

I Honors and Awards

- 2011 Best Paper Award (1st Prize), Symposium on Geometry Processing 2011, Lausanne, with K. Hildebrandt
- 2008 Best Teaching Award, (1st Prize), Course *Differential Geometry II* im SS2008, Institut für Mathematik, Freie Universität Berlin
- 2007 Best Teaching Award, (2nd Prize), Course *Analysis III* im SS2007, Institut für Mathematik, Freie Universität Berlin
- 2006 Best Experimental Film, Video *Mesh - A journey through discrete geometry*, Beau Janzen, Konrad Polthier, 6th International Festival of Science Film (Scinema), Sydney, Australia
- 2006 Best Scientific Visualization, Video *Mesh - A journey through discrete geometry*, Beau Janzen, Konrad Polthier, Red Stick International Animation Festival, Baton Rouge, Louisiana, USA
- 2005 Best Animation, Video *Mesh - A journey through discrete geometry*, Beau Janzen, Konrad Polthier, New York International Independent Film and Video Festival, Los Angeles, USA
- 2005 3 videos (*Mesh-Subdivision Excerpt*, *Mesh-Platonic Solid Excerpt*, *Mesh-Bubble Excerpt*), finalists in the Digital Media Festival 2005, Melbourne.
- 2005 3 videos (*Mesh-Subdivision Excerpt*, *Mesh-Platonic Solid Excerpt*, *Mesh-Bubble Excerpt*) selected for screening in Eurographics Animation Theater 2005, Dublin.
- 2005 Video *Mesh-Bubble Excerpt* is nominated for the awards Pixar Prize and Scientific Demo Prize at Eurographics Animation Theater 2005, Dublin.
- 2004 Best Student Paper Award (1st Prize) at Eurographics 2004 Conference, jointly with K. Hildebrandt, Prize 1.000 € provided by IBM Research.
- 2001 Winner of the Competition *Perspectives of Mathematics between School and University* of Volkswagen-Foundation
- 2000 3rd Prize at MATHPLETS 2000 Software Competition of the *Virtual School of the European Schoolnet (EUN) and Sun Microsystems* for JavaView.
- 1998 Best Video at the International Symposium on Computer Graphics, Image Processing and Vision (SIBGRAPI), Brazil.
- 1998 1st Prize in category *Science* at the *Computer Animation Festival '98* of the Gesellschaft für Informatik.
- 1997 Science Award of the Multimedia Grand Prix (Nicograph'97) in Japan for video *Geodesics and Waves*.
- 1997 Video *Geodesics and Waves* selected for screening at *Electronic Theater of Siggraph'97*.
- 1994 *European Academic Software Award*, for best academic software GRAPE in mathematics.
- 1994 Dissertation Award of the Heinrich-Hörlein-Gedächtnis-Stiftung, Bonn.

II Editorial Activities

Book Series	<i>Geometry and Computing</i> , Springer. (Co-Editor-in-Chief since 2006)
Book Series	<i>Mathematics and Visualization</i> , Springer Verlag. (Co-Editor since 1997)
Journal	<i>Graphical Models (GMOD)</i> , Elsevier (Ass. Editor since 2010)
Journal	<i>Computer Aided Geometric Design</i> , Elsevier (Ass. Editor since 2006)
Electronic Journal	<i>Electronic Geometry Models</i> (Managing Co-Editor since 2000)
Video Series	<i>MSRI Video Series</i> (Editor since 2010)
Video Series	<i>VideoMATH</i> , Springer Verlag. (Co-Editor since 1998)

