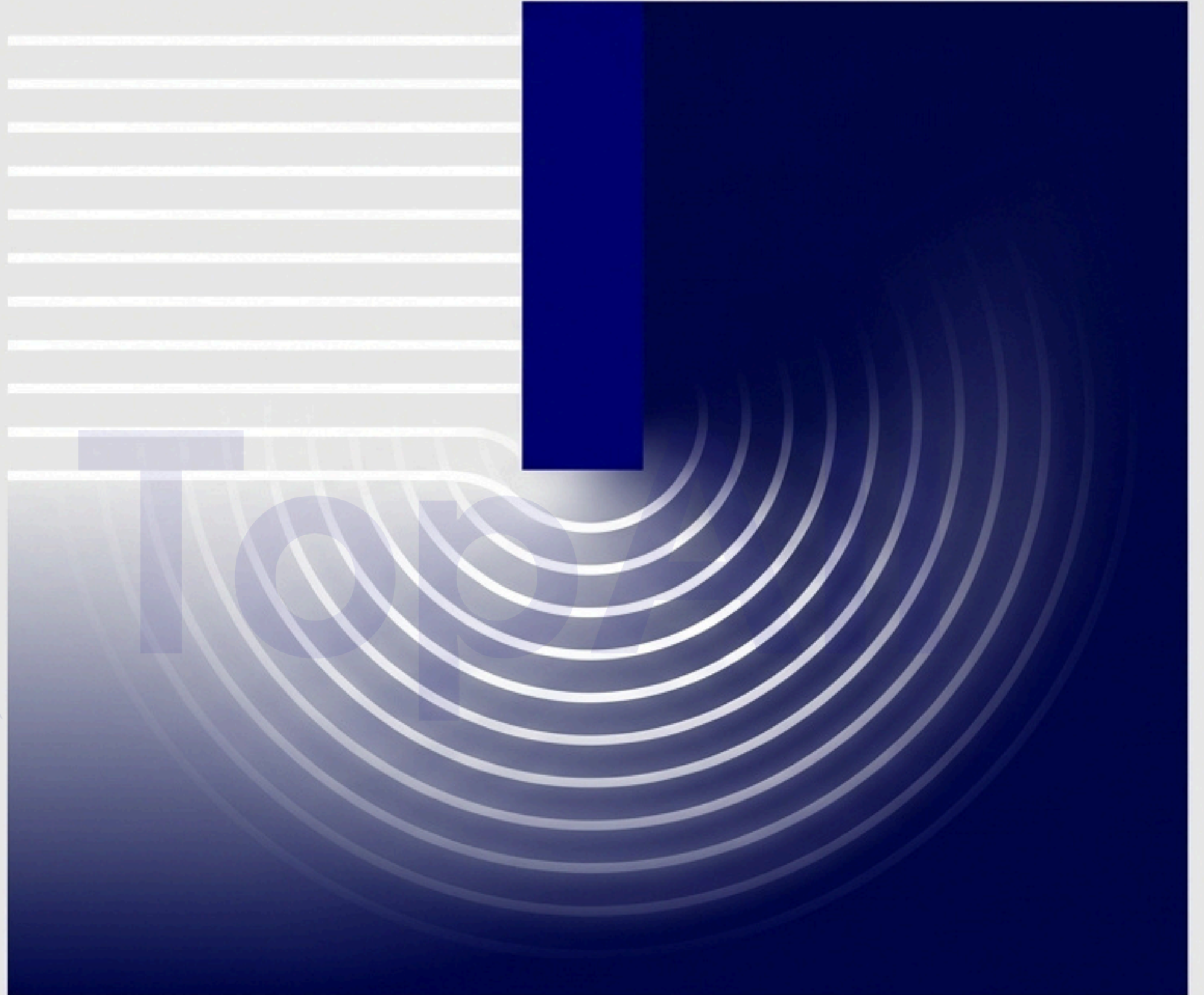
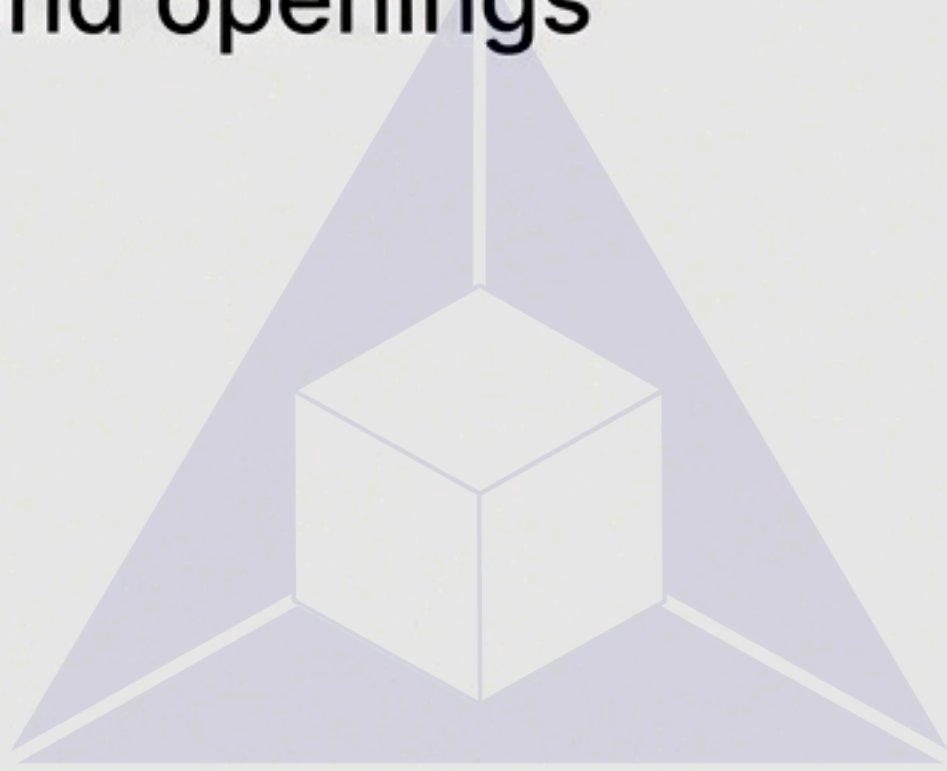


