

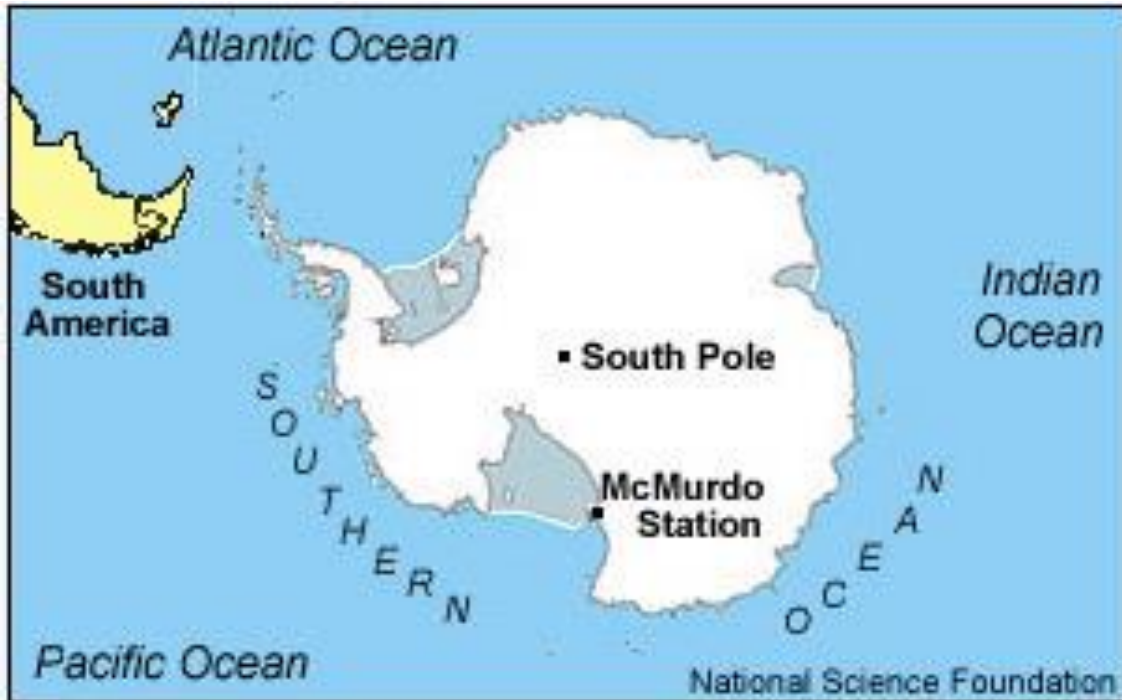
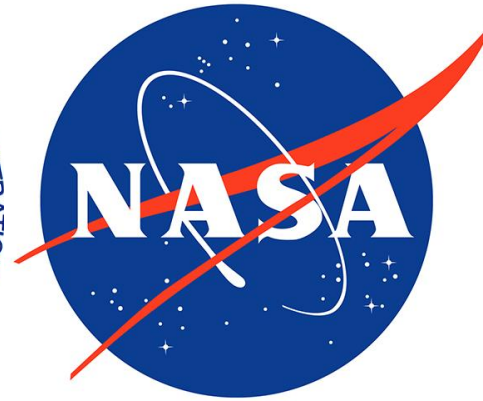
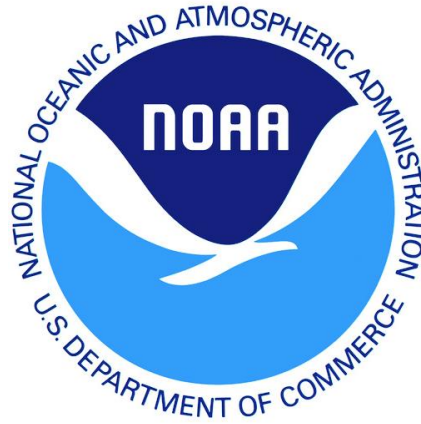
# Utilizing McMurdo Station, Antarctica as a Lunar South Pole ISRU Analog Proving Ground

