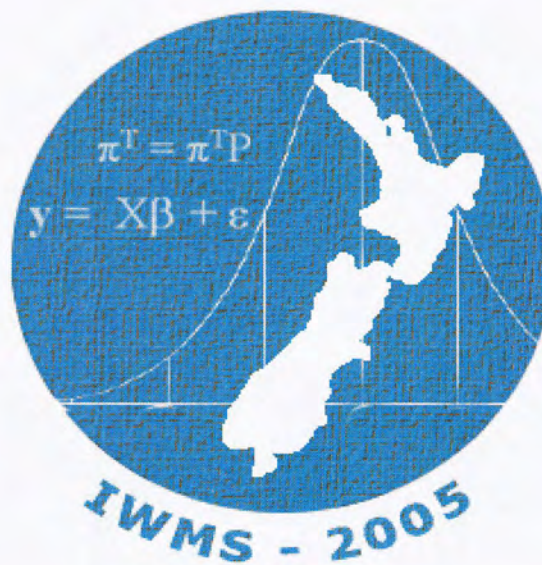


# Program and Abstracts



## 14<sup>th</sup> International Workshop on Matrices and Statistics

29<sup>th</sup> March to 1<sup>st</sup> April 2005

Massey University, Albany Campus  
Auckland, New Zealand



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### Program and Abstracts

Edited by Paul Cowpertwait and Jeff Hunter

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This workshop has been endorsed by the following Societies:

The International Statistical Institute

IWMS 2005 is a Satellite Conference to the ISI 55th  
Biennial Session, Sydney April 5 – 12, 2005.



The International Linear Algebra Society



# Sponsors

The International Organizing Committee and the Local Organizing Committee wish to acknowledge the support provided by the following sponsors:

Royal Society of New Zealand  
International Conference Fund provided by the NZ Government  
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SAS  
Supporting the SAS Lecturer, Prof S Searle, and the SAS Reception



Nokia  
Supporting the Workshop and the Nokia Lecturer, C R Rao



Massey University  
Supporting C R Rao as a Distinguished Visitor to both the Palmerston  
North and Albany Campuses



The New Zealand Statistical Association  
Supporting the NZSA Visiting Lecturer for 2005, C R Rao with travel  
in New Zealand to Otago University, University of Canterbury,  
Victoria University of Wellington, Massey University at Palmerston  
North, University of Waikato, University of Auckland, and Massey  
University at Auckland



The New Zealand Mathematical Society  
Supporting the NZMS Lecturer, E Seneta



## Workshop Booklet

The purpose of the conference is to stimulate research and, in an informal setting, to foster the interaction of researchers in the interface between statistics (including applied probability) and matrix theory. The Workshop will provide a forum through which statisticians may be better informed of the latest developments and newest techniques in linear algebra and matrix theory and may exchange ideas with researchers from a wide variety of countries.

International Workshops in Matrices and Statistics are held annually in different locations around the world. This Workshop is the fourteenth in the series with the Workshops having been held at the following locations:

1. Tampere, Finland, August 1990
2. Auckland, New Zealand, December 1992
3. Tartu, Estonia, May 1994
4. Montréal, Québec, Canada, July 1995
5. Shrewsbury, England, July 1996
6. Istanbul, Turkey, August 1997
7. Fort Lauderdale, Florida, USA, December 1998
8. Tampere, Finland, August 1999
9. Hyderabad, India, December 2000
10. Voorburg, The Netherlands, August 2001
11. Lyngby, Denmark, August 2002
12. Dortmund, Germany, August 2003
13. Bedlewo, Poland, August 2004

*March 2005 marks the 200<sup>th</sup> anniversary of Legendre's appendix on the method of least squares*

## **International Organising Committee**

Prof George P.H. Styan (Chair), McGill University, Montréal, Canada  
Dr Simo Puntanen, University of Tampere, Finland  
Prof Dr Hans Joachim Werner

