

PREFACE

The George Boole Mathematical Sciences Conference Domains XII took place, embedded in the George Boole Mathematical Sciences Conference, Cork, Ireland in 2015. Domains XII took place on 25 - 28 Aug 2015.

As part of the celebrations of Boole's bicentenary (www.georgeboole.com), the George Boole Mathematical Sciences (GBMS) Conference (including Domains XII) were held in University College Cork (UCC) during the last two weeks of August 2015.

George Boole (1815 – 1864) was the first professor of mathematics at Cork. Boole's efforts to mathematize logical thinking caused a lasting paradigm shift in the 19th century which enlarged the scope and potency of modern mathematics, and provided a wealth of ideas for applications in diverse scientific areas resulting in ground-breaking innovations during the 20th century and beyond.

This event included over 100 lectures in selected areas:

- Theme 1: Boole and Beyond in Quantum Information Theory
- Theme 2: From Boole's Algebra of Logic to Boolean Algebra, and Beyond
- Theme 3: Complex and Boolean Networks Geometry and Visualization
- Theme 4: Geometry and Visualization
- Theme 5: Harmonic Analysis
- Theme 6: Invariants from Moduli Spaces
- Theme 7: Mathematical Financial Modelling Post-Crisis
- Theme 8: Quantum Probabilistic Symmetries and Quantized Boolean Algebras

The following events were embedded in and associated with the conference:

- 2015 Annual Meeting of the Irish Mathematical Society (IMS)
- Domains XII
- When Boole Meets Shannon

All articles have already been published in the regular issues of Logical Methods in Computer Science.

The current issue of the journal Logical Methods in Computer Science is the result of an open call for submissions on the topic “Domain Theory and its Applications”.

The international conference Domains is aimed at computer scientists and mathematicians alike who share an interest in the mathematical foundations of computation. Previous Domains meetings include Paris (2014), Swansea (2011), Sussex (2008) and Novosibirsk (2007). Domains is an open and interactive event, welcoming talks on topics related to domains and related aspects (list included below) as well as talks pertaining to the general Boole theme of the overarching mathematical sciences conference.

Invited speakers

- Stephen Brookes (Carnegie Mellon)
- Thierry Coquand (Gothenburg)
- Abbas Edalat (Imperial College)
- Jean Goubault-Larrecq (LSV, CNRS & ENS de Cachan)
- Chris Heunen (Oxford)
- Gordon Plotkin (Edinburgh)
- Dana Scott (Carnegie Mellon)

Steering Committee

- Ulrich Berger (Swansea)
- Martin Escardo (Birmingham)
- Achim Jung (Birmingham)
- Klaus Keimel (Darmstadt)
- Michel Schellekens (UCC)

Organizers

- Aoife Hennessy (WIT)
- Michel Schellekens (UCC)

Topics of interaction with domain theory for this workshop included, but were not limited to: *program semantics, program logics, probabilistic computation, exact computation over the real numbers, lambda calculus, games, models of sequential computation, constructive mathematics, recursion theory, realizability, real analysis and computability, topology, metric spaces and domains, idempotent analysis and domains, locale theory, category theory, topos theory, type theory.*

The volume was edited by Michel Schellekens (UCC, School of Computer Science and IT) with support from guest editor Achim Jung (University of Birmingham).

Domain Theory and its Application
 ⟨Domains XII⟩ ⟨2015⟩ Guest Editors: M. Schellekens, Achim Jung.