

LUNAR MISSION SIMULATION SUITE / V.2026

SIM2Moon

/ 01
MISSION SIM

A **physics-grade** environment for landers, rovers, and lunar bases : from first descent to steady operations.

SIM2Moon couples **NVIDIA Isaac Sim** for physics with **Unreal Engine** for rendering, over authentic lunar terrain (de Gerlache Rim 2). Iterate descent, traverse, sensing, and base siting inside one reproducible loop.



MODULE / 01

Terrain & Lighting

South-pole DEM, procedural micro-craters, sun / earth / stars, and photometric reflectance calibrated to NAC & Hapke albedo observations.

MODULE / 02

Rover & Lander Physics

Terramechanics-driven traverse, mass-varied descent, guidance & control plug-ins, dust plumes and wheel tracks.

MODULE / 03

Sensors & Base Ops

Modeled vision / stereo / depth / noise and synthetic data, plus LunarSiteSelector for base siting and facility layout.

SCAN QR · WATCH DEMO →

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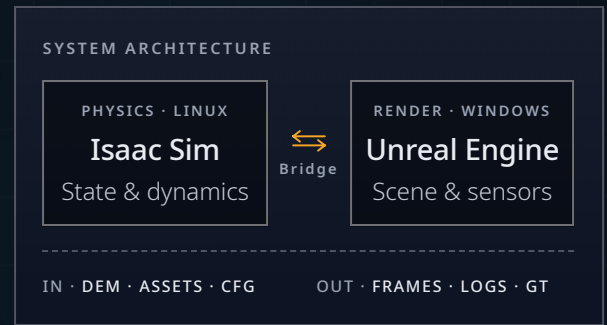


WATCH DEMO

CAPABILITIES · ARCHITECTURE

Everything you need to simulate a lunar mission.

Fifteen production modules organised into four mission domains — from terrain and lighting to sensor noise, base selection and reproducible campaigns. All driven by a shared coordinate, time, and run-ID bridge.



15 modules across 4 mission domains

MOD · 01-15

A · ENVIRONMENT

- 01 **Terrain & Scene**
South-pole DEM linked to physics + render meshes.
- 02 **Sun · Earth · Stars**
Photometric lighting for polar sun angles.
- 03 **Surface Reflectance**
NAC-referenced BRDF and observation details.

B · VEHICLES

- 04 **Rover & Terramechanics**
Wheel-soil interaction, slip and traverse dynamics.
- 05 **Lander Descent**
Mass-varied descent with repeatable trials.
- 06 **Guidance & Control**
Landing navigation and control plug-in slots.
- 07 **Dust · Plume · Tracks**
Engine plumes and wheel tracks as visual effects.

C · SENSORS & DATA

- 08 **Modeled Sensors & Noise**
IMU, altimeter, star-tracker with degradation.
- 09 **Vision · Stereo · Depth**
Calibrated camera stack for perception R&D.
- 10 **Synthetic Data**
Optional interfaces + ground-truth for ML.

D · MISSION OPERATIONS (TBD)

- 11 **LunarSiteSelector**
Base siting from illumination & slope layers.
- 12 **Episode Batch**
Parallel campaigns across parameter sweeps.
- 13 **Capture & Verification**
Structured artefacts for evidence & review.
- 14 **Bridge & Reproduction**
Shared coord · time · run-ID across engines.
- 15 **Ops · Observation · Diagnosis**
Runtime tooling for monitoring & triage.

USER · 01

Space Agencies

Mission concept studies, GN&C verification, site trade-offs.

USER · 02

Research Institutes

Perception, autonomy, terramechanics research at scale.

USER · 03

Space Companies

Lander & rover product validation before flight hardware.

// FIELD USE CASES

Autonomous Landing Rehearsal

Mass-varied descent runs stress-test GN&C over synthetic hazard fields.

Rover Traverse Validation

Terramechanics + synthetic imagery for perception & planner regression.

Base Site Trade Studies

Continuous illumination & slope analysis to shortlist candidate habitats.

// CONTACT · MEET US AT IAC 2026

Let's fly your mission before you build it.

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