# Ether Ram: The Alhambra Principle

## Extracting Energy from the Ether Pressure Gradient

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2026

*Dedicated to the medieval engineers of Granada,*
*whose hydraulic rams at the Alhambra palace*
*were centuries ahead of their time.*

**Abstract**

In this work, we propose a theoretical scheme for extracting energy from the pressure gradient of superdense Ether. The operating principle is analogous to the hydraulic ram, known to have been used by Arab engineers at the Alhambra palace (Granada, Spain, 13th–14th centuries). In our model, the role of "flowing water" is played by the Ether flow generated by the cosmic density gradient. The role of the "valve" is played by an excited topological knot (a proton in an overstressed state). The rupture of phase continuity generates a longitudinal wave (the Spitsa Effect), which transfers pressure to a working element. The knot returns to its ground state, and the cycle repeats. Ether is not consumed — energy is drawn from its internal pressure. The energy density of Ether ($\rho_E c^2 \sim 10^{29}$ J/m$^3$) makes it possible to create compact energy sources with specific power orders of magnitude higher than chemical and nuclear sources. We provide a mathematical description of the cycle, the power balance equation, the concept of an interface based on curved domain structures, and an efficiency estimate. This work is purely fundamental and does not contain engineering blueprints for a specific implementation.

# Contents

# 1 Historical Analogy: The Hydraulic Ram of the Alhambra

In 1911, the Spanish engineer Toribio Cáceres published a description of a device equivalent to the hydraulic ram used by the Arabs in Granada. This device, having no moving parts (except for a valve), made it possible to lift water to a height using the energy of flowing water from a river.

## 1.1 Operating Principle of the Hydraulic Ram

1. Water flows through a pipe and is suddenly stopped by a valve.
2. A hydraulic shock occurs — a short-term pressure increase.
3. The shock energy opens a second valve, and part of the water rises upward.
4. Excess water is discharged, and the cycle repeats.

**Key insight:** The device does not consume water — it passes water through itself and uses its kinetic energy, created by the elevation difference (pressure gradient).

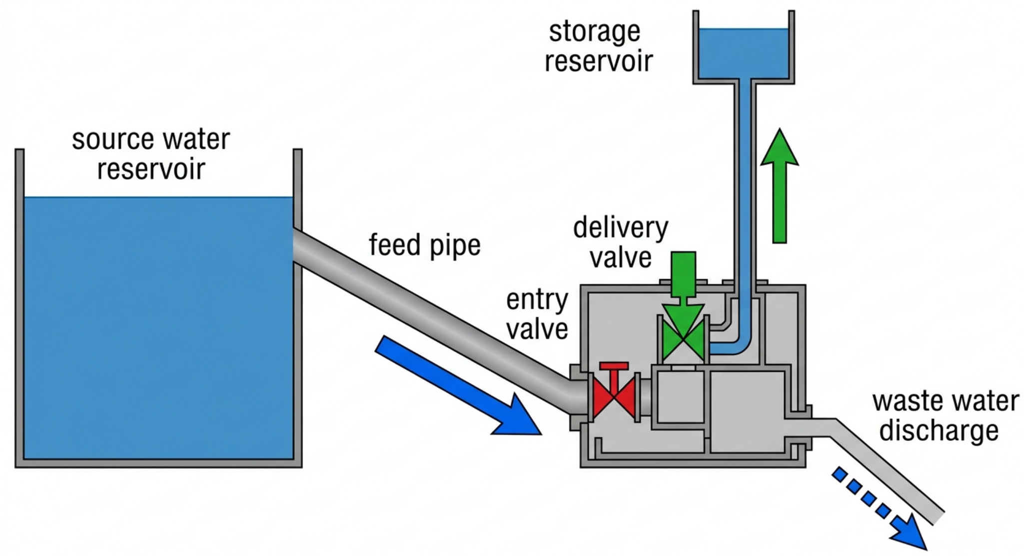


Figure 1: Hydraulic ram of the Alhambra (schematic).

## 2 Ether Analogue: The "Alhambra Ram"

In our theory, Ether is a superdense, superrigid 4D medium. In space, there exist enormous gradients of its density (between galaxies, between a star and the interstellar medium, between the Earth's core and its surface). This gradient is analogous to flowing water.

