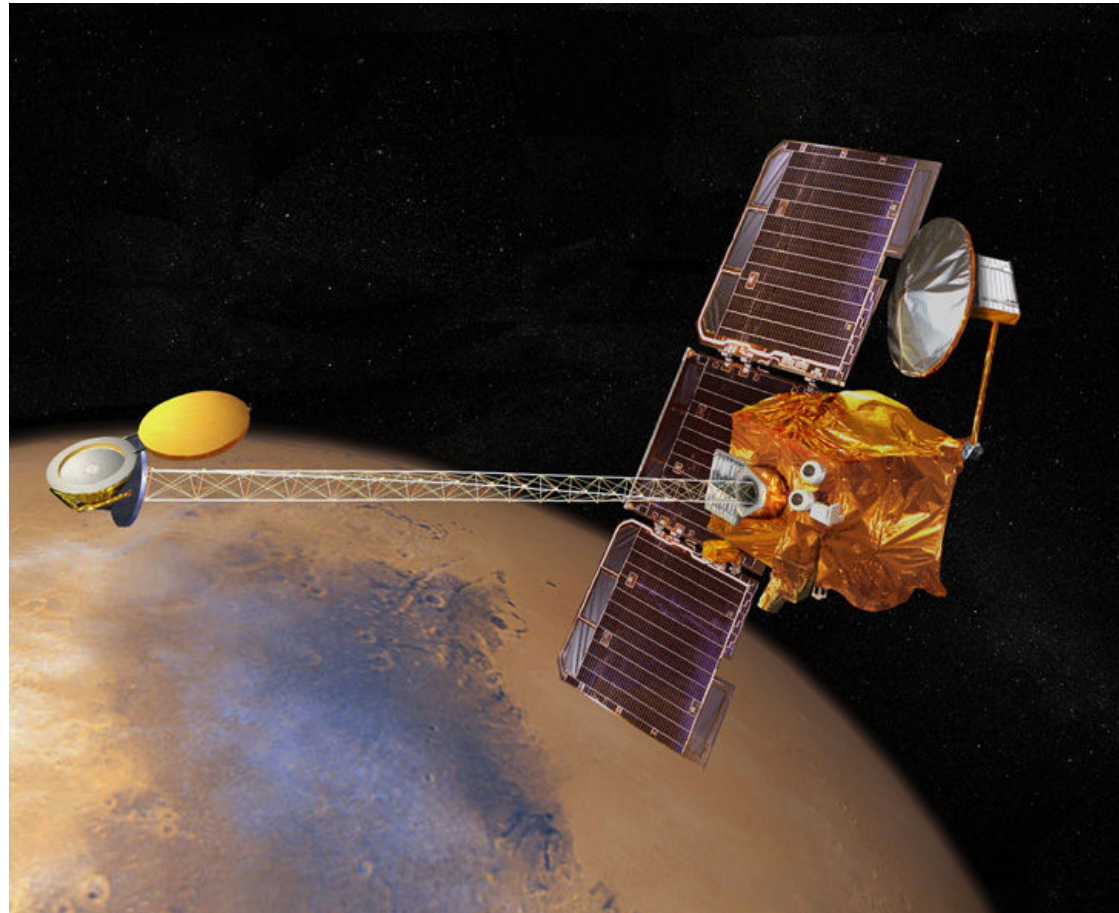
Mars Meteorite ETA79001 –180Myr old

Mars Ar 40 is Super-abundant

Argon 40 is produced by neutron irradiation of Potassium 39 changing it to Potassium 40 which decays after 1.28 Billion years to Argon 40

Mars $^{40}\text{Ar}/^{36}\text{Ar}$, $1.9(\pm 0.3) \times 10^3$ vs Earth
 $^{40}\text{Ar}/^{36}\text{Ar}$, 298.56 or Mars $\sim 6x$ Earth Consistent
with large neutron flux on Mars soil

