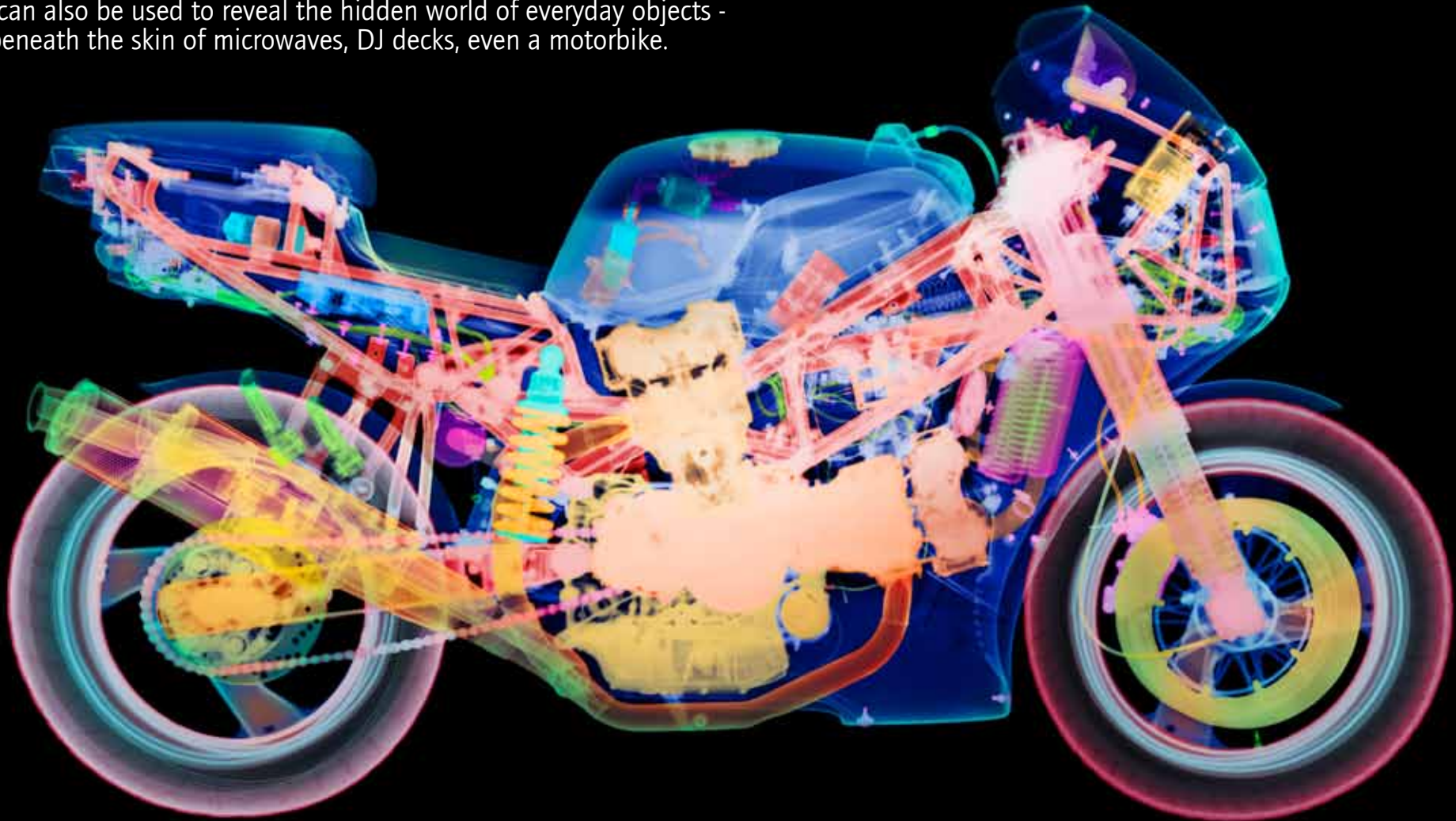