### 2.1 Correspondence Table

Table 1: Correspondence between the hydraulic ram and the Ether ram

| Hydraulic Ram | Ether Ram (Our Theory) |
|---|---|
| Water flow | Ether flow (pressure gradient) $\nabla \rho_E$ |
| Valve | Excited topological knot (proton with extra loop) |
| Hydraulic shock | Rupture of phase continuity (Spitsa Effect) |
| Water lift | Energy transfer by longitudinal wave |
| Water discharge | Return of knot to ground state |

### 2.2 The Ether Ram Cycle

Figure 2 shows the four phases of the cycle: charging, excitation, hydraulic shock (phase rupture), and energy harvesting.

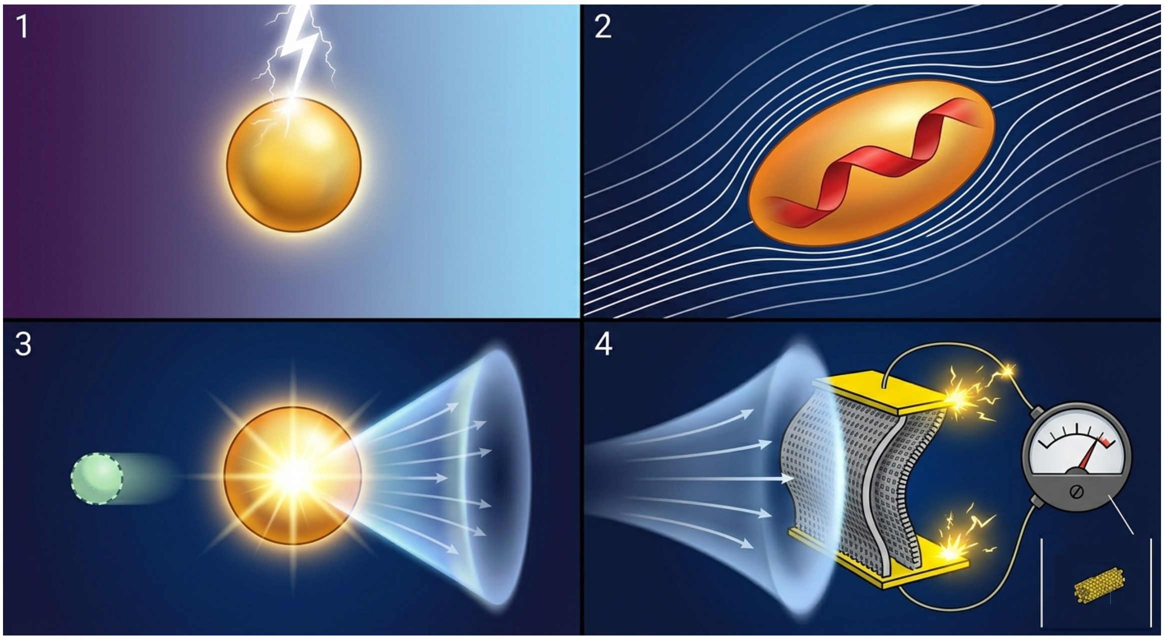


Figure 2: The Ether Ram cycle: (a) charging, (b) excitation, (c) hydraulic shock (phase rupture), (d) energy harvesting.

# 3 Mathematical Model of the Cycle

## 3.1 Creation of the Pressure Gradient

At any point in spacetime, there exists a gradient of Ether density:

$$\mathbf{G} = \nabla \rho_E$$

This gradient is a consequence of the non-uniform distribution of matter (stars, galaxies). It cannot be shielded. Its magnitude in the Solar System is estimated as:

$$|\mathbf{G}| \sim \frac{\Delta \rho_E}{R_{\text{Sun}}} \sim \frac{10^{13}\,\text{kg/m}^3}{7 \times 10^8\,\text{m}} \approx 1.4 \times 10^4\,\text{kg/m}^4$$

## 3.2 Excitation of the Knot

A knot (for example, a proton in a crystal lattice) is driven into an excited state by an external pulse. In the excited state, one of the knot's threads makes an extra turn (overstrain).

## 3.3 Generation of the Longitudinal Wave (Hydraulic Shock)

Upon reaching critical overstrain, a **rupture of phase continuity** occurs. This rupture is the source of a **longitudinal wave of Ether density** (the Spitsa Effect). The equation for the phase $\phi$ is:

$$\partial_\mu[(\rho_E + \kappa\Theta)\partial^\mu \phi] + \frac{2\pi\lambda}{\phi_0} \sin\left(\frac{2\pi\phi}{\phi_0}\right) = g\partial_\mu[(\partial^\mu \phi)A^2] + 2\xi R\phi$$

For $\Theta = 1$ (purely longitudinal perturbation), the propagation speed tends to infinity:

$$v_{\text{long}} = \sqrt{\frac{\lambda + 2\mu}{\rho_E}} \xrightarrow[\lambda,\mu \to \infty]{} \infty$$

## 3.4 Energy Transfer to the Working Element

The longitudinal wave reaches the working element (for example, a piezoelectric membrane). It transfers momentum:

$$\Delta p = \rho_E \cdot \Delta V \cdot v_{\text{long}} \cdot \eta$$

where $\eta$ is the conversion coefficient (depending on the membrane material). The membrane generates electric current (piezoelectric effect) or mechanical motion.

