

Rodney J. Baxter – Life and Career

Murray Batchelor

Baxter2025 Exactly Solved Models and Beyond:
Celebrating the Life and Achievements of Rodney James Baxter,
Canberra, Sept 8-11, 2025



London

Rodney was born on 8 February 1940 in Walthamstow, London. Here he is preparing to start school at Bancroft's, where he did well at mathematics and “naturally veered towards the science subjects”.



Cambridge

Late in 1957 Rodney went up to Cambridge to sit and pass the scholarship examination for Trinity College. He began as an undergraduate at Cambridge in the autumn of 1958 and in his last year he specialised in mathematical physics.



Rodney punting on the Cam

Canberra

After graduating with a first, Rodney applied for a PhD scholarship to the ANU. He was successful and arrived in Sydney in September 1961 after a 40 day boat trip.

Rodney submitted his PhD thesis “Aspects of the statistical mechanics of gases” under the supervision of Kenneth LeCouteur in 1964.

Not thinking of himself as an academic, Rodney took up a job as a “reservoir engineer” with the London office of the Iraq Petroleum Company.

But after 5 months he decided to take up a three-year research fellowship at the ANU, arriving back in Canberra in June 1965.

During this time Rodney became involved with the Canberra Repertory Society performing in a number of plays.

LeCouteur advised Rodney that he would benefit from some international experience, so he accepted an offer from Elliott Lieb of a lectureship in the mathematics department at MIT, which Rodney was to take up from October 1968.

But before then Rodney met and married Elizabeth.



At MIT Rodney shared an office with Colin Thompson and Douglas Abraham.

The three of them attended one of Joel Lebowitz's regular statistical mechanics meetings at Yesheva, where they met many famous names in the field, including Lars Onsager.

After returning to Australia in 1972 Colin Thompson organised the first Australian Statistical Mechanics Meeting in Melbourne in 1973. So began the series of annual meetings alternating between Melbourne and Canberra with Rodney organising the meetings at the ANU.

Rodney took up a tenured position in the Theoretical Physics Department at the ANU in 1971, rising through the ranks of Fellow, Senior Fellow, Professorial Fellow and Professor before retiring in November 2002 as Emeritus Professor.

Family life in Canberra



Rodney and Elizabeth with Anne and Andrew

From Some academic and personal reminiscences of Rodney James Baxter

Colleagues at ANU

Research Fellows in the Department of Theoretical Physics with joint publications:

- Ian Enting (1976, 77, 78, 80)
- Paul Pearce (1981, 82, 83, 84)
- Reinout Quispel (1987, 90)
- Vladimir Bazhanov (1990, 92, 93, 95, 99)

Others at ANU with joint publications:

- Michael Barber (1973, 87)
- Murray Batchelor (1987, 95)

PhD students

(1976) **Stewart Kelland**

The ice and Potts models in statistical mechanics

(1979) **Shiu Kuen Tsang**

Corner transfer matrices of the Ising model in statistical mechanics

(1985) **Peter Forrester**

Exactly solved models in statistical mechanics and their interplay with classical analysis

(1989) **Aleks Owczarek**

Properties of the six vertex and related models in statistical mechanics

(1996) **Michael O'Rourke**

Interfacial tension and finite-size effects of some exactly solved models in statistical mechanics

(1997) **Geoffrey Campbell**

Combinatorial identities in number theory related to q -series and arithmetical functions



Rodney with Peter Forrester, 1986 J G Crawford Prize Recipient

Photo credit: Baxter Family Album

Visiting Positions

- (1972) and (1980) Visiting Professor, SUNY Stony Brook
- (1975) Visiting Professor, University of Edinburgh
- (1992) Royal Society Research Professor at Cambridge
- (1999) Visiting Miller Research Professor, Berkeley

Visitors

Over the years, Rodney attracted many visitors to ANU for extended visits. These have included:

- Fred Wu
- George Andrews
- Jean-Marie Maillard
- Helen Au-Yang and Jacques Perk
- Barry McCoy
- Bernard Nienhuis



Rodney with Jean-Marie Maillard, March 1985 Tidbinbilla



Rodney with Bill Wise, Tony Guttman and Ian Enting, ANU stat mech meeting, Nov 1987

Photo credit: Baxter Family Album



Rodney with Tetsuji Miwa, Vincent Pasquer, Michio Jimbo and
Andreas Klümper, June 1989 Mt Ainslie

