

INSPIRATION CHAOS THEORY

Natural systems, such as climate systems and geological movements, often exhibit chaotic behavior. The formation process of caves and certain stages of Earth's evolution can also be extremely sensitive to initial conditions. This sensitivity further increases the complexity and unpredictability of the geological evolution of caves.

$$C_{t+1} = A \cdot \sin(\omega t + \phi) + \gamma \cdot (R + M_t)$$

- C_{t+1} : The state of the cave at the next time point (e.g., sediment thickness, structural changes).
- $A \cdot \sin(\omega t + \phi)$: Represents natural periodic changes, such as seasonal rainfall or temperature fluctuations.
- $\gamma \cdot (R + M_t)$: Chaotic and random disturbances.

Decoding the Connection

Chaos theory allows me to rethink the 3D scan model and the use of color, incorporating elements of unpredictability. Time in the cave is not a linear flow; it is stretched, compressed, and fractured, with each geological layer encapsulating a vast span of years.

This formula and the 3D model inspire me to add lighting effects that represent random fluctuations—shifting colors and shadows, silent traces left by time in the natural world.

INSPIRATION FOR THE FUTURE PREDICTING AND RETROSPECTING TIME



The unpredictability of chaotic system also means that we can use this formula to simulate possible future changes. By adjusting parameters such as A , γ , and others, the 3D model can showcase how the cave might evolve under different environmental conditions. This also helps me better understand that time is not merely a linear flow but a multi-dimensional weave in natural systems.

INSPIRED BY LUCY



Inspired by *Lucy*, I envision caves as the time cornerstone of the Earth. Just as Lucy explores the nonlinear concept of time, the formation process of caves represents an accumulation of existence along the Earth's timeline. It is also the "materialization" of nature's self-recording.