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## Brain Tricks

Jonathan Fahey, 02.18.09, 03:00 AM EST

**Your eyes may not be taking in everything in front of you.**

The edges of things attract more of our brain's attention than the flat fields in the middle. Everyone knows this, and it makes sense. It's important to know where things end and begin.

Susana Martinez-Conde, the director of the Laboratory of Visual Neuroscience at Barrow Neurological Institute in Phoenix, suspected there was something even more interesting to our brains: corners.

Martinez-Conde, who has long used examples in visual art to inform her studies, took her clue from the artist Victor Vassarely's famous "nested squares" piece. As it happens, the corners look brighter and more salient than straight edges, even when both the corners and edges have the same luminance. (See "The Truth In Illusions.")

Play with her "Alternating Brightness Star" below to see how the effect works. Each of the individual concentric stars (the default is set at 20) are the same brightness all the way around. Yet our eyes see bright lines emanating from the center of the image, corresponding to the stars' corners. This is because the corners of each star look brighter--or, the brain suggests, more important-- than the flat edges of the star.

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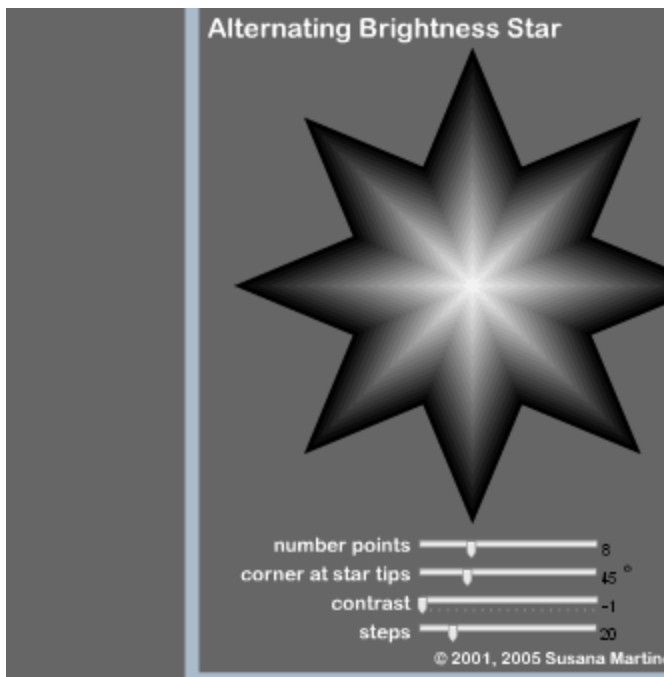
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Martinez-Conde calls these "illusory folds." They turn from light to dark when the contrast is reversed, and their strength changes depending on the angle of the corner, getting stronger as the angle gets sharper. Maybe this explains why toddlers like to go straight for the sharpest thing they can find--sharp things are indeed very interesting.

Stephen Macknik, who directs the Laboratory of Behavioral Neurophysiology at the Barrow Institute and often collaborates with Martinez-Conde, is specifically interested in how the brain interprets visual stimuli. He used the illusion included below to locate where in the brain at least some visual awareness is created.

In this illusion, which he calls the "Standing Wave of Invisibility," the middle of the three bars, the target, is always present, and it doesn't move. Yet it is rendered invisible by the two bars on either side of it, called the masks.



Move closer

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To try to see behind more illusions, see *"Tricked Ya! How Illusions Work."*

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These masks flicker in opposition to the target, but they never physically cover it, demonstrating how our brains can be tricked into not registering something that our eyes see.

You can use buttons below the illusion to vary the distance of the masks from the target. The closer the masks, the more powerful their effect. As the distance between the mask and the target decreases, so does the visibility of the target.

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