

## INDEX

ALBRECHT, A., AVRACHENKOV, K., HOWLETT, P. and VERMA, G.;	
Evolutionary dynamics in discrete time for the perturbed positive	
definite replicator equation	148
AVRACHENKOV, K.; see Albrecht, A.	148
BRAZIL, M.; see Sirinanda, K. G.	334
BRINDLEY, J.; see Watt, S. D.	423
CALMON, P.-F.; see Fradkin, L. J.	406
CHATILLON, S.; see Fradkin, L. J.	406
CHISHOLM, G.; see Weir, G.	386
CHIU, M. C.; Mean–variance equilibrium asset-liability management	
strategy with cointegrated assets	209
DARMON, M.; see Fradkin, L. J.	406
DJAKOU, A. K.; see Fradkin, L. J.	406
EJOV, V. V.; see Ivanitskiy, A. Y.	302
FRADKIN, L. J., DJAKOU, A. K., PRIOR, C., DARMON, M., CHATILLON,	
S. and CALMON, P.-F.; The alternative Kirchhoff approximation in	
elastodynamics with applications in ultrasonic nondestructive testing	406
GOSWAMI, V.; see Panda, G.	89
GROSSMAN, P. A.; see Sirinanda, K. G.	334
HARPER, J. F.; Asymptotics of a Gauss hypergeometric function with two	
large parameters: A new case	446
HOWELL, P. D., OCKENDON, H. and OCKENDON, J. R.; Draping woven	
sheets	355
HOWLETT, P.; see Albrecht, A.	148
HOWLETT, P. and TOROKHTI, A.; An optimal linear filter for estimation	
of random functions in Hilbert space	274
HUANG, Z.; see Watt, S. D.	423
IVANITSKIY, A. Y., EJOV, V. V. and VASILYEV, F. P.; Pointwise residual	
method for solving primal and dual ill-posed linear programming problems	
with approximate data	302
KORBEINIKOV, A., SHCHEPAKINA, E. and SOBOLEV, V.;	
The paradox of enrichment, spatial heterogeneity, community	
effects and the phenomenon of apparent disappearance in the marine	
bacteriophage dynamics	453
LEVENEUR, J.; see Weir, G.	386
LI, H. and YANG, K.; Asymptotic behaviour of the stochastic Maki–Thompson	
model with a forgetting mechanism on open populations	185
LU, F. Q.; see Yan, J. L.	256
MARSLAND, S., MCLACHLAN, R. I. and TUFAIL, M. Y.; Conformal image	
registration based on constrained optimization	235

MCINTOSH, A. C.; see Watt, S. D.	423
MCLACHLAN, R. I.; see Marsland, S.	235
MCLEAN, W.; Implementation of high-order, discontinuous Galerkin time stepping for fractional diffusion problems	121
MOHSIN, M. and ZAIDI, A. A.; On existence and uniqueness of solutions to a pantograph type equation	489
NELSON, M. I. and WEBER, R. O.; Editorial: Special issue celebrating the achievements of Professor G. C. Wake	353
NOLAN, T. H. and WAND, M. P.; Streamlined solutions to multilevel sparse matrix problems	18
OCKENDON, H.; see Howell, P. D.	355
OCKENDON, J. R.; see Howell, P. D.	355
OUYANG, Y., WAN, Z. M. and WAN, Z.; Game model for online and offline retailers under buy-online and pick-up-in-store mode with delivery cost and random demand	62
PANDA, G. and GOSWAMI, V.; Strategic customers in Markovian queues with vacations and synchronized abandonment	89
PRIOR, C.; see Fradkin, L. J.	406
RODRIGO, M. R.; see Zulkarnaen, D.	318
RUBINSTEIN, J. H.; see Sirinanda, K. G.	334
SHCHEPAKINA, E.; see Korobeinikov, A.	453
SIDHU, H. S.; see Watt, S. D.	423
SIMPSON, M. J.; Critical length for the spreading–vanishing dichotomy in higher dimensions	3
SIRINANDA, K. G., BRAZIL, M., GROSSMAN, P. A., RUBINSTEIN, J. H. and THOMAS, D. A.; Optimal location of an underground connector using discounted Steiner tree theory	334
SOBOLEV, V.; see Korobeinikov, A.	453
TAYLOR, S. and YANG, X.; Estimates for approximate solutions to a functional differential equation model of cell division	469
THOMAS, D. A.; see Sirinanda, K. G.	334
TOROKHTI, A.; see Howlett, P.	274
TUFAIL, M. Y.; see Marsland, S.	235
VASILYEV, F. P.; see Ivanitskiy, A. Y.	302
VERMA, G.; see Albrecht, A.	148
WAN, Z.; see OuYang, Y.	62
WAN, Z. M.; see OuYang, Y.	62
WAND, M. P.; see Nolan, T. H.	18
WANG, Q. and ZHANG, Z.; A modified immersed finite volume element method for elliptic interface problems	42
WATT, S. D., HUANG, Z., SIDHU, H. S., MCINTOSH, A. C. and BRINDLEY, J.; One-dimensional chaotic laminar flow with competitive exothermic and endothermic reactions	423
WEBER, R. O.; see Nelson, M. I.	353
WEIR, G., CHISHOLM, G. and LEVENEUR, J.; The magnetic field about a three-dimensional block neodymium magnet	386

