HOME

Why Do We See Entire Galaxies When We Close Our Eyes? The Strange Science Behind This Forgotten Phenomenon

By bestfolkmedicine · 29/10/2026 · 11 min read



Have you ever closed your eyes and discovered that the darkness is not really dark?

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Instead of complete blackness, you begin to see tiny glowing dots. They move, multiply, and swirl. Strange colors appear out of nowhere. Spirals expand and disappear. Geometric patterns transform

into tunnels, waves, and what looks like an entire galaxy floating inside your head.

For some people, these mysterious visions have been present since childhood.

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They may appear when resting in a dark room, preparing to fall asleep, or simply closing the eyes for a few moments. Others notice them after rubbing or pressing their eyelids.

The experience can be so vivid that it almost feels as though another world exists behind closed eyes.

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But what exactly are we seeing?

Scientists have a name for these extraordinary visual sensations: **phosphenes**.

And the explanation reveals something fascinating about how the human brain creates our experience of reality.

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The Strange Universe That Appears When We Close Our Eyes

Most people assume that closing their eyes should produce complete darkness.

After all, without light entering the eyes, what could there possibly be to see?

But the visual system does not simply shut down when the eyelids close.

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The retina, optic nerves, and visual areas of the brain remain biologically active.

Even in darkness, nerve cells can generate spontaneous electrical activity.

Under certain conditions, these signals may produce visual sensations that resemble light, color, or movement.

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People describe these experiences in surprisingly similar ways:

- Thousands of tiny dots resembling stars in space.
- Colorful clouds that slowly expand and contract.
- Spirals rotating inward or outward.
- Bright circles surrounded by darker regions.
- Geometric grids, honeycomb structures, and moving lines.
- Tunnels that appear to stretch into the distance.
- Pulsating waves and flashes of colored light.

Some patterns are brief and simple.

Others are intricate, continuously changing, and almost impossible to describe.

Yet none of these images necessarily corresponds to anything physically present in front of the eyes.

They are visual experiences generated within the nervous system itself.

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What Are Phosphenes?

Phosphenes are perceptions of light that occur without a corresponding external light stimulus.

The word comes from Greek roots associated with light and appearance.

Unlike ordinary vision, which begins when incoming light stimulates retinal photoreceptors, phosphenes may originate from mechanical, electrical, or spontaneous activity within the visual pathway.

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For example, rubbing the eyes can stimulate retinal cells and produce flashes or colored shapes.

Certain forms of electrical or magnetic stimulation can also produce phosphenes.

They may even arise spontaneously.

This means the brain can produce the sensation of seeing light without actually receiving the usual light-based signal from the surrounding world.

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The result is a remarkable demonstration of an important neurological principle:

What we experience as vision is constructed by the brain from neural activity—not simply recorded like a photograph.

Why Does Pressing Closed Eyes Create a Galaxy of Moving Lights?

One of the most familiar ways people discover phosphenes is by applying pressure to their closed eyelids.

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The retina contains specialized cells that convert visual information into electrical signals.

Normally, light initiates the process.

However, mechanical deformation of the eye can also activate parts of the retinal circuitry.

When the retina generates electrical activity, signals travel through the visual pathway toward the brain.

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The brain processes this activity, and a person may perceive flashes, spots, or colorful patterns.

Because the signals are not created by an ordinary external scene, the resulting visual experience can appear unusual or abstract.

Instead of recognizable objects, the brain may generate shifting geometric forms.

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Although this explains why pressure can produce phosphenes, deliberately pressing on the eyeballs is not recommended. Repeated or forceful pressure can cause eye injury.

Fortunately, some people experience similar phenomena without touching their eyes at all.

Why Can We See These Patterns Without Pressing Our Eyes?

This is where the phenomenon becomes even more interesting.

Phosphenes do not always require physical stimulation.

Research suggests that spontaneous neural activity and changes in visual-system excitability can contribute to internally generated visual experiences.

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A study published in 2017 investigated how closing the eyes affects the excitability of the visual cortex.

Researchers used transcranial magnetic stimulation to determine the level of stimulation required to produce phosphenes.

They found that phosphene thresholds were lower when participants had their eyes closed, suggesting increased visual-cortex excitability under the experimental conditions.

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The results indicate that closing the eyes changes how the visual system responds to internally generated and externally applied signals.

