



**Executive Summary
of the
Annual Report 2005**



EURANDOM

The core business of EURANDOM is fundamental research in the stochastic sciences and their applications in an international environment.

EURANDOM
European Institute for Statistics,
Probability, Stochastic Operations Research
and their Applications

Introducing EURANDOM

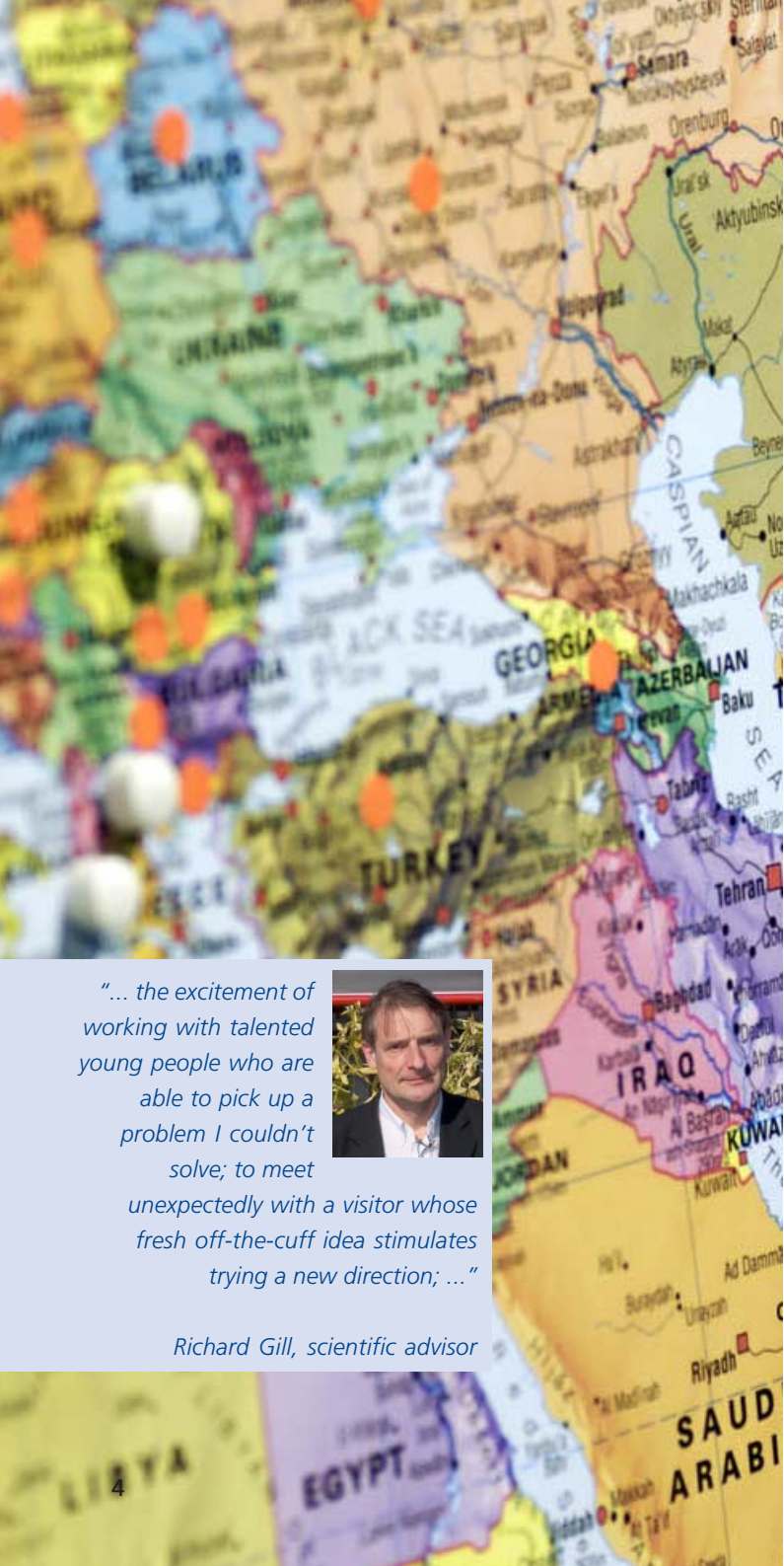
EURANDOM was founded as an international institute on 30 June 1997 by the Netherlands Organisation for Scientific Research (NWO) and Eindhoven University of Technology (TU/e) and has been operational since the summer of 1998. Basic funding comes from NWO and TU/e.