YAN, J. L., ZHENG, L. H., ZHU, L. and LU, F. Q.; Linearly implicit energy-preserving Fourier pseudospectral schemes for the complex modified Korteweg–de Vries equation	256
YANG, K.; see Li, H.	185
YANG, X.; see Taylor, S.	469
ZAIDI, A. A.; see Mohsin, M.	489
ZHANG, Z.; see Wang, Q.	42
ZHENG, L. H.; see Yan, J. L.	256
ZHU, L.; see Yan, J. L.	256
ZULKARNAEN, D. and RODRIGO, M. R.; Modelling human carrying capacity as a function of food availability	318

## PREPARATION OF MANUSCRIPTS

The ANZIAM Journal is typeset in L<sup>A</sup>T<sub>E</sub>X. Style files are available from <http://www.austms.org.au/Publ/ANZIAM/authorinfo.shtml>.

The manuscript should conform to the following rules. In case of any doubt, authors are advised to refer to previous papers in the Journal.

**1. Abstract, title and author details.** An abstract not exceeding 300 words should be included in the manuscript. If the title is long, supply also a shortened form of the title not exceeding 40 characters, including spaces. Addresses should be shown under the authors name, including e-mail address if available.

**2. Main headings.** Main headings should be numbered, centred and shown thus:

### 2. Preliminary results

**3. Theorems.** The titles LEMMA, THEOREM, COROLLARY, REMARK, DEFINITION *etc.* should be left-justified and numbered consecutively with arabic numerals, *e.g.*

LEMMA 1.1. The content of the lemma, theorem *etc.* should follow, as here.

**4. Acknowledgements.** If acknowledgements of support and assistance are made, these should be given at the end of the article. Footnotes should be avoided.

**5. Equations.** Equations should be punctuated to conform to their place in the syntax of the sentence. Equation numbers should be shown on the right in round brackets.

**6. References.** The reference list should be in ALPHABETICAL ORDER by name of first author, preceded by a reference number in square brackets. These references should be cited in the text by giving the appropriate number in square brackets. The following layout for books, journal articles, theses, articles in books, and conference proceedings respectively, must be followed.

