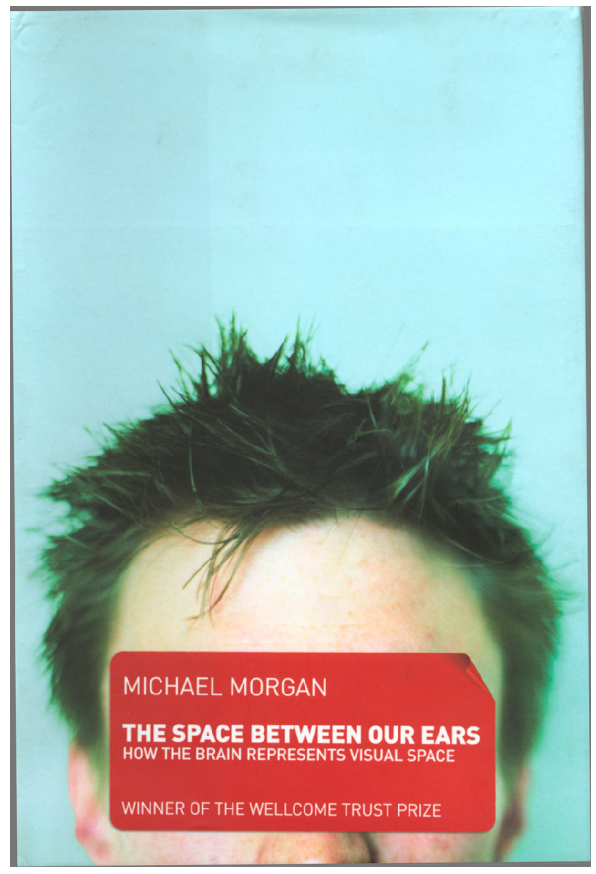
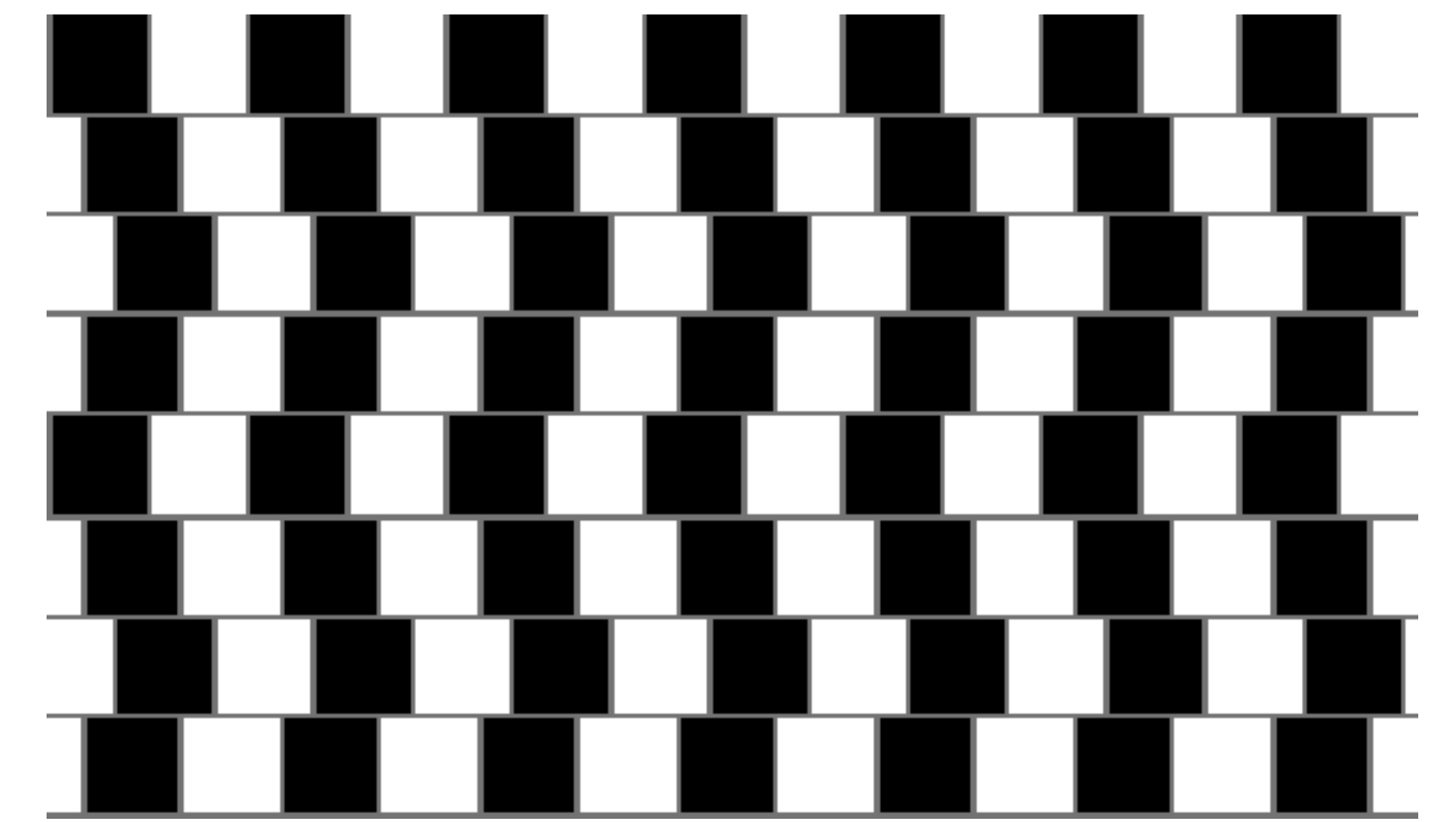