Scientists have suggested that the brain may enter a more internally oriented mode when external visual input is reduced.

This could help explain why patterns, colors, and visual sensations sometimes become more noticeable in darkness.

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However, the precise mechanisms behind spontaneous closed-eye visual experiences are still being investigated.

Why Do the Patterns Look Like Spirals, Tunnels, and Galaxies?

Perhaps the most extraordinary feature of phosphenes is their geometry.

Why do people see repeating patterns rather than entirely random images?

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Why are spirals, tunnels, webs, and grids described so frequently?

Researchers studying visual perception have identified a group of recurring geometric patterns known as **form constants**.

The term is associated with the work of psychologist Heinrich Klüver, who described several recurring visual geometries.

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These include four broad categories:

1. Spirals

Rotating shapes that seem to curl inward or expand outward.

2. Tunnels and Funnels

Concentric patterns that create the impression of traveling through a tunnel or looking into a distant opening.

3. Lattices and Honeycombs

Repeating geometric structures resembling grids, meshes, or interconnected cells.

4. Cobwebs

Fine, branching patterns resembling spiderwebs or networks.

These visual forms have been observed across different experimental and neurological conditions.

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Mathematical models suggest that the organization and connectivity of neurons in the primary visual cortex may help explain why certain geometric patterns repeatedly emerge.

In other words, some of the strange shapes we see with closed eyes may reflect the underlying architecture and dynamics of the brain's visual-processing networks.

This does not mean we are literally seeing our neurons.

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Rather, the activity of these networks may produce recognizable patterns in our subjective visual experience.

Why Does It Feel Like Looking Into Another Universe?

The visual system is capable of constructing experiences of depth, movement, brightness, and color.

When the usual visual input is reduced, internally generated activity may still produce some of these qualities.

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A cluster of bright points against darkness can resemble distant stars.

Moving circular patterns may create a sensation of depth.

Expanding geometric shapes may resemble traveling through space.

When multiple effects occur simultaneously, the experience can feel remarkably similar to observing a miniature universe.

But the galaxy-like appearance is an interpretation of visual patterns, not evidence that another physical universe exists inside the brain.

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The underlying phenomenon is neurological.

The emotional experience, however, can be genuinely extraordinary.

Why Do Some People See Much More Than Others?

Not everyone describes closed-eye visual experiences in the same way.

Some people report only occasional sparks or flashes.

Others experience intricate moving patterns or rich combinations of colors.

Several factors may contribute to differences in visual perception, including spontaneous neural activity, visual-system sensitivity, attention, lighting conditions, and individual differences in brain processing.

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The ability to notice subtle visual sensations may also vary.

For example, a person who pays close attention to visual activity in darkness may become more aware of patterns that another person barely notices.

Researchers have not established a simple explanation for why some healthy individuals report especially elaborate closed-eye imagery.

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There is also no reliable evidence that particularly vivid phosphenes indicate greater intelligence, creativity, spiritual ability, or a more advanced brain.

They are fascinating experiences, but their complexity does not automatically carry a special psychological meaning.

Can Children Experience Phosphenes?

Yes.

Children may notice colorful spots, moving shapes, or flashes when they close or rub their eyes.

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Some people remember discovering the phenomenon at a very young age.

Because children are often curious about sensory experiences, these unexpected lights may seem especially mysterious.

A child might describe them as stars, fireworks, colorful insects, or entire imaginary worlds.

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Experiencing occasional phosphenes does not necessarily indicate a medical problem.

However, recurring unexplained visual symptoms, especially those accompanied by headaches, visual loss, or other neurological changes, should be assessed by a healthcare professional.

Children should also be discouraged from pressing on their eyes to create visual effects.

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Do Phosphenes Have Anything to Do With Dreams?

Phosphenes and dreams are different phenomena, although both demonstrate the brain's ability to generate visual experiences.

Phosphenes generally involve relatively simple lights, colors, flashes, and geometric patterns.

Dreams often involve complex scenes, recognizable people, emotions, events, and narratives.

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There are also visual experiences that occur while falling asleep, known as hypnagogic imagery.

These may include abstract patterns, rapidly changing images, recognizable objects, or brief dreamlike scenes.

Someone lying in bed with closed eyes may therefore experience a combination of visual phenomena.

