Researchers tout molecular-scale devices for quantum computing

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LONDON — Researchers at the Universities of Edinburgh (Scotland) and Manchester (England) have created a molecular device they suggest could act as a building block for super-fast quantum computers.

Instead of developing computers based on silicon chips, the groups used molecular scale technology.

The work is being part funded by the European Commission and the researchers reported their findings in the latest issue of *Nature* .

The scientists achieved the breakthrough by combining tiny magnets with molecular machines that can shuttle between two locations without the use of external force. The manoeuvrable magnets could one day be used as the basic component in quantum computers.

Conventional computers work by storing information in the form of bits, which can represent information in binary code - either as zero or one.

Quantum computers would use quantum binary digits, or qubits, which are far more sophisticated as they are capable of representing not only zero and one, but a range of values simultaneously.

According to Professor Richard Winpenny, of the University of Manchester's School of Chemistry: "To perform computation we have to have states where the qubits speak to each other and others where they don't - rather like having light switches on and off.

"Here we have shown we can bring the qubits together, control how far apart they are, and potentially switch the device between two or more states. The remaining challenge is to learn how to do the switching, and that's what we're trying to do now."

Professor David Leigh, of Edinburgh University's school of chemistry, added: "This development brings super-fast, non-silicon based computing a step closer."

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