IT'S NOT AN ILLUSION



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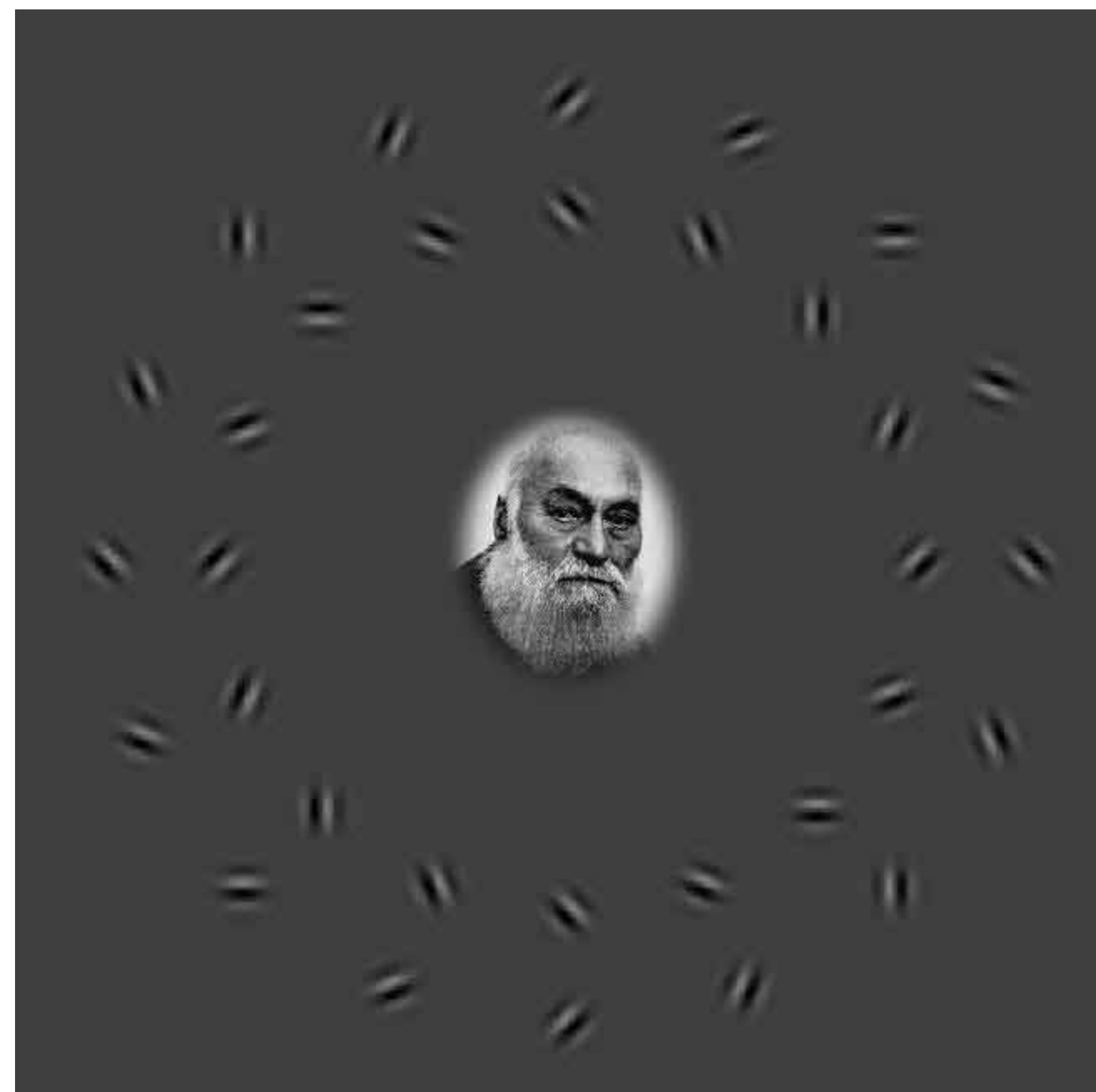


<http://www.brainspaces.pwp.blueyonder.co.uk>

(1) Look at Sigmund Exner's nose and move your head towards the poster, and away again.