Photo credit: Baxter Family Album



Rodney with Jacques Perk and Vladimir Bazhanov,
July 1989 Molongolo Gorge

Photo credit: Baxter Family Album



Rodney with Jim McGuire, Nov 1989 Molongolo Gorge

Photo credit: Baxter Family Album

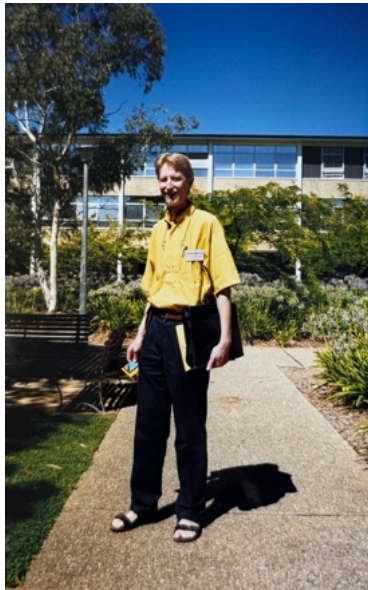


Rodney with Atsuo Kuniba and Yuri Stroganov, Oct 1990 Uriarra

Photo credit: Baxter Family Album



Rodney and Elizabeth host a dinner party for C.N. Yang, 14 Feb, 1992



Rodney with Fred Wu, Bernard Nienhuis, Canberra 2000



Elizabeth, Rodney with Helen Au-Yang and Barry McCoy, Canberra 2008

Photo credit: An Accidental Academic



Yang-Baxter, Statphys, Cairns, July 2010

Selected Conference

Taniguchi Conference “Integrable Models in Quantum Field Theory and Statistical Mechanics”, Kyuzeso, Katata, 24-28 Oct (1988)



Visit to Chongqing



Rodney with Huanqiang Zhou and a giant poster, May 2014

Honours and Awards

Throughout his career, Rodney received many major honours and awards:

- (1975) Pawsey Medal, Australian Academy of Science
- (1977) Elected Fellow of the Australian Academy of Science
- (1980) Boltzmann Medal, International Union of Pure and Applied Physics

“For his brilliant contributions to the field of critical phenomena, in the form of exact solutions of several two-dimensional models”. Cited in particular for his solution of the eight-vertex model “whose solution has cast new light on the concept of universality”.

- (1982) Elected Fellow of the Royal Society of London
- (1983) Lyle Medal, Australian Academy of Science
- (1987) Dannie Heineman Prize, American Physical Society
- (1994) Harrie Massey Medal, British Institute of Physics
- (2003) Centenary Medal, Australian Government
- (2006) Lars Onsager Prize, American Physical Society

- (2006) Lars Onsager Lecture and Medal, Norwegian University of Science and Technology
- (2013) Royal Medal, Royal Society of London

“for his remarkable exact solutions of fundamental models in statistical mechanics”

- (2020) Peter Baume Award, Australian National University
- (2021) Henri Poincare Prize, International Association of Mathematical Physics

“For ground-breaking contributions to the study of exactly solvable models in statistical mechanics, which have led to, and continue to inspire, profound developments across a broad spectrum of mathematics and physics.”

Conferences

- Yang-Baxter Equations, Conformal Invariance and Integrability in Statistical Mechanics and Field Theory, ANU, 10-14 July (1989)
- Yang-Baxter Equations in Paris, 24-30 July (1992)
- APCTP-Nankai Symposium on Yang-Baxter Systems, Nonlinear Models and Their Applications, Seoul, 20-23 October (1998)
- Baxter 2000: The Baxter Revolution in Mathematical Physics, ANU, 13-19 February (2000)
- Baxter 2015: Exactly Solved Models & Beyond, Cairns, 19-25 July (2015)
- Baxter 2020: Frontiers of Integrability, ANU, 11-14 February

Yang-Baxter Equations, Conformal Invariance and Integrability in Statistical Mechanics and Field Theory

Canberra July 10-14, 1989 [CMA Special Year in Mathematical Physics]



PROCEEDINGS OF THE CONFERENCE

YANG-BAXTER EQUATIONS IN

PARIS

edited by

Jean-Marie Maillard

World Scientific

THE BAXTER REVOLUTION IN MATHEMATICAL PHYSICS



THE AUSTRALIAN NATIONAL UNIVERSITY

Canberra, 13-19 February 2000

Organisers:

M.T.Batchelor (Canberra)

V.V.Bazhanov (Canberra)

P.A.Pearce (Melbourne)

This workshop is to be held in honour of R.J. Baxter's 60th birthday. It will highlight Professor Baxter's pioneering contributions in exactly solved models in statistical mechanics which have inspired crucial developments in key areas of mathematical physics.

