

Nereus Surface Formation Case Studies – Volume I

Expedition Archive 11B – Nereus System

Recovered Field Data – Year 2471 AE

1. Thermal-Weathered Granite

Formation Type: Fractured plutonic rock

Primary Process: Thermal fatigue, exfoliation, and mechanical disintegration under extreme diurnal cycles

Geological Overview

This formation exhibits characteristic **thermal stress fracturing**, where repeated expansion and contraction from temperature extremes have caused outer rock layers to **spall and peel away** in sheets. The sharp edges and flaking surfaces indicate **granular disintegration**, where mineral grains (quartz, feldspar, mica) separate along microfractures.

Wind abrasion and limited moisture infiltration further accelerate the process, creating **angular blocks and sharp clefts**. The visible contrast between darkened oxidized surfaces and lighter freshly exposed interiors reflects prolonged exposure to radiation and oxidizing atmospheric compounds.

Nereus Adaptation

On Nereus, extreme **thermal fluxes from ionized storms** amplify this process. The surface granite could appear **partially vitrified**, with a glassy sheen in fracture zones where plasma lightning has melted the uppermost layers. Dust and acidic rainfall deposit faint cyan mineral blooms along fissures, giving the rock a cold, bioluminescent undertone – a fusion of **heat-born and chemical weathering**.

2. Tafoni (Honeycomb Weathering)

Formation Type: Granitic or sandstone cavities

Primary Process: Salt weathering and alveolar corrosion

Geological Overview

Tafoni form through **chemical and salt-driven erosion**, where saline water penetrates rock pores and then evaporates, leaving behind crystals that expand and fracture the stone from within. Over time, this leads to **cavernous pits and alveoli**, producing the distinctive honeycomb texture.

Wind and rainfall accentuate these cavities, smoothing inner surfaces while leaving outer crusts rough and corroded. Light refracts within the cavities, creating an interplay of shadow and depth that enhances their visual intricacy.

Nereus Adaptation

On Nereus, these formations could result from **acidic rainfall** and **ion-saturated mists** interacting with silica-based rock. Instead of salt crystallization, **electrochemical corrosion** might hollow out the stone, producing **plasma-scorched alveoli** that glow faintly under stormlight.

The result: alien honeycomb caverns – a stone memory of chemical warfare between rain and mineral.

3. Hoodoo / Pedestal Rock Formation

Formation Type: Erosional spires and arches

Primary Process: Differential erosion by wind and water

Geological Overview

Hoodoos develop when alternating layers of hard and soft rock erode at different rates. The caprock protects the column beneath, creating tall, slender spires. The process relies on **abrasive winds and intermittent precipitation**, carving smooth fluted columns and undercut ledges.

Nereus Adaptation

On Nereus, **hyper-pressurized, electrically charged winds** would elevate this process to a new scale. These winds carry fine, magnetized dust that partially melts upon impact, resulting in surfaces with **dual textures** – vitrified and matte.

Some formations may display **ion-burned striations** and **translucent glass veining**, glowing with residual plasma energy.

Artistically, these structures embody the idea of **erosion as art**, the unseen sculptor shaping the planet's memorials.

"Even destruction leaves form."

4. Columnar Basalt (Giant's Causeway Type)

Formation Type: Basaltic polygonal columns

Primary Process: Rapid cooling and contraction of lava flows

Geological Overview

When basaltic lava cools quickly, it contracts and fractures into **polygonal prisms**, most often hexagonal. These cracks propagate downward as cooling continues, forming vertical columns – a natural manifestation of **mathematical order in chaos**.

The consistent geometry and tiered cliffs at coastal regions occur as **wave erosion** reveals the columns. Each polygonal cell represents a cooling front, a frozen pulse of the planet's thermal history.

Nereus Adaptation

On Nereus, these formations might be remnants of **ancient plasma vents** or **geothermal conduits**. The columns could appear **semi-translucent**, with cyan luminescent veins tracing the original fractures.

Water erosion and ion storms further refine them, carving fluted channels that shimmer under dim light.

These crystalline basalt towers symbolize **the planet's memory of heat** – the aftermath of creation itself.

"Even geometry mourns."

Summary

The geological diversity of Nereus embodies the planet's dual nature – order and decay, glass and dust, creation and erosion. Each formation tells the story of a world reshaped by catastrophe yet still sculpting beauty from ruin.

Together, they form a lithological language – a record of the planet's soul written in stone.