- [1] M. Abramowitz and I. A. Stegun (eds), *Handbook of mathematical functions* (Dover, New York, 1970).
- [2] S. N. Biswas and T. S. Santhanam, "Coherent states of para-Bose oscillators", *J. Austral. Math. Soc. Ser. B* **22** (1980) 210–217.
- [3] F. H. Busse, "On the mean field problem of thermal convection", *Max-Planck Inst. Phys. Astrophys. Rep. MPI-PAE/Astro* **31** (1970) 1–31.
- [4] E. M. Casling, "Slender planing surfaces", Ph. D. Thesis, University of Adelaide, 1978.
- [5] R. H. Day, "Adaptive process and economic theory", in *Adaptive economic models* (eds R. H. Day and T. Groves), (Academic Press, New York, 1975) 1–38.
- [6] J. W. Miles, "Resonant response of harbors (the harbor paradox revisited)", *Proc. 8th Symp. Naval Hydro.* (1970) 95–115.

**7. Tables.** Each should be preceded by a caption beginning: TABLE 1 (or 2, 3, *etc.*)

**8. Figures.** Each figure should have a caption beginning: FIGURE 1 (or 2, 3, *etc.*)

Authors should provide diagrams drawn to professional standards in the form of encapsulated Postscript files. Other forms of diagrams drawn to professional standard may be acceptable, however this may also necessitate a payment from the author(s) to cover additional cost involved in processing them.

## SUBMISSION OF MANUSCRIPTS

Prior to submission authors are asked to read the section "Preparation of Manuscripts" on the previous page.

Authors of articles submitted for publication in The ANZIAM Journal are asked to ensure that their manuscripts are in a form suitable for sending to the printer. Editors reserve the right to return poorly presented material to authors for revision.

The author should submit a pdf file if possible to the Online Journal System. Follow the instructions at <http://anziamj.austms.org.au/ojs/index.php/ANZIAMJ/user/register>.

It will speed up processing of accepted papers if a  $\text{\LaTeX}$  version of the manuscript is available. It is not necessary to send such a file with the submitted paper. This will be requested if the paper is accepted.

Authors of accepted papers will be provided with a complimentary electronic version of their paper as published.

Excessive costs incurred by the Australian Mathematical Society through corrections to or withdrawal of articles may be charged to the authors concerned.

Submission of a paper to The ANZIAM Journal is a representation by the author that the manuscript has not been copyrighted or published, and that it is not being considered for publication elsewhere.

## THE ANZIAM JOURNAL AND THE ELECTRONIC SUPPLEMENT

The Journal of the Australian Mathematical Society began publication in 1959, and from 1975 appeared in two series, Series A (Pure Mathematics and Statistics) and Series B (Applied Mathematics). Series B is now The ANZIAM Journal and is published in volumes comprising four quarterly parts. There is also a fifth (electronic) part designed for rapid publication (<http://anziamj.austms.org.au/ojs/index.php/ANZIAMJ>). The Editor-in-Chief is A. J. Roberts, School of Mathematical Sciences, The University of Adelaide, ADELAIDE, SA 5005; [anthony.roberts@adelaide.edu.au](mailto:anthony.roberts@adelaide.edu.au). All five parts are refereed. All accepted papers have the option of publication in the electronic part.

It is the editorial policy of The ANZIAM Journal to consider papers in any field of applied mathematics and related mathematical sciences. Novel applications of mathematics in real situations are especially welcome. All papers must include some indication of applicability, and an introduction that can be understood by non-specialist readers from the whole applied mathematical community.



# Cambridge Core

The new home of  
Cambridge Journals  
[cambridge.org/core](http://cambridge.org/core)

Cambridge Core



CAMBRIDGE  
UNIVERSITY PRESS

# Mathematics

Books and Journals from  
Cambridge University Press

Cambridge is a world leading publisher in pure and applied mathematics, with an extensive programme of high quality books and journals that reaches into every corner of the subject.

Our catalogue reflects not only the breadth of mathematics but also its depth, with titles for undergraduate students, for graduate students, for researchers and for users of mathematics.

We are proud to include world class researchers and influential educators amongst our authors, and also to publish in partnership with leading mathematical societies.

