

# Advances in Applied Probability

---

The Editorial Board would like to encourage the submission to the *Advances* of review papers summarising and coordinating recent results in any of the fields of applied probability.

In addition to these review papers, *Advances* is also designed to be a medium of publication for (1) longer research papers in applied probability, which may include expository material, (2) expository papers on branches of mathematics of interest to probabilists, (3) papers outlining areas in the biological, physical, social and technological sciences in which probability models can be usefully developed, (4) papers in applied probability presented at conferences which do not publish their proceedings, and finally, (5) letters to the editor on any appropriate topic in applied probability.

As from March 1994, *Advances* will include a new section devoted to stochastic geometry and statistical applications (see the announcement and call for papers in the March issue).

In short, the main function of *Advances* is to define areas of recent progress and potential development in applied probability. As with the *Journal of Applied Probability*, *Advances* undertakes to publish papers accepted by the Editors within 15 months of their submission; letters to the editor will normally be published more rapidly.

Volume 25 No. 3 of *Advances* contains the following papers:

- SEAN P. MEYN AND R. L. TWEEDIE. Stability of Markovian processes II: continuous-time processes and sampled chains  
SEAN P. MEYN AND R. L. TWEEDIE. Stability of Markovian processes III: Foster–Lyapunov criteria for continuous-time processes  
YADONG WU. A multilevel birth–death particle system and its continuous diffusion  
C. DONATI-MARTIN AND M. YOR. On some examples of quadratic functionals of Brownian motion  
C. TERESA LAM. Superposition of Markov renewal processes and applications  
D. J. DALEY AND L. D. SERVI. A two-point Markov chain boundary-value problem  
SABYASACHI BASU AND GREGORY C. REINSEL. Properties of the spatial unilateral first-order ARMA model  
LAWRENCE MARKUS AND ANANDA WEERASINGHE. Stochastic non-linear oscillators  
ADAM SHWARTZ AND ALAN WEISS. Induced rare events: analysis via large deviations and time reversal  
HUEI-MEI LIANG AND V. G. KULKARNI. Stability condition for a single-server retrial queue  
P. LEGUESDRON, J. PELLAUMAIL, G. RUBINO AND B. SERICOLA. Transient analysis of the  $M/M/1$  queue

Subscription rates (per volume) for the *Advances* in 1993 are the same as for the *Journal* (see inside back cover). A discount of 10% is allowed to subscribers who order current issues of both the *Journal* and *Advances* at the same time direct from the Applied Probability Office. A detailed price list for both current and back issues is available on request.

Cheques made out on US, UK and Australian banks will be acceptable: they should be made payable to *Applied Probability*, and sent to:

Executive Editor, Applied Probability,  
Department of Probability and Statistics,  
The University, Sheffield S3 7RH, UK

## **ROLLO DAVIDSON TRUST**

The Trustees of the Rollo Davidson Trust give notice that they have awarded a Rollo Davidson Prize for 1993 to Gérard Ben Arous (Paris) for his work on large deviations, stochastic Taylor formulae, and interacting particle systems, and to Robin Pemantle (Wisconsin) for his work on probability on trees, reinforced random walk and the contact process.

# Queueing Systems

## Theory and Applications

Editor-in-Chief: **N.U. Prabhu**, Cornell University, 221 E & TC Building, Ithaca, NY 14853, U.S.A.,  
e-mail: [questa@orle.cornell.edu](mailto:questa@orle.cornell.edu), Fax: +1-607-255-9129

---

Recently Published: Volume 13, No. 1-3, May 1993, QUEUEING NETWORKS

**V. Anantharam, R. L. Disney and J. Walrand**, Editorial introduction  
**J. M. Harrison and V. Nguyen**, Brownian models of multiclass networks  
**J. G. Dai and Y. Wang**, Nonexistence of Brownian models for certain multiclass queueing networks  
**F. P. Kelly and C. N. Laws**, Dynamic routing in open queueing networks  
**P. R. Kumar**, Re-entrant lines  
**V. Marbukh**, Large scale circuit switched communication network  
**R. F. Serfozo**, Queueing networks with dependent nodes and concurrent movements  
**W. A. Massey and W. Whitt**, Networks of infinite server queues with nonstationary Poisson input  
**R. J. Boucherie and N. M. van Dijk**, A generalization of Norton's theorem for queueing networks  
**S. Stidham Jr. and R. Weber**, A survey of Markov decision models for control of networks of queues

