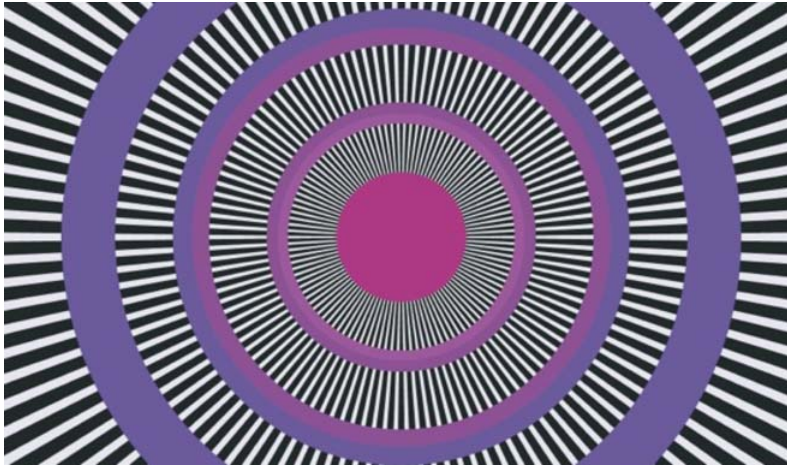




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Eye Flicker Explains 'Enigma' Optical Illusion

By Brandon Keim  November 21, 2008 | 5:21:40 PM Categories: [Perception](#)



Rapid, unconscious eye movements explain a famous optical illusion in which a still image appears to move.

When the eye movements, called microsaccades, were suppressed, test subjects reported that the Enigma illusion — an illustration that seems to flicker and turn — remained stationary.

Scientists don't yet understand exactly how microsaccades contribute to vision, but they seem to help us perceive peripheral details while fixated on an object. (To experience this yourself, focus on the dot in the image at right. The fixation will reduce your microsaccades and cause the surrounding circle to fade.)



"Our subjective experience is that sometimes our eyes move, and sometimes they don't. But they're moving all the time," said Susana Martinez-Conde, a visual neuroscientist at the Barrow Neurological Institute in Phoenix.

Martinez-Conde's findings, published in the *Proceedings of the National Academy of Sciences*, do more than explain a neat trick. They also suggest an answer to an optical controversy: whether motion in static images originates in our eyes or our brains.

The eyes have it.

"If we can prove that microsaccades are involved, this rules out the hypothesis that the illusion comes solely from the visual cortex. It may be involved, but the illusion starts with the eye," she said.

Martinez-Conde still doesn't know exactly how microsaccades create the false perception of motion. She suspects that each slightly differing peripheral image either displaces or is superimposed over the previous image, resulting in movement.

Further research is needed on the causes, she said, but her findings may be immediately insightful: Microsaccade disorders may underlie some vision disorders.

"Individuals could produce too many microsaccades, or not enough," said Martinez-Conde. "But they're not typically studied in eye exams."

[Microsaccades drive illusory motion in the Enigma illusion \[PNAS\]](#)

Images: 1. [Isia Leviant's "Enigma"](#) / [Michael Bach 2. Troxler illusion](#) / [WikiMedia Commons](#)