Mars Uranium and Thorium Paradox



Mars Uranium and Thorium Paradox

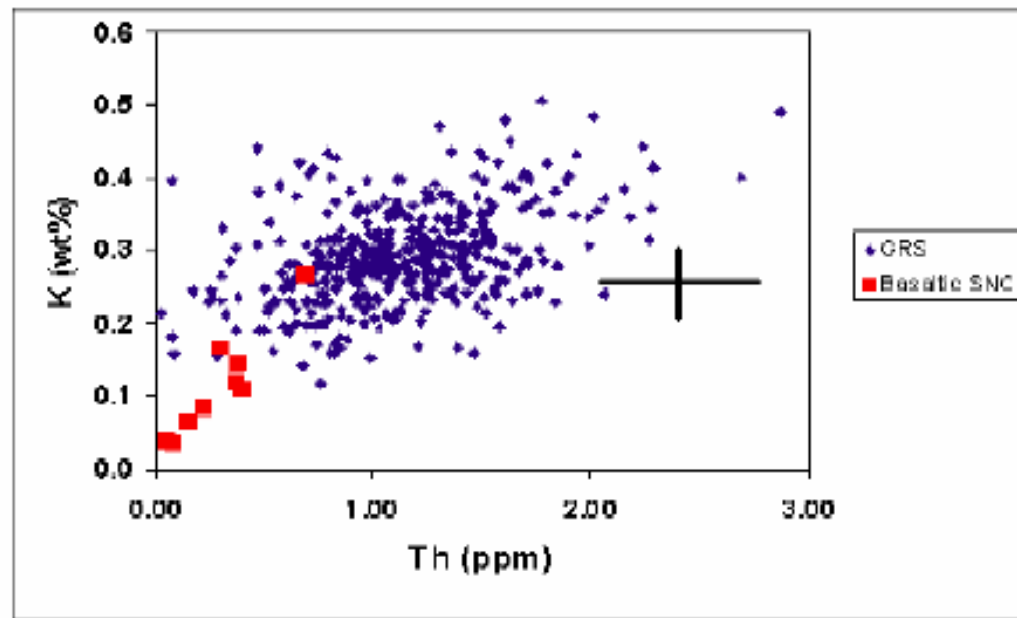
