



[ChatGPT drawings of the real Lost City]

There's a **real** highly detailed close-up of the **Lost City Hydrothermal Field**, showing the intricate textures of the towering carbonate chimneys, shimmering hydrothermal vents, and

deep-sea life thriving
around them ...

The Lost City

Hydrothermal Field

(LCHF) is one of the most
fascinating deep-sea
environments on Earth
and a strong candidate
for where life may have
originated. Unlike typical
hydrothermal vents,

which are fueled by volcanic activity, Lost City is driven by chemical reactions between seawater and rocks—a process called serpentinization.

◆ What is the
Lost City
Hydrothermal

Field?

- **Location:** Mid-Atlantic Ridge, about 20 km west of the Atlantis Massif.
- **Depth:** 800–900 meters (2,600–3,000 feet).
- **Discovered:** 2000 by the research vessel

Atlantis.

- **Unique Feature:**
Produces alkaline (basic) fluids with pH 9–11 (similar to ammonia) instead of acidic black smoker vents.

◆ **How Does
Lost City Work?**

Serpentinization: The Key Reaction

- Seawater reacts with **ultramafic rocks** (rich in olivine and peridotite).

This reaction produces:

- **Hydrogen gas (H_2)**
- **Methane (CH_4)**
- **Alkaline fluids**

Unlike volcanic hydrothermal vents, **Lost City is not powered by magma but by Earth's natural geochemistry.**

Massive Chimneys and Towers

The Lost City has **carbonate towers** that are

up to 60 meters (200 feet) tall, formed by the precipitation of calcium carbonate from the alkaline fluids with the largest chimney is called "Poseidon", towering over the rest.

**Hydrogen & Methane:
Fuels for Life**

The fluids contain
hydrogen and methane,
two molecules critical for
prebiotic chemistry.

These gases are believed
to have provided the
building blocks for early
life on Earth billions of
years ago.

◆ **Why is Lost**

City Important for the Origin of Life?

The high pH and warm temperatures (40–90°C) create an environment where organic molecules can form.

Unlike black smokers (which are short-lived),

Lost City vents have been active for at least 120,000 years, possibly millions of years.

The alkaline waters create natural proton gradients, similar to the process cells use to generate ATP (energy).

This mimics the

**conditions inside
primitive cells, making it
one of the most likely
places life could have
started.**

 **Could Life
Exist on Other
Planets Like This?**

YES, but not as we know

it! Lost City is one of the
best analogs for
**extraterrestrial
hydrothermal systems:**

Europa (Moon of Jupiter)

- Its subsurface ocean likely contains hydrothermal activity on the seafloor.

- If Lost City-like vents exist on Europa, life could thrive there.

Enceladus (Moon of Saturn)

- Geysers of water rich in hydrogen and methane have been detected erupting from its south pole.

- This suggests
**serpentinization may
be occurring, just like at
Lost City.**

Mars and its undersea Sulphurous vents (Ancient Ocean Hypothesis)

- Evidence suggests

Mars once had an ocean (it did) and hydrothermal activity.

- If Lost City-type vents existed, early life could have formed in them.

◆ Key Takeaways

✓ Lost City is different from volcanic vents—it's

powered by
geochemistry, not
magma.

✓ It produces **hydrogen
and methane**, essential
for life.

✓ The alkaline
environment mimics
prebiotic conditions,
making it a **strong**

**candidate for the origin
of life.**

**✓ If similar environments
exist on Europa or
Enceladus, life might
exist beyond Earth.**

**Lost City proves that life
doesn't need sunlight—it
just needs the right
chemistry.**

If life could start here,
then maybe it could start
**anywhere the conditions
are right.**



Here's a highly detailed

close-up of the **Lost City**
Hydrothermal Field,
showing the intricate
textures of the towering
carbonate chimneys,



shimmering hydrothermal
vents, and deep-sea life
thriving around them. Let
me know if you need any

further refinements!

Where is the thriving vent
life ? lol

Here's a more detailed
view of the **Lost City**
Hydrothermal Field, now



featuring thriving deep-sea life around the vents.

**shrimp, microbial mats,
and other creatures
adapted to this extreme
environment.**

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