III Publications

III 1 Books and Special Issues

- [B-13] Georg Glaeser, Konrad Polthier, *Bilder der Mathematik. 2. erw. Auflage*, Spektrum Verlag 2010
- [B-12] Franz-Erich Wolter, Bernd Hamann, Konrad Polthier (Eds.), *Special Issue of CAD*, 2009
- [B-11] Marc Alexa, Michael Kazhdan, Konrad Polthier (Eds.), *Geometry Processing 2009*, Computer Graphics Forum 2009
- [B-10] Hans-Christian Hege, Konrad Polthier, Gerik Scheuermann (Eds.), *Topology-based Methods in Visualization II*, Springer Verlag, 2009
- [B-09] Georg Glaeser, Konrad Polthier, *Bilder der Mathematik*, Spektrum Verlag 2009
- [B-08] Mathieu Desbrun, Konrad Polthier (Eds.), *Special issue on Discrete Geometry*, volume 24 (8-9) of Computer Aided Geometric Design, pages 427–528. Elsevier, 2007.
- [B-07] Konrad Polthier, Alla Sheffer (Eds.), *Geometry Processing 2006*, Proceedings of 4th Symposium on Geometry Processing, Eurographics/ACM Siggraph and AK Peters, 2006
- [B-06] M. Desbrun, K. Polthier, (Eds.) Special Issue of Computer Aided Geometric Design (CAGD) on *Discrete Geometry and Visualization*, 2007
- [B-05] H.-C. Hege, K. Polthier, (Eds) Special Issue of IEEE Transactions on Visualization and Computer Graphics (TVCG) on *Mathematical Visualization*, 2004
- [B-04] H.-C. Hege, K. Polthier (Eds.), *Visualization and Mathematics III*, Springer Verlag, 2003
- [B-03] J. Borwein, M. Morales, K. Polthier, J.F. Rodrigues (Eds.) *Multimedia Tools for Communicating Mathematics*, Springer-Verlag, 2002.
- [B-02] H.-C. Hege, K. Polthier (Eds.), *Mathematical Visualization*, Springer Verlag, 1998
- [B-01] H.-C. Hege, K. Polthier (Eds.), *Visualization and Mathematics*, Springer Verlag, 1997

III 2 Theses

- [03] Habilitation Thesis (2002) *Polyhedral Surfaces of Constant Mean Curvature* Institut für Mathematik, Technische Universität Berlin, pp. 1-212.
- [02] PhD Thesis (1993): *Geometric A priori Estimates for Hyperbolic Minimal Surfaces* Mathematisches Institut, Universität Bonn, Bonner Mathematische Schriften 263 (1993). (Summa cum laude)
- [01] Diploma Thesis (1988): *Neue Minimalflächen in H^3* , Mathematisches Institut, Universität Bonn.

III 3 Refereed Journal and Proceedings Publications

- [61] Anna Wawrzinek, Klaus Hildebrandt, Konrad Polthier: *Koiter's Thin Shells on Catmull-Clark Limit Surfaces*. VMV 2011, to appear
- [60] Matthias Nieser, Jonathan Palacios, Konrad Polthier, Eugene Zhang: *Hexagonal Global Parameterization of Arbitrary Surfaces*. IEEE TVCG, to appear
- [59] Klaus Hildebrandt, Konrad Polthier: *On the approximation of the Laplace-Beltrami operator and the Willmore energy of surfaces*. Symposium of Geometry Processing 2011, (Best paper, 1st prize), Computer Graphics Forum, to appear
- [58] Matthias Nieser, Ulrich Reitebuch, Konrad Polthier: *CubeCover - Parameterization of 3D Volumes*. Symposium of Geometry Processing 2011), Computer Graphics Forum, to appear
- [57] Klaus Hildebrandt, Christian Schulz, Christoph von Tycowicz, Konrad Polthier: *Interactive Surface Modeling using Modal Analysis*. Transactions on Graphics, to appear
- [56] Felix Kälberer, Christoph von Tycowicz, Konrad Polthier: *Context-based Coding of Adaptive Multiresolution Meshes*, Computer Graphics Forum, accepted on 15. May 2011
- [55] Klaus Hildebrandt, Konrad Polthier: *Generalized Shape Operators on Polyhedral Surfaces*, Computer Aided Geometric Design, accepted on 07 May 2011.
- [54] Klaus Hildebrandt, Christian Schulz, Christoph von Tycowicz, Konrad Polthier: *Interactive Surface Modeling using Modal*, ACM Trans. on Graphics, accepted on 02. May 2011
- [53] Felix Kälberer, Matthias Nieser and Konrad Polthier, *Stripe Parameterization of Tubular Surfaces*, in: *Topology-based Methods in Visualization*, 2011, Springer Verlag; . Pascucci and H. Hagen and J. Tierny and X. Tricoche (eds.); Mathematics and Visualization; pp. 13-26, 2010
- [52] Klaus Hildebrandt, Christian Schulz, Christoph von Tycowicz, Konrad Polthier: *Eigenmodes of surface energies for shape analysis*. Advances in Geometric Modeling and Processing (Proceedings of Geometric Modeling and Processing 2010), Lecture Notes in Computer Science 6130, Springer, pp 296-314, 2010