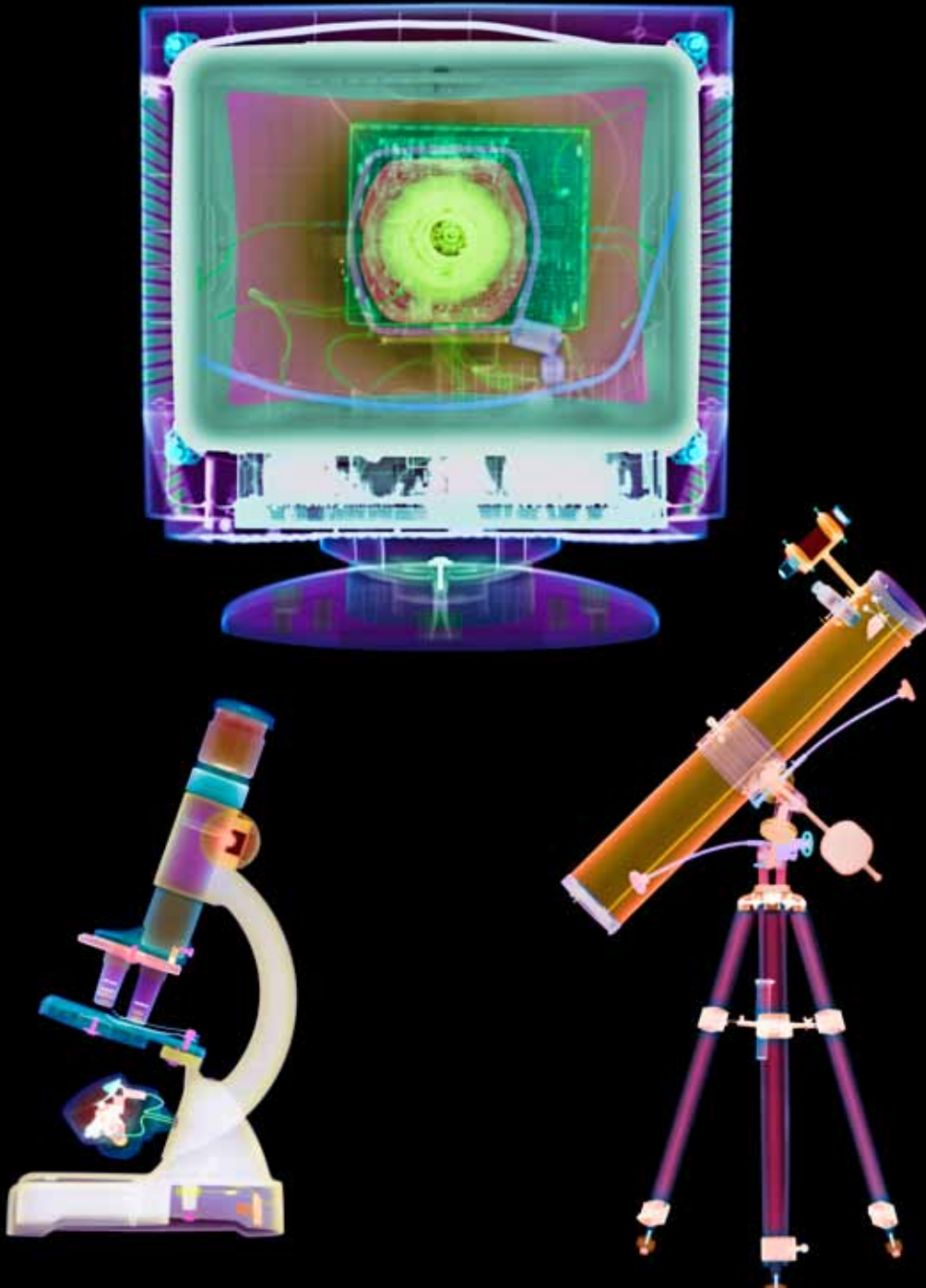