Mission Statement

The mission of EURANDOM is to foster research in the stochastic sciences and their applications. It achieves this mission:

- ▲ by recruiting and training talented young researchers and helping them to find their way to tenured positions in academia and industry;
- ▲ by carrying out and facilitating research through postdoctoral and graduate appointments, visitor exchange and workshops;
- ▲ by taking initiatives for collaborative research at the European level.





"... the excitement of working with talented young people who are able to pick up a problem I couldn't solve; to meet unexpectedly with a visitor whose fresh off-the-cuff idea stimulates trying a new direction; ..."



Richard Gill, scientific advisor

The role of stochastics

Stochastics is a mathematical discipline that plays an important role in our technological society. Stochastics consists of statistics, probability theory and stochastic operations research. We are more and more faced with organisations, systems and processes so complex that a description and analysis in terms of random elements is more appropriate and effective than a fully deterministic approach. Accordingly, stochastics is becoming increasingly important in other disciplines, like physics, chemistry, biology, economics and telecommunication.

Stochastics is internationally flourishing. Consequently, there is a great need to train a new generation of mathematicians with a strong knowledge of the foundations of stochastics, a good insight into the applicability of stochastics in diverse areas, and an open attitude toward newly developing theories and applications.

Research at EURANDOM

Research at EURANDOM covers stochastics and its applications, as well as its interfaces with other disciplines. The core business of EURANDOM is fundamental research in an international environment, carried out by a select and non-tenured staff of junior researchers and senior advisors, supplemented with an extensive programme of seminars, workshops and visitors. In spite of its modest size, EURANDOM is engaged in many activities on a local, national and international scale, making it into an important research facility in Europe.



Workshops and visitors

One of the key instruments of EURANDOM in realising its mission is its workshop and visitor programme. This programme offers young scientists a well developed training opportunity. Workshops gather top researchers in the field. Sometimes concentrated courses are given, sometimes junior researchers get a special role in a workshop. With the visitors they frequently develop a close cooperation.

Research programmes

The scientific activities of EURANDOM are organised in three research programmes, which all are central in the area of stochastics. Each programme has 3-4 themes.

Queueing and Performance Analysis (QPA)

- ▲ Performance Analysis of Production Systems
- ▲ Performance Analysis of Communication Systems
- ▲ Queueing Theory
- ▲ Multivariate Risk Modelling

Random Spatial Structures (RSS)

- ▲ Critical Phenomena
- ▲ Disordered Systems
- ▲ Combinatorial Probability

Statistical Information and Modelling (SIM)

- ▲ Statistical Signal and Image Analysis
- ▲ Statistics in Biology
- ▲ Statistics in Industry

Research at EURANDOM is thematic and interdisciplinary.

QPA is concerned with the performance analysis

"...there is no coincidence and chance in probability theory..."

*Onno Boxma,
scientific director*



of stochastic systems. It focuses on queueing theory and its main application

areas. In addition the methodological overlap in queueing and risk theory is exploited to study multivariate problems in those two fields.

RSS focuses on systems consisting of a large number of interacting random components, possibly with disorder. It aims to capture their large space-time behaviour through a combination of probabilistic, combinatorial and ergodic techniques, with special emphasis on critical phenomena and universality.

SIM combines analytic and algebraic methods to address a variety of statistical questions, including statistical classification, bootstrap, micro-arrays, gene expression, design of experiments, predictive maintenance.

In addition to these programmes other projects may be running. Over 2005 there were two projects:

- ▲ Battery Modelling and Management. This 5-year project was successfully concluded in Autumn 2005, but will be continued in a new recently approved project, Integrated Batteries (I-BAT).
- ▲ Reinsurance. This project was stopped as a separate project in 2005. However, a central part of this research will be continued as a theme within the QPA group, Multivariate Risk Modelling.

Scientific staff

Each programme hosts around eight postdocs and graduate students, is supervised by senior scientific advisors, and is guided by an international steering committee.

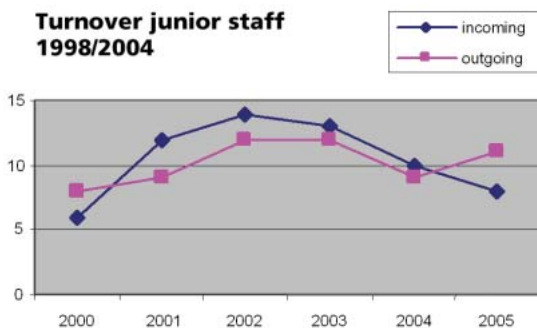
Since its start, some 70 PD's and PhD's have been working at EURANDOM (excluding the current researchers). About 25 junior researchers are working at EURANDOM at any time. Most of the researchers (80%) find tenured positions in academia or industry after they left the institute.