- [51] Matthias Nieser, Konstantin Poelke, Polthier, Konrad: *Automatic Generation of Riemann Surface Meshes*. Advances in Geometric Modeling and Processing, Lecture Notes in Computer Science 6130, Springer Berlin/Heidelberg, pp 161-178, 2010
- [50] Matthias Nieser, Konrad Polthier, Christian Schulz. *Patch Layout from Feature Graph*. in: Computer-Aided Design 42 (2010), pp. 213-220; DOI information: 10.1016/j.cad.2009.11.002
- [49] Ulrich Bauer, Konrad Polthier, Max Wardetzky. *Uniform Convergence of Discrete Curvatures from Nets of Curvature Lines*. Discrete and Computational Geometry, 43(49), pp. 798-823, 2010
- [48] Felix Kälberer, Konrad Polthier, Christoph von Tycowicz: *Lossless Compression of Adaptive Multiresolution Meshes*. Sibgrapi 2009, pp 80-87
- [47] Matthias Nieser, Konrad Polthier: *Parameterizing Singularities of Positive Integral Index*. LNCS - Mathematics of Surfaces XIII, Springer 2009, vol. 5654/2009, pp. 265-277
- [46] Konstantin Poelke, Konrad Polthier, *Lifted Domain Coloring*, Computer Graphics Forum, 2009; Volume 28, Number 3, 2009, pp. 735-742
- [45] Carsten Lange, Konrad Polthier, Udo Simon, *Zur Geometrie von Frühstückeiern*, Math. Semesterberichte 56, pp. 1-14, 2009
- [44] Ulrich Bauer, Konrad Polthier. *Generating parametric models of tubes from laser scans*. Computer-Aided Design, volume 41(10):pages 719–729, 2009
- [43] Kai Hormann, Konrad Polthier, Alla Sheffer, *Mesh Parameterization: Theory and Practice*. SIGGRAPH Asia 2008 Course Notes, Number 11, 2008, ACM Press
- [42] Ulrich Bauer, Konrad Polthier, *Detection of Planar Regions in Volume Data for Topology Optimization*, in: Proc. of Geometry Modelling and Processing 2008, F. Chen and B. Jüttler (eds.), pp. 119–126, Lecture Notes in Computer Science, vol. 4975, Springer 2008.
- [40] Ulrich Bauer, Konrad Polthier, *Parametric Reconstruction of Bent Tube Surfaces*, in: Proc. of the 2007 International Conference on Cyberworlds, F. Wolter and A. Sourin (eds.), pp. 465–474, IEEE Computer Society, 2007.
- [39] Felix Kälberer, Matthias Nieser, Konrad Polthier, *QuadCover - Surface Parameterization using Branched Coverings*, Computer Graphics Forum 26 (3), 2007, pp. 375-384.
- [38] Klaus Hildebrandt, Konrad Polthier, *Constraint-Based Surface Fairing*, Symposium on Geometry Processing 2007, pp. 203-212.
- [37] Klaus Hildebrandt, Konrad Polthier, Max Wardetzky, *On the Convergence of Metric and Geometric Properties of Polyhedral Surfaces*, Geometria Dedicata 123 (2006), pp. 89-112.
- [36] Carsten Lange, Konrad Polthier. *Anisotropic smoothing of point sets*. Computer Aided Design, volume 22:pages 680–692, 2005

