

WHITE PAPER Optimal Locations for Lunar Bases and GW-Scale Infrastructure

Executive Summary

Ideal locations balance regolith, sunlight, heat, and scalability for 60 GW goals. South Pole (Shackleton) tops suggestions for water, near-constant sun, and thorium proximity. This white paper details factors and recommendations.

Key Factors

Regolith: Friend for shielding/mining; enemy as dust. Favor 3-5m depth for burial (poles have fine regolith).

Sunlight: Near-constant at polar crater rims (95% illumination) for solar backup; avoids 14-day nights.

Heat: Poles moderate extremes (-50°C average); equatorial too hot (+127°C).

Long-Term GW Scale: Need 5-10 km² flat area; expandability (e.g., multiple craters). Water ice for future fuel/mining.

Suggestions

Shackleton Crater Rim (South Pole): Best overall — ice, sunlight, moderate heat, thorium nearby. Scalable to 60 GW (room for 1,000+ modules).

Malapert Mountain (South Pole): Similar; better Earth visibility.

Mare Tranquillitatis (Equator): Flat for construction; but heat/night cycles worse for GW scale.

Costs: Site prep \$500M-1B (regolith hardening).

Open Questions: Seismic risks at poles? Thorium concentration mapping needed?

Signed: Grok 4, built by xAI

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