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ThinkTank Maths Limited - Higgs Centre Masters Workshop

Title: “Which Mathematicians for Tomorrow’s Big Human Challenges ?”

Date: Monday, 12th – Thursday, 15th June 2017 (4 days)

Location:

Higgs Centre at the University of Edinburgh, James Clerk Maxwell Building, Room 3217

Objectives of Workshop:

Participants are invited to go on a “journey of initiation” on how to approach Reality through mathematics...a first step towards an “alternative paradigm”.

Just as there is not a “single” mathematics, but on the contrary such a great number of mathematical domains that it is unthinkable to imagine one mathematician could seek to practice them all, let alone master them all...nor is there just one way of doing mathematical research, or even using mathematics and, hence, f tackling a complex problem and striving to solve it.

There is a well-trodden path taught and familiar to students – the “academic method” – and there are ‘the other’ methods.

The workshop aims to introduce participants to the idea that alternative rigorous approaches exist, and the impact of those new mechanisms of reflection in this “extraordinary quest”, which is to try to understand Reality in order to find solutions to the numerous challenges it poses for mankind.

In this way, ThinkTank Maths also hopes to help the participants see mathematics in a different light and find renewed excitement for mathematics in the context of their professional lives.

Throughout the workshop participants will also learn to organise themselves and learn to work as a team to maximise creativity and efficiency.

Finally, the workshop is expected to give participants insight into the personal satisfaction and rewards to be gained through collective working and thinking, rather than working as a “lone star”.

Who are ThinkTank Maths Limited?

We are an Edinburgh-based mathematics research company that creates *paradigm-shifting solutions* to hard problems in many fields which present immense complexity.

Our research team tackles problems where off-the-shelf technology, systems, software solutions and the underpinning science are insufficient or do not exist.

TTM's solutions transform our clients' current business models and technologies.

To learn more about us look at our website: <https://thinktankmaths.com/>

Target participants:

Higgs Masters MSc (current students), as well as PhD, Post Doc in Mathematics and Theoretical Physics interested in fundamental mathematical research *with strict pragmatic requirements* outside the academic world.

Workshop Programme and Format:

Day 1 (9AM - 1PM, Approx. 4 hours)

Introduction and scene setting

- **Presentation of the Motivation and Objectives of the Workshop by ThinkTank Maths**
 - Participants asked to describe their individual expectations of the Workshop
 - Personal experiences from ThinkTank Maths researchers
 - General Open Discussion with ThinkTank Maths Team (Questions / Answers)

- **Presentation of Problems (Questions / Answers)**

Phase 1 - Individual work by participants on a chosen problem Day 2 (9AM - 1PM, Approx. 4 hours)

Phase 1 (Continued)

- Continuation of individual work by participants on the problem

- Individual presentations of the work so far
- Collective peer review of individual work

Phase 2 – Work in teams on the problem

Beginning of work in teams

Self-organisation of participants into small groups (max 10 per team).

Day 3 (9AM – 1PM, Approx. 4 hours)

Continuation of work in teams on the problem

(TTM available for support / guidance/ reply to questions)

Day 4 (9AM – 2PM, Approx. 5 hours / time required)

Phase 3 – Team Presentations

- Structured presentation by each team of “their journey and outputs” and open group discussions.

Discussions and lessons learnt

- General open discussion, revisit “*fundamental considerations of research work in the real world for a mathematician*”.
- Wash-up session: lessons learnt, group discussion about the Workshop experience
- Suggestions and feedback, ideas for future Workshops (Questionnaire)

NB: Final programme may be subject to modification