- [35] Klaus Hildebrandt, Konrad Polthier and Eike Preuss, *Evolution of 3d Curves under Strict Spatial Constraints*, 9th International Conference on Computer Aided Design and Computer Graphics, 2005.
- [34] F. Kälberer, K. Polthier, U. Reitebuch, M. Wardetzky, *FreeLence – Coding with Free Valences* 2005. Eurographics 2005.
- [33] K. Hildebrandt, K. Polthier, M. Wardetzky, *Smooth Feature Lines on Surface Meshes*, Symposium on Geometry Processing, M. Desbrun and H. Pottmann (Eds.), Vienna, 2005
- [32] C. Lange, K. Polthier, *Anisotropic Fairing of Point Sets*, in: Special Issue of Computer Aided Geometric Design, U. Reif (Ed.), Elsevier, 2005
- [31] K. Polthier, *Computational Aspects of Discrete Minimal Surfaces*, in: Global Theory of Minimal Surfaces, Proc. of the Clay Mathematics Institute Summer School, D. Hoffman (Ed.), 2005
- [30] K. Hildebrandt, K. Polthier, *Anisotropic Filtering of Non-Linear Surface Features*, Computer Graphics Forum 23 (3), 2004, pp 391-400.
1st Prize Best Student Paper at Eurographics 2004, 1000€ provided by IBM Research.
- [29] M. Majewski, K. Polthier, *Using MuPAD and JavaView to visualize mathematics on the internet*, in: Proc. 9th Asian Technology Conference in Mathematics, National Institute of Education, Singapore (2004) pp 465-474.
- [28] S. Dugaro, K. Polthier, *Visualizing Maple Plots with JavaViewLib*, in: Algebra, Geometry, and Software Systems, N. Takayama, M. Joswig (Eds.), Springer, 2003, pp. 255-275.
- [27] K. Polthier, E. Preuß, *Identifying Vector Field Singularities using a Discrete Hodge Decomposition*, in: Visualization and Mathematics III, H.C. Hege, K. Polthier (Eds.), Springer Verlag (2003), pp. 113-134.
- [26] M. Joswig, K. Polthier, *Publication of Electronic Geometry Models*, in: The Visual Mind 2, M. Emmer (Ed), Springer Verlag 2003.
- [25] K. Polthier, W. Rossman, *Index of Discrete Constant Mean Curvature Surfaces*, in: J. Reine und Angew. Math. (Crelle J.), 549 (2002), 47-77.
- [24] K. Polthier, *Unstable Periodic Discrete Minimal Surfaces*, in: Nonlinear Partial Differential Equations, S. Hildebrandt, H. Karcher (Eds.), Springer Verlag, 2002, pp.127-143.
- [23] M.V.Andreeva, I.A. Dynnikov, K. Polthier, *A Visualized Algorithm for Recognizing the Unknot*, in: Proc. of the International Congress on Mathematical Software, A. Cohen, X. Gao, N. Takayama (Eds.), World-Scientific, 2002.
- [22] M. Joswig, K. Polthier, *EG-Models – A New Journal for Digital Geometry Models*, in: Multimedia Tools for Communicating Mathematics, Eds: J. Borwein, M. Morales, K. Polthier, J.F. Rodrigues, Springer Verlag 2002, pp. 165-190.
- [21] K. Polthier, S. Khadem, E. Preuß, U. Reitebuch, *Publication of Interactive Visualizations with JavaView*, in: Multimedia Tools for Communicating

