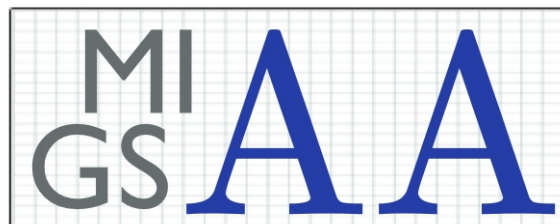


# Maxwell Institute Graduate School in Analysis and its Applications – MIGSAA

Gonçalo dos Reis

University of Edinburgh &  
Maxwell Institute for Mathematical Sciences

2014/Oct/13



## What is MIGSAA?

MIGSAA is a new [Centre for Doctoral Training](#) in Analysis and its Applications, funded by EPSRC, SFC and the two Universities.

It will take in around 60 PhD students over 5 yearly intakes (Sept 2014 – Sept 2018) in the areas of [Mathematical Analysis and its Applications](#) interpreted broadly, with the needs of both academia and industry/commerce as beneficiaries in mind.

It is a joint venture between UoE and HWU under the aegis of the [Maxwell Institute for Mathematical Sciences](#).

The degree programme is jointly administered between the two universities, students will be registered at both\*, will receive a [PhD jointly awarded by the two institutions](#).

Students will be trained across the broad spectrum of Analysis and its Applications, including [theoretical analysis, PDE, stochastic analysis, numerics and appropriate areas of applied mathematics](#).

## What's the difference...?

### What's the difference compared to a “standard” PhD programme?

In a standard PhD, students are admitted with a named supervisor in mind, the supervisor will direct the research that the student undertakes, and this leads to the PhD thesis after around 3 – 3.5 years of study.

In a CDT, students are admitted to the programme (rather than with a specific supervisor), and take PhD training courses and projects over their first year which help shape their perspective, leading to a match with a supervisor some time in the second half of Year 1.\*

It is still the case that the research project directed by the supervisor is the centrepiece of the PhD, but this is augmented by an on-going training programme in Years 2–4 of the student's studies.

Note that the MIGSAA PhD is a 4-year programme and MIGSAA students are funded for the full 4 years.

## Why do it differently?

A number of answers:

- Concern that the standard route leads to students who are too narrowly trained
- Statistics demonstrating that more broadly trained students from other systems are more successful in obtaining jobs – academic and otherwise
- Concern that there is too little of a connect between academia and industry/commerce
- The current system is producing too few PhDs in Mathematical Analysis and its Applications

We will offer the best practice from PhD training internationally to students in CDTs with a view of addressing the above concerns.

## Mathematical Scope of MIGSAA

Analysis, Stochastic Analysis/Probability, Numerical Analysis, Applications of Analysis within Applied Mathematics.

This includes but not limited to:

- Linear and nonlinear PDEs
- Harmonic analysis
- Mathematical analysis of large scale discrete structures
- Applied analysis
- Dynamical systems
- Stochastic analysis, financial mathematics, applied probability
- Computational mathematics

We have at least 40 potential supervisors – some from other Schools in UoE and HWU and some from industrial partners.

## Other features of MIGSAA – Breadth

We want all MIGSAA students to have some awareness across the intellectual spectrum from theoretical to stochastic to applied and numerical.

Therefore we expect all students to take some training spanning these areas – even though their eventual PhD thesis may specialise in only one or two.

In the modern world theoreticians need to know about implementation of their results and likewise applied mathematicians need an understanding of the underlying theory.

And stochastics are (literally) to be found everywhere!

## Other features of MIGSAA – Depth

Expanding one's horizons in mathematics is a lifelong endeavour.

In the top North American and European institutions PhD students, postdocs and academic staff attend advanced courses on a regular basis.

We will be offering a suite of advanced courses within MIGSAA (and beyond) and it's expected that MIGSAA students will continue to attend some of these into their second, third and fourth years.

