

REVIEWS

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The Abel Prize 2003–2007: The First Five Years
 Homage to a Pied Puzzler
 Song of Two Worlds

The Abel Prize 2003–2007: The First Five Years edited by Helge Holden and Ragni Piene, 2010, Springer, 327 pp, £58.99, US\$89.95 with DVD, ISBN 978-3-642-01372-0.

The Abel prize was established by the Norwegian government in 2002, the bicentenary of Abel's birth, to recognise outstanding scientific work in the field of mathematics. Since then it has been awarded annually, and this book surveys the first five years.

The volume under review presents the winners of the first five prizes, together with a brief history of the prize and a very short biographical sketch of Selberg, the first, honorary, laureate. There is a short autobiographical piece by each laureate, followed by a more extensive review of their work. Included with the book is a DVD of interviews carried out with the laureates when their prizes were awarded.

The writers of the various overviews of the prizewinners' work have been set a difficult task. Each presents in some detail the main achievements of the respective laureates, while endeavouring to give an overview suitable for a general mathematical audience. In general I think they have been very successful, and the resulting essays provide a rewarding insight into the respective fields.

The first and longest review, by Pilar Bayer, is of the work of Serre. It is also the most ambitious, as it attempts in 55 pages to survey almost all 285 publications. Unfortunately this does mean that in places the material turns into little more than a list of topics, with classic works such as FAC (faisceaux algébriques cohérent) reduced to a few short lines. On the other hand, the reader soon appreciates the range and power of Serre's work across a number of fields.

The second review, by Nigel Hitchin, surveys the background to the Atiyah–Singer index theorem and some of its many applications. This leads the reader gently but rapidly from the definition of an index, through the various geometric ideas needed and then on to various versions of the index theorem in different contexts.

The remaining reviews are shorter, and cover selected highlights of the respective laureates' work. Helge Holden and Peter Sarnak review the contributions of Lax, particularly to partial differential equations, integrable systems, and scattering theory. Tom Körner discusses Carleson's contributions to modern analysis (particularly the proof of Lusin's conjecture), and this essay is noteworthy both for being aimed (in part) at a general audience and also containing some actual proofs! Finally, Terry Lyons discusses Varadhan's work in stochastic analysis. Each of these essays provides the reader with a flavour of the respective disciplines, and of the distinctive contribution of the various laureates.

The short autobiographical pieces by the various laureates are each of interest, but still more rewarding are the lengthy interviews included on the accompanying DVD. The majority of these were shown on Norwegian TV, and the interviewers (both mathematicians) and interviewees do an excellent job at balancing technical precision with the demands of a general audience.

This volume is intended to be the first of a series; if the rest reach the same high standard then they will provide a rich survey of a broad range of modern mathematics.

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