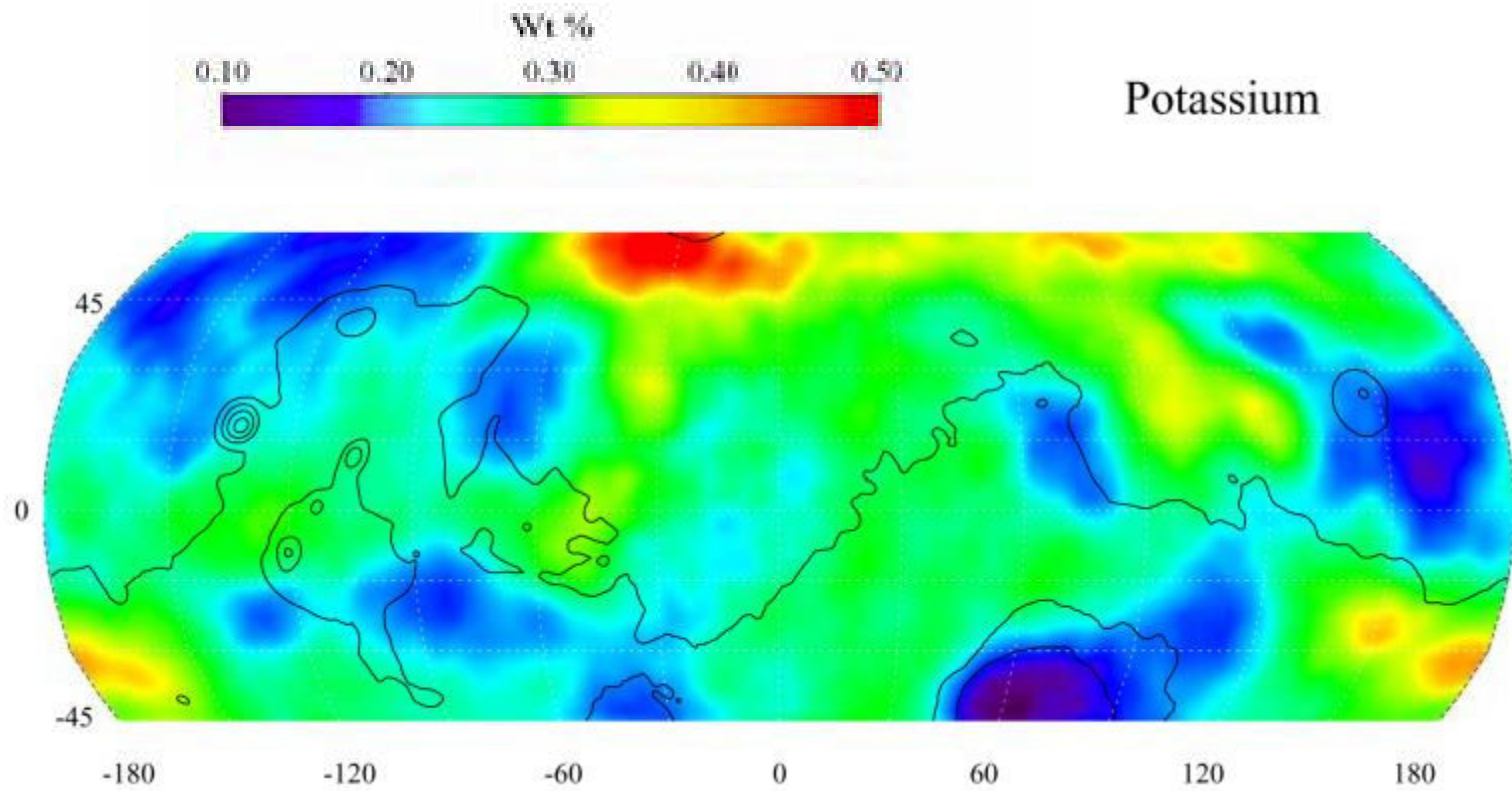
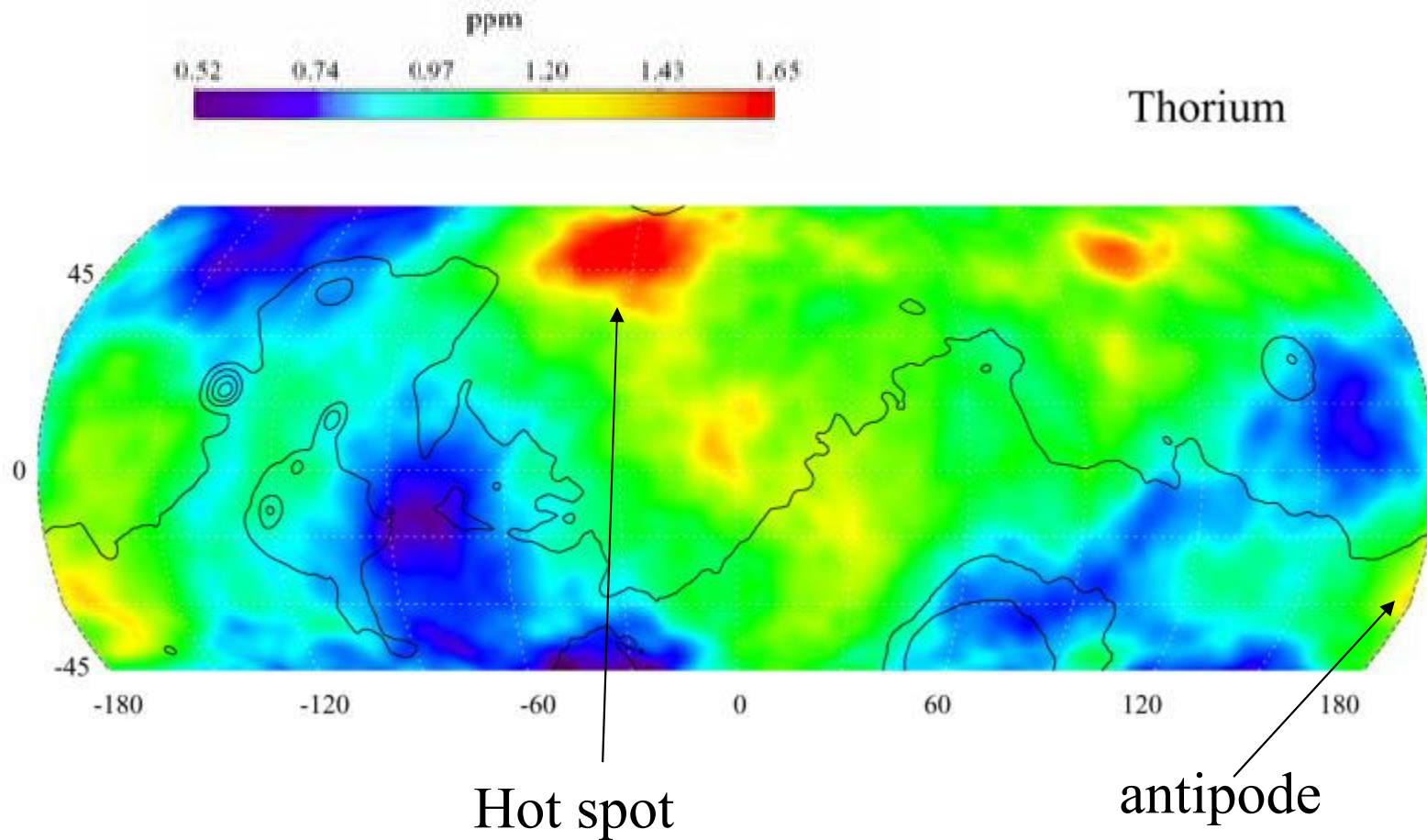