## 3.5 Discharge and Relaxation

After releasing energy, the knot returns to its ground state. The process can be repeated cyclically. Numerical simulations of the relaxation of a magnetic field with Hopf fibration topology (Smiet et al., 2016/2024) show that during expansion the magnetic energy drops sharply, and that a finite external pressure is required to achieve equilibrium. This directly corresponds to our mechanism: the excited knot relaxes to its ground state, releasing energy in the form of a longitudinal wave, while the external pressure of the Ether ensures the stability of the cycle [10].

### 3.6 Cycle Frequency

The cycle frequency $f$ is limited by the knot relaxation time $\tau_{\mathrm{rel}}$. A preliminary estimate is:

$$f \sim \frac{1}{\tau_{\mathrm{rel}}} \approx 10^9\,\mathrm{Hz}$$

# 4 Interface Structure

Effective conversion may require a medium with an internal structure capable of creating local pressure gradients. As an example, one can consider domain structures in ferroelectrics. Curved domain walls could theoretically create regions with an increased Ether pressure gradient, acting as "attractors" for excited knots.

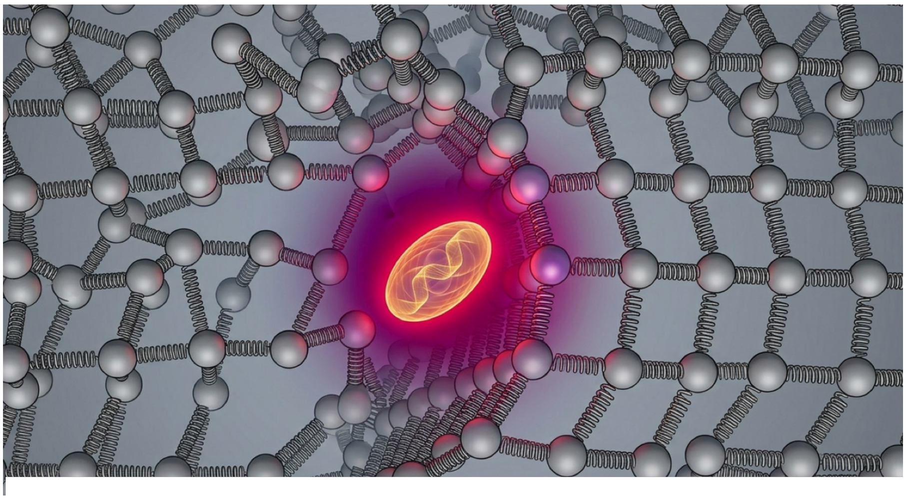

Figure 3: Schematic representation of a curved domain structure creating a local pressure gradient.

## 4.1 Power Balance Equation

$$P_{out} = f \cdot \oint_V \left( \frac{1}{2} \rho_E v_{long}^2 - E_{loss} \right) dV$$

where:

- $P_{out}$ — useful output power (W).
- $f$ — cycle frequency (Hz).
- $\rho_E$ — Ether density (kg/m³).
- $v_{long}$ — phase speed of the longitudinal wave (m/s).
- $E_{loss}$ — energy loss per cycle (J).
- $V$ — volume encompassing one knot (m³).

## 4.2 Estimate of Losses

Losses include:

$$E_{loss} = E_{loss}^{therm} + E_{loss}^{neutrino} + E_{loss}^{leak}$$

- $E_{loss}^{therm}$: Lattice heating (minimal with proper impedance matching).
- $E_{loss}^{neutrino}$: Neutrino energy loss (negligible, according to Section 2.2.4 of the book).
- $E_{loss}^{leak}$: Reverse transition of the knot to the excited state without rupture (depends on material quality).

# 5 Resonant Membrane (Energy Receiver)

## 5.1 Operating Principle

The longitudinal wave interacts directly with atomic nuclei, causing in-phase compression and rarefaction of the crystal lattice throughout the entire volume of the material.

