

# JOURNAL OF SOUND AND VIBRATION

An official medium of publication for the Institute of Acoustics

Founder: E.J. Richards

Editors Emeritus: P.E. Doak  
C.L. Morfey  
M. Petyt  
W. Soedel

## Editorial Board

### Editor-in-Chief:

**M.P. Cartmell**  
Department of Mechanical Engineering,  
University of Glasgow, Glasgow G12 8QQ, UK  
E-mail: jsv@isvr.soton.ac.uk

### Receiving Editors:

**A. Metrikine (Also Deputy Editor-in-Chief)**  
Faculty of Civil Engineering and Geosciences,  
Delft University of Technology, Stevinweg 1,  
2628 CN Delft, The Netherlands  
E-mail: jsv@isvr.soton.ac.uk

**L.G. Tham (Also Deputy Editor-in-Chief)**  
University of Hong Kong, Hong Kong  
E-mail: jsv@isvr.soton.ac.uk

### Subject Editors:

**R.J. Astley**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton,  
SO17 1BJ, UK  
E-mail: jsv@isvr.soton.ac.uk

**Y. Aurégan**  
Laboratoire d'Acoustique de l'Université du Maine,  
LE MANS Cedex 9, France  
E-mail: jsv@isvr.soton.ac.uk

**L. Huang**  
Dept. of Mechanical Engineering,  
The University of Hong Kong, Pokfulam Road,  
Hong Kong, China  
E-mail: jsv@isvr.soton.ac.uk

**S. Ilanko**  
Department of Engineering, School of Science &  
Engineering, The University of Waikato, New Zealand  
E-mail: jsv@isvr.soton.ac.uk

**P.F. Joseph**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton, SO17 1BJ, UK  
E-mail: jsv@isvr.soton.ac.uk

**D. Juvé**  
Centre Acoustique, LMFA, UMR CNRS 5509,  
Ecole Centrale de Lyon, 36 Avenue Guy de Collongue,  
69134 Ecully Cedex, France  
E-mail: jsv@isvr.soton.ac.uk

**J. Lam**  
University of Hong Kong, Hong Kong  
E-mail: jsv@isvr.soton.ac.uk

**R.E. Musafir**  
Department of Mechanical Engineering and Department  
of Water Resources and Environmental Engineering,  
Federal University of Rio de Janeiro, Brazil  
E-mail: jsv@isvr.soton.ac.uk

**H. Ouyang**  
Department of Engineering, University of Liverpool,  
Liverpool L69 3GH, UK  
E-mail: jsv@isvr.soton.ac.uk

**K. Shin**  
Andong National University, South Korea  
E-mail: jsv@isvr.soton.ac.uk

**D.J. Thompson**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton SO17 1BJ, UK  
E-mail: jsv@isvr.soton.ac.uk

**I. Trendafilova**  
Department of Mechanical Engineering,  
Strathclyde University, Glasgow G1 1XJ  
E-mail: jsv@isvr.soton.ac.uk

**L. Virgin**  
Department of Civil and Environmental Engineering,  
Duke University, Durham, NC, USA  
E-mail: jsv@isvr.soton.ac.uk

**D. Wagg**  
Department of Mechanical Engineering, Queens Building,  
University of Bristol, Bristol BS8 1TR, UK  
E-mail: jsv@isvr.soton.ac.uk

### Assistant Editors:

**I. Kovacic**  
Department of Mechanics, Faculty of Technical Sciences,  
University of Novi Sad, Serbia

**J. Muggleton**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton, SO17 1BJ, UK

**C. Powles**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton, SO17 1BJ, UK

**E. Rustighi**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton, SO17 1BJ, UK

### Book Reviews Editor:

**M.C.M. Wright**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton SO17 1BJ, UK  
E-mail: jsv@isvr.soton.ac.uk

### Editorial Advisory Board:

**S. Adhikari**  
School of Engineering,  
University of Wales Swansea,  
Swansea SA2 8PP, UK

**M. Amabili**  
Department of Mechanical Engineering,  
McGill University, 817 Serbrooke Street West,  
Montreal, Quebec, Canada, H3A 2K6

**E.T.K. Au**  
Department of Civil Engineering,  
The University of Hong Kong, Hong Kong

**H. Bodén**  
MWL, AVE, KTH, SE-10044, Stockholm, Sweden

**J. Brownjohn**  
Department of Civil and Structural Engineering,  
University of Sheffield, Mappin Street, Sheffield  
S1 3JD, UK

**C.J. Chapman**  
Department of Mathematics, University of Keele,  
Keele, Staffordshire ST5 5BG, UK

**A. Cummings**  
Trenwith, Ludlow Road, Little Stretton,  
Church Stretton, Salop, SY6 6RB, UK

**P. Cupial**  
Institute of Mechanics and Machine Design,  
Cracow University of Technology, A Jana Pawla II 37,  
Krakow PL-31-854, Poland