The two circles of grating patches appear to rotate in opposite directions.

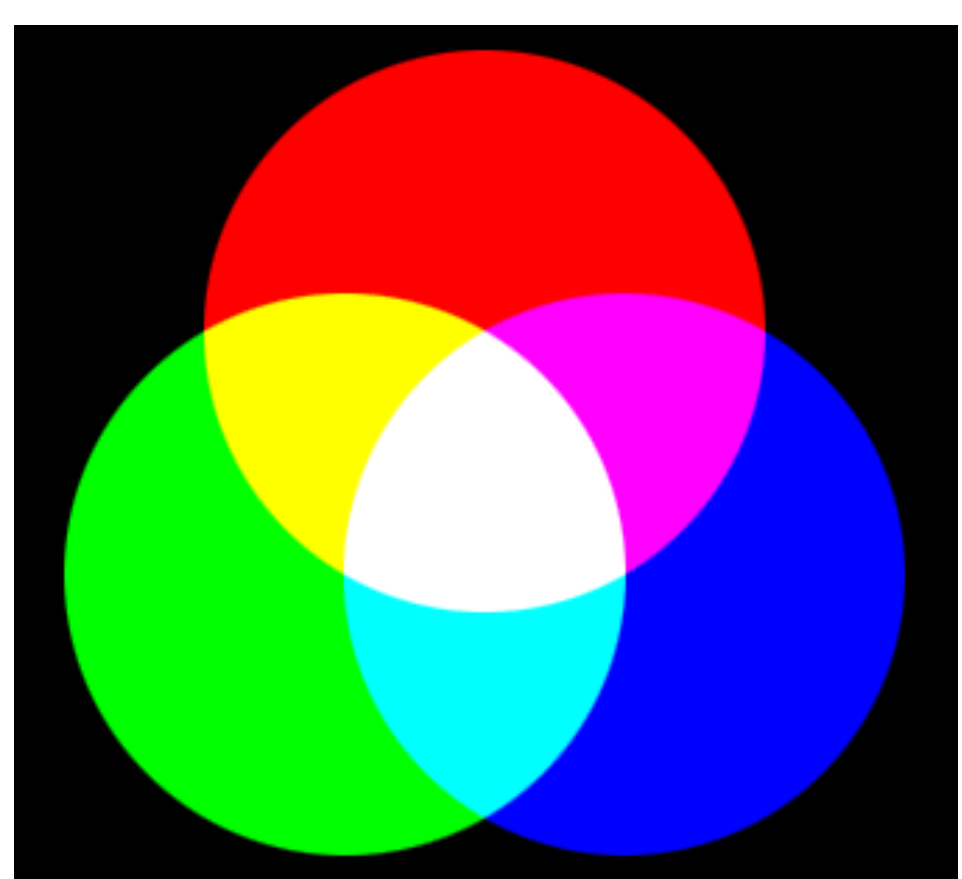
There is no apparent rotation if the bars inside the patches are vertical or horizontal. They must be oblique (e.g. 45 deg, as here)



(2) Phenomena like Pinna's rotating wheel (and the Cafe Wall image above) are often called 'visual illusions' but the concept of illusion is scientifically muddled.

Are there 'non illusory' perceptions where we see things as they really are? What would they look like?

Most so-called illusions are simply limitations of our sensory systems.



(3) Example: We see red + green + blue as white because we have only three cone pigments, which cannot distinguish R + G + B from a flat spectrum. This is no more an 'illusion' than our failure to see UV wavelengths

(5) When we move towards Exner's image, the individual patches on the wheel expand centrifugally from the centre. Because they are oblique they stimulate the detectors that respond to oblique motion.

This makes the wheel appear to rotate, as well as to expand.

SO WHAT'S LEFT TO EXPLAIN?

(4) The rotating wheel effect depends on another limitation of our visual brain, which detects motion with small, localised analogue computers called 'receptive fields'

Because of their small size these 'motion detectors' cannot distinguish between different directions of motion of the same straight line, parallel to their long axis:

