The Physics of Non-Hermitian Operators

PREFACE

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This special issue contains contributions presented at the workshop on The Physics of Non-Hermitian Operators held at Stellenbosch, South Africa in November 2005. A few additional articles are included from researchers who could not attend the meeting.

The workshop was the fourth meeting in a series on Pseudo-Hermitian Hamiltonians in Quantum Physics which commenced in Prague in 2003 as a result of growing interest in non-Hermitian Hamiltonians in general, and PT-symmetric quantum mechanics and quantum field theory in particular. Naturally, Hamiltonians of open systems are an obvious part of this topic, but the focus here is rather on systems where unitary time evolution as such is not undermined. This rather new, and perhaps ambitious, field thus explores a possible generalization of quantum mechanics which incorporates non-Hermitian Hamiltonians into a consistent quantum mechanical framework.

New results of a physical and mathematical nature have brought about appreciable progress; earlier work has been uncovered or even rediscovered and links between sub-fields have been established. This issue should provide a stimulus for initiating further advances in the field, re-focus on earlier perspectives and explore open and controversial questions. While non-Hermitian operators have been encountered in theoretical physics since the advent of quantum mechanics, their systematic mathematical investigation and their possible physical implications is a relatively new subject, further explored in this issue.

We would like to thank the University of Stellenbosch and the South African National Research Foundation for their financial support, without which it would not have been possible to plan and organize the workshop. Organizational aspects and technical support were very ably taken care of by Christine Ruperti and Tinus Botha whom we would like to thank again. Finally, we also appreciate and acknowledge the invitation from the Editorial Board of *Journal of Physics A: Mathematical and General* for the opportunity to publish this special issue and trust that this will indeed widen the interest and stimulate progress in the field.

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Guest Editors

Participants in the Fourth International Workshop on Pseudo-Hermitian Hamiltonians in Quantum Physics-PHHQP4 (Stellenbosch, South Africa, 23-25 November 2005)