# Diffraction

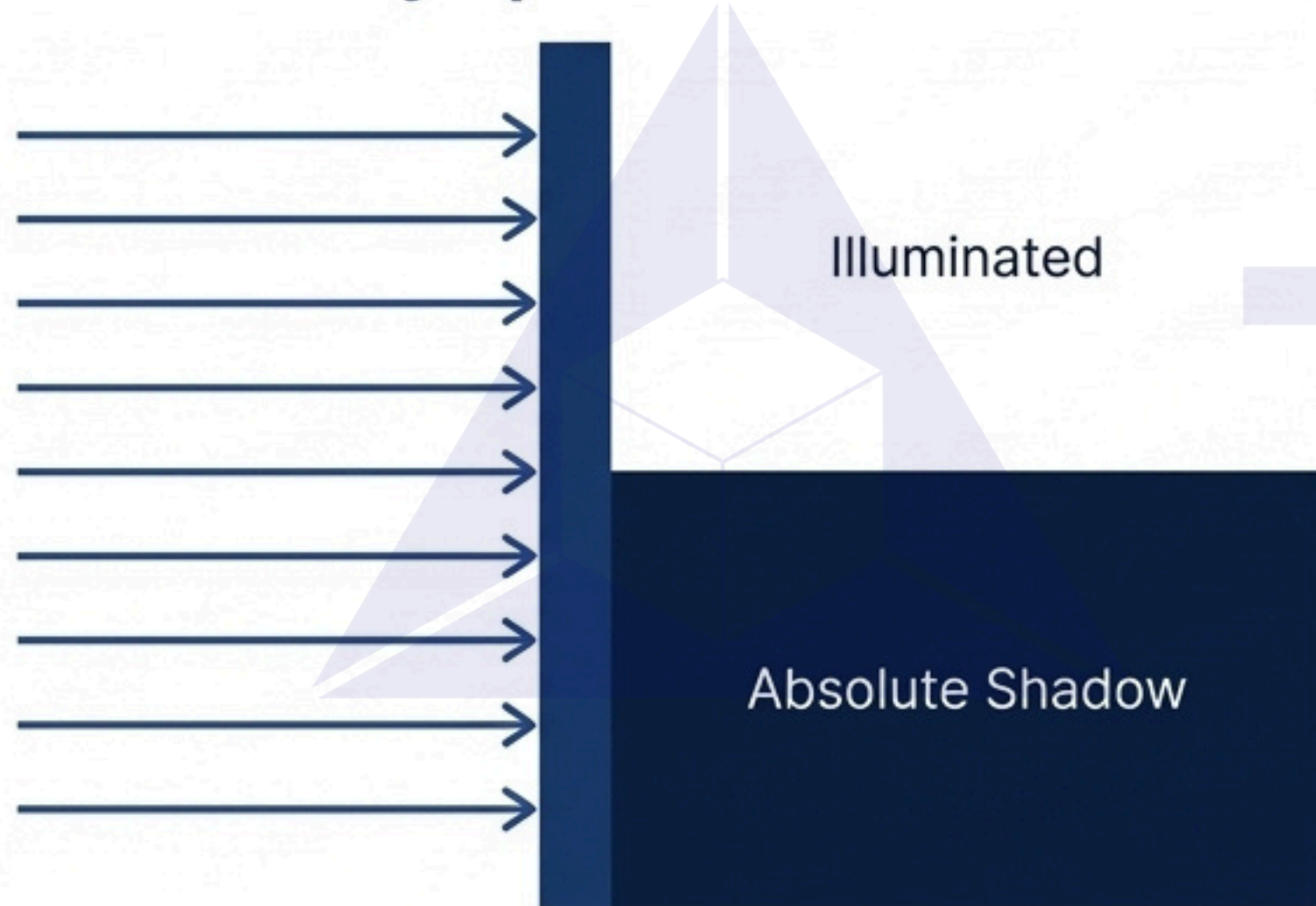
Why light spreads near  
edges and openings