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11/16/2022









USAF



USAF



NSF/OPP



NSF/OPP

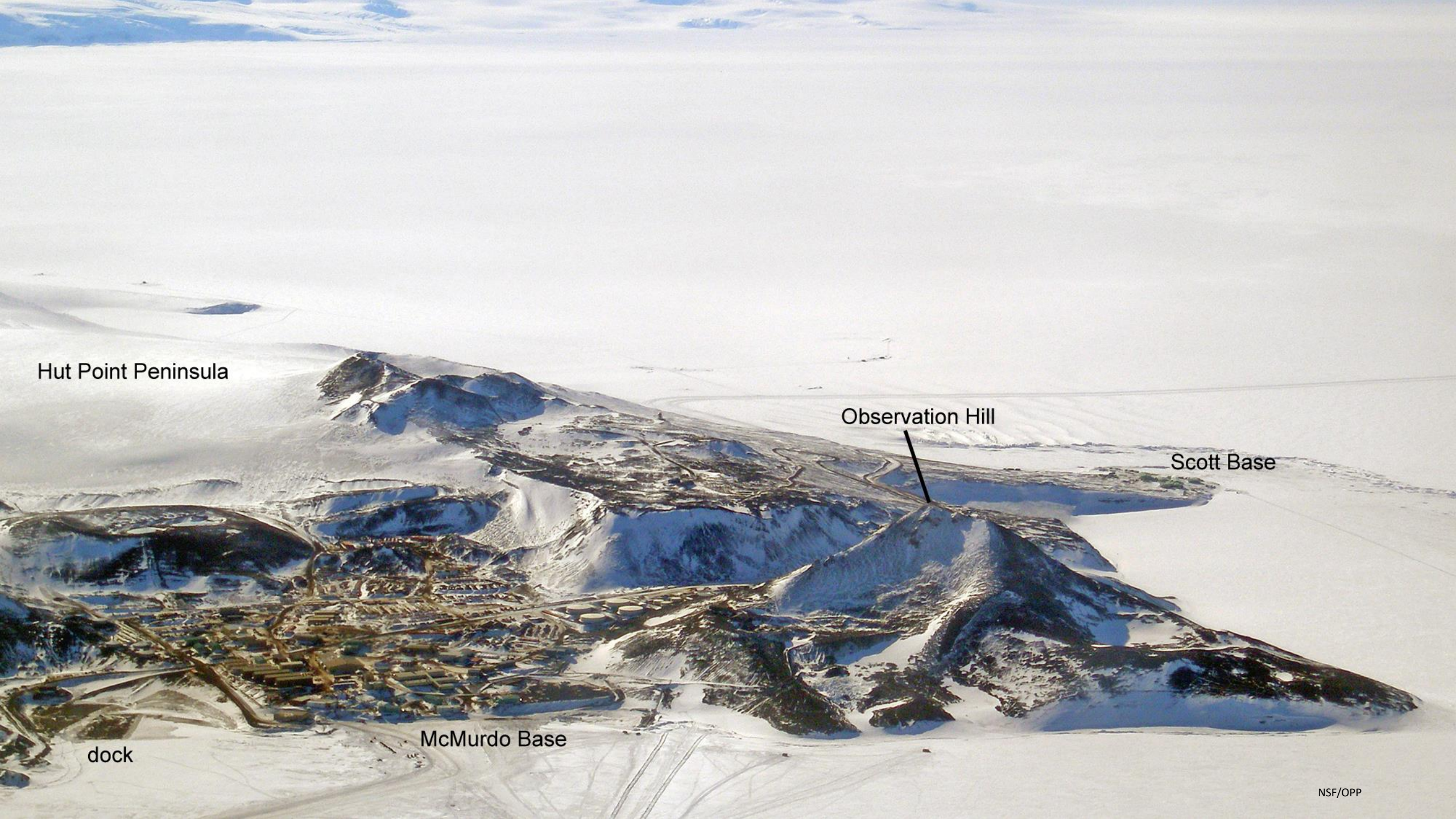


NSF/OPP









Hut Point Peninsula

Observation Hill

Scott Base

dock

McMurdo Base













Most of NASA's Human Research Program-related activity is conducted at McMurdo Station, a coastal outpost located on the volcanic hills at the southern tip of Ross Island. Studies undertaken at McMurdo Station focus on variables such as isolation, telemedicine, and the human response to harsh environments.

