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## Molecular scale technology used for quantum computers

19/03/2009 [Email to a friend](#)**Researchers claim to have created a molecular device that could eventually become the basis of super fast quantum computers.**

Instead of developing computers around silicon chips, the researchers suggest designing devices around molecular scale technology. The project, funded by the European Commission, was undertaken at the Universities of Manchester and Edinburgh. The breakthrough was made by combining tiny magnets with molecular machines that can shuttle between two locations without the use of external force. It is these manoeuvrable magnets that could replace conventional components in quantum computers.



Prof David Leigh from the University of Edinburgh's school of chemistry explained that quantum computers will use binary digits (qubits) that are capable of representing zero and one, but a further range of values simultaneously. This will enable intricate calculations to be performed far quicker than conventional computers.

"This development brings super fast, non silicon based computing a step closer." Prof Leigh said. "The magnetic molecules involved have potential to be used as qubits and combining them with molecular machines enables them to move, which could be useful for building quantum computers. The major challenges we face now are to bring many of these qubits together to build a device that could perform calculations, and to discover how to communicate between them."

Prof Richard Winpenney from the University of Manchester's school of chemistry, added: "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."

## Author

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