To be published in June; Volume 13, No. 4

**G-H. Hsu and U. Jensen**, The matched queueing network PH/M/C - oPH/PH/1  
**H. Chen and W. Whitt**, Diffusion approximations for open queueing networks  
**X-G. Liu and J. A. Buzacott**, Tandem queueing networks with blocking  
**S. Chakravarthy**, Analysis of a finite MAP/G/1 queue with group services  
**J. A. C. Resing**, Polling systems and multitype branching processes  
**I. F. Akyildiz and C. C. Huang**, Queueing networks with multiple job classes  
**B. K. Kumar, P. R. Parthasarathy and M. Sharafali**, Transient solution of an M/M/1 queue with balking  
**Y. Takahashi and O. Hashida**, Correction to our paper

To be published in July; Volume 14, No. 1

**Y. Kogan and R. Sh. Liptser**, Limit non-stationary behaviour of large closed queueing networks with bottlenecks  
**M. C. Fu and J-Q. Hu**, Smoothed perturbation analysis for queues with finite buffers  
**H. Takagi**, M/G/1/K queues with N-policy and setup times  
**X. Tan, Y. Yang and C. Knessl**, The conditional sojourn time distribution  
**J. Keilson and L. D. Servi**, The M/G/1/K blocking formula and its generalizations  
**Y. Zhu and H. Li**, The MacLaurin expansion for a G/G/1 queue with Markov-modulated arrivals and services  
**R. Sh. Liptser**, Large deviations for a simple closed queueing model

---

## Please request a free sample copy!

---

**Subscription volumes 13-15, 1993**, Institutional price: Sfr. 1099.50/\$ 815.00 together incl. postage  
**Personal subscription**: A personal subscription to Queueing Systems, volumes 13-15, 1993 is available at Sfr. 176.50/ \$ 126.00 per volume including postage. The personal subscription is meant for private use only and may not be made available to institutes and libraries. It must be prepaid privately and ordered directly from J.C. Baltzer AG, Science Publishers, Wettsteinplatz 10, CH-4058 Basel, Switzerland.

**How to subscribe**: In the **United States** please send your order to J.C. Baltzer AG, Science Publishers, P.O. Box 8577, Red Bank, NJ 07701-8577. **From all other countries** please send your order to the address below.



**J.C. Baltzer AG, Science Publishers,**

Wettsteinplatz 10, 4058 Basel, Switzerland,

E-mail: [publish@baltzer.nl](mailto:publish@baltzer.nl), Fax: +41 61 6924262

## SUBSCRIPTION RATES

Subscription rates (post free) for the 1993 volume of the *Journal* are as follows:

US\$168.00; \$A222.00; £96.00 for libraries and institutions;

US\$56.00; \$A74.00; £32.00 for individuals belonging to a recognised scientific society.

Members of the London Mathematical Society should apply direct to the Secretary of the Society for copies of the *Journal*.

All enquiries about the *Journal*, as well as other subscriptions, should be sent to the Executive Editor, Applied Probability, Department of Probability and Statistics, The University, Sheffield S3 7RH, UK. The price of back numbers varies from volume to volume, and enquiries should be sent to the Executive Editor. Cheques, money orders, etc. should be made out to *Applied Probability*; cheques on US, UK and Australian banks will be acceptable.

## NOTES FOR CONTRIBUTORS

Papers published in the *Journal* are of two kinds:

(1) *research papers* not exceeding 20 printed pages;

(2) *short communications* of a few printed pages in the nature of notes or brief accounts of work in progress.

*Review papers*, *longer research papers* and *letters to the editor* are published in *Advances in Applied Probability*, a companion journal. (Note: Letters relating specifically to papers which have appeared in the *Journal of Applied Probability* will continue to appear in the *Journal*.)

The editors may publish accepted papers in either journal, according to the space available, in order to meet the 15-month deadline in publication referred to below.

### Submission of papers

Papers submitted to the *Journal of Applied Probability* are considered on the understanding that they have not been published previously and are not under consideration by another publication. Papers will not be reprinted without the written permission of the Trust. It is the policy of the *Journal* not to accept for publication papers which cannot appear in print within 15 months of the date of receipt of the final version. Authors will receive 50 reprints of their papers free, and joint authors a proportional share of this number. Additional reprints will be provided at cost.