The list of invited speakers includes:

Ludwig Faddeev (St. Petersburg)

Vaughan Jones (Berkeley)

Barry McCoy (Stony Brook)



Exactly Solved Models & Beyond

19–25 July 2015, Palm Cove, Australia

Speakers to include: Rodney Baxter, George Andrews, Ludwig Faddeev, Tony Guttmann, Michio Jimbo, Barry McCoy, Stanislav Smirnov, Nalini Joshi, Craig Tracy, Helen Au-Yang, Benjamin Basso, Alexander Bobenko, Hermann Boos, Jan de Gier, Patrick Dorey, Vladimir Mangazeev, Paul Fendley, Omar Foda, Angela Foerster, Peter Forrester, Rinat Kashaev, Andreas Klumper, Jean-Michel Maillet, Jean-Marie Mailard, Alexei Litvinov, Sergei Lukyanov, Masahito Yamazaki, James McGuire, John Links, Giuliano Niccoli, Jacques Perk, Wen-Li Yang, Jorgen Rasmussen, Milena Radnovic, Yao-Zhong Zhang*, Junji Suzuki, Roberto Tateo, Atsuo Kuniba, Yu-Peng Wang

Organizing committee: Vladimir Bazhanov, Murray Batchelor, Gary Bosnjak, Vladimir Mangazeev, Xi-Wen Guan, Alex Owczarek, Paul Pearce, Reinout Quispel, Sergey Sergeev, Ole Warnaar

International advisory committee: Ludwig Faddeev, Tony Guttmann, Tetsuji Miwa, Sergei Lukyanov, Changrim Ahn, Alexander Bobenko, Mo Lin Ge, Hubert Saleur

BAXTER
2015

<http://baxter2015.anu.edu.au>



Rodney at Baxter2015



Group photo from Baxter2020

Special Journal Issues

- Special Issue: Proceedings of Yang-Baxter Equations, Conformal Invariance and Integrability in Statistical Mechanics and Field Theory, Int. J. Mod. Phys. 4, 701-1126 (1990)
Guest Editors: Michael Barber, Paul Pearce
- Special Issue: Proceedings of the Baxter Revolution in Mathematical Physics, A Meeting in Honor of R.J. Baxter's 60th Birthday, J. Stat. Phys. 102, 373-1084 (2001)
Guest Editors: Murray Batchelor, Vladimir Bazhanov, Paul Pearce
- Exactly Solved Models and Beyond: A Special Issue in Honour of R J Baxter's 75th Birthday, J. Phys. A 48-49 (2015-2016)
Guest Editors: Murray Batchelor, Vladimir Bazhanov, Vladimir Mangazeev

Exactly Solved Models and Beyond: a special issue in honour of R J Baxter's 75th birthday

Guest Editors

Murray Batchelor *Chongqing University and Australian National University*

Vladimir Bazhanov *Australian National University*

Vladimir Mangazeev *Australian National University*

Scope

Rodney Baxter's pioneering contributions to the study of exactly solved models in statistical mechanics, dating back to the early 1970s, continue to have a profound impact in both mathematics and physics. His body of work includes both finding remarkable new solutions of key models and the invention of powerful techniques for calculating their physical properties. Baxter's concepts of commuting transfer matrices, functional relations and corner transfer matrices have inspired developments across a broad spectrum of mathematical physics. The notion of Yang-Baxter integrability originating from lattice models led to profound advances in quantum field theory, in knot theory and in the development of quantum groups. Such integrable models have played a central role in the AdS/CFT correspondence in string theory and are also being realised in experiments in low-dimensional physics.



Picture. Rodney Baxter. Credit: Elizabeth Baxter

This special issue is a collection of articles which reflect the ongoing influence of Baxter's work.

Some academic and personal reminiscences of Rodney James Baxter

R J Baxter

Mathematical Sciences Institute, The Australian National University, Canberra, A.C.T.
0200, Australia

Received 19 March 2015

Accepted for publication 5 May 2015

Published 4 June 2015



CrossMark

Abstract

I discuss (in reverse chronological order) three highlights of my academic career, setting them in a personal context.

Keywords: statistical mechanics, exactly solved models, Ising models

(Some figures may appear in colour only in the online journal)

1. Introduction

I take great pleasure that so many of my friends and colleagues will be taking the trouble to gather in Cairns in July 2015. I also thank those who have written or are writing papers for this special issue of the journal. Here I take the opportunity to write down something of what I have done to occasion this event.

As many of you know, my work has been in the field of exactly solved models in

An Accidental Academic



Rodney Baxter



R. J. Baxter

Photo credit: Baxter Family Album

Rodney is greatly missed, but
his legacy will live forever!