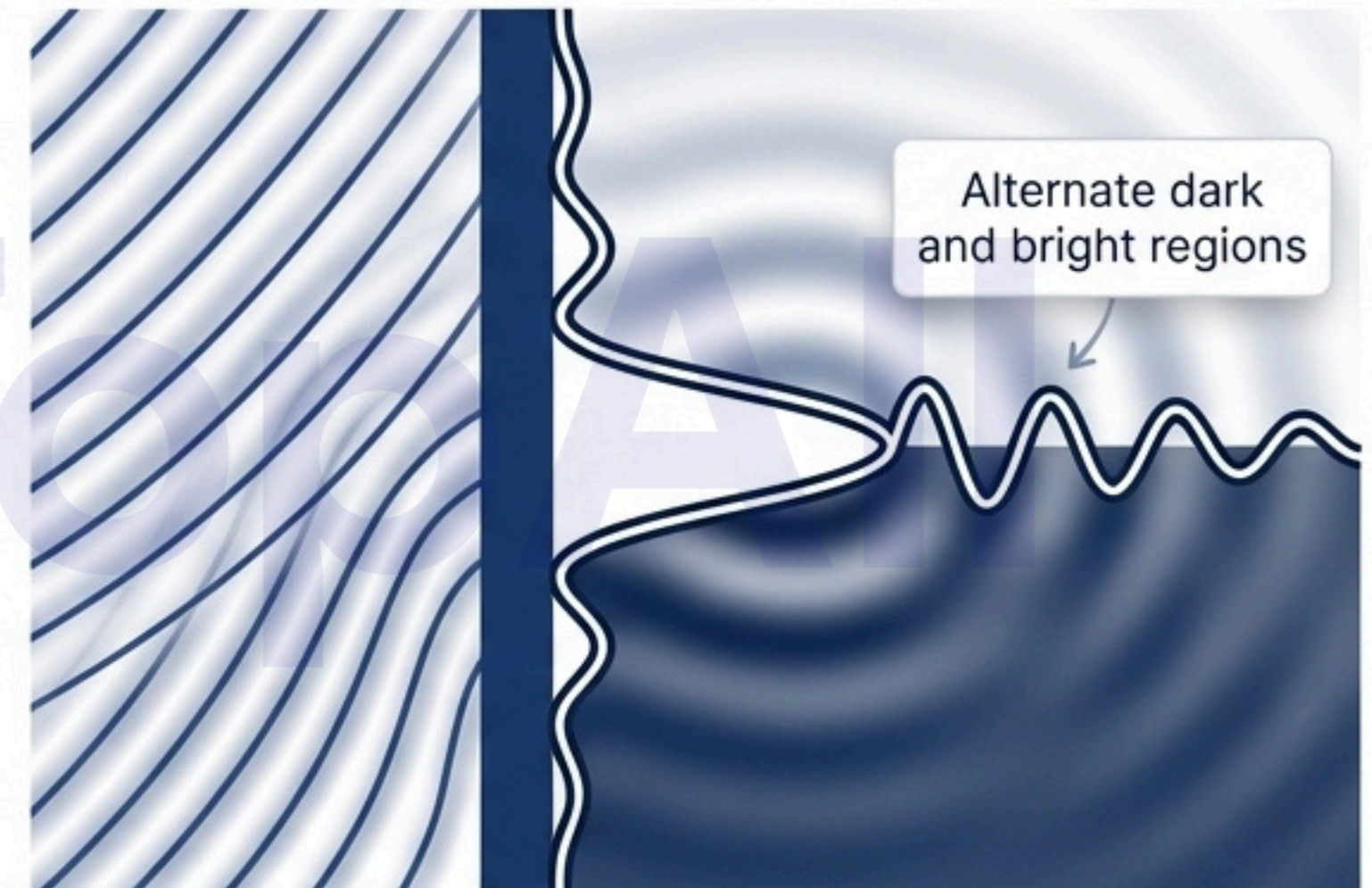
# What Is Diffraction?