## **Local Committee**

### **Institute of Information and Mathematical Sciences, Massey University**

Prof Jeffrey J Hunter – Chair  
Freda Anderson – Secretary  
Paul Cowpertwait - Abstracts and Editor  
Claire Jordan - Accommodation, Conference Dinner, Catering  
Marie Fitch – Catering  
Nikki Luke - Local arrangements  
Barry McDonald – Transport  
Beatrix Jones and Danny Walsh – Excursion  
Stephen Ford – Webmaster

## **Supporting ex-officio members**

Professor Stephen Haslett, Massey University - Representing the Statistics Research Consulting Centre, Massey University, Palmerston North  
Dr Harold Henderson, AgResearch, Ruakura - Representing the New Zealand Statistical Association  
Professor Robert McKibbin - Representing the Institute of Information and Mathematical Sciences, Massey University, Albany Campus, Auckland  
Mr Eddie Davis - Representing the Royal Society of New Zealand International Conference Fund with funding provided by the Government through the Ministry of Research, Science and Technology ISAT Linkages Fund

# Contents

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Conference Program .....	1
Abstracts.....	7
Publication of Papers .....	45
List of Participants .....	47
Photograph of Participants from the last IWMS Meeting.....	49
Some Biographical Material on the Keynote Speakers .....	51



# Conference Program

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Tuesday March 29

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8.00 – 9.20	<b>Registration</b> – Foyer of Quad B Building, Massey University, Albany Campus Auckland
9.20 - 9.30	<p><b>Maori Powhiri</b></p> <p>The powhiri is the Maori welcome ceremony. It removes the tapu of the Manuhiri (visitors) to make them one with the Tangata Whenua (Home people) and is a gradual process of the Manuhiri and the Tangata Whenua coming together.</p> <p>International and New Zealand visitors to assemble in the Quadrangle between Quad A and Quad B Buildings. Massey University participants to assemble in Quad B 5.</p>
9.30	<p><b>Response</b> on behalf of the Tangata Whenua - Jeff Hunter</p> <p><b>Waiata</b></p> <p><b>Response</b> on behalf of the Manuhiri - George Styan</p>
9.35	<b>Opening Remarks</b> by Jeff Hunter, Chair of Local Organising Committee
9.40	<b>Welcome to Massey University</b> by Prof John Raine, Deputy Vice Chancellor, Massey University, Auckland
Session 1:	<b>Keynote Lecture 1</b>
09.45	<p><b>Welcome to the Massey University Distinguished Lecturer</b> by Robert Anderson, Pro-Vice Chancellor, College of Sciences, Massey University</p> <p><b>Introduction</b> of the Nokia Lecturer - George Styan, Chair of the International Organizing Committee</p>
09.50 – 10.50	<p><b>Nokia Lecture – Eberly Professor Emeritus C R Rao,</b>          Pennsylvania State University, USA  <i>Statistical Proofs of Matrix Theorems</i></p>
11.00 – 11.30	<b>Morning Tea</b> - Foyer to Quad B

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### Session 2: Invited Lectures

Chair: Alan Lee

- 11.30 – 12.00      **Tõnu Kollo**, University of Tartu, Estonia and D. von Rosen, Swedish University of Agricultural Sciences, Sweden  
*Approximation of the Parameter Distributions of Growth Curve Model*
- 12.00 – 12.30      **Nye John**, Waikato University, Hamilton, New Zealand  
*Inverse of the Information Matrix*
- 12.30 – 13.00      **Alexander Kukush**, Kiev National Taras Shevchenko University, Ukraine  
*Invariant estimator in a quadratic measurement error model*
- 13.05 - 14.00      **Lunch** - Staff Lounge, Study Centre
- 

### Session 3: Invited Lectures

Chair: Nye John

- 14.00 – 14.30      **Götz Trenkler**, Dortmund University, Germany  
*On the commutativity of orthogonal projectors*
- 14.30 – 15.00      **Stephen Haslett**, Massey University, New Zealand and John Haslett, Trinity College Dublin  
*What are the residuals for the linear model?*
- 15.00 – 15.30      **Joachim Werner**, Univ of Bonn, Germany and Ingram Olkin, Stanford University  
*On permutations of matrix products*
- 15.30 – 16.00      **Afternoon Tea**
- 