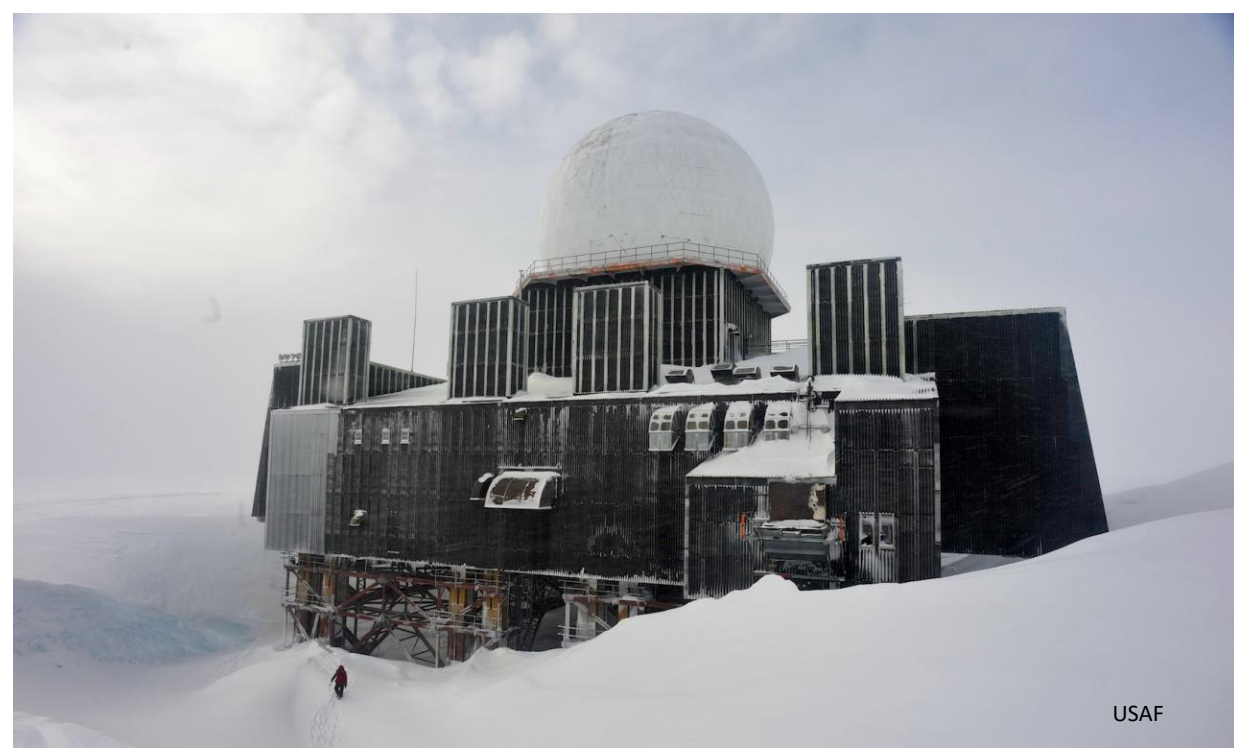


# 13 Seasons as a Heavy Equipment Operator in Antarctica





# 3 Seasons on the USAF Dew-Line

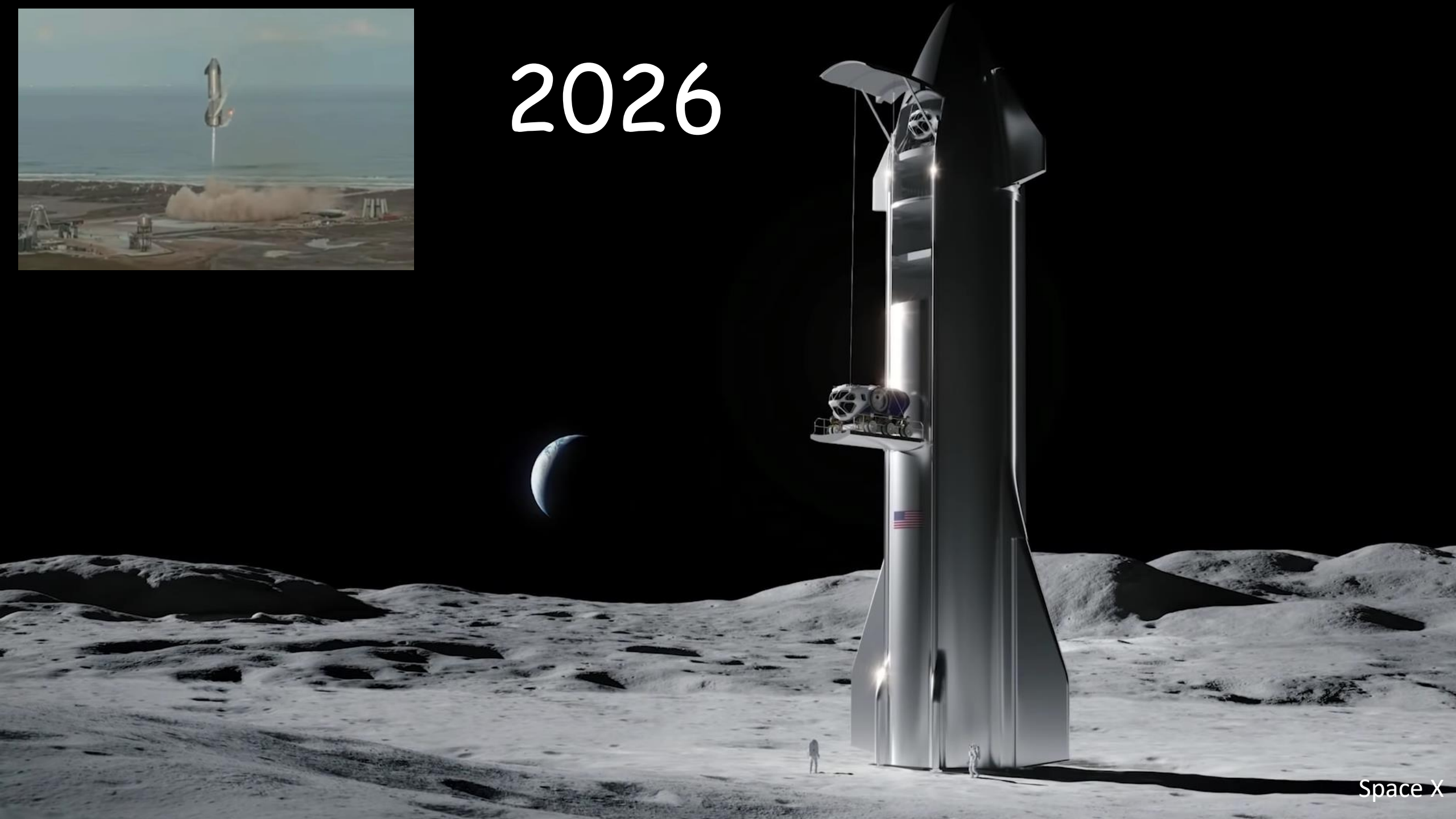








2026





Houghton Crater, Devon Island, Canada





# Arrival Heights

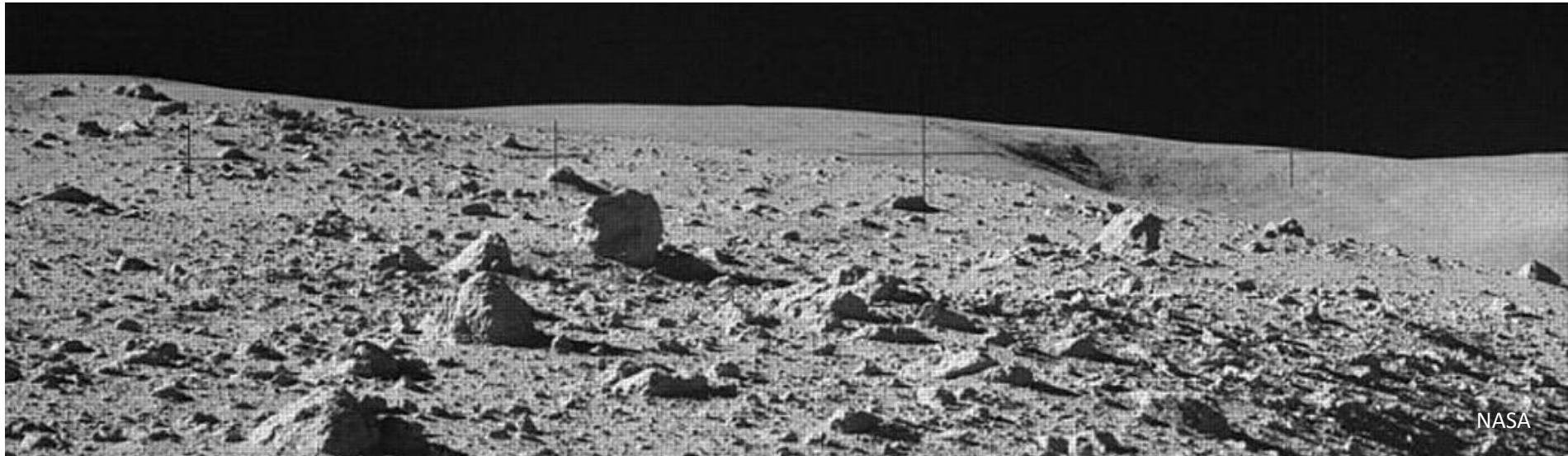


NSF/OPP





Rob Lindeman



NASA



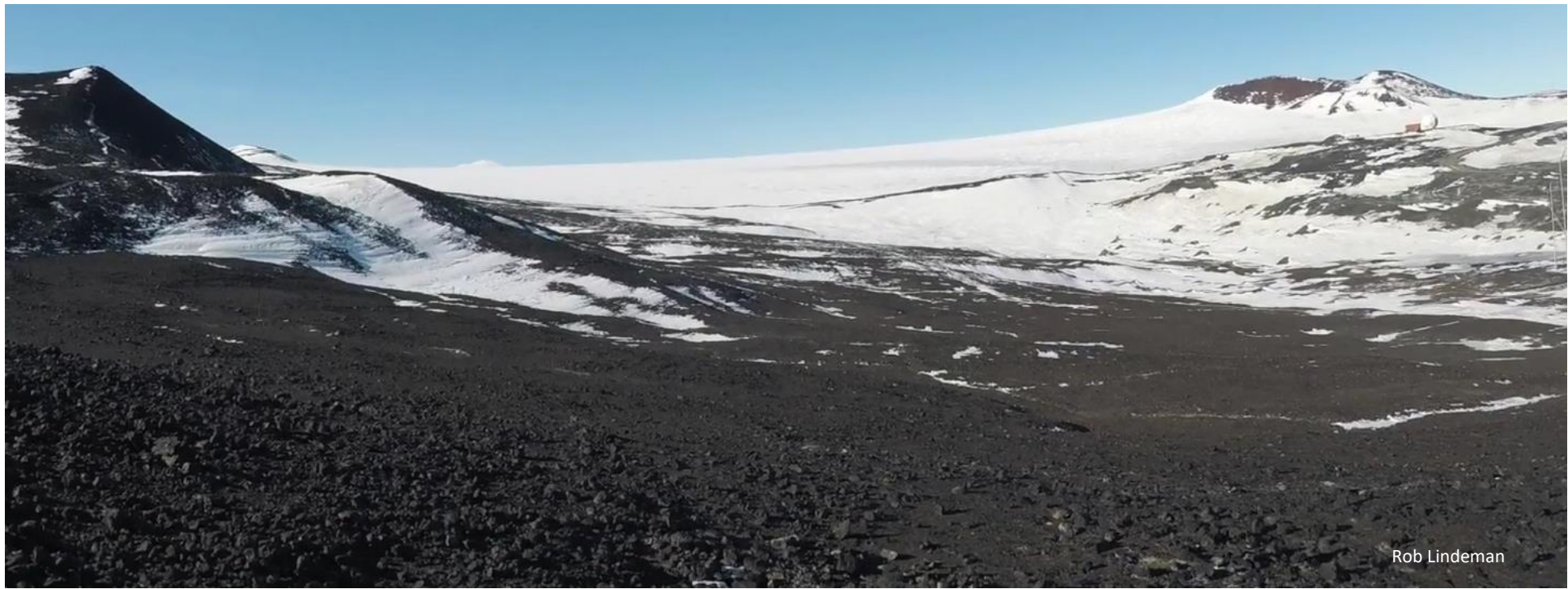


NASA



Alchetron





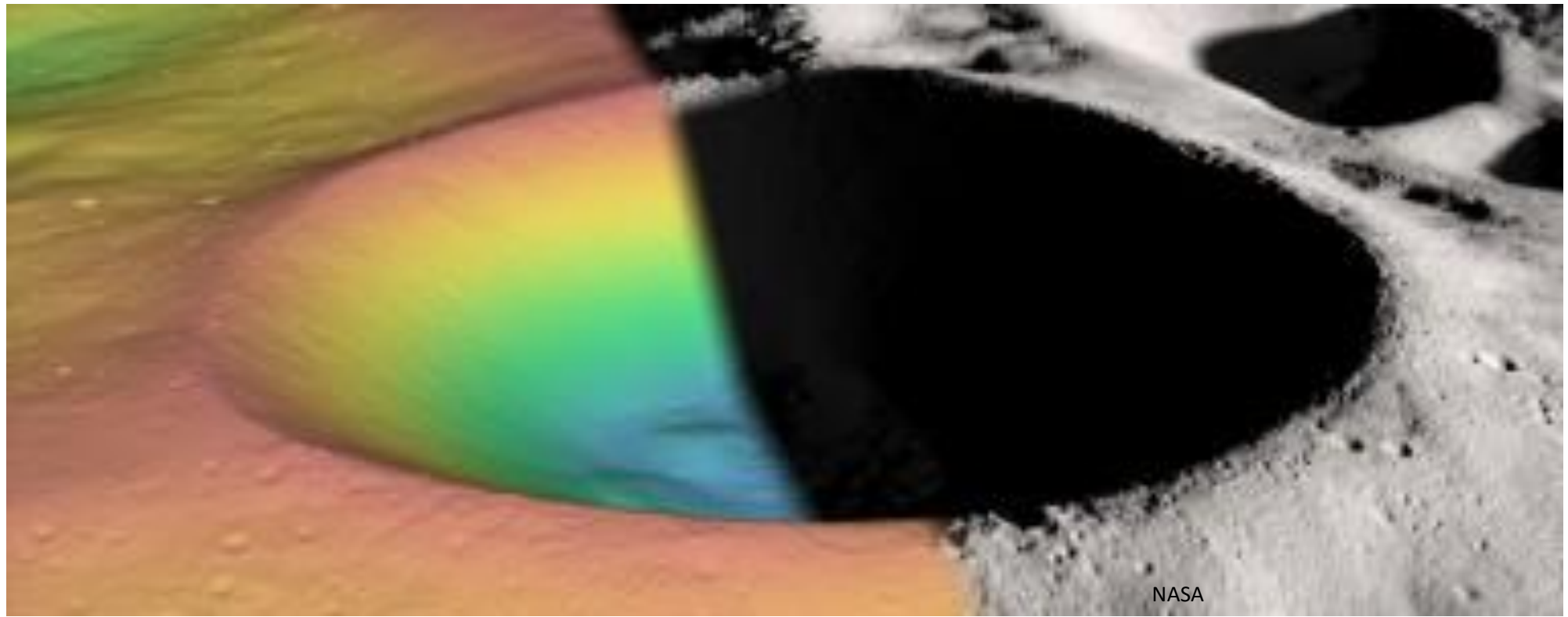
Rob Lindeman