Staff

	Jr. staff	dir.	ddm.staff	Adv
People in fte*	22,6	1,8	3,75	2

**full-time equivalents as a total result over 2005*

**Turnover junior staff
1998/2004**



In and out over 2005 are slightly out of balance, due to the ending of two projects.

About one third of the former employees found a position at a Dutch university or in a research group of a Dutch industry. 70% - 80% have secured tenured positions in academia or industry.



Board, Scientific Council and directors

Board

- ▲ Dr. ir. J.M.M. Ritzen (chairman), since January 2004
- ▲ Prof.dr. J.K. Lenstra (secretary / treasurer), since January 2005
- ▲ Prof.dr. R.A. van Santen, until March 2005
- ▲ Prof.dr.ir. C.J. van Duijn, since April 2005.

Scientific Council

- ▲ Prof.dr. S. Asmussen, Department of Mathematical Sciences, University of Aarhus, Denmark
- ▲ Prof.dr. F. Baccelli, École Normale Supérieure, Paris, France
- ▲ Prof.dr. E. Bolthausen, University of Zürich, Switzerland
- ▲ Prof.dr. S. Borst, Centrum voor Wiskunde en Informatica, Amsterdam, The Netherlands
- ▲ Prof.dr. D. Dawson (chairman), Carleton University, Ottawa and McGill University, Montreal, Canada
- ▲ Prof.dr. F. Delbaen, Swiss Federal Institute of Technology, Zürich, Switzerland
- ▲ Prof.dr. A. Frigessi, University of Oslo, Norway
- ▲ Prof.dr. P. Green, University of Bristol, UK
- ▲ Prof.dr. A. Greven, Mathematisches Institut, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- ▲ Prof.dr. P. Hall, Centre for Mathematics and its Applications, Australian National University, Canberra, Australia
- ▲ Prof.dr. P. Massart, Université Paris Sud XI, Orsay, France
- ▲ Prof.dr. N. Veraverbeke, Universiteit Hasselt, Diepenbeek, Belgium.

Mrs. Prof.dr. C. Klüppelberg, Technical University München, Germany, stepped down in 2005. Her successor is prof.dr. V. Schmidt, University of Ulm, Germany.

Directors

W.Th.F. den Hollander, scientific director,
until October 2005.

H.P. Wynn, scientific co-director,
until October 2005.

O.J. Boxma, scientific director
since October 2005.

W.J.M. Senden, managing director.



Facts and Figures

Workshops and Conferences

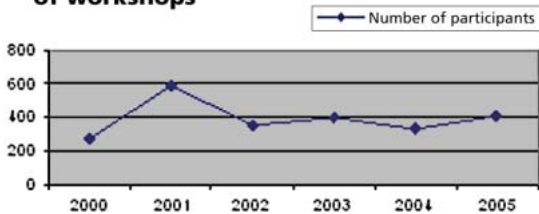
Workshop topics are chosen by the scientific advisors and by the steering committees of the research programmes. Ideas for topics are collected from postdocs and senior visitors, and through the various European networks and programmes in which EURANDOM participates.



**Workshops and conferences held at
EURANDOM in 2005:**

January 3-7	RSS
"Dynamical Systems, Probability Theory and Statistical Mechanics"	
February 2-5	QPA
"Rare events in communication networks", an EURO-NGI workshop	
March 14-18	RSS
Workshop on self-similar random structures Hausdorff dimension and branching	
May 9-10-11	RI
Workshop "Risk Measures & Risk Management - General Aspects"	
June 24	SIM
Regional Meeting on "Design of Experiments (DOE) and Statistical Process Control (SPC)"	
September 20-23	RSS
Workshop "Interacting Stochastic Systems" Directly followed (on September 23) by Stochastics Afternoon	
	General
October 3-4-5	SIM
Workshop "Modelling in classification and statistical learning" (2 nd PASCAL workshop)	
October 13-14	RSS
BRG-meeting	
December 12 & 13	RI
Workshop "The Economics & Finance of Extremes"	
December 16	RSS
Workshop "Physics in Ecology"	

Number of participants of workshops



Number of workshops at EURANDOM in 2005: 10
Total number of participants: 408

EURANDOM sponsored 1 workshop (of EIDMA):
March 14-18 SIM
Symmetry studies
A Minicourse by Marlos A. G. Viana.