### Session 4: Contributed Lectures

Chair: Alexander Kukush

- 16.00 – 16.20      **B. Jones**, Massey University, Auckland and M. West, Duke University, N.C., U.S.A.  
*Covariance decomposition for Gaussian graphical models*
- 16.20 – 16.40      **Burkhard Schaffrin**, Ohio State University, Columbus, Ohio, USA  
*On the optimal choice of the regularization parameter through variance ratio estimation*
- 16.40 – 17.00      **Song-Gui Wang** and **Zhong-Zhen Jia**, Beijing University of Technology, Beijing, China  
*Estimating the covariance matrix by spectral decomposition approach in linear mixed model*
- 17.00 – 17.20      **Mike Doherty**, Statistics New Zealand, Wellington.  
*Partially diffuse starting values in state-space models*
- 17.30 – 20.30      **“SAS Reception”** - Opening Reception held in the Staff Lounge, Study Centre
-

Wednesday March 30

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Session 5: Keynote Lecture 2

09.00 **Introduction to the SAS Lecturer – Joachim Werner**, Vice Chair of the International Organizing Committee

09.05 – 10.05 **SAS Lecture – Professor Emeritus Shayle Searle**, Cornell University, Ithaca, New York, U.S. *Reflections on a fifty year random walk midst matrices and statistics*

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10.05 **Workshop Photograph**

10.20 – 10.40 **Morning Tea** - Foyer to Quad B

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Session 6A: Invited Lectures  
Chair: Stephen Haslett

10.40 – 11.10 **C R Rao**, Pennsylvania State University, U.S.  
*Anti eigen and singular values of a matrix and applications to problems in Statistics*

11.10 – 11.40 **Karl Gustafson**, University of Colorado, Boulder, Colorado, U.S.  
*The geometry of statistical efficiency*

11.40 – 12.10 **Garry Tee**, University of Auckland, New Zealand  
*Eigenvectors of block circulant matrices*

Session 6B: Contributed Lectures

12.10 – 12.30 **Imbi Traat and Tatjana Nahtman** University of Tartu, Estonia  
*A matrix with consecutive integer eigenvalues*

12.30 – 12.50 **Kimmo Vehkalahti**, University of Helsinki, Finland  
*Leaving useful traces when working with matrices*

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Excursion

13.00 – Boxed Lunch Pickup.  
Participants to assemble outside the Atrium Building for the Bus to the Ferry.

13.15 – Bus departs for Excursion to Waiheke

14.00 – Ferry leaves for Waiheke.

The excursion will explore Waiheke Island. Participants will get to choose among several attractions, including wineries, beaches, a boutique olive oil production facility, and the village shops and galleries.

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Thursday March 31

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Session 7: Keynote Lecture 3

- 09.00                    **Introduction to the New Zealand Mathematical Society Lecturer - Associate Professor Mick Roberts**, President of the NZMS
- 09.05 – 10.05        **NZMS Lecturer – Professor Eugene Seneta**, University of Sydney, Australia. *Coefficients of Ergodicity in a Matrix Setting*
- 10.05 – 10.30        **Morning Tea** - Foyer to Quad B
- 

Session 8A: Invited Lectures

Chair: Tonu Kollu

- 10.30 – 11.00        **Estate Khmaldze**, Victoria University of Wellington, New Zealand  
*Inverse matrices, Volterra operators and innovation processes: application to statistics*
- 11.00 – 11.30        **Anyue Chen**, University of Greenwich, U.K.  
*Asymptotic Birth-Death Processes: A Matrix Analysis Approach*
- 11.30 – 12.00        **Moshe Haviv**, The Hebrew University of Jerusalem, Israel  
*On singularly perturbed Markov chains*
- Session 8B:            Contributed Lectures
- 12.00 – 12.20        **D. Alexander and G. Jones**, Massey University, Palmerston North, N.Z.  
*Convergence Properties of Alternating Markov Chains*
- 12.20 – 12.40        **Jeff Hunter**, Massey University, Auckland, N.Z.  
*Simple procedures for finding mean first passage times in Markov chains*
- 12.40 – 13.00        **G. Jones**, Massey University, Palmerston North, N.Z.  
*Properties of transition matrices for chain binomial models*
- 13.05 – 14.00        **Lunch** - Staff Lounge, Study Centre
- 

