

Preface

These proceedings contain the main topics and results presented at the Fourth International Conference on Multivariate Approximation. The meeting took place during the week of September 24–29, 2000 at the now well-known “Haus Bommerholz”, the guest-house of the University of Dortmund. It hosted 43 participants from 16 countries, and the program included 9 invited one-hour lectures, 21 contributed talks, and two problem sessions. The articles collected here are carefully peer-refereed and suitably edited for publication.

Following the tradition of this series of conferences, the meeting was aimed at advancing selected topics of Multivariate Approximation Theory. These include approximation on compact sets (such as spheres, balls, or compact homogeneous manifolds), spherical designs and energy functionals, interpolation by radial basis functions and by splines, frame theory and Gabor analysis, refinable function systems and subdivision, properties of harmonic, polyharmonic and blending functions, sampling and data compression, among others.

The editors would like to express their thanks to all who have given their support to the conference, and to the preparation of this book. In particular, our thanks go to the Deutsche Forschungsgemeinschaft for their funding of the conference, to the University of Dortmund, and to the staff of Haus Bommerholz for their help running the conference, and to the Universities of Dortmund and Duisburg for the financial support of this proceedings volume. We are grateful to all the authors and referees who helped us maintain a high scientific standard. In addition, we acknowledge the constant help of Dr. Hermann Hoch (Duisburg) during the production of this proceedings volume. Last but not least, we would like to thank the publisher for including this book in the *International Series of Numerical Mathematics*.

June 30, 2000

Werner Haußmann

Kurt Jetter

Manfred Reimer

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Participants

Nicolay N. Andreev, *Department of Function Theory, Steklov Institute
of Mathematics, stz. Gubkina 8, Moscow GSP-1, Russia*
email: andreev@mccme.ru

David H. Armitage, *Department of Pure Mathematics, Queen's University,
Belfast BT7 1NN, Northern Ireland*
email: d.armitage@qub.ac.uk

John J. Benedetto, *Department of Mathematics, University of Maryland,
College Park, MD 20742, U. S. A.*
email: jjb@math.umd.edu

Elena E. Berdysheva, *Mathematisches Institut, Universität Erlangen,
Bismarckstr. 1 1/2, D-91054 Erlangen, Germany*
email: berdyshe@mi.uni-erlangen.de

Peter Binev, *Institute of Mathematics, Bulgarian Academy of Sciences,
Sofia 1090, Bulgaria*
email: binev@fmi.uni-sofia.bg

Borislav D. Bojanov, *Department of Mathematics, University of Sofia,
5 James Bourchier Blvd., BG-1164 Sofia, Bulgaria*
email: boris@fmi.uni-sofia.bg

Len P. Bos, *Department of Mathematics and Statistics, University of Calgary,
Calgary, Alberta T2N 1N4, Canada*
email: lpbos@math.ucalgary.ca

Dietrich Braess, *Institut für Mathematik, Ruhr-Universität Bochum,*
D-44780 Bochum, Germany
email: braess@num.ruhr-uni-bochum.de

Johann Brauchart, *Institut für Mathematik A, Technische Universität Graz,*
Steyrergasse 30, A-8010 Graz, Austria
email: brauchart@finanz.math.tu-graz.ac.at

Andreas Busch, *Fachbereich Mathematik, Universität Dortmund,*
D-44221 Dortmund, Germany

Maria Charina, *Institut für Angewandte Mathematik und Statistik,*
Universität Hohenheim, D-70593 Stuttgart, Germany
email: mcharina@uni-hohenheim.de

Ole Christensen, *Department of Mathematics, Technical University of*
Denmark, DK-2800 Lyngby, Denmark
email: olechr@mat.dtu.dk

Costanza Conti, *Dipartimento di Energetica, Università di Firenze,*
Via Lombroso 6 / 17, I-2800 Firenze, Italy
email: costanza@sirio.de.unifi.it

Franz-Jürgen Deltos, *Fachbereich Mathematik, Universität Siegen,*
Walter-Flex-Str. 33, D-57068 Siegen, Germany
email: delvos@mathematik.uni-siegen.de

Zeev Ditzian, *Department of Mathematics, University of Alberta,*
Edmonton, Alberta, Canada T6G 2G1
email: zditzian@math.ualberta.ca

Nira Dyn, *School of Mathematical Sciences, Tel Aviv University,*
Ramat Aviv, 69978 Tel Aviv, Israel
email: niradyn@math.tau.ac.il

Karol Dziedziul, *Faculty of Applied Mathematics, Technical University*
of Gdansk, ul. Narutowicza 11/12, 80-952 Gdansk, Poland
email: kdz@mifgate.pg.gda.pl

