



Annual General Meeting

14 November 2014

3.00 – 6.00pm

Jeffrey Hall, Institute of Education

(20 Bedford Way, London, WC1H 0AL. Nearest tube: Russell Square)

Programme

Annual General Meeting

The meeting will include the presentation of certificates to the LMS Prize-winners in 2014.

E. Brian Davies (King's College London)

Non-self-adjoint spectral problems

Abstract: Non-self-adjoint spectral theory is not yet a coherent subject, in the sense that there is no analogue of the spectral theorem for self-adjoint operators that can act as a basis for further research. The very high instability of eigenvalues under small perturbations often affects the analysis of particular models. The number of examples understood is expanding rapidly and will continue to do so into the foreseeable future.

We describe joint work with Michael Levitin on the $N \rightarrow \infty$ asymptotic spectral behaviour of a particular family of large non-self-adjoint matrices $A_{c,N}$ associated with a self-adjoint linear pencil. Crucial insights were obtained by numerical experiments, even though the final analysis does not rely on numerics. The problem is a matrix analogue of an indefinite self-adjoint linear pencil that concerns a Dirac operator with an indefinite potential. In some sense it is the simplest matrix example of its type, but its behaviour is still far more complex than one might expect. The eigenvalues of the matrix $A_{c,N}$ converge to the real axis as $N \rightarrow \infty$, but the details of the convergence depend strongly on the choice of the real parameter c , in a way that presently defies understanding, even at a numerical level.

Tea/Coffee

Announcement of Election Results

Nick Trefethen (Oxford)

Naylor Lecture: Mathematics of the Faraday Cage

Abstract: Everybody has heard of the Faraday cage effect, in which a wire mesh does a good job of blocking electric fields. Surely the mathematics of such a famous and useful phenomenon has been long ago worked out and written up in the textbooks?

It seems to be not so. One reason may be that that the effect is not as simple as one might expect: it depends on the wires having finite radius. Nor is it as strong as one might imagine: the shielding improves only linearly as the mesh spacing decreases. Mathematically, the subject is an appealing case study in the behaviour of harmonic functions, with links to Brownian motion and diffusion processes. Physically, Faraday cage shielding can be regarded as a process of electrostatic induction by a surface of limited capacitance. The talk will present results developed jointly with Jon Chapman and Dave Hewett.

The meeting will be followed by a reception at De Morgan House, Russell Square, and the Society's Annual Dinner at the Montague Hotel, 15 Montague Street, London, WC1B 5BJ. The cost to attend the dinner will be £53 per person. Those wishing to attend the dinner should contact Carol Chessis (AnnualDinner_RSVP@lms.ac.uk) by **Monday 3 November**.

For further details about the AGM, please contact Elizabeth Fisher (lmsmeetings@lms.ac.uk)