

Preface

In May 2012, 42 mathematicians congregated in the beautiful seclusion offered by Gjógv, a small community on the Faroese island Eysturoy, to create a productive scientific event centered between the mathematical fields of operator algebras and dynamical systems. Experiencing both the force of the Atlantic Ocean and the tranquil beauty of sunny pastures, the participants enjoyed the hospitality of the Gjáargarður guest house as well as of the University of the Faroe Islands for almost a week, exchanging mathematical ideas and results at lectures as well as at more informal occasions.

The conference marked the conclusion of a 3-year program made possible by the generous support of the NordForsk program funded by the Nordic Research Council, involving 60 mathematicians in Denmark, the Faroe Islands, Norway, and Sweden. The Gjógv meeting was also generously supported by the Faroese Research Council and the University of the Faroe Islands as well as by the Centre for Symmetry and Deformation at the University of Copenhagen. The organizers of the conference were the group leaders of the nodes of the NordForsk network, namely, Toke Meier Carlsen [Trondheim], Søren Eilers [Copenhagen], Nadia Larsen [Oslo], Gunnar Restorff [Tórshavn], Sergei Silvestrov [Västerås/Lund], Wojciech Szymański [Odense], Klaus Thomsen [Aarhus], and Lyudmila Turowska [Göteborg], with Restorff acting as the local organizer in charge of the rather nontrivial logistics for this memorable event.

Apart from members of the network, senior and junior alike, the organizing committee invited five external speakers:

- Claire Anantharaman-Delaroche [Orléans]
- Siegfried Echterhoff [Münster]
- Wolfgang Krieger [Heidelberg]
- Efren Ruiz [Hilo, Hawaii]
- Dana Williams [Dartmouth]



Fig. 1 The grass-roofed guesthouse Gjáargarður

The interplay between operator algebras and dynamical systems, the scientific focus of both the NordForsk network and the conference, is a topic of dramatic current interest. These two areas benefited from the genius of John von Neumann in their early days, but have developed independently over the decades following World War II. The network aimed to steer the force resulting from the leading international position of Nordic mathematics in the area of operator algebras in the direction of the exciting cross field at the boundary of dynamics and functional analysis, the main goal being to understand and analyze C^* -algebras and von Neumann algebras associated to dynamics, as well as to develop the relevant concepts in dynamics.

This volume documents some of the substantial progress made by the network, which existed for almost 3 years prior to the closing conference. However, the network's impact on Nordic mathematics will be felt for some time, in particular due to the strong scientific ties forged between the NordForsk network members and the eight nodes as a result of conferences such as the one in Gjógv and the many personal visits by researchers in the network to other nodes.

There are many ways in which operator algebra and dynamics interact and during the existence of the NordForsk network several or perhaps even most of these interactions were explored at meetings or focused visits. The individual chapters of this proceedings volume illustrate several of these interactions. Chapter 1 deals with von Neumann algebras arising from discrete measured groupoids, Chap. 2 with purely infinite Cuntz-Krieger algebras, and Chap. 3 with filtered K -theory over finite topological spaces, whereas C^* -algebras associated to shift spaces (or subshifts) is the topic of Chap. 4. Graph C^* -algebras are studied in Chaps. 5 and 7, and in Chap. 6 irrational extended rotation algebras are shown to be C^* -alloys. Chapter 8 deals with free probability and Chap. 9 with renewal systems, whereas KMS-states of Cuntz-algebras are used in Chap. 10 to give a new proof of the Grothendieck



Fig. 2 Group photo of the participants.

Back row: Wolfgang Krieger [Heidelberg], Søren Eilers [Copenhagen], Hannes Thiel [Copenhagen/Münster], Tron Omland [Trondheim], Johan Öinert [Copenhagen], Sigurd Segtnan [Oslo], Søren Knudby [Copenhagen], Sören Möller [Odense], Nadia Larsen [Oslo], Klaus Thomsen [Aarhus], James Gabe [Copenhagen], Tim de Laat [Copenhagen], Efren Ruiz [Hawaii Hilo], Jonas Andersen Seebach [Aarhus], Sara E. Arklint [Copenhagen], Fredrik Ekström [Lund], Johan Richter [Lund].

Middle row: Maria Ramirez-Solano [Copenhagen], Gunnar Restorff [Tórshavn], Dana Williams [Dartmouth], Sergei Silvestrov [Västerås], Magnus Landstad [Trondheim], Toke Meier Carlsen [Trondheim], Eduard Ortega [Trondheim], Rasmus Bentmann [Copenhagen], Rune Johansen [Copenhagen], Adam P.W. Sørensen [Copenhagen/Wollongong], Steven Deprez [Copenhagen], Alexander Stolin [Gothenburg].

Front row: George A. Elliott [Copenhagen/Toronto], Erling Størmer [Oslo], Rui Palma [Oslo], Siegfried Echterhoff [Münster], Claire Ananthataman-Delaroche [Orléans], Martin Wanvik [Trondheim], Wojciech Szymański [Odense], Jesper With Mikkelsen [Odense], Lyudmila Turowska [Gothenburg], Jyotishman Bhowmick [Oslo], Asger Törnquist [Copenhagen]

theorem for jointly completely bounded bilinear forms on C^* -algebras. In Chap. 11, Cuntz-Li algebras associated with the α -adic numbers are constructed as crossed products, and in Chap. 12, crossed products of injective endomorphisms (the so-called Stacey crossed products) are studied. In Chap. 13, another type of operator algebras associated to dynamical systems, namely, C^* -completions of the Hecke algebra of a Hecke pair, is studied, whereas Chap. 14 gives an overview on how operator algebras can be used to study wavelets. Finally, Chap. 15 deals with semiprojective C^* -algebras, and in Chap. 16, the topological dimension of type I C^* -algebras is studied.



Fig. 3 View from the pass Skúvadalsskarð south of the village Gjógv



Fig. 4 View of the village Gjógv

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Fig. 5 The sail-vessel Norðlýsið seen out through the opening of a grotto on the west shore of the island Hestur during a boat trip. After the boat trip, an official reception was held by the University of the Faroe Islands in Tórshavn followed up by a public lecture about mathematics by Søren Eilers



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Copenhagen, Denmark
Tórshavn, Faroe Islands
Västerås, Sweden
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