Discovery to put science in a spin

A typical SbB spiral galaxy.

A cosmological mystery that seems to defy modern physics has emerged from the graceful spinning of spiral galaxies. Analysis by Dr David Roscoe (Applied Mathematics) has uncovered an apparent analogue of the bizarre world of quantum mechanics but on a cosmic, rather than an atomic, scale.

Dr Roscoe's work has revealed that a characteristic parameter calculated from the rotation of galaxies is limited to discrete values rather than a continuous range, rather like a car that jumps spontaneously 10mph faster each time the accelerator pedal is touched.

This flies in the face of orthodox gravitational theory and poses a challenge to the modern understanding of physics. "We can see echoes of the early discoveries of quantum mechanics here, and in its own way it is possibly as significant", said Dr Roscoe.

Just as quantum mechanics describes how energy at an atomic level exists only in distinct, indivisible lumps, Dr Roscoe's results imply that an analogous system might be at work at the opposite end of the size scale. What this means, however, remains pure speculation. Dr Roscoe's initial results have been published in the journal *Astronomy and Astrophysics.*

He has analysed three independent sets of rotation data involving almost 2,500 galaxies. This information was gathered by independent groups of astronomers in Australia and the United States. In all cases the effect appears strongly.

"This is a real phenomenon of galactic dynamics that is likely to have very far-reaching implications for astrophysics in general", said Dr Roscoe.

The Week That Was...

Chris Routh has been Manager of ECUS (Environmental Consultancy University of Sheffield) for the past ten years.

Monday

Not the best day for interviewing in my opinion but needs must. We saw two candidates for a senior environmental auditor position that has become vacant; both excellent in their own way. However, when one candidate wants £10K more than the other then the choice is obvious... isn't it? Next up is a meeting with Professor David Lerner and Dr Ruth Davidson from the Civil and Structural Engineering Department, to explore the possibility of joint commercial work on groundwater protection and environmental risk assessment – very fruitful and indicative of the tremendous potential to exploit academic excellence in the commercial field.

Tuesday

Began the day with an early morning appointment with the Registrar and Secretary, Dr David Fletcher, to introduce ECUS and discuss our business plans for the future – we all need friends in high places! Move on to the Finance Department for a meeting with ECUS's management accountant, Karen Longden, to agree the format for financial budgets to be included in our business plan for the next four years. An afternoon assignment with British Steel generated several possibilities for future work. Ended the working day with a meeting with all ECUS staff to generate some ideas on improving communication within the Consultancy – fuelled by doughnuts and muffins.

Wednesday

Out of the office with Jon Tilney, our Principal Environmental Scientist, for a meeting with a firm of consulting engineers in Leamington Spa, discussing progress on a project involving the restoration of an asbestos tip. Blue asbestos, potential for groundwater pollution and a sett full of badgers; I guess global warming and rising sea levels will have to wait until tomorrow.

Thursday

Trying to practise what we preach, I had a morning meeting with our internal energy expert, Fiona Dummigan, to discuss ways in which we can reduce our energy and water consumption here at Endcliffe Holt, the Consultancy's offices on Fulwood Road. Spend the afternoon in Leeds at a workshop held for the City Council's approved suppliers, of which we are one.

Friday

Meet with Dr John Hodgson who has returned from a visit to our counterparts in Cordoba, Argentina, under the aegis of the Darwin Initiative. ECUS has been particularly successful in its programmes of funding for environmental projects in countries rich in biodiversity but poor in resources, helping to establish projects in Russia, Iran, Argentina, and a tiny British dependency in the South Atlantic, Gough Island. Apart from the interesting science, John returns bearing a pleasing poster designed specifically for the project and a box of excellent Argentinian chocolate biscuits. Had lunch with Dr Lee Newman, from the University of Washington at Seattle and Dr Alan Baker (Animal and Plant Sciences), who are experts on plants that 'clean up' contaminated sites. Finished the working week by catching up on e-mail and hard copy mail. Also spent time trying to sort out problems at our Chilean office in Santiago – mostly created by their indifferent English and my non-existent Spanish.