Session 9: Jerzy K. Baksalary Memorial Session

Organised by: Oskar Maria Baksalary, George Styan, Simo Puntanen, and Götz Trenkler

Chair: George Styan

- 14.00 – 15.30        **George Styan**, Mc Gill University, Montreal Canada; **Simo Puntanen**, Univ Tampere, Finland and **Götz Trenkler**, Dortmund University, Germany  
*Comments on the life and work of Jerzy K. Baksalary (1944 - 2005)*
- 15.30 – 16.00        **Afternoon Tea**
-

Session 10: Contributed Lectures\*

Chair: Moshe Haviv

16.00 – 16.20	<b>W. Sakamoto</b> , Osaka University, Japan <i>Diagnosing non-linear regression structure with power additive smoothing splines</i>
16.20 – 16.40	<b>Eric Iksoon Im</b> , University of Hawaii at Hilo, USA <i>Hessian Equivalence to Bordered Hessian</i>
16.40 – 17.00	<b>C. M. Cuadras</b> , University of Barcelona, Spain. <i>Continuous canonical correlation analysis</i>
17.00 – 17.20	<b>Lakshmi Narasimhaiah</b> , Adhiyamaan College of Engineering, Tamil Nadu, India; Kishore Hoysal, Islamiah Institute of Engineering, Bangalore, India. <i>Model for students expected performance level through varying control limits in relation to Power of Valuation</i>

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19.00 – 24.00	<b>Workshop Dinner</b> , Spencer on Byron
19.00	Pre dinner drinks
19.30	Conch call to guests
	Hato Petera Maori Cultural Group
20.00	Dinner - New Zealand Theme

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Friday April 1

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Session 11: Keynote Lecture 4

09.00	<b>Introduction to the Keynote Lecturer - Simo Puntanen</b> , Member of International Organizing Committee
09.05 – 10.05	<b>Keynote Lecture – Emeritus Professor George Seber</b> , University of Auckland, New Zealand. <i>Things my mother never told me about Matrices</i>
10.05 – 10.30	<b>Morning Tea</b> -foyer to Quad B

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Session 12: Invited Lectures

Chair: Simo Puntanen

10.30 – 11.00	<b>S Ejaz Ahmed</b> , University of Windsor, Canada. <i>Approximation Assisted Estimation of Eigen Vectors Under Quadratic Loss</i>
11.00 – 11.30	<b>Alan Lee and Alastair Scott</b> , University of Auckland, New Zealand <i>Semi-parametric Efficiency, Projection and the Scott-Wild Estimator</i>

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\* Paper presented by title: Karuthan Chinna, University of Technology MARA, Malaysia (with Parthasarathy Balachandar, Multimedia University, Cyberjaya, Malaysia). *Modelling Multivariate Meta-Analysis using Bootstrap Resampling Techniques.*

**Session 13: Invited Lectures****Chair: Götz Trenkler**

- 11.30 – 12.00      **Jarkko Isotalo and Simo Puntanen**, University of Tampere, Finland  
*Comparison of the ordinary least squares predictor and the best linear unbiased predictor in the general Gauss-Markov model*
- 12.00 - 12.30      **George P.H. Styan**, McGill University, Montréal, Canada; **Simo Puntanen**, University of Tampere, Finland; **Ka Lok Chu**, Dawson College, Montréal, Canada; **Jarkko Isotalo**, University of Tampere, Finland;  
*Inequalities and equalities associated with the Watson efficiency in orthogonally partitioned full rank linear models*
- 12.30 – 13.00      **Simo Puntanen**, University of Tampere, Finland; **Ka Lok Chu**, Dawson College, Montréal, Canada; **Jarkko Isotalo**, University of Tampere, Finland; **George P.H. Styan**, McGill University, Montréal, Canada  
*Decomposing the Watson efficiency in partitioned linear models*
- 13.05 – 14.30      **Lunch** - Staff Lounge, Study Centre
- 14.00 –              **Concluding Remarks – George Styan**
-