The breakdown of geometrical shadows

## Ray Optics Prediction



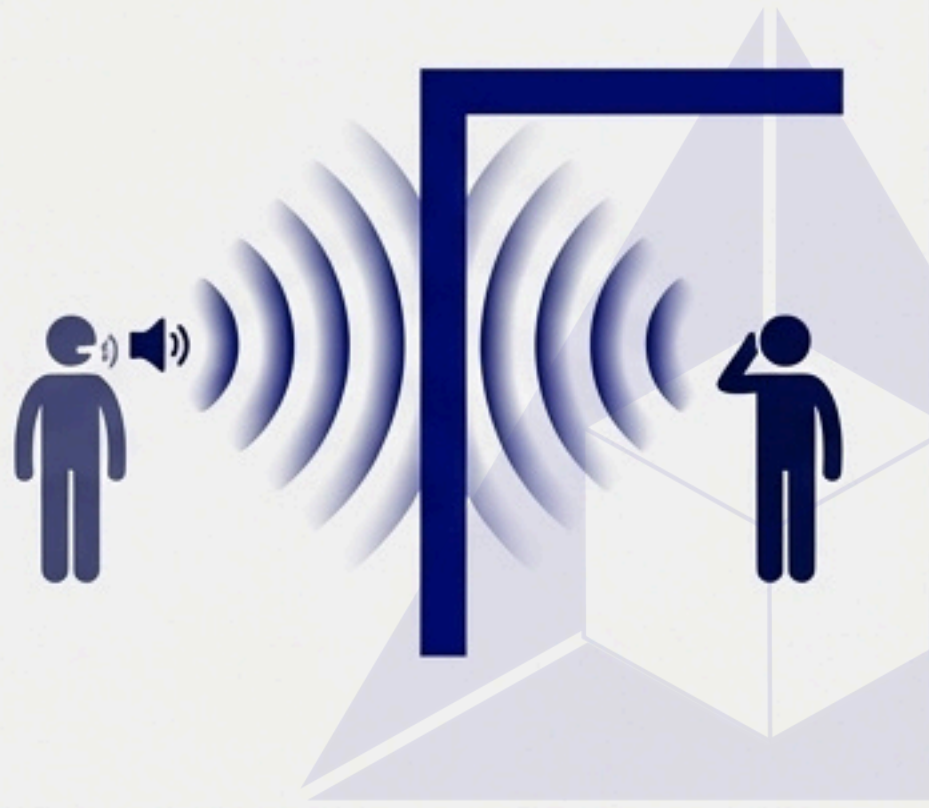
## Wave Optics Reality



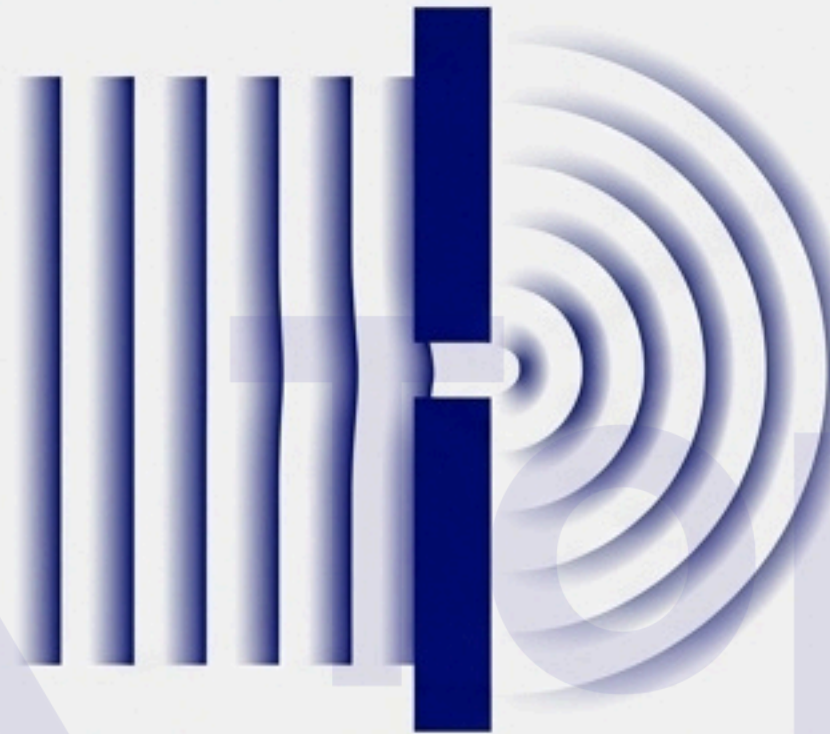
Light bends into regions where we would expect a perfect