

# Preface

The field of quantum information and quantum coherence has come a long way since the previous SUSSP44 summer school on a similar topic, *Simple Quantum Systems* at Stirling in 1994. There has been a surge of interest in both theoretical and experimental aspects of quantum information. Its attraction lies mainly in the fact that it is relevant not only for the foundations of quantum physics but also to applications in the field of quantum technologies, with the enigmatic quantum computer being perhaps the most prominent example. In the last two decades, there has been a shift from the emphasis on fundamental quantum physics theory and experiments, on simply generating and measuring quantum systems, towards their purposeful control and manipulation. The main driving force behind this has been the rapidly developing field of quantum information. One example is quantum key distribution, which during this period has changed from proof-of-principle laboratory-based science to a set of commercially available security products for the information exchange market. A greater challenge, the use of quantum systems for information processing, is at an earlier stage. Quantum information processing, due to the parallel nature of information in entangled quantum systems, can be much more efficient than classical computation for certain problems. A key component in all the above is the generation and protection of coherence in quantum systems.

The SUSSP67 summer school on *Quantum Information and Coherence* was held at Strathclyde University in Glasgow 28 July–9 August 2011 (Fig. 1). With 152 participants and 14 lecturers, spanning a broad range of topics from aspects of quantum information and coherent phenomena, the school provided a buzzing atmosphere. The goal of the school was twofold. First, to broaden and deepen the background knowledge of young researchers in the general areas of quantum information and coherence through a series of advanced lectures given by acknowledged experts in the field. Second, to provide a perspective of the latest research and future trends in this area. The summer school provided an intensive programme, with formal lectures and discussion sessions combined with a programme of social and cultural events which created a relaxed and stimulating atmosphere for interaction and learning. Most lecturers gave four one-hour lectures with both tutorial introductions and state-of-the-art developments in their area.



**Fig. 1** SUSSP67 participants. The Barony Hall, Glasgow 2011. Photo by Daniel Oi

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