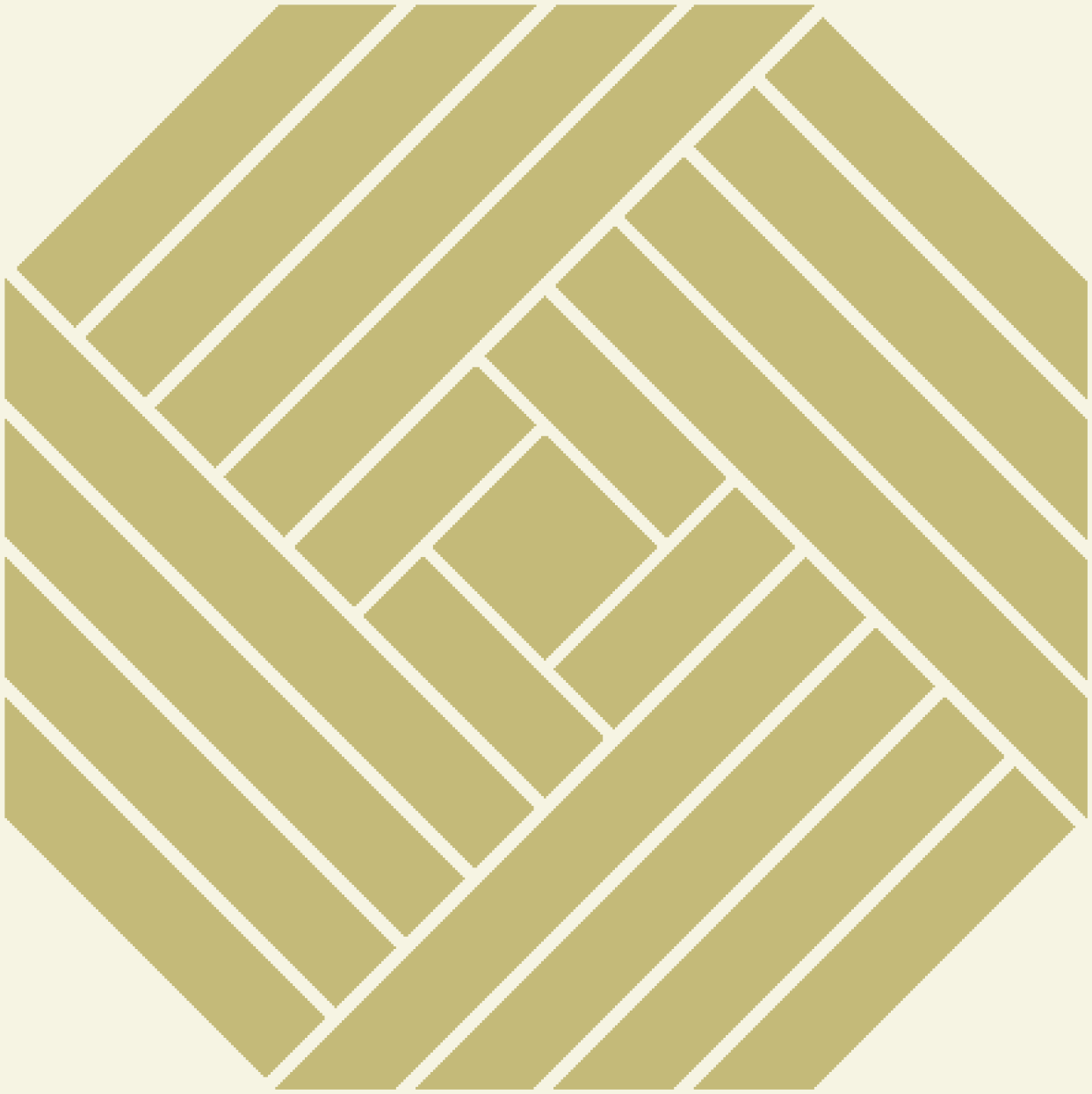
VOLUME 147 NUMBER 1 JANUARY 2011

ISSN 0010-437X

COMPOSITIO MATHEMATICA



FOUNDATION COMPOSITIO MATHEMATICA

London Mathematical Society

https://doi.org/10.1112/S0010437X10000138 Published online by Cambridge University Press

COMPOSITIO MATHEMATICA

www.compositio.nl

Managing Editors:

S. J. Edixhoven
Mathematical Institute
University of Leiden
P. O. Box 9512
NL–2300 RA Leiden
The Netherlands

B. J. J. Moonen
Korteweg–de Vries Institute
University of Amsterdam
P. O. Box 94248
NL-1090 GE Amsterdam
The Netherlands

B. J. Totaro
DPMMS
University of Cambridge
Wilberforce Road
Cambridge CB3 0WB
United Kingdom

Editorial Board:

A. A. Beilinson, *University of Chicago, IL, USA;* **P. Biran,** *ETH Zürich, Switzerland;* **C. Breuil,** *Université Paris-Sud, Orsay, France;* **D. Calegari,** *California Institute of Technology, CA, USA;* **J.-H. Evertse,** *University of Leiden, The Netherlands;* **G. Faltings,** *Max-Planck-Institut für Mathematik, Bonn, Germany;* **D. Gaitsgory,** *Harvard University, Cambridge, MA, USA;* **J.-M. Hwang,** *Korea Institute for Advanced Study, Korea;* **B. Keller,** *Université Paris Diderot, France;* **B. Kleiner,** *Courant Institute of Mathematical Sciences, NY, USA;* **M. Kontsevich,** *Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France;* **J. A. Lurie,** *Harvard University, Cambridge, MA, USA;* **M. Mustaţă,** *University of Michigan, Ann Arbor, MI, USA;* **B. C. Ngô**, *University of Chicago, IL, USA;* **E. M. Opdam,** *University of Amsterdam, The Netherlands;* **P. Sarnak,** *Princeton University, NJ, USA;* **B. Siebert,** *Universität Hamburg, Germany;* **Z. Szabó,** *Princeton University, NJ, USA;* **A. Valette,** *Université de Neuchâtel, Switzerland;* **C. Voisin,** *Université Pierre et Marie Curie, Paris, France;* **B. Wilking,** *Universität Münster, Germany;* **T. D. Wooley,** *University of Bristol, UK.*

Aims and Scope. The aim of *Compositio Mathematica* is to publish first-class mathematical research papers. By tradition the journal focuses on papers in the mainstream of pure mathematics. This includes the fields of algebra, number theory, topology, algebraic and analytic geometry and (geometric) analysis. Papers on other topics are welcome if they are of interest not only to specialists. All contributions are required to meet high standards of quality and originality and are carefully screened by experts in the field.

Compositio Mathematica (ISSN 0010-437X) is published bi-monthly in January, March, May, July, September and November as one annual volume of six parts by the London Mathematical Society and distributed by Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK / Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013–2473, USA. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: send address changes in the USA and Canada to *Compositio Mathematica*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994–2133.

Subscriptions. The annual subscription rate for 2011 is €1297/£898 (USA, Canada and Mexico US$1655). These prices include delivery by air and access to an online version. Single issues cost €216/£150 (USA, Canada and Mexico US$276) plus postage.

Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent, or direct to Cambridge University Press at the UK address above, or in the USA, Canada or Mexico to Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, NY 10994–2133, USA. 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. Japanese prices for institutions are available from Kinokuniya Company Ltd, PO Box 55, Chitose, Tokyo 156, Japan.

© Foundation Compositio Mathematica. All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Publishers or a licence permitting restricted copying in the UK by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1P 9HE, or in the USA by the Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923. Organisations in the USA that are also registered with the C.C.C. may copy material (beyond the limits permitted by sections 107 and 108 of U.S. copyright law) subject to payment to C.C.C. of the per-copy fee of $16.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0010-437X/08 $16.00.

Individual readers of this publication, and non-profit libraries acting for them, are permitted to make fair use of the material, such as to make a single copy of one article for use in teaching or research. Permission is also granted to quote brief passages from this publication in reviews, provided that the customary acknowledgement of the source is given.

https://doi.org/10.1112/S0010437X10000138 Published online by Cambridge University Press

COMPOSITIO MATHEMATICA

VOLUME 147 NUMBER 1 JANUARY 2011

Peng Gao and **Liangyi Zhao** One level density of low-lying zeros of families of L-functions 1–18

Ritabrata Munshi On mean values and non-vanishing of derivatives of L-functions in a nonlinear family 19–34

David Burns and **Henri Johnston** A non-abelian Stickelberger theorem 35–55

Barry Mazur and **Karl Rubin** Refined class number formulas and Kolyvagin systems 56–74

Claus Diem On the discrete logarithm problem in elliptic curves 75–104

Damien Calaque, Giovanni Felder, Andrea Ferrario and **Carlo A. Rossi** Bimodules and branes in deformation quantization 105–160

Jérémy Blanc and **Frédéric Mangolte** Geometrically rational real conic bundles and very transitive actions 161–187

O. Schiffmann and **E. Vasserot** The elliptic Hall algebra, Cherednik Hecke algebras and Macdonald polynomials 188–234

Annette Huber, Guido Kings and **Niko Naumann** Some complements to the Lazard isomorphism 235–262

Florian Herzig A Satake isomorphism in characteristic p 263–283

Christine Berkesch The rank of a hypergeometric system 284–318

Gábor Székelyhidi Greatest lower bounds on the Ricci curvature of Fano manifolds 319–331

Patrick Morton Corrigendum: On certain algebraic curves related to polynomial maps 332–334

https://doi.org/10.1112/S0010437X10000138 Published online by Cambridge University Press

https://doi.org/10.1112/S0010437X10000138 Published online by Cambridge University Press