Papers should be written in English or French; papers in other languages may be accepted by the editors, but will appear (subject to the author's agreement) in English or French translation in the *Journal*. Scripts should be typewritten, using double spacing, and at least one copy should be on one side of the paper only. Each paper should be accompanied by

(i) a short abstract of approximately 4–10 lines giving a non-mathematical description of the subject matter and results;

(ii) a list of keywords detailing the contents for the purpose of computerised information retrieval;

(iii) primary and secondary classifications using the 1991 Mathematics Subject Classification, to be found in the 1990 Annual Index of *Mathematical Reviews*.

Authors are advised to consult *The Author's Guide to the Applied Probability Journals* when preparing papers for submission. A copy of this guide may be obtained on application to the Applied Probability Office.

**For efficiency in processing, authors are requested to send three copies of all submissions to the Applied Probability Office in Sheffield**, rather than to individual editors. Authors overseas are asked to ensure that their submissions are sent by airmail. The Editor-in-Chief and the Applied Probability Office are in regular contact and full details of all papers submitted are available to Professor Heyde at The Australian National University in Canberra.

### Copyright

The copyright of all published papers shall be vested in the Trust. When a paper is accepted for publication, the Trust requests the author(s) to sign a form assigning copyright to the Trust. Failure to do this promptly may delay or prevent publication.

Authorisation to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the Applied Probability Trust for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$00.50 per copy, plus .10 per page is paid directly to CCC, 27 Congress St., Salem, MA 01970, USA. 0021-9002/93 \$00.50+ .10.

Volume 30 Number 3

*Research Papers*

- 497 ALBERT W. MARSHALL AND INGRAM OLKIN. Bivariate life distributions from Pólya's urn model for contagion
- 509 MASAOKI KIJIMA. Quasi-limiting distributions of Markov chains that are skip-free to the left in continuous time
- 518 FRANK BALL AND GEOFFREY F. YEO. Lumpability and marginalisability for continuous-time Markov chains
- 529 FRANK BALL, ROBIN K. MILNE AND GEOFFREY F. YEO. On the exact distribution of observed open times in single ion channel models
- 538 C. CHRIS WU. Critical behaviour of percolation and Markov fields on branching planes
- 548 YASUSHI MASUDA. Partially observable semi-Markov reward processes
- 561 WILFRID S. KENDALL. On the empty cells of Poisson histograms
- 575 ROBERT J. ELLIOTT. A general recursive discrete-time filter
- 589 SID BROWNE AND J. MICHAEL STEELE. Transient behavior of coverage processes with applications to the infinite-server queue
- 602 R. A. MALLER AND S. ZHOU. The probability that the largest observation is censored
- 616 F. THOMAS BRUSS AND THOMAS S. FERGUSON. Minimizing the expected rank with full information
- 627 M. T. DIXON. Equilibrium points for three games based on the Poisson process
- 639 RICHARD M. FELDMAN, BRYAN L. DEUERMEYER AND CIRIACO VALDEZ-FLORES. Utilization of the method of linear matrix equations to solve a quasi-birth-death problem
- 650 GUY LATOUCHE AND V. RAMASWAMI. A logarithmic reduction algorithm for quasi-birth-death processes
- 675 HENRY W. BLOCK, TIMOTHY M. COSTIGAN AND ALLAN R. SAMPSON. Optimal second-order product probability bounds
- 692 HENRY W. BLOCK, JIE MI AND THOMAS H. SAVITS. Burn-in and mixed populations
- 703 ESTHER FROSTIG. Optimal policies for machine repairmen problems
- 716 XIULI CHAO. On Klimov's model with two job classes and exponential processing times

*Short Communications*

- 725 NEIL O'CONNELL. Yule process approximation for the skeleton of a branching process
- 730 W. NAGEL. Orientation-dependent chord length distributions characterize convex polygons
- 737 WALTER BÖHM, J. L. JAIN AND S. G. MOHANTY. On zero-avoiding transition probabilities of an  $r$ -node tandem queue: a combinatorial approach
- 742 EROL GELENBE. G-networks with triggered customer movement
- 749 Corrections