Fig. 5. K, Th variations on Mars compared to Martian (SNC) basaltic meteorites. Typical statistical uncertainty shown on right.

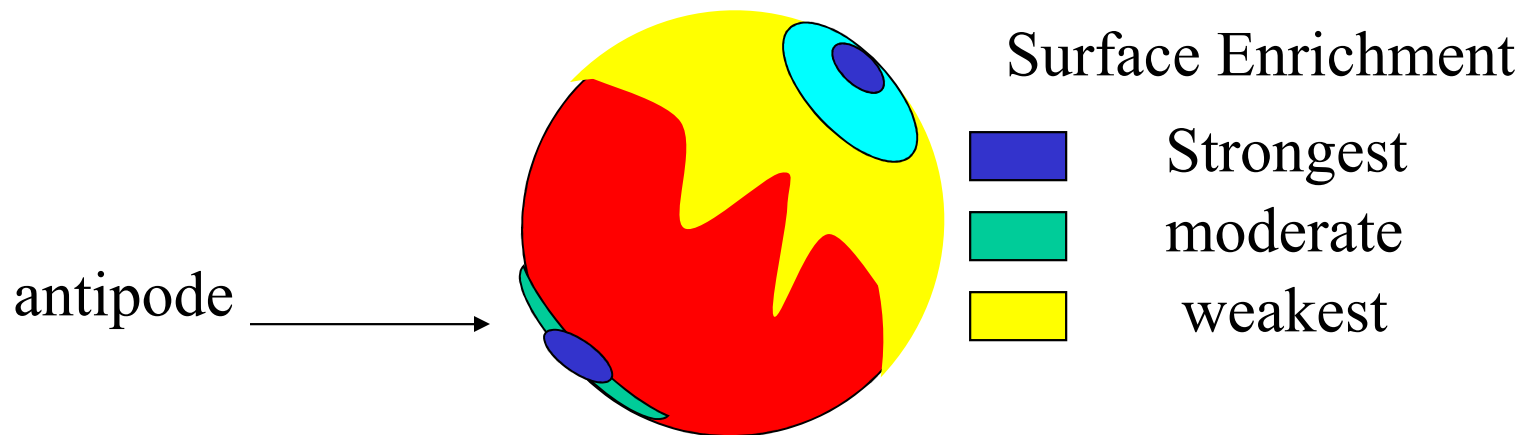
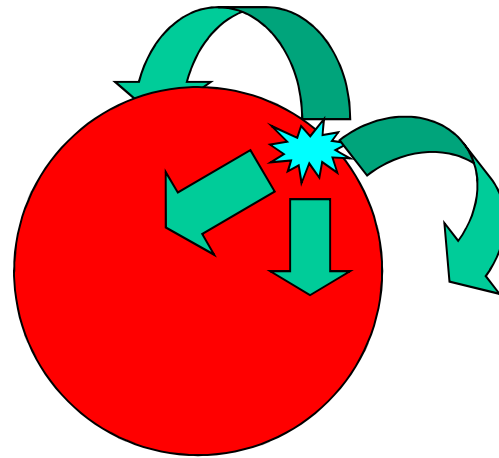
Mars Potassium