NASA



Steep Slopes will be a challenge





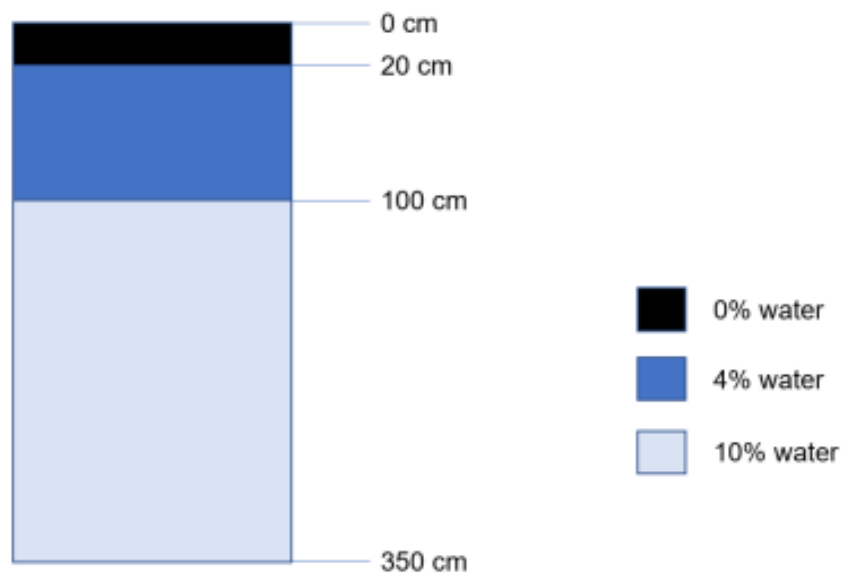


Peter Smith's Martian Ice

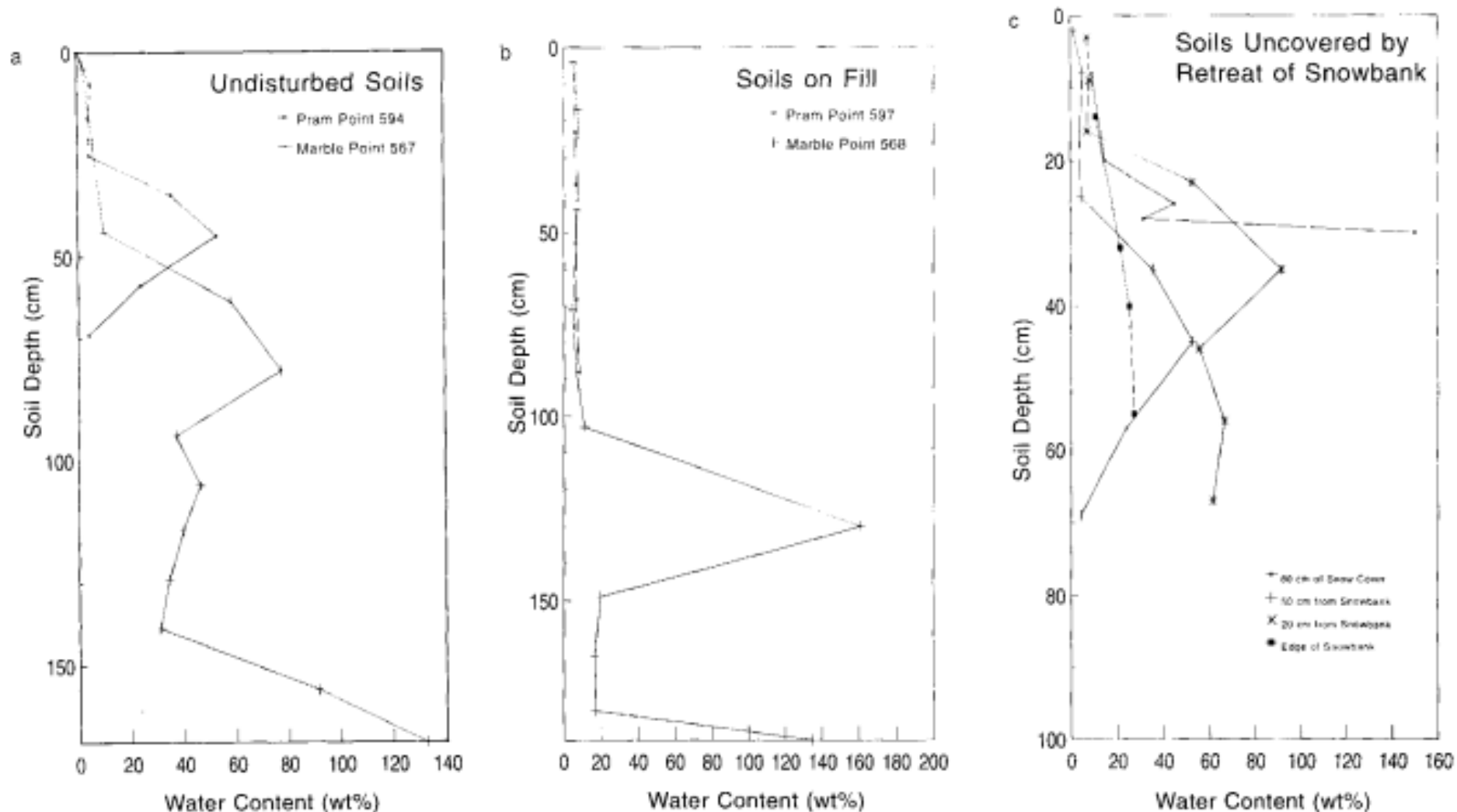


Figure 5. Hypothetical Icy Regolith Profile

Percentage of Water (wt%) in Icy Regolith at Various Depths







Campbell, Iain B., G. G. C. Claridge, and Megan R. Balks. "The effect of human activities on moisture content of soils and underlying permafrost from the McMurdo Sound region, Antarctica." *Antarctic Science* 6, no. 3 (1994): 307-314.

