

# Dancing the Time Warp in the quantum world

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It's a unique dance-meets-science experiment

Imagine dancing in a nightclub – and it's your movements that are controlling not only the sound but also a range of stunning, bright visual effects surrounding you.

This is the experience that a groundbreaking interactive experiment will be giving dancers this summer.

The person behind the idea is the appropriately named Dr. Glowacki.

The project was developed at the University of Bristol with funding from the Engineering and Physical Sciences Research Council (EPSRC).

Combining an array of 3D cameras and innovative computer software, ‘danceroom Spectroscopy’ (dS) creates sounds and images from people’s movements. The cameras capture these movements and feed them into a computer where a programme, custom-built by Dr. Glowacki’s team, interprets them as energy fields. The computer is linked to five projectors, resulting in people’s real-time energy fields being projected in 360° onto the sides of the dome’s interior. Meanwhile thousands of colorful interactive particles react to the force of the dancer’s energy fields. These particles represent the billions of tiny particles that exist all around us, but are normally too small for our eyes to see.

The energy of the dancers’ movements creates forces that warp the particle motion. This produces a visual effect similar to a pebble being dropped into a pool of water, except in this case the dancer is the pebble and gets to watch as their own movement creates complex waves and ripples. The dancer sees an abstract projection of their outline with particles swirling around them. People can use their ‘energy fields’ to interact with the particles - catching, pushing, sharing and [dancing](#) with them.

There’s also a sonic component to the experiment: as you move within the space, your energy field causes the particles to slosh about and vibrate. The vibrations are analyzed by a computer and sent to a musician who uses software programmed to respond to the different types of vibration in pre-set ways. This turns them into sounds, transforming people’s energy into electronic beats and soundscapes.

The event is taking place on August 4th and 5th in a giant 21-meter, 360° dome on the forecourt of Weymouth Pavilion in Dorset as part of the Cultural Olympiad.

As the number of people taking part increases and they move in unison the results become more dramatic. The capabilities of dS will also be shown off during ‘Hidden Fields’, a choreographed performance by a troupe of five specially trained dancers.

“dS is part interactive art installation, part immersive science experience, part large-scale video game, and part musical instrument,” says Dr. David Glowacki, who has led the project. “Our inspiration has been the mysterious world of nano-quantum mechanics and our aim has been to provide an impression of how everyday motion has an impact on the invisible nano-world of atoms and molecules that are always around us but we don’t think about.”

Dr. Glowacki says: “As well as encouraging people to think about how they interact with the world at a molecular level, our work is showing how tricks from physics and molecular dynamics can be used to monitor and measure the energy of crowds in real-time. This could lead to interesting applications, such as the development of ‘dynamic logos’ that change in response to crowd movements, or novel educational tools and new approaches to physiotherapy. I’m currently setting up a spin-out company to explore the possibilities.”

**More information:** [danceroom-spec.com/?page\\_id=999](http://danceroom-spec.com/?page_id=999)

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