

Aerodynamics Conference



ROYAL  
AERONAUTICAL  
SOCIETY

## THE FUTURE OF AERODYNAMICS

**BRISTOL / 24-26 JULY 2018**

This conference will provide a forum for the presentation and discussion of aspects of the advancement of the aerodynamic disciplines and their application in the military context through current research, nearer term conception and longer term design and operations.

The objective being to bring together aerodynamics professionals for a balanced perspective of fundamental science and technological issues.



**[www.aerosociety.com/events](http://www.aerosociety.com/events)**

### Sponsorship Opportunities

**Sponsorship and Exhibition opportunities are available for this conference.  
For more information please contact [conference@aerosociety.com](mailto:conference@aerosociety.com) or +44 (0)20 7670 4345**



ROYAL  
AERONAUTICAL  
SOCIETY

# Written Paper Prizes

The most prestigious and long-standing awards in global aerospace honouring achievements, innovation and excellence.

The Royal Aeronautical Society Written Paper Prizes are awarded annually for the best papers published in *The Aeronautical Journal* by the Society during the previous calendar year. Awards can be conferred at Gold, Silver or Bronze level. The Written Paper Prizes are presented following the approval of the Council of the Royal Aeronautical Society on the basis of recommendations from the RAeS Medals & Awards Committee, supported by the Editor-in-Chief of *The Aeronautical Journal*. The Society recognises the achievements, innovation and excellence of both individual and multiple authors.

## **Submission of Manuscripts**

All manuscripts should be submitted online at: <http://www.edmgr.com/aeroj>

Any enquiries should be directed to Wayne J Davis at [aerojournal@aerosociety.com](mailto:aerojournal@aerosociety.com).  
The current set of instructions for authors are available at: <http://journals.cambridge.org/AER>

## **Subscriptions**

*The Aeronautical Journal* (ISSN 0001-9240) is published monthly in 12 issues each year.

### **Non-Members**

The subscription price (excluding VAT) to *The Aeronautical Journal* for volume 122 (2018), which includes print and electronic access, is £579 (USA, Canada and Mexico US\$869) and includes delivery by air; single parts are available at £55 (USA, Canada and Mexico US\$83) plus postage. The electronic-only price available to institutional subscribers is £508 (USA, Canada and Mexico US\$762). EU subscribers (outside the UK) 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, may be sent to any bookseller or subscription agent or direct to the publishers: Cambridge University Press, UPH, Shaftesbury Road, Cambridge CB2 8BS, or in the USA, Canada, and Mexico to Cambridge University Press, Journals Fulfillment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA. Japanese Prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo, Japan.

### **RAeS Members**

The subscription price for RAeS members is £94 for Hardcopy and online access and £72 for online access only. Individual copies are £8.20. Orders are available from: Membership Department, Royal Aeronautical Society, No.4 Hamilton Place, London, W1J 7BQ, UK. Tel: +44 (0)20 7670 4304 or email: [subscriptions@aerosociety.com](mailto:subscriptions@aerosociety.com)

### **RAeS Conference Proceedings**

Details, prices and availability of Royal Aeronautical Society Conference Proceedings can be obtained from: RAeS Conference and Events Department, No.4 Hamilton Place, London, W1J 7BQ, UK. Tel: +44 (0)20 7670 4345, email: [conference@aerosociety.com](mailto:conference@aerosociety.com) or via [www.aerosociety.com/events/catch-up-on-events/conference-proceedings](http://www.aerosociety.com/events/catch-up-on-events/conference-proceedings)

### **Advertising**

All advertising enquiries should be sent to Simon Levy, [simon.levy@aerosociety.com](mailto:simon.levy@aerosociety.com)

### **Internet Access**

*The Aeronautical Journal* is included in the Cambridge Journals Online service and can be found at: <http://journals.cambridge.org/AER>.

*The Aeronautical Journal* now supports open access publications across its hardcopy and online platforms, and accepts papers to consider for publication under both the 'green' and 'gold' open access options.

Information contained within *The Aeronautical Journal* has been published in good faith and the opinions expressed do not represent those of the Royal Aeronautical Society.

The Royal Aeronautical Society is a registered charity: No 313708

© 2018 Royal Aeronautical Society

All rights reserved. No part of this publication may be reproduced in any form or by any means, electronic, photocopying or otherwise, without permission in writing from Cambridge University Press. Permission to copy (for users in the USA) is available from the Copyright Clearance Center, <http://www.copyright.com>.

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.

Printed in the UK by Bell & Bain Limited, Glasgow.



# CONTENTS

Volume 122 Number 1253

July 2018

**Professor Holger Babinsky**

Editorial 1021

**Y. Y. Tee and Z. W. Zhong**

Modelling and simulation studies of the runway capacity of Changi Airport 1022

**X. Zhao, X. Huang, T. Zhang and Y. Wang**

Integrated speed/synchrophasing control of turboprop engine 1038

**J. K.-W. Lam and R. D. Woods**

Ice accretion and release in fuel systems 1051

Large-scale rig investigations

**H. Tokutake and M. Kido**

Localisation method for a Mars aircraft using multispectral images 1083

**Q.-J. Zhao, X. Chen, Y.-Yang Ma and G.-Q. Zhao**

Investigations of synthetic jet control effects on helicopter rotor in forward flight based on the CFD method 1102

**K. A. Dulani Daminda Kuruppu and C. J. Hettiarachchi**

Case study on aircraft tyre wear in Y12 aircraft tyres 1123

**S. Z. Guo, X. M. Zheng, H. S. Ang and H. M. Cai**

Cruise missile head shape optimisation using an adaptive sampling surrogate model 1145

Front Cover: Changi Airport Singapore (hey tiffany!/Flickr)

---

**Cambridge Core**

For further information about this journal  
please go to the journal website at:  
[cambridge.org/aer](http://cambridge.org/aer)



MIX  
Paper from  
responsible  
sources  
FSC® C007785

CAMBRIDGE  
UNIVERSITY PRESS