<https://researchcommons.waikato.ac.nz/handle/10289/934>





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# Temperature Comparison

McMurdo Station, is located at Lat. 77.88°S,  
Monthly Averages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
Average daily temperature °C	-2.9	-9.5	-18.2	-20.7	-21.7	-23	-25.7	-26.1	-24.6	-18.9	-9.7	-3.4	-16.9

Devon Island, is located at Lat. 75.45° N, the average temperature on Devon is -17 degrees Celsius, or 1 degree Fahrenheit,

But it is misleading because McMurdo Station's temperatures are taken in the middle of town and the temperatures are much lower on the Ice Shelf or up on Arrival Heights. Today's temperature in McMurdo was +4° F, while at the same time today at Willy Field on the Ice Shelf, 10 miles away, it was -15° F.

Climate data for McMurdo Station (extremes 1956–present)													[hide]
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	10.2 (50.4)	5.9 (42.6)	-1.1 (30.0)	0.0 (32.0)	-1.3 (29.7)	3.3 (37.9)	-4.4 (24.1)	-2 (28)	-3.7 (25.3)	4.5 (40.1)	10.0 (50.0)	10.8 (51.4)	10.8 (51.4)
Average high °C (°F)	-0.6 (30.9)	-7.3 (18.9)	-16.2 (2.8)	-17.3 (0.9)	-21 (-6)	-20.4 (-4.7)	-21.7 (-7.1)	-22.7 (-8.9)	-20.8 (-5.4)	-14.3 (6.3)	-6.5 (20.3)	-0.4 (31.3)	-14.2 (6.4)
Daily mean °C (°F)	-2.8 (27.0)	-8.8 (16.2)	-17.3 (0.9)	-20.9 (-5.6)	-23.3 (-9.9)	-22.9 (-9.2)	-25.8 (-14.4)	-27.4 (-17.3)	-25.7 (-14.3)	-19.4 (-2.9)	-9.7 (14.5)	-3.5 (25.7)	-17.3 (0.9)
Average low °C (°F)	-4.6 (23.7)	-11.4 (11.5)	-21.3 (-6.3)	-23.4 (-10.1)	-26.5 (-15.7)	-26.8 (-16.2)	-28.4 (-19.1)	-29.5 (-21.1)	-27.5 (-17.5)	-19.8 (-3.6)	-10.9 (12.4)	-4.4 (24.1)	-19.7 (-3.5)
Record low °C (°F)	-22.1 (-7.8)	-25 (-13)	-43.3 (-45.9)	-41.9 (-43.4)	-44.8 (-48.6)	-43.9 (-47.0)	-50.6 (-59.1)	-49.4 (-56.9)	-45.1 (-49.2)	-40 (-40)	-28.5 (-19.3)	-18 (0)	-50.6 (-59.1)







Thank You!

