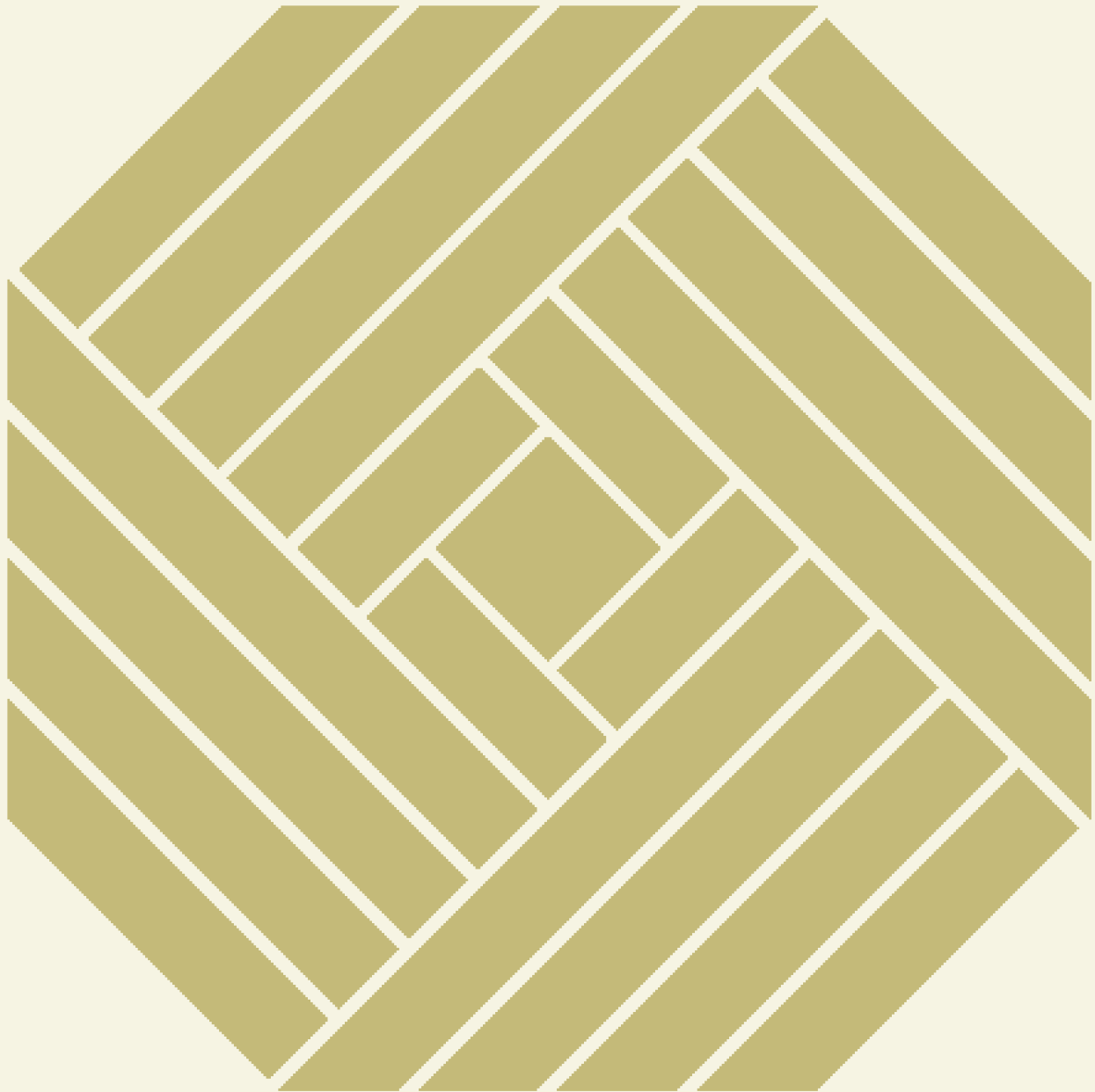


COMPOSITIO MATHEMATICA



FOUNDATION COMPOSITIO MATHEMATICA

London Mathematical Society



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. Mustață**, *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 2012 is €1336/£925 (USA, Canada and Mexico US\$1705). These prices include delivery by air and access to an online version. Single issues cost €223/£154 (USA, Canada and Mexico US\$284) 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. Organizations in the USA that are registered with the C.C.C. may therefore copy material beyond the limits permitted by sections 107 and 108 of US copyright law subject to payment to C.C.C. of the per-copy fee. This consent does not extend to multiple copying for promotional and commercial purposes. Code 0010-437X/2012.

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.



COMPOSITIO MATHEMATICA

VOLUME 148 NUMBER 4 JULY 2012

Marc Masdeu CM cycles on Shimura curves, and p -adic L -functions	1003–1032
Robert Harron On Greenberg's L -invariant of the symmetric sixth power of an ordinary cusp form	1033–1050
Valery Alexeev and Rita Pardini Non-normal abelian covers	1051–1084
F. L. Zak Castelnuovo bounds for higher-dimensional varieties	1085–1132
Alexander I. Efimov Cohomological Hall algebra of a symmetric quiver	1133–1146
Valeria Ornella Marcucci and Gian Pietro Pirola Generic Torelli theorem for Prym varieties of ramified coverings	1147–1170
Gavin Brown, Michael Kerber and Miles Reid Fano 3-folds in codimension 4, Tom and Jerry. Part I	1171–1194
D. Rogalski and Susan J. Sierra Some projective surfaces of GK-dimension 4	1195–1237
Yashar Memarian A lower bound on the waist of unit spheres of uniformly convex normed spaces	1238–1264
Salem Ben Saïd, Toshiyuki Kobayashi and Bent Ørsted Laguerre semigroup and Dunkl operators	1265–1336