**E. Dokumaci**  
Dokuz Eylul University, Bornova 35100, Izmir, Turkey

**J.F. Dunne**  
University of Sussex, Falmer, Brighton,  
E Sussex, BN1 9QT, UK

**I. Elishakoff**  
Florida Atlantic University,  
Boca Raton, FL 33431-0991, USA

**S.J. Elliott**  
Institute of Sound and Vibration Research,  
University of Southampton, Southampton SO17 1BJ, UK

**F. Farassat**  
NASA Langley Research Center, M/S 460,  
Hampton, VA 23681-2199, USA

**J.M. Fields**  
10407 Royal Road, Silver Spring, MD 20903, USA

**G.M.L. Gladwell**  
Department of Civil Engineering, University of Waterloo,  
Ontario, Canada, N2L 3G1

**S.A.L. Glegg**  
Florida Atlantic University,  
Boca Raton, FL 33431-0991, USA

**D.J. Gorman**  
770 King Edward Ave., University of Ottawa,  
P.O. Box 450, Stn. A., Ottawa K1N 6N5, Canada

**M. Griffin**  
Human Factors Research Unit, Inst. of Sound and  
Vibration Research, University of Southampton,  
Highfield, Southampton SO17 1BJ, UK

**J.-L. Guyader**  
INSA-Lyon, F-69621 Villeurbanne Cedex, France

**P. Hagedorn**  
Department of Applied Mechanics,  
Darmstadt University of Technology,  
Darmstadt D-64289, Germany

**M. Harrison**  
The Royal Academy of Engineering,  
London SW1P 3LW, UK

**M. Heckl**  
Department of Mathematics, Keele University,  
Keele, Staffordshire ST5 5BG, UK

**J. Horner**  
Department of Aeronautical & Automotive Engineering,  
Loughborough University, Loughborough LE11 3TD, UK

**H.Y. Hu**  
Institute of Vibration Engineering Research,  
Nanjing University of Aeronautics and Astronautics,  
29 Yudao Street, Jiangsu 210016, China

**A. Kahrman**  
Department of Mechanical Engineering,  
Ohio State University, 201 West 19th Ave,  
Columbus, OH, 43210, USA

**D. Kennedy**  
Cardiff School of Engineering (ENGINE),  
University of Wales Cardiff, PO Box 925  
The Parade, Cardiff CF24 0YF, UK

**Y-H. Kim**  
Department of Mechanical Engineering,  
KAIST, Taejeon 305-701, Korea

**V.V. Krylov**  
Department of Aeronautical and Automotive Engineering,  
Loughborough University, Loughborough LE11 3TU, UK

**R.S. Langley**  
Department of Engineering, University of Cambridge,  
Trumpington St., Cambridge CB2 1PZ, UK

**A. Lees**  
Department of Mechanical Engineering,  
University of Wales Swansea, Singleton Park,  
Swansea SA2 8PP, UK

**A.W. Leissa**  
Department of Mechanical Engineering,  
Colorado State University, Fort Collins,  
CO 80523-1374, USA

**R. Lewandowski**  
Institute of Structural Engineering,  
Poznan University of Technology,  
Piotrowo Street 5, Poznan 60-965, Poland

**S. Liguore**  
Boeing Company, St. Louis, MO 63166-0516, USA

**K. Nagai**  
Department of Mechanical System Engineering,  
Gunma University, Kiryu, Gunma 376-8515, Japan

**N. Noiray**  
Turbomachines Group, Alstom (schweiz)  
AG - Power Systems, Baden Switzerland

**M. Paidoussis**  
Department of Mechanical Engineering,  
McGill University, Montreal H3A 2K6, Canada

**K.S. Peat**  
Department of Mathematical Sciences, Loughborough  
University, Loughborough LE11 3TU, UK

**B.A.T. Petersson**  
Institute of Fluid Dynamics and Technical Acoustics,  
Technical University of Berlin, D-10587 Berlin, Germany

**S.W. Rienstra**  
Department of Mathematics and Computer Science,  
Eindhoven University of Technology, The Netherlands

**A.A. Shabana**  
Department of Mechanical Engineering,  
University of Illinois at Chicago, 842 W. Taylor Street,  
Chicago, IL 60607-7022, USA

**R. Singh**  
Dept. of Mechanical Engineering, The Ohio State University,  
201 West 19th Ave, Columbus, OH 43210 USA

**S. Sorokin**  
Department of Mechanical Engineering,  
Aalborg University, Pontoppidanstraede  
101, Aalborg DK-9220, Denmark

**J.Q. Sun**  
School of Engineering, University of California Merced,  
CA 95344, USA

**Q. Wang**  
Department of Mechanical and Manufacturing  
Engineering, University of Manitoba, Winnipeg, Canada

**J. Woodhouse**  
Department of Engineering, University of Cambridge,  
Trumpington St., Cambridge CB2 1PZ, UK

**Y.B. Yang**  
Department of Civil Engineering,  
National Taiwan University,  
No 1 Sec 4 Roosevelt Road,  
Taipei 10617, Taiwan