Hans G. Feichtinger, *Institut für Mathematik, Universität Wien,*
Strudlhofgasse 4, A-1090 Wien, Austria
email: fei@tyche.mat.univie.ac.at

Jörg Fliege, *Fachbereich Mathematik, Universität Dortmund,*
D-44221 Dortmund, Germany
email: fliege@math.uni-dortmund.de

Stephen J. Gardiner, *Department of Mathematics,*
University College Dublin, Dublin 4, Ireland
email: gardiner@acadamh.ucd.ie

Peter J. Grabner, *Institut für Mathematik A,*
Technische Universität Graz, Steyrergasse 30, A-8010 Graz, Austria
email: grabner@weyl.math.tu-graz.ac.at

Werner Haußmann, *Mathematisches Institut, Gerhard-Mercator-Universität*
Duisburg, D-47048 Duisburg, Germany
email: haussmann@math.uni-duisburg.de

Simon Hubbert, *Department of Mathematics, Huxley Building,*
Imperial College, 180 Queen's Gate, London SW7 2BZ, England
email: simon.hubbert@ic.ac.uk

Kurt Jetter, *Institut für Angewandte Mathematik und Statistik,
Universität Hohenheim, D-70593 Stuttgart, Germany*
email: kjetter@uni-hohenheim.de

Anna Kamont, *Mathematical Institute PAN, ul. Abrahama 18,
81-825 Sopot, Poland*
email: a.kamont@impan.gda.pl

John Klinkhammer, *Mathematisches Institut, Gerhard-Mercator-Universität
Duisburg, D-47048 Duisburg, Germany*
email: klinkhammer@math.uni-duisburg.de

Hermann König, *Mathematisches Seminar, Universität Kiel,
Ludewig-Meyn-Str. 4, D-24098 Kiel, Germany*
email: hkoenig@math.uni-kiel.de

Alain Le Méhauté, *Département de Mathématiques, Université de Nantes,
2 Rue de la Houssinière, F-44072 Nantes Cedex, France*
email: alm@math.univ-nantes.fr

Jeremy Levesley, *Department of Mathematics, University of Leicester,
Leicester LE1 7RH, England*
email: jl1@mcs.le.ac.uk

Tom Lyche, *Institutt for Informatikk, University of Oslo,
P.O.Box 1080 Blindern, N-0316 Oslo, Norway*
email: tom@ifi.uio.no

Ulrike Maier, *Mathematisches Institut, Justus-Liebig-Universität Giessen,
Arndtstr. 2, D-35392-Giessen, Germany*
email: ulrike.maier@math.uni-giessen.de

H. Michael Möller, *Fachbereich Mathematik, Universität Dortmund,*
D-44221 Dortmund, Germany
email: moeller@math.uni-dortmund.de

Geno Nikolov, *Department of Mathematics, University of Sofia,*
5 James Bourchier Blvd., BG-1164 Sofia, Bulgaria
email: geno@fmi.uni-sofia.bg

Günther Nürnberger, *Fakultät für Mathematik und Informatik,*
Universität Mannheim, D-68131 Mannheim, Germany
email: nuern@euklid.math.uni-mannheim.de

Petar Petrov, *Department of Mathematics, University of Sofia,*
5 James Bourchier Blvd., BG-1164 Sofia, Bulgaria
email: peynov@fmi.uni-sofia.bg

Götz Pfander, *Institut für Angewandte Mathematik und Statistik,*
Universität Hohenheim, D-70593 Stuttgart, Germany
email: pfander@uni-hohenheim.de

Manfred Reimer, *Fachbereich Mathematik, Universität Dortmund,*
D-44221 Dortmund, Germany
email: reimer@math.uni-dortmund.de

Edward B. Saff, *Department of Mathematics,*
University of South Florida, Tampa FL 33620, U.S.A.
email: esaff@math.usf.edu

Robert Schaback, *Institut für Numerische und Angewandte Mathematik,*
Universität Göttingen, D-37083 Göttingen, Germany
email: schaback@math.uni-goettingen.de

Robert S. Womersley, *School of Mathematics, University of New South Wales,
Sydney, NSW 2052, Australia*
email: r.womersley@unsw.edu.au

Vladimir A. Yudin, *Department of Higher Mathematics, Moscow Institute
of Power Engineering, Krasnokazarmennaya 15, Moscow 105 835, Russia*
email: yudin@vayudin.mccme.ru

Frank Zeilfelder, *Fakultät für Mathematik und Informatik, Universität
Mannheim, D-68131 Mannheim, Germany*
email: zeilfeld@euklid.math.uni-mannheim.de

Georg Zimmermann, *Institut für Angewandte Mathematik und Statistik,
Universität Hohenheim, D-70593 Stuttgart, Germany*
email: gzim@uni-hohenheim.de