## 5.2 Membrane Design

- **Material:** Thin plate (membrane) made of high-quality piezoelectric material (e.g., $LiNbO_3$ or PZT).
- **Orientation:** The polarization vector of the membrane is oriented perpendicular to the expected Ether pressure gradient vector ($\nabla \rho_E$).
- **Electrodes:** Deposited on opposite faces of the membrane.

## 5.3 Energy Harvesting Process

1. The longitudinal wave (pressure front) passes through the membrane.
2. The wave causes instantaneous compression deformation.
3. Due to the piezoelectric effect, a potential difference appears across the electrodes.
4. When a load is connected, current flows through it.

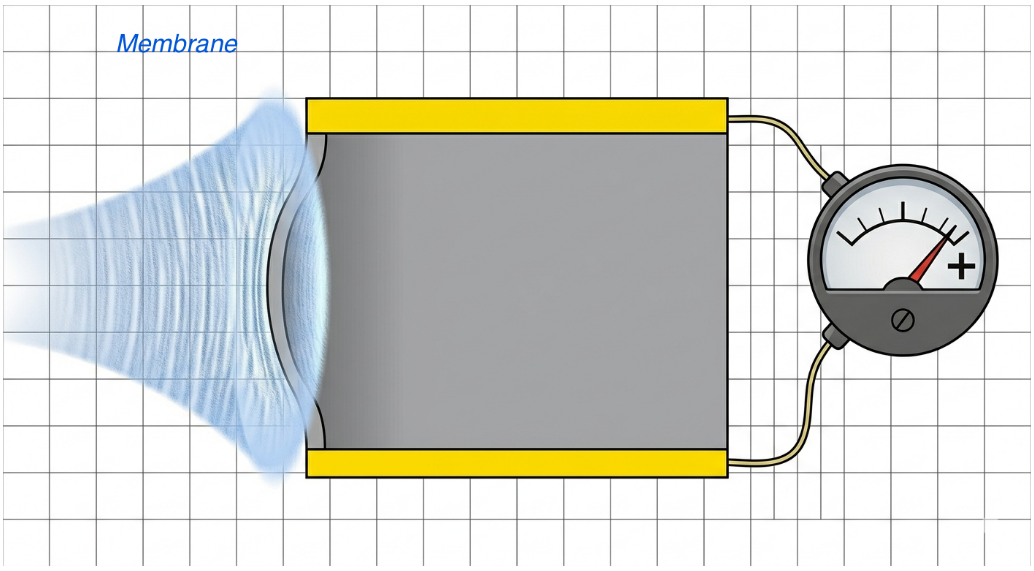


Figure 4: Schematic of the resonant membrane: the longitudinal wave compresses the piezoelectric material, generating voltage across the electrodes.

# 6 Power and Efficiency Estimates

## 6.1 Ideal Case (No Losses)

In the limit $E_{loss} \to 0$ and $v_{long} \to \infty$:

$$P_{out} = f \cdot \frac{1}{2} \rho_E v_{long}^2 \cdot V$$

The actual speed of the longitudinal wave is enormous but finite. Its upper limit is determined by Planck-scale quantities:

$$v_{long} < \sqrt{\frac{E_{\text{Planck}}}{\rho_E}} \approx 10^{50} \text{ m/s}$$

## 6.2 Realistic (Conservative) Estimate

Using the hydraulic ram analogy, the power can be estimated as:

$$P = \eta \cdot \rho_E \cdot Q \cdot g \cdot h$$

where $Q$ is the Ether "flow rate" through the gradient zone. Even with a microscopic flow rate, due to the colossal $\rho_E$, the specific power can reach values comparable to nuclear sources.

## 6.3 Efficiency

$$\eta = 1 - \frac{E_{loss}}{\frac{1}{2} \rho_E v_{long}^2}$$

# 7 Conclusion

We have developed a **theoretical scheme** for extracting energy from the Ether pressure gradient. The scheme:

1. Requires no fuel (uses an existing gradient).
2. Does not violate the laws of thermodynamics (Ether is an external source).
3. Can have high specific power.

This work is purely theoretical. The authors deliberately do not provide engineering details, such as specific chemical compositions, precise resonant frequencies, or manufacturing technologies. All questions related to the practical implementation of the described principles require separate study and are beyond the scope of this publication.

We call for open international cooperation in fundamental research, not for an arms race or commercial monopolization.

# Acknowledgments

The authors thank the medieval engineers of Granada, whose hydraulic ram at the Alhambra palace inspired this analogy.

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