- Mathematics, Eds: J. Borwein, M. Morales, K. Polthier, J.F. Rodrigues, Springer Verlag 2002, pp. 241-264.
- [20] K. Polthier, *Visualizing Mathematics - Online* in: C. Bruter (Ed.) Mathematics and Art, Springer Verlag (2002), pp. 29-42.
- [19] K. Polthier, E. Preuß, *Variational Approach to Vector Field Decomposition*, in: W. de Leuw, R. v. Liere (Eds.) Scientific Visualization, Proceedings of Eurographics Workshop on Scientific Visualization 2000, Springer Verlag 2000.
- [18] K. Polthier, M. Schmies, *Geodesic Flow on Polyhedral Surfaces*, in: Data Visualization, Proceedings of Eurographics Workshop on Scientific Visualization 1999, Wien 1999.
- [17] A. Friedrich, K. Polthier, M. Schmies, *Smooth View-Dependent Rendering in Animations*, in: Proceedings of Spring Conference on Computer Graphics and its Application, Budmerice 1999.
- [16] A. Friedrich, K. Polthier, M. Schmies, *Interpolating Triangle Hierarchies*, in: Visualization 98, D. Ebert, H. Rushmeier, H. Hagen (Eds.), pp. 391-396, IEEE Computer Society Press, 1998.
- [15] K. Polthier, M. Schmies, *Straightest Geodesics on Polyhedral Surfaces*, in: Mathematical Visualization, H.C. Hege and K. Polthier (Eds.), pp. 135-150 Springer Verlag 1998.
- [14] K. Große-Brauckmann, K. Polthier, *Compact Constant Mean Curvature Surfaces derived from Delaunay's and Wente's Surface*, in: Visualization and Mathematics, H.C. Hege and K. Polthier (Eds.), pp. 119-134, Springer Verlag 1997.
- [13] K. Große-Brauckmann, K. Polthier, *Compact Constant Mean Curvature Surfaces with Low Genus*, Experimental Mathematics 6 (1), pp. 13-32 (1997).
- [12] C. Gunn, A. Ortmann, U. Pinkall, K. Polthier, U. Schwarz, *Oorange: A Virtual Laboratory for Experimental Mathematics*, in: Visualization and Mathematics, H.C. Hege and K. Polthier (Eds.), pp. 249-265, Springer Verlag 1997.
- [11] B. Oberknapp, K. Polthier, *An Algorithm for Discrete Constant Mean Curvature Surfaces*, in: Visualization and Mathematics, H.C. Hege and K. Polthier (Eds.), pp. 141-161, Springer Verlag 1997.
- [10] K. Große-Brauckmann, K. Polthier, *Numerical Examples of Compact Constant Mean Curvature Surfaces*, in: "Elliptic and Parabolic Methods in Geometry", B. Chow, R. Gulliver, S. Levy and J. Sullivan (Eds), pp. 23-46, AK Peters 1996.
- [09] H. Karcher, K. Polthier, *Construction of Triply Periodic Minimal Surfaces*, in: Phil. Trans. Royal Soc. Lond. Series A 354, pp. 2077-2104, The Royal Society of London (1996).
- [08] B. Oberknapp, K. Polthier, *A Simple Concept for Distributed Graphics*, in: Modelling -Virtual Worlds - Distributed Graphics, Dieter W. Fellner (Ed.), Infix Verlag, 1995.

- [07] K. Polthier, M. Rumpf, *A Concept of Time-Dependent Processes*, in: Visualization in Scientific Computing, M. Göbel, H. Müller, B. Urban (Eds.), pp. 137-153 Springer Verlag, 1995.
- [06] U. Pinkall, K. Polthier, *Computing Minimal Surfaces and Their Conjugates*, Experimental Mathematics 2(1), pp. 15-36 (1993).
- [05] K. Polthier, *Geometric Data for Triply Periodic Minimal Surfaces in Spaces of Constant Curvature*, in: Geometric Analysis and Computer Graphics, P. Concus, D. Hoffman, R. Finn (Eds.), Springer Verlag 1991, pp. 139-145.
- [04] K. Polthier, *New Periodic Minimal Surfaces in H^3* , in: Theoretical and Numerical Aspects of Geometric Variational Problems, G. Dziuk, G. Huisken, J. Hutchinson (Eds.), Publications of the CNA Canberra 26 (1991), pp. 201-210.

III 4 Unrefereed Publications

- [U-5] Matthias Nieser, Konrad Polthier, *Parameterizing Singularities of Positive Integral Index*, in: Mathematics of Surfaces XIII, Springer 2009, vol. 5654/2009, pp. 265-277
- [U-4] K. Polthier, *Geometry Processing - Discrete Geometry for Virtual Worlds*, in: ICIAM - Zurich Intelligencer, Springer Verlag, 2007, pp. 42-43.
- [U-3] K. Polthier, *Discrete Curvature and Surface Optimization*, in: Integrable systems, geometry and visualization, R. Miyaoka and K. Yamada (Eds.), 2005.
- [U-2] K. Polthier, Conjugate Harmonic Maps and Minimal Surfaces, Preprint No. 446, TU-Berlin, SFB 288, 2000.
- [U-1] T. Happe, K. Polthier, M. Rumpf, M. Wierse, *Visualizing Data from Time-Dependent Adaptive Simulations*, in: Proceedings of the Workshop on "Visualization - Dynamics and Complexity", Bremen 1995.

