

Preface

Dan Walls was a notable presence in quantum optics almost from the beginning of the modern era of intense research in the field, right up to the time of his untimely death. In the 30 years that have passed since his PhD at Harvard, he established a school of theoretical quantum optics in New Zealand, first at the University of Waikato and then at the University of Auckland, which gained an international reputation for its seminal contributions in the area of quantum fluctuations and noise, and as a leading center advancing and promoting the latest directions in quantum optics. Today his numerous students lead active research groups throughout New Zealand and Australia, and also in the United States. Dan is remembered by colleagues as an enthusiastic collaborator, and as a generous host during their visits to New Zealand as guest scientists or participants at the summer meetings arranged by Dan Walls and John Harvey.

To honor Dan's achievements, and in recognition of the influence of his enthusiasm, insight, and generosity, on them individually and on quantum optics research more widely, a group of Dan Walls' students and colleagues have assembled this collection of papers reviewing current research directions in quantum optics. At some stage in his career, Dan Walls contributed to each of the areas featured here. He was actively working on Bose–Einstein condensation right up until his last months, and we have included in this volume a completed, but unpublished, manuscript by Dan, Scott Parkins, and Atac Imamoglu, the theme of which is developed around three topical research areas – cavity QED, nonlinear optics, and quantum information; this paper looks in anticipation towards the next advances of high importance and impact, as was so often the case in Dan's work. Recent developments in each of these areas are described in a number of the contributions. Other papers cover the areas of quantum interference, and the area of Dan's most significant accomplishments, quantum noise processes.

During the early part of Dan Walls' career, travel out of New Zealand was not at all a small undertaking. Dan was, nevertheless, from the beginning, renowned as an international traveller and regular attendee at meetings in Europe and the United States. It is fitting that over this last year he has been recognized, through special sessions or symposia, at a number of international meetings. He was so recognized at the TAMU-ONR Workshop on Quantum

Optics, held in Jackson, Wyoming in July of 1999. A number of the papers presented at that meeting are reproduced, in tribute, in this volume.

We wish to express our thanks to all those who have contributed to this book, either as authors or in the refereeing of the papers. With no explicit direction from us, the range of the contributed papers provides a review of the latest developments across virtually the entire field of quantum optics. The standard of the papers is high, as we hoped it would be, and the work of the referees has helped us in that. We also extend our appreciation and thanks to Colleen Vande Voorde at the Oregon Center for Optics, for her management of the editorial communications with authors and referees, and for her help in compiling the numerous electronic files, producing a book of pleasant appearance and a suitable tribute to the memory of our colleague Dan Walls.

Eugene, Cambridge, College Station
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