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The distinction depends on the timing, nature, and complexity of the images.

Not every visual experience behind closed eyes should automatically be classified as a phosphene.

The Surprising Connection Between Phosphenes and Space Exploration

Phosphenes are not limited to ordinary experiences in dark rooms.

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Astronauts have reported unusual flashes of light during space missions, even when their eyes were closed.

Scientists have investigated these events and found evidence that energetic charged particles can interact with the visual system.

Research published in 2025 reviewed evidence from spaceflight crews, particle-accelerator experiments, and medical treatment involving charged particles.

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The findings support the conclusion that ionizing particles can trigger visual sensations without ordinary light entering the eyes.

These space-related phosphenes involve mechanisms different from simply rubbing the eyelids.

Nevertheless, they demonstrate how diverse physical processes can generate perceptions of light.

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Could Phosphenes Help Scientists Understand Vision?

One of the most intriguing scientific applications of phosphene research concerns artificial vision.

Scientists have explored whether controlled stimulation of the visual system could create useful visual perceptions in people with severe sight loss.

Electrical stimulation of the retina or visual cortex can sometimes generate phosphene-like sensations.

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In experimental visual prosthesis systems, researchers aim to use patterns of stimulation to communicate basic visual information.

The challenge is considerable.

Producing isolated points of light is very different from restoring normal vision.

Researchers must understand how the brain interprets stimulation patterns, how stable the resulting perceptions are, and how to translate visual information into meaningful signals.

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Nevertheless, phosphenes have become valuable tools in the study of visual processing and experimental vision-restoration technologies.

Are Phosphenes Dangerous?

Occasional phosphenes, particularly those associated with rubbing the eyes or occurring briefly in darkness, are often harmless.

However, not every unexplained flash of light should be dismissed as a normal phosphene.

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Certain visual symptoms can indicate eye or neurological conditions requiring medical evaluation.

Important warning signs include:

- A sudden increase in flashes of light.
- Many new floating spots appearing in the visual field.
- A dark shadow or curtain spreading across part of the vision.
- Sudden loss or deterioration of vision.
- Visual disturbances accompanied by significant neurological symptoms.
- New or persistent symptoms that differ from a person's usual experience.

Flashes and new floaters can sometimes indicate problems involving the vitreous or retina, including retinal tears or retinal detachment.

These conditions require prompt assessment, particularly when symptoms occur suddenly.

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Migraine aura can also produce flashing lights, zigzag lines, or geometric patterns.

The important distinction is that an occasional familiar closed-eye phenomenon is different from a sudden or unexplained change in normal vision.

The Biggest Mystery Is How the Brain Creates What We See

Phosphenes raise a much broader question about human perception.

If the brain can create moving lights, colors, tunnels, and geometric patterns without external visual information, how much of ordinary vision depends on interpretation?

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The answer is: a great deal.

Even when our eyes are open, the brain continuously processes incoming signals, interprets relationships, detects movement, identifies objects, and constructs our visual experience.

Our eyes collect information, but perception depends on neural processing.

Phosphenes reveal a small part of this process in an unusually noticeable way.

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They demonstrate that visual experiences can arise from the activity of the visual system itself.

The shifting patterns seen behind closed eyelids are not evidence of another dimension.

They are evidence of something already remarkable: the brain's capacity to generate structured visual experiences.

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Final Thoughts: A Hidden World Behind Closed Eyes

For many people, the experience begins in childhood.

A moment of darkness becomes a moving field of lights.

Tiny dots turn into colorful spirals.

Patterns appear, transform, disappear, and return.

What feels like an entire galaxy is actually an extraordinary interaction between the eyes, nervous system, and brain.

Scientists have studied phosphenes for generations, yet questions remain about why individual experiences vary so dramatically and how internally generated visual activity becomes conscious perception.

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The next time you naturally notice moving points of light behind closed eyes, remember that this familiar experience offers a glimpse into one of neuroscience's most fascinating subjects: how the brain creates the experience of seeing.

You do not need to open your eyes to experience light—because vision is not produced by light alone.

Medical Disclaimer

This article is for educational purposes only and does not replace professional medical advice. Do not press or apply force to the eyeballs to trigger phosphenes. Seek prompt ophthalmological evaluation for sudden flashes, new floaters, shadows across vision, or unexpected visual changes.

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