Lectures and seminars

Lectures and seminars are organised on a regular basis within the framework of each of the research programmes.

Sometimes seminars are joint events, e.g. the QPA-SOR seminar with TU/e, the national



"...this postdoc seminar presented an outstanding combination of mathematical approach, biological intuition and high-tech innovative equipment as it was demonstrated"

Dmitri Danilov, junior researcher

Mark Kac seminar and the national Quantum seminar.

Number of lectures and seminars in 2005: 76

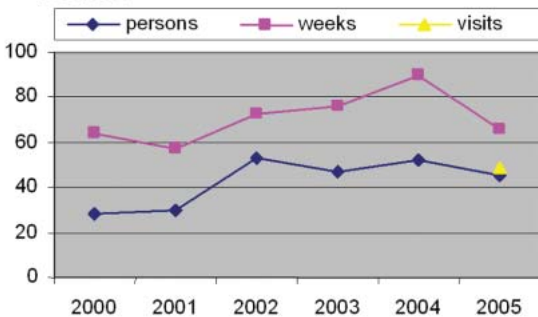
Visitors

In total 45 researchers visited EURANDOM in 2005 (from several days up to 2 months).

The QPA as well as the SIM programme had 1 long term visitor, each for 2 months; this visit is included in the mentioned numbers.

Number of visitors in 2005:	45
Total number of visits in 2005:	49
Total duration of stay:	66 weeks

Visitors



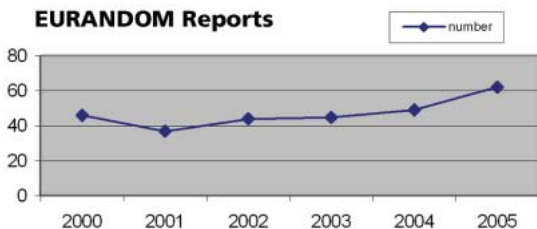
EURANDOM Professor

This year the EURANDOM chair was occupied by two senior scientists. Professor F. Baccelli (INRIA, Rocquencourt and ENS, Paris) has been appointed EURANDOM Professor for 6 months starting October 2004. His public lecture on November 23, 2004 was on "Mean-Field Interaction Models for Large TCP Networks", followed by the mini-course "Signal to Interference Cells of a Spatial Point Process".

In 2005 professor S. Resnick, School of Operations Research and Industrial Engineering, Cornell University, was appointed EURANDOM professor. On May 17, 2005 he gave a Public lecture, "Multivariate heavy tails, asymptotic independence and beyond", followed by his mini-course on "Heavy tailed analysis".

Publications

EURANDOM Reports

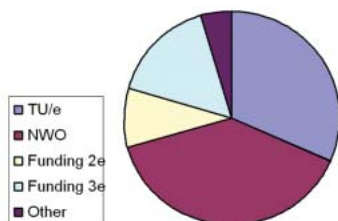


In 2005, 62 EURANDOM Reports were written, while 141 publications appeared in international refereed journals

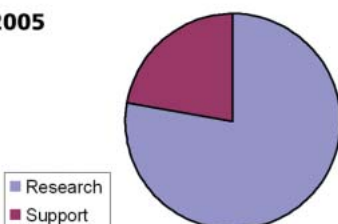
Finance

The following figures report on income and expenditure:

Income 2005



Expenditure 2005



Research includes costs of salary of postdocs and graduate students, scientific director, scientific advisors, EURANDOM chair, computing, library, workshops & visitors and travel costs.

Support includes salary of the administrative staff and managing director, housing, depreciation and general costs.

Location

EURANDOM is located on the campus (Laplace building) of Eindhoven University of Technology (TU/e), the Netherlands. The campus is situated close to the centre and the railway station of Eindhoven.

Facilities

EURANDOM provides office space and computing facilities. Lecture rooms and a modest library annex common room are also available. Full scale libraries may be found on the campus of the Technische Universiteit Eindhoven (TU/e).

The TU/e campus facilities such as a sports centre, a language lab and restaurants are also available for EURANDOM staff. Post-docs and long-term guests can be accommodated in the University guest house, the Fellowtel, close to the campus. All employees can join the TU/e collective health insurance and can get help with procedures concerning visa, etc.



Prof.dr.ir. O.J. Boxma,
Scientific Director
Eindhoven, April 2006



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The full text of the Annual Report 2005
is available under the button 'annual reports'.