For further details visit:  
[cambridge.org/core-mathematics](http://cambridge.org/core-mathematics)

Cambridge  
Core

 **CAMBRIDGE**  
UNIVERSITY PRESS

*cotg u*

THE AUSTRALIAN MATHEMATICAL SOCIETY

<i>President:</i>	J. RAMAGGE	School of Mathematics and Statistics University of Sydney NSW 2006, Australia
<i>Secretary:</i>	D. C. JACKSON	Department of Mathematics and Statistics La Trobe University Bundoora, VIC 3086, Australia
<i>Treasurer:</i>	L. FERRARIO	Mathematical Sciences Institute Australian National University Canberra, ACT 2601, Australia

**Membership and correspondence:** Applications for membership, notices of changes of address or title or position, members' subscriptions and correspondence related to accounts should be sent to the Treasurer. All other correspondence should be sent to the Secretary.

**Subscriptions:** Four parts are planned for 2020. Subscription prices for 2020 are £399 (\$732 in USA, Canada and Mexico) which includes print and electronic access. The electronic-only access price for 2020 is £324 (\$590 in USA, Canada and Mexico). Single parts cost £115 (\$210 in USA, Canada and Mexico). Prices include delivery by air where appropriate. EU subscribers who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Orders, which must be accompanied by payment, should be sent to a subscription agent, book-seller, or direct to the publishers: Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS or, in the USA, Canada and Mexico, Cambridge University Press, Journals Fulfilment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA. Japanese prices are available from Kinokuniya Company Ltd, PO Box 55, Chitose Tokyo 156, Japan. Periodicals postage is paid at New York, NY and additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to *The ANZIAM JOURNAL*, Cambridge University Press, Journals Fulfilment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA.

This journal is included in the Cambridge Journals Online service. Further information, and online access for subscribers, is available at <http://journals.cambridge.org/anz>.

**Copying:** This journal is registered with the Copyright Clearance Centre, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are registered with the CCC may therefore copy materials beyond the limits permitted by sections 107 and 108 of US copyright law subject to payment to CCC of the per-copy fee of \$16.00. This consent does not extend to multiple copying for promotional and commercial purposes. Code 1446-1811/2020 \$16.00.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from Cambridge or the American branch of Cambridge University Press.

Published by Cambridge University Press for the Australian Mathematical Publishing Association Incorporated. Printed in the United Kingdom at Bell & Bain Ltd, Glasgow.

© 2021 Australian Mathematical Publishing Association Inc.



This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see [www.fsc.org](http://www.fsc.org) for information.



# Table of Contents

---

<b>Editorial: Special issue celebrating the achievements of Professor G. C. Wake</b> <i>Nelson, M. I. &amp; Weber, R. O.</i>	353
<b>Draping woven sheets</b> <i>Howell, P. D., Ockendon, H. &amp; Ockendon, J. R.</i>	355
<b>The magnetic field about a three-dimensional block neodymium magnet</b> <i>Weir, G., Chisholm, G. &amp; Leveneur, J.</i>	386
<b>The alternative Kirchhoff approximation in elastodynamics with applications in ultrasonic nondestructive testing</b> <i>Fradkin, L. J., Djakou, A. K., Prior, C., Darmon, M., Chatillon, S. &amp; Calmon, P.-F.</i>	406
<b>One-dimensional chaotic laminar flow with competitive exothermic and endothermic reactions</b> <i>Watt, S. D., Huang, Z., Sidhu, H. S., McIntosh, A. C. &amp; Brindley, J.</i>	423
<b>Asymptotics of a Gauss hypergeometric function with two large parameters: A new case</b> <i>Harper, J. F.</i>	446
<b>The paradox of enrichment, spatial heterogeneity, community effects and the phenomenon of apparent disappearance in the marine bacteriophage dynamics</b> <i>Korobeinikov, A., Shchepakina, E. &amp; Sobolev, V.</i>	453
<b>Estimates for approximate solutions to a functional differential equation model of cell division</b> <i>Taylor, S. &amp; Yang, X.</i>	469
<b>On existence and uniqueness of solutions to a pantograph type equation</b> <i>Mohsin, M. &amp; Zaidi, A. A.</i>	489
<b>Author Index</b>	513