Seeing world through X-rays

Science, medicine and industry without X-rays is unimaginable. From cancer detection to airport baggage scans, the X-ray is ubiquitous. Yet the technology can also be used to reveal the hidden world of everyday objects - to get beneath the skin of microwaves, DJ decks, even a motorbike.





"X-ray photography gives you the ability to see through things, to see past our normal perception of the objects that surround us," says photographer Hugh Turvey.

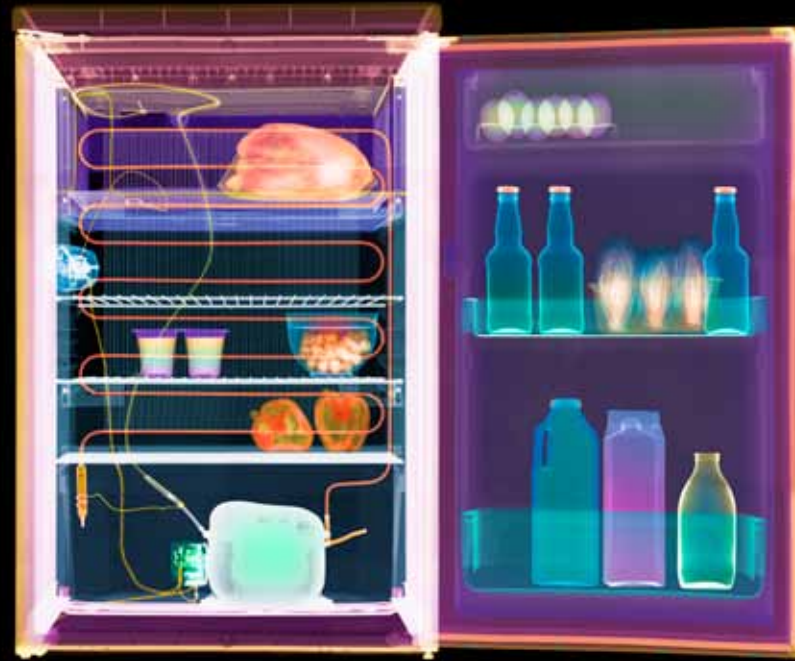
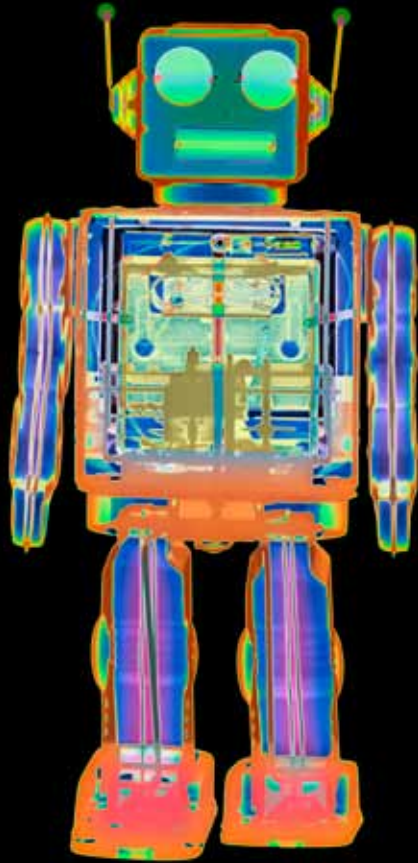
Turvey is one half of an artistic partnership - the other partner is Artemi Kyriacou - called Gusto. They specialise in making high-quality scientific images for advertising and industry. For this series, Gusto began by taking X-rays of each object at several different densities, or 'layers':

"Three-dimensional objects aren't that uniform in terms of density," says Turvey. "So we

can't take just one X-ray."

Each density layer is scanned into a computer, and the final image begins to take shape: "The images are a complex mix of photography and X-ray," says Turvey. "In some examples, there's more X-ray and less photography; in others the reverse. We try to produce what we consider to be the best balanced image."