shadow, creating alternating intensity fringes.

# Diffraction Is a Wave Property

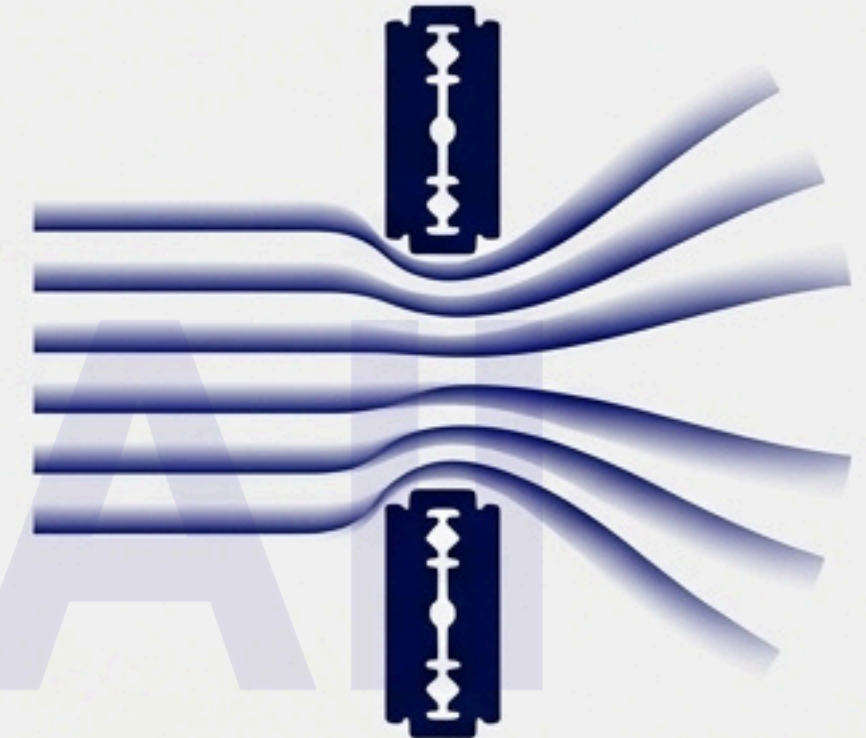
A general characteristic exhibited by all types of waves



Sound: Bends easily around walls and corners.



