The INDEPENDENT

World's smallest movie: IBM uses individual atoms to make record-breaking short film of boy kicking football

'The Boy With the Atom' may be the most scientifically advanced cartoon ever made - not to mention, the tiniest

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It looks more like an ancient videogame than a modern movie. Yet "The Boy With the Atom" may be the most scientifically advanced cartoon ever made - not to mention, the tiniest. IBM created the one-minute film of a stick-boy dancing, bouncing on a trampoline and tossing a ball into the air by rearranging individual carbon monoxide molecules on a frame measuring 45 by 25 nanometres. There are one billion nanometres in a metre. IBM claims it is the smallest stop-motion animation ever made.

"The Boy With The Atom" was created using a scanning tunnelling microscope at the firm's laboratory in San Jose, California. The microscope was invented by an IBM researcher in the 1980s to allow scientists to study atoms close-up. It magnifies an image more than 100 million times, and can move individual carbon monoxide molecules using a tiny needle, which attracts and moves them across a copper surface. The device is remotely controlled and operates at minus 268 degrees Celsius; the atoms would move freely of their own accord at higher temperatures. The dots that form the image, say IBM's scientists, are the oxygen atoms in the carbon monoxide molecules.

Andreas Heinrich, the lead scientist on the project, said in an accompanying making-of video that atoms have been filmed in motion before, but nothing on this scale has ever been manipulated to make a narrative film. "This movie is a fun way to share the atomic-scale world," Heinrich said. "The reason we made this was not to convey a specific scientific message directly, but to engage with students, to prompt them to ask questions."

Jamie Panas of Guinness World Records said Guinness had certified the movie as the world's "Smallest Stop-Motion Film". It was shot earlier this year by four scientists over 10 18-hour days, and contains 242 frames. The same technology could be used in future to create computer data storage. Last year, Heinrich led a team which discovered it could store data on just 12 magnetic atoms. The film was a diversion, but, said IBM, "Even nanophysicists need to have a little fun."