Scientific Program of the Conference

Monday, September 25:

1st Morning Session: Chair: *K. Jetter*

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| 9:00 | Opening of the Conference |
| 9:30 – 10:30 | <i>J. J. Benedetto</i> : The Role of Tiling in Multidimensional Fourier Frames and Wavelet Theory |

2nd Morning Session: Chair: *H. König*

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| 11:00 – 12:00 | <i>N. Dyn</i> : Multiscale Subdivision Schemes and Refinability |
| 12:00 – 12:30 | <i>C. Conti</i> : Convolution of Function Vectors |

Afternoon Session: Chair: *L. Bos*

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| 15:30 – 16:30 | <i>J. Levesley</i> : Approximation on Compact Homogeneous Manifolds |
| 16:30 – 17:00 | <i>S. Hubbert</i> : Interpolation on Spheres Using Basis Function Methods |
| 17:00 – 17:30 | <i>A. Le Méhauté</i> : On the Evaluation of Splines and Radial Basis Functions |
| 17:30 – 18:00 | <i>F. Zeilfelder</i> : Local Lagrange Interpolation by Bivariate Splines |
| 19:00 – 20:30 | 1st Problem Session |

Tuesday, September 26:

1st Morning Session: Chair: *G. Nürnberger*

- 9:00 – 10:00 *E. Saff*: Distributing Many Points on a Sphere:
A Minimum Energy Approach
- 10:00 – 10:30 *P. J. Grabner*: Energy Functionals and
Numerical Integration

2nd Morning Session: Chair: *P. Binev*

- 11:00 – 11:30 *N. A. Andreev*: Approximations on the
 m –Dimensional Sphere
- 11:30 – 12:00 *V. A. Yudin*: New Properties of Spherical Designs
- 12:00 – 12:30 *U. Maier*: Interpolation at Spherical Designs

Afternoon Session: Chair: *N. Dyn*

- 15:30 – 16:30 *Z. Ditzian*: New Moduli of Smoothness on the Sphere
- 16:30 – 17:00 *E. E. Berdysheva*: Several Extremal Problems
for Multivariate Positive Definite Functions
- 17:00 – 17:30 *T. Lyche*: On the p –Norm Condition Number
of the Multivariate Triangular Bernstein Basis

Wednesday, September 27:

1st Morning Session: Chair: *E. Saff*

9:00 – 9:30 *P. Petrov*: Best One-Sided L^1 –Approximation
by $B^{2,1}$ –Blending Functions

9:30 – 10:00 *D. H. Armitage*: Harmonic Functions that Vanish at
Certain Lattice Points

10:00 – 10:30 *S. J. Gardiner*: Convergence of Rational Interpolants
with Preassigned Poles

2nd Morning Session: Chair: *M. Reimer*

11:30 – 12:30 *R. S. Womersley*: Choosing Points on the Sphere for
Polynomial Interpolation and Quadrature

Thursday, September 28:

1st Morning Session: Chair: *A. Le Méhauté*

9:00 – 10:00 *B. D. Bojanov*: Cubature Formulae for
Polyharmonic Functions

10:00 – 10:30 *G. Nikolov*: Some Cubature Formulae Using
Mixed Type Data

2nd Morning Session: Chair: *T. Lyche*

11:00 – 11:30 *A. Kamont*: General Haar Systems and
Greedy Approximation

11:30 – 12:00 *P. G. Binev*: Tree Approximation

12:00 – 12:30 *G. Pfander*: Multidimensional Generalized
Haar Wavelets

Afternoon Session: Chair: *J. J. Benedetto*

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| 15:30 – 16:30 | <i>H. G. Feichtinger</i> : Functional Analytic Concepts for Spline Type Spaces and Gabor Analysis |
| 16:30 – 17:00 | <i>G. Zimmermann</i> : Short–Time Fourier Transform of Ultra–Distributions |
| 17:00 – 17:30 | <i>O. Christensen</i> : Approximation of the Inverse Frame Operator and Applications to Gabor Frames |
| 19:00 – 20:30 | 2nd Problem Session |

Friday, September 29:

1st Morning Session: Chair: *H. M. Möller*

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| 9:30 – 10:00 | <i>K. Dziedziul</i> : Asymptotic Formulas for the Error in Cardinal Interpolation and Orthogonal Projection |
| 10:00 – 10:30 | <i>M. Charina</i> : Image Data Compression with Three–Directional Splines |

2nd Morning Session: Chair: *W. Haußmann*

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| 11:00 – 12:00 | <i>L. Bos</i> : Complex Variable Techniques in Multivariate Approximation |
| 12:00 | Closing of the Conference |