Analysis group

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Permanent staff in analysis

- Professor Jim Langley (Complex Analysis)
- Dr. Joel Feinstein (Functional Analysis)
- Dr. Joachim Zacharias (Functional Analysis)
- We hope to have a new permanent member of staff in analysis by next year.

Complex Analysis

Professor Langley's research is on **functions of a complex variable**
The starting point is Picard's theorem.

Theorem (Picard's Theorem)

Any function which is analytic on $\mathbb{C}$ and which omits two values must be constant.

This is sharp, because the function e^z omits one value (namely 0).

Since 1996, Professor Langley has had six students who have graduated with a Ph.D. in this area.

Complex Analysis Group

- Two current Ph.D. students
- Two postdoctoral researchers (from Warwick, Berlin)
- Weekly PG seminars
- Occasional joint seminars with integrable systems group at Loughborough.
- For (lots of) details see

  http://www.maths.nott.ac.uk/personal/jkl/RESEARCH

Dr Feinstein (Functional Analysis)

Dr Feinstein's main interests are in **Banach algebras of complex-valued functions.**

Research projects include the following

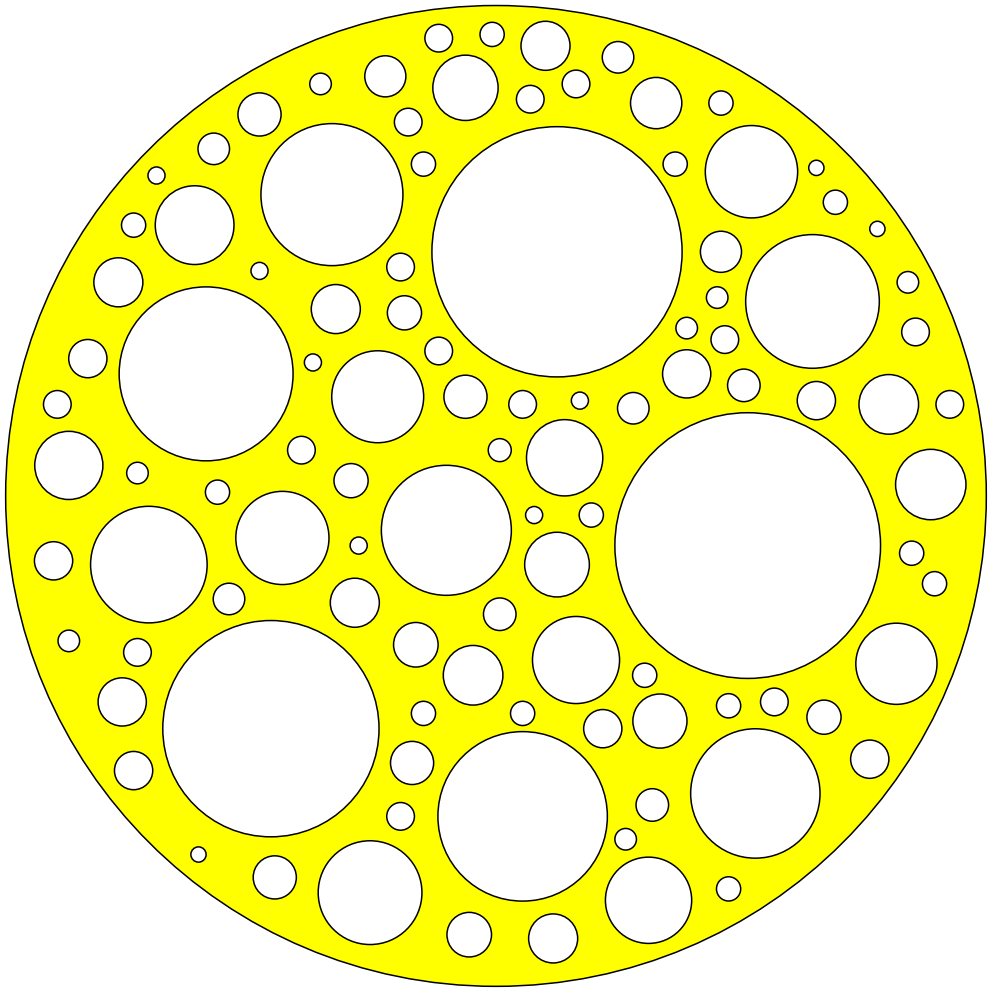
- Regularity conditions
- Rational and polynomial approximation
- Classification of endomorphisms and derivations
- Algebraic extensions of commutative Banach algebras.

Since 1997, Dr Feinstein has had four students who have graduated with a Ph.D. in this area.

Dr Feinstein has two current research students: one just starting, one just finishing!

Dr Feinstein (continued)

Work in this area includes the construction of **Swiss cheeses**!



For more details, see **http://www.maths.nott.ac.uk/personal/jff**

Dr Zacharias (Functional Analysis)

Dr Zacharias's research interests mainly concern simple C*-algebras and their classification, using:

- K-theory;
- semigroups of endomorphisms on von Neumann algebras (which have connections to quantum probability);
- C*-dynamical systems;
- tensor products of C*-algebras.

Two of Dr Zacharias's research students have recently graduated with Ph.D. degrees.

C*-algebras and their classification

C*-algebras and their measure theoretical counterpart, von Neumann algebras, are algebras of operators on a Hilbert space which were first motivated by quantum theory and occurred in group representations and ergodic theory.

- C*-algebras can also be characterised abstractly as Banach algebras by a very natural norm condition.
- C*-algebras have occurred in many other branches of mathematics. Very recently for instance they were successfully applied to essentially solve a longstanding conjecture in topology due to S.P. Novikov.
- Currently there are one research student and one postdoctoral researcher working with Dr Zacharias in this area.