Categories in Algebra, Geometry and Mathematical Physics

Conference and Workshop in Honor of Ross Street’s 60th Birthday
July 11–16, July 18–21, 2005
Macquarie University, Sydney, Australia
Australian National University, Canberra, Australia

Alexei Davydov
Michael Batanin
Michael Johnson
Stephen Lack
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Editors
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Preface

In July 2005 conferences were held to honour Ross Street on the occasion of his 60th birthday. Colloquially, they were called StreetFest, and indeed it was a festival, with a week of lectures at Ross’ own Macquarie University in Sydney Australia, followed by another week of lectures at the Australian National University in the national capital, Canberra, roughly 300km from Sydney.

The conferences were entitled Categories in Algebra, Geometry and Mathematical Physics and Workshop on Categorical Methods in Algebra, Geometry and Mathematical Physics. Those titles were chosen to emphasise the breadth of the applications of Ross’ own work, and the exciting progress that has been made in recent years in the applications of category theory. To maximise the potential benefits of these applications and the further theoretical progress that they inspire, it is crucial that category theorists and experts from the various fields of application collaborate more closely than ever. The conferences were designed to facilitate this interaction.

The conferences were attended by almost one hundred participants, with over sixty of them international participants, including remarkably many outstanding leaders from their various fields. Talks were long and interaction was encouraged so as to improve communication among participants with different specialisations.

For the present volume the editors solicited original research papers and expository articles from the conference participants and others closely (mathematically) related to Ross and his work. The articles were rigorously refereed and twenty two have been chosen for publication here. The papers selected span across many of the application areas including gauge theory, homotopy techniques, K-theory and quantum field theories. The common thread is the use of category theoretic techniques, and reflecting their importance we have also included papers whose main contribution is to category theory itself.

The editors gratefully acknowledge the conference sponsorship of the Australian Mathematical Sciences Institute, Macquarie University, and the Australian National University. We benefited from the fine organisational and technical skills of Victoria Benning, Daniel Steffen and Chris Wetherell. Special thanks are due to William Chen and Alan Carey for their valuable support.

The complete programmes of the conferences, and related information, remain available at http://streetfest.maths.mq.edu.au from which browsers can find abstracts of all the talks.
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Category theory has become the universal language of modern mathematics. This book is a collection of articles applying methods of category theory to the areas of algebra, geometry, and mathematical physics. Among others, this book contains articles on higher categories and their applications and on homotopy theoretic methods. The reader can learn about the exciting new interactions of category theory with very traditional mathematical disciplines.