Water: Ripples radiate outwards after passing a narrow opening.



Light: Bends around microscopic edges and slits.

**Diffraction is not unique to light. It is a universal proof of wave behavior.**



**You've Learned the Theory.  
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

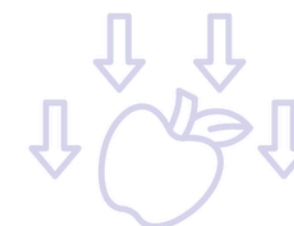
**Practice Now**



[At prep.topall.app](https://prep.topall.app)



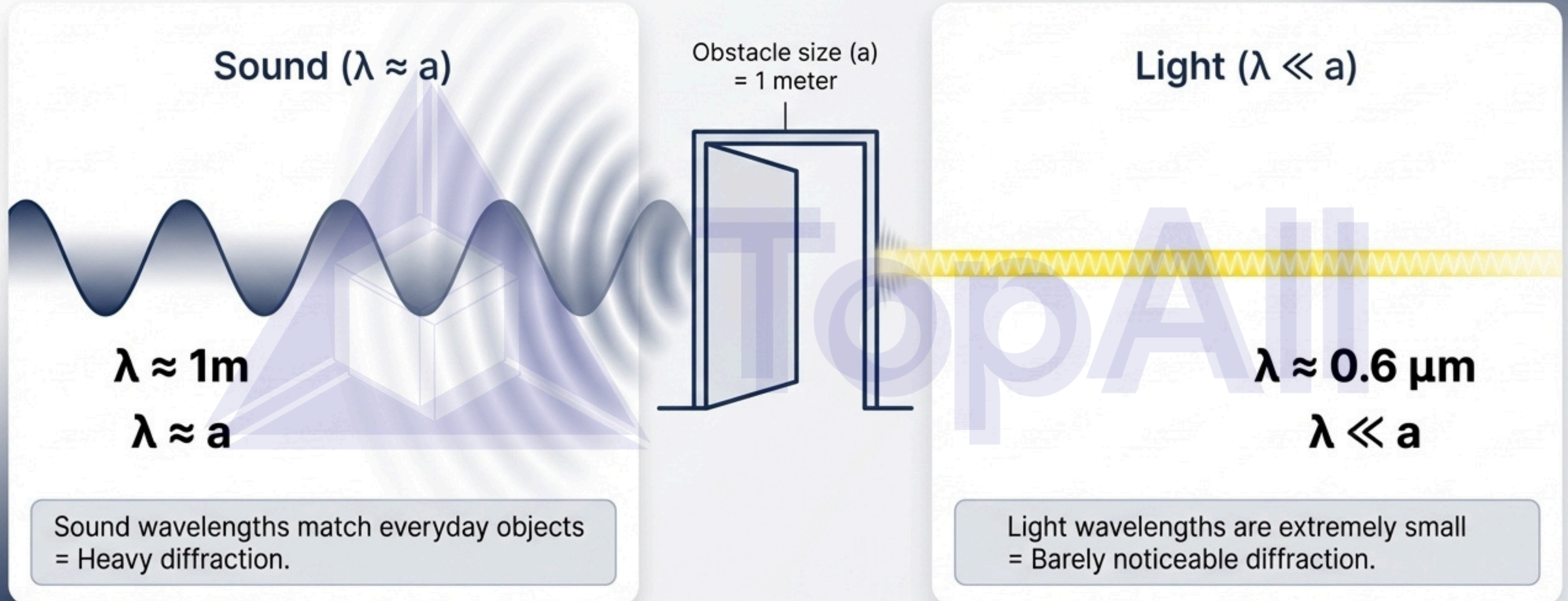
### Key Highlights



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- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter

# Why We Don't Notice It Daily

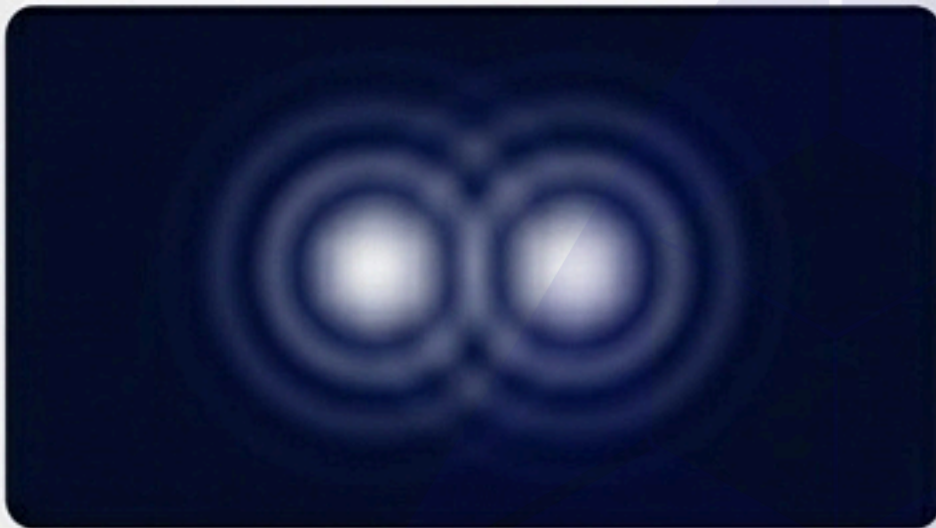
The scale paradox of visible light



Because of the smallness of visible light's wavelength, it approximately travels in straight lines (Geometrical Optics).

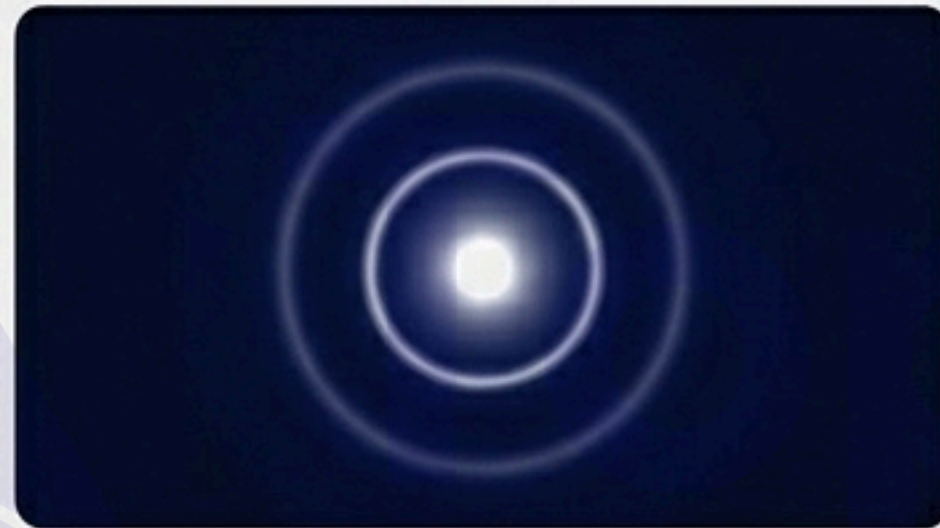
# Real-World Importance

Where diffraction limits and creates



## Resolution Limit

The finite resolution of our eyes and microscopes is strictly limited by diffraction blurring tiny points of light.



## Astronomical Limits

Even with perfect lenses, telescopes cannot resolve infinitely distant stars into perfect points due to wave spreading.



## Diffraction Gratings

The vibrant, shifting colors you see when viewing a CD are directly caused by microscopic tracks diffracting light.

# Key Takeaways



## Boundary Phenomenon

Diffraction happens when wave effects matter near edges and openings, causing light to bend into geometrical shadows.



## Limits Resolution

It is the fundamental physical barrier to the infinite resolution of optical instruments like microscopes and telescopes.



## Proof of Wave Theory

Like interference, the spreading of light definitively validates Huygens' and Young's wave model of light over Newton's corpuscular theory.



# You've Learned the Theory.

## Now Let's Test It.

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