The process is not as simple as it sounds. A standard X-ray plate measures about 43 by 35 cm. For small objects like the hair dryer and the headphones, that's not a problem - they fit on the plate. But for larger



objects like the washing machine and the central heating boiler, Gusto had to make several exposures and then stitch them together in the computer.

By far the most stunning - and complex - image is that of the Ducati motorbike. Because of its size, Gusto had to make 30 exposures just to complete

one density layer. Then they found that the X-rays weren't powerful enough to penetrate the densest areas of the bike, like the engine block. So they turned to another, more powerful technique - gamma ray photography - which is used in industry to examine things like welds in airframes. This

allowed them to 'see' further into the bike:

"Because it was so large, the Ducati was the most technically challenging object," says Turvey, "but it was also the most satisfying. The X-ray image of the Ducati is a visual explanation of how a motorbike works - but it also

shows you how clever and intricate its construction is, and how much skill goes into its design."

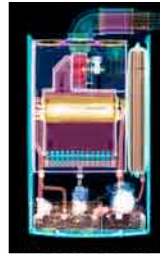
ENDS 410 WDS © SCIENCE PHOTO LIBRARY

FULL PICTURE SET

For captions and credits, please refer to the captions.txt file



h100766.tif



h130381.tif



h130382.tif



h130383.tif



h130384.tif



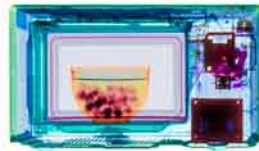
h130385.tif



h130386.tif



h130387.tif



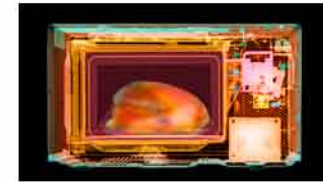
h130388.tif



h130389.tif



h130390.tif



h130391.tif



h130392.tif



h130393.tif



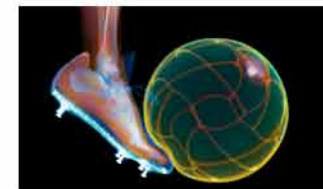
h130394.tif



h130395.tif



h504183.tif



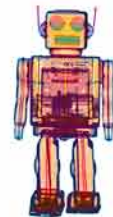
p965049.tif



r104097.tif



t260155.tif



t260156.tif



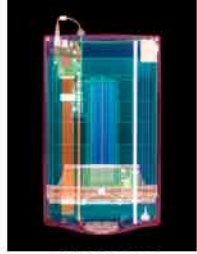
t415232.tif



t415233.tif



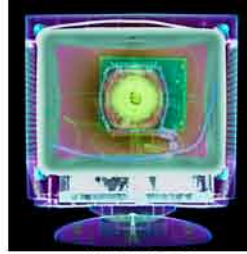
t415234.tif



t415235.tif



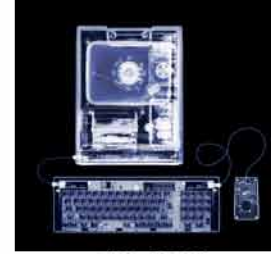
t415236.tif



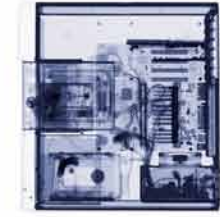
t415237.tif



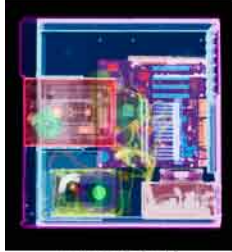
t420426.tif



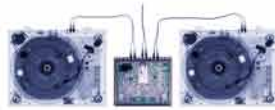
t420427.tif



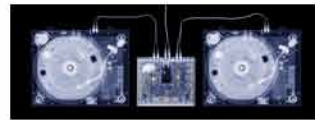
t420429.tif



t420430.tif



t515260.tif



t515261.tif



t515262.tif



t515263.tif



t515264.tif



t515265.tif



t615230.tif



t615231.tif