Mars Thorium

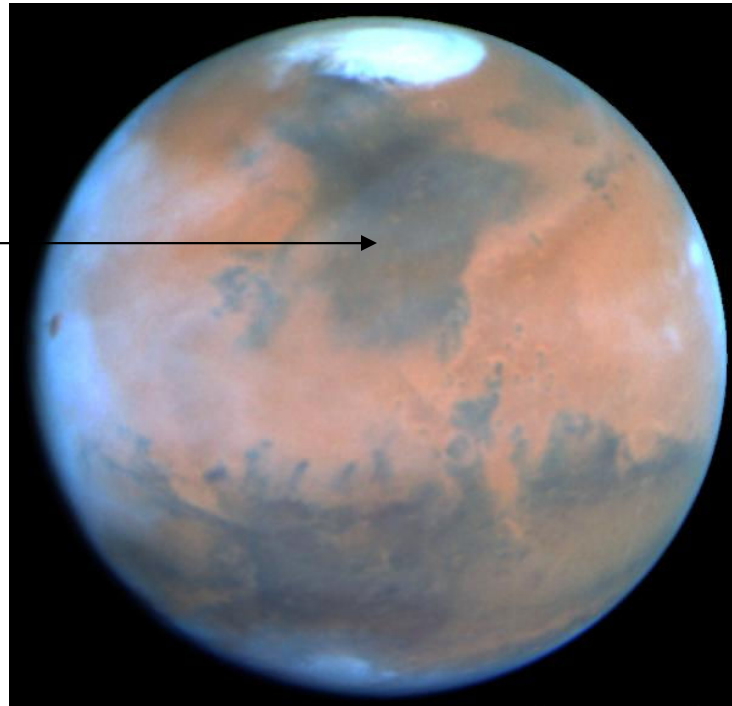


Global Debris Dispersal

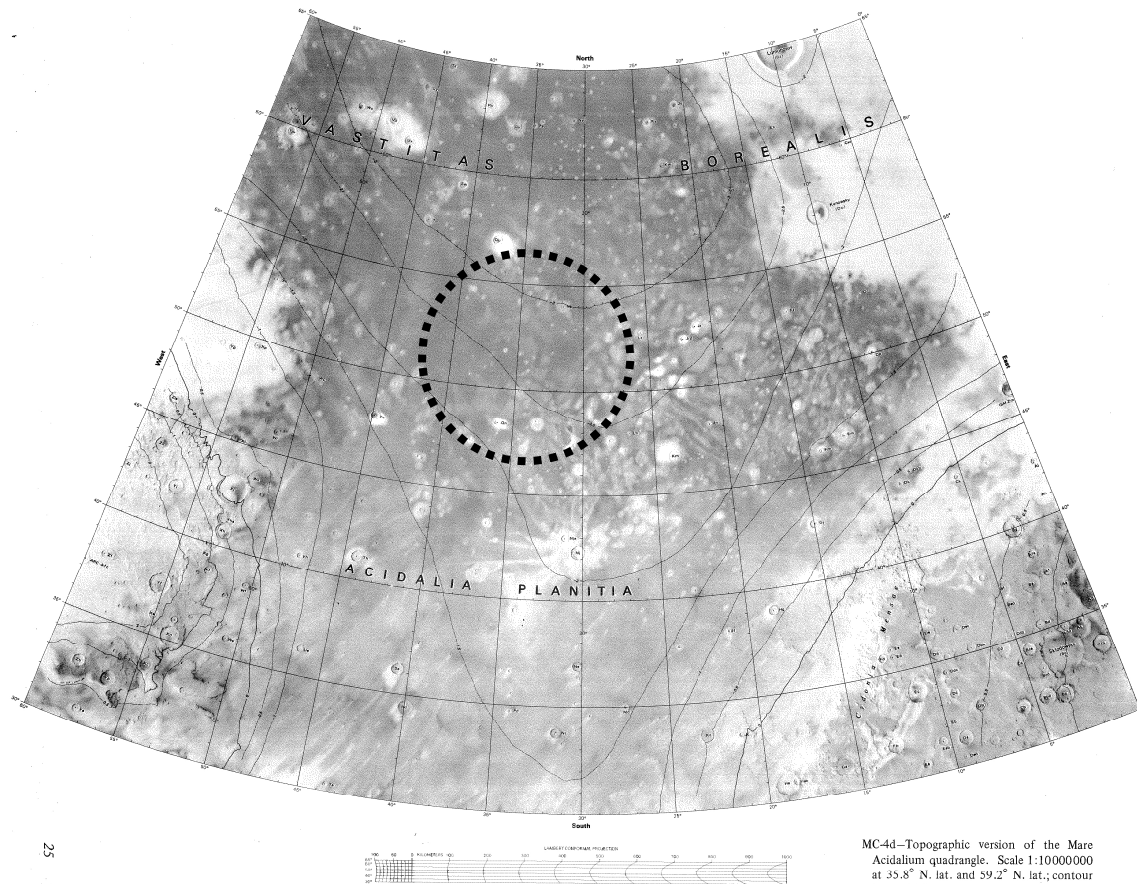


Mare Acidalium

Hot spot



Mare Acidalium



MC-4d—Topographic version of the Mare Acidalium quadrangle. Scale 1:10000000 at 35.8° N. lat. and 59.2° N. lat.; contour interval 1 km.

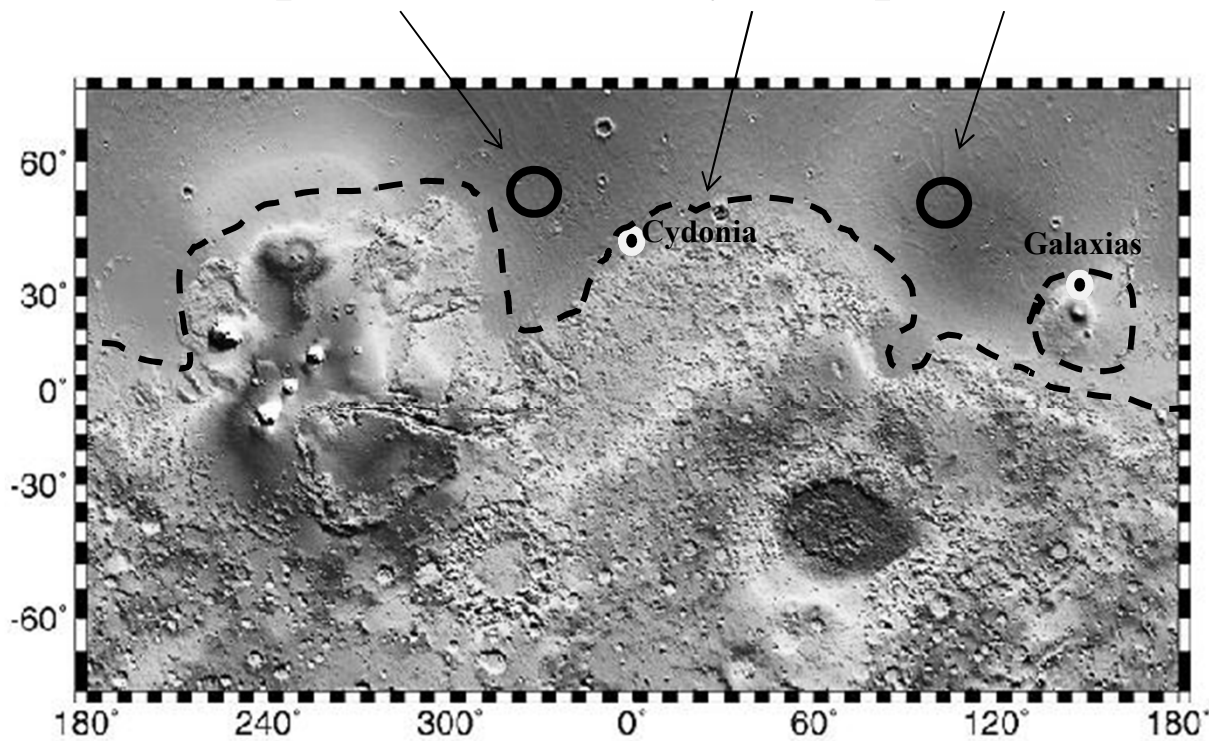
Lyot Impact

Lyot impact appears to have dried up ocean with nuclear explosions following northern ocean disappearance. Nuclear explosions appear to have been follow-up “planetary sterilization”

Lyot Impact and Nuclear Explosion
bracket Cydonia Mesa

Correlation of Catastrophes to Archeological Sites

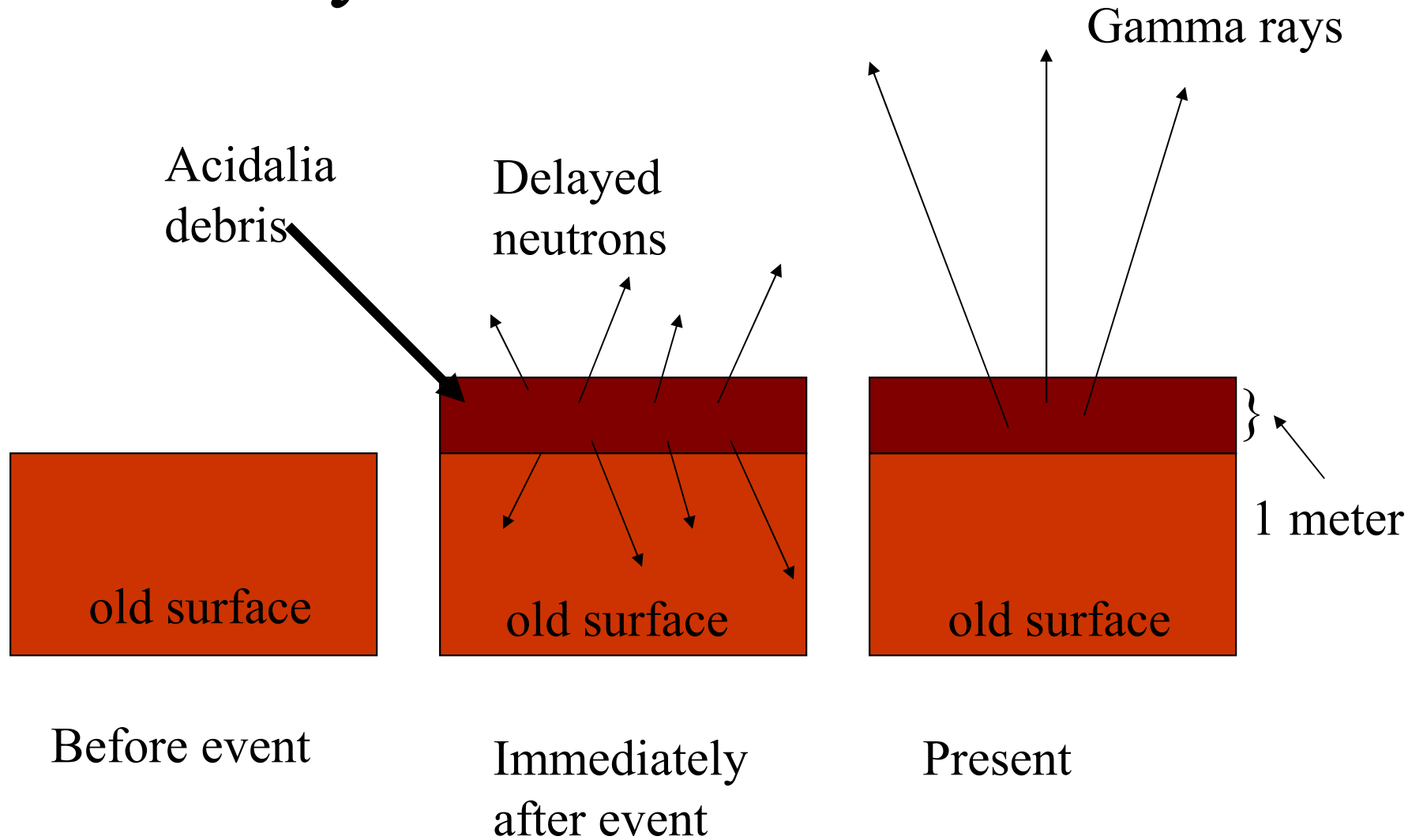
Nuclear Impact Lyot Impact Nuclear Impact



Northern region near Cydonia appears to have been “*accident prone*”

Hypothesis: Mars suffered
explosion of large Thermonuclear
weapon with fusion+fission over
Mare Acidalium and possible a
smaller one over Utopia Planum
Both had mixed U-Th casing and
D-T secondary

Delayed Neutrons after Event

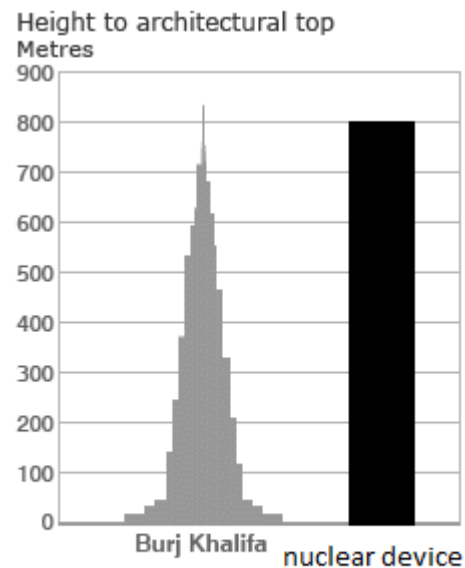


Model parameters

- Xenon 129 $\sim 10^{33}$ atoms $\sim 10^{35}$ Fissions
- Thorium layer $\sim 10^{37}$ atoms $\sim 10^{35}$ Fissions
- $10^{15}/\text{cm}^2$ delayed neutrons $\times 10^{18} \text{ cm}^2 = 10^{33}$ delayed neutrons $\sim 10^{35}$ Fissions
- 10^{35} fissions $\times 3 \times 10^{-11} \text{ J/fission} \sim 10^{24} \text{ J}$
- $10^{24} \text{ J} = 1 \text{ Chixulube} \sim 10^6 \text{ MT (terraton)}$
- $10^6 \text{ MT} \sim$ total nuclear energy released on Earth (Xenon (fission) Earth \sim Xenon Mars)

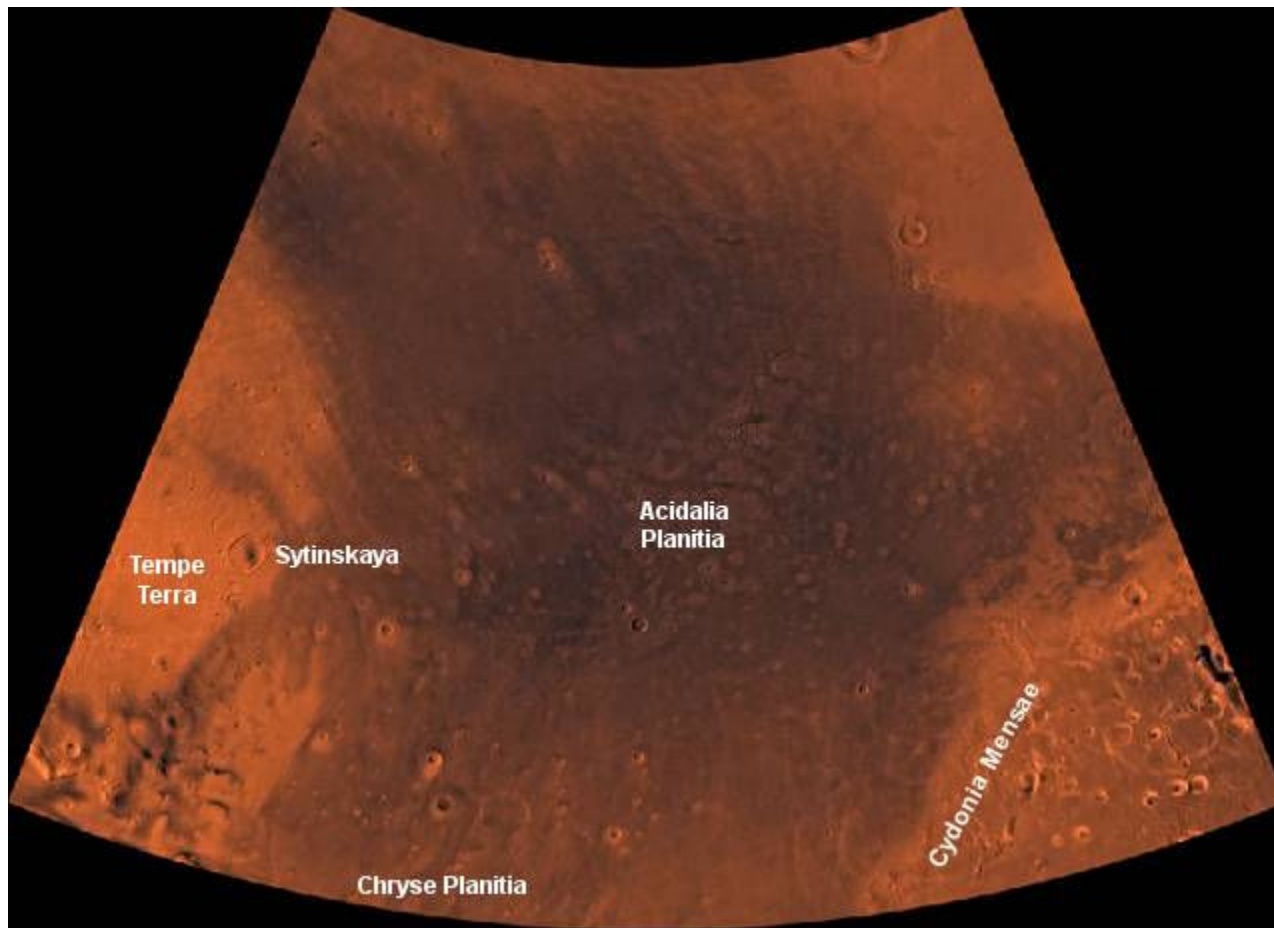
Size and Yield

- Yield ~ 1 billion megatons
- Size 100meter diameter cylinder 800 meters long

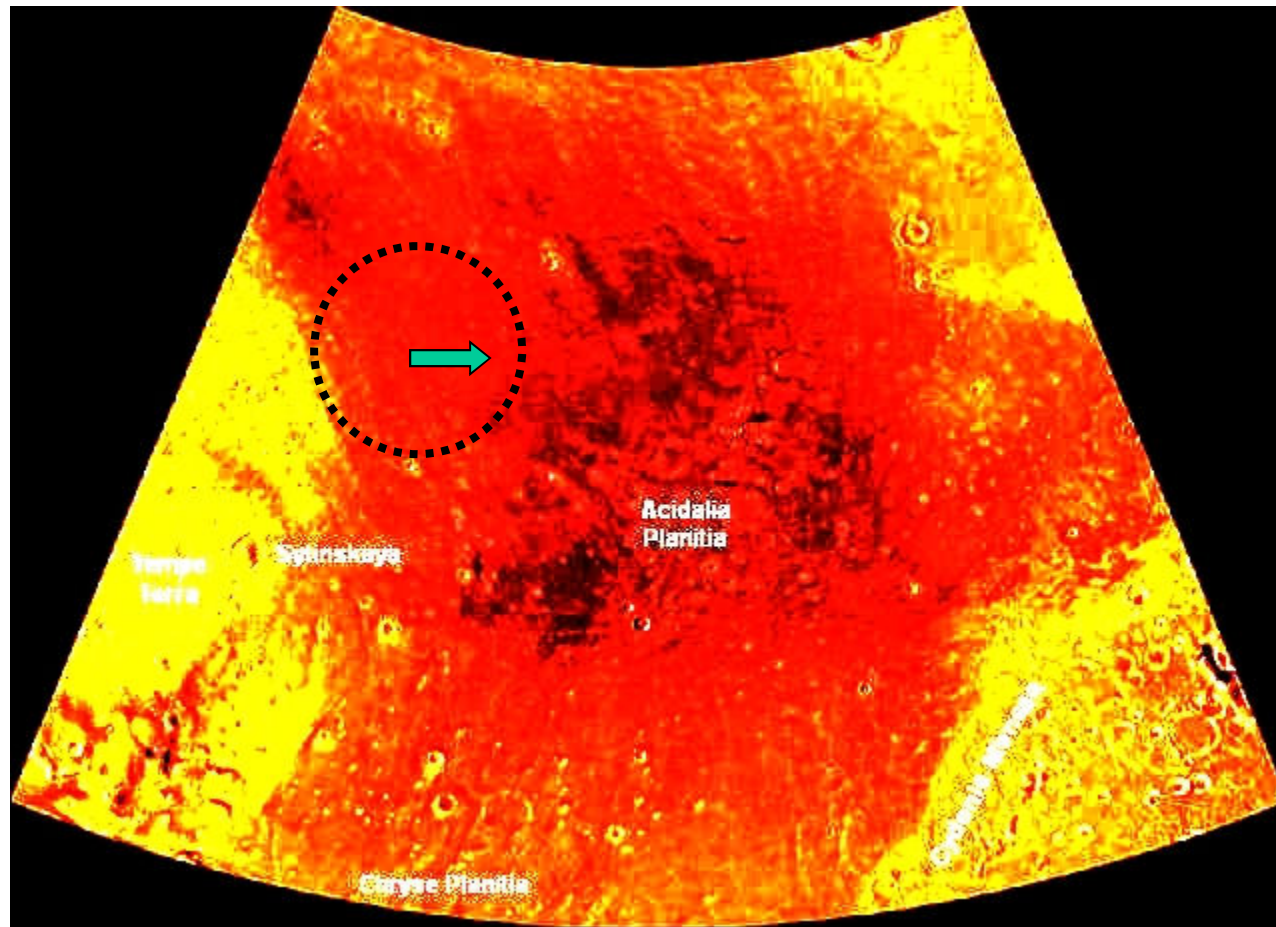


Location: Dubai
Height: 828m (2,716ft)

Mare Acidalium Site?



Mare Acidalium Site?



Predictions

- Residues of Uranium plutonium fission will found in surface layer
- Residues of Thorium-U233 fission will be found in surface layer
- Large amounts of radioactive K 0.7Gyr half life will be found buried in high amounts at Acidalium site

Problems

- Evidence for Mars paleo-nuclear event is strong- *but no crater at ground zero*
- Natural nuclear reactor explosion would have created a large deep crater
- Absence of crater suggests Air Burst after ocean dried up

Summary

- The Xenon, Krypton and U-Th anomalies can be explained by a large Thermonuclear weapon explosion in the past- *and little else*
- The weapon exploded over Mars Acidalium after ocean was dried up, throwing debris globally and releasing large amounts of Xenon while a U-Th rich debris layer irradiated the surface by delayed neutrons
- Residues of Thorium-Uranium fission will be found in surface layer- radioactive K will be found buried in high amounts at Acidalium site