## Other features of MIGSAA – Extra-MI research links

Some of our “supporters” outside the Maxwell Institute come from:

- Institute of Petroleum Engineering, HWU (Christie, Geiger, McDougall)
- School of Informatics, UoE (Dianikolas, Eteessami)
- Department of Chemical Engineering, HWU (Ocone)
- School of Biological Sciences, UoE (Grima)
- School of the Built Environment, HWU (Pender)
- School of Engineering, UoE (Sun)



## Other features of MIGSAA – Industrial links

Our Industrial supporters include:

- Selex ES UK (Defense and civil technological markets)
- DSTL (Defence Science and Technology Laboratory)
- Microsoft Inria
- John Deere (Agriculture services)

Students working on projects with a significant input from industrial partners can expect a good deal of interaction with those partners and significant exposure to the industrial environment at this stage.

Our industrial partners Selex, Dstl and Microsoft INRIA have **agreed to host placements**.

We will host quarterly industrial afternoons, and pan-MIGSAA factory visits will be offered by Selex.

## Other features of MIGSAA – International Placements

A number of [International Placements](#) will be available (usually in Year 3 or 4) for students whose research project would benefit from such an arrangement.

▷ This needs approval!

## Other features of MIGSAA – Sharing the experience

It's well established that young researchers in mathematics thrive when they're well-connected to each other and not working in isolation.

It's also recognised that learning with and from your peers is very important.

For these reasons all our Y1 students will be housed together at 15 S. College St to share the Y1 experience together and take the same suite of courses.

We are also planning a number of pan-MIGSAA events for Y2 – Y4 in order to encourage these connections to continue to grow – crash courses, mini-symposia, residential symposia, MIGSAA Student Colloquium, peer-learning topic-focused interactive research workshops...

You will also enjoy all the benefits of everything that is offered in the Graduate Schools of Mathematics at UoE and HWU.

## Generic skills

We'll also offer a full programme of relevant *soft skills*.

- Talk in public
- Organizational skills
- Best practices
- Networking
- ...

## Academic matters – practical details for Year 1

During Year 1 you will do a mini taster project in the autumn, jointly with another student(s), and a more substantial project in the second semester and into the summer, possibly leading on to a thesis topic.

You will also follow a collection of courses during Year 1, mainly from the SMSTC, but some specially designed for MIGSAA students.

There will be a progression board to confirm progress to Year 2 and beyond – in much the same way as progression to Year 2 is currently handled at the two universities

## Some key people

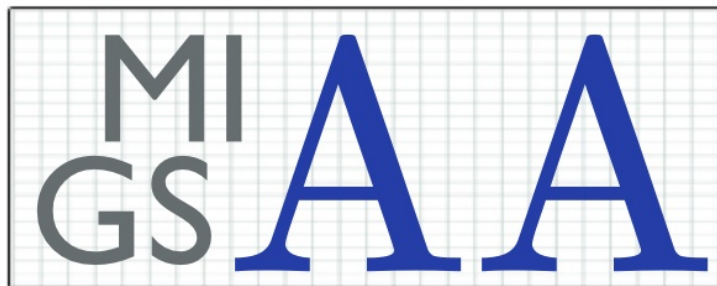
- MIGSAA Administrator: Keira Farrell
- Director: Tony Carbery (UoE)
- Deputy Director: Dugald Duncan (HWU)
- Director of Training: Jim Wright (UoE)
- Director of Cohort: Kevin Painter (HWU)
- Communications Officer: Ben Leimkuhler (UoE)
- Industrial Liaison Officer: Gabriel Lord (HWU)
- Generic Skills Director: Lyonell Boulton (HWU)

## Points of reference

- MIGSAA Programme Handbook for students entering in 2014
- MIGSAA Website:  
<http://www.maxwell.ac.uk/MIGSAA.php>
- Keira Farrell (15 S.College St)  
[keira.farrell@ed.ac.uk](mailto:keira.farrell@ed.ac.uk)
- Tony Carbery  
[A.Carbery@ed.ac.uk](mailto:A.Carbery@ed.ac.uk)

And finally...

**Thank you for listening!**



Any questions?

Gonçalo dos Reis, [G.dosReis@ed.ac.uk](mailto:G.dosReis@ed.ac.uk)