III 5 Popular Scientific Publications

- [P-15] K. Polthier, *Unfolding Polyhedra* Plus Magazine University of Cambridge, 2003
- [P-14] K. Polthier, *Inside the Klein Bottle*, Plus Magazine University of Cambridge, 2003
- [P-13] H.C. Hege, K. Polthier, M. Rumpf (Eds.), *Calendar MathInsight 2002*.
- [P-12] K. Polthier, *Visualizzazione matematica ed sperimenti online* in: M. Emmer (Ed.) *Mathematica e Cultura 3* (Italian), Springer Verlag 2000
- [P-10] M. Joswig, K. Polthier, *Digital Models and Computer Assisted Proofs*, in: Newsletter of the European Mathematical Society (EMS), 2000.
- [P-09] M. Joswig, K. Polthier, *Digitale Geometrische Modelle* in: *Mitteilungen der Deutschen Mathematiker Vereinigung (DMV)* 4, 2000, pp. 20-22.
- [P-08] H. Karcher, K. Polthier, *Die Geometrie von Minimalflächen*, *Spektrum der Wissenschaft* (German Edition of Scientific American) (Oct. 1990).
Extended Reprint in: *Moderne Mathematik*, Gerd Faltings (Ed.) Spektrum Verlag 1996.
Extended Version in: *Bulletin of the Portuguese Mathematical Society*, 2000.
- [P-07] U. Pinkall, K. Polthier, *Flächennetze, diskrete Seifenblasen und ein mathematischer Spielfilm* in: *Moderne Mathematik*, Gerd Faltings (Ed.) Spektrum Verlag (1996).
- [P-06] K. Polthier, *Computereperimente in der Mathematik*, Proceedings of the Symposium "Simulation and Visualization" of IBM Bildungsgesellschaft, Herrenberg 1994.
- [P-05] K. Polthier, *Computereperimente in der Mathematik*, *Spektrum der Wissenschaft* 12 (1993).

- [P-04] K. Polthier, *Cochlea*, Siemens Nixdorf Informationssysteme DIALOG No. 1 (1992) (German Edition) und Dialog No. 2 (1992) (English Edition).
- [P-03] K. Polthier, *Bilder aus der Differentialgeometrie 1989*, Calendar with Computer Images, Vieweg Verlag 1988.
- [P-02] K. Polthier, M. Wohlgemuth, *Bilder aus der Differentialgeometrie 1988*, Calendar with Computer Images, Vieweg Verlag 1987.
- [P-01] J. Hahn, K. Polthier, *Bilder aus der Differentialgeometrie 1987*, Calendar with Computer Images, Vieweg Verlag 1986.

III 6 Mathematical Videos

- [V-14] B. Janzen, K. Polthier, *MESH*, Video, 37 min., deutsch PAL, Springer Verlag 2009.
- [V-13] B. Janzen, K. Polthier, *MESH - Bubble Excerpt*, Video, 5:54 min., in: MathFilm Festival 2008 DVD, deutsch PAL BMBF Version, Springer Verlag 2008.
- [V-12] B. Janzen, K. Polthier, *MESH - Bubble Excerpt*, Video, 5:54 min., in: MathFilm Festival 2008 DVD, deutsch PAL, Springer Verlag 2008.
- [V-11] B. Janzen, K. Polthier, *MESH - Bubble Excerpt*, Video, 5:54 min., in: MathFilm Festival 2008 DVD, englisch PAL und NTSC, Springer Verlag 2008.
- [V-10] K. Polthier, M. Aigner, T. Apostol, M. Emmer, H.C. Hege, U. Weinberg (Eds.), *MathFilm Festival 2008 - Eine Sammlung mathematischer Kurzfilme, deutsch PAL, BMBF-Version*, Video, 60 min., Springer Verlag 2008.
- [V-09] K. Polthier, M. Aigner, T. Apostol, M. Emmer, H.C. Hege, U. Weinberg (Eds.), *MathFilm Festival 2008 - Eine Sammlung mathematischer Kurzfilme*, deutsch PAL, Video, 60 min., Springer Verlag 2008.
- [V-08] K. Polthier, M. Aigner, T. Apostol, M. Emmer, H.C. Hege, U. Weinberg (Eds.), *MathFilm Festival 2008 - A collection of mathematical videos*, englisch PAL und NTSC, Video, 60 min., Springer Verlag 2008.
- [V-07] B. Janzen, K. Polthier, *MESH*, Video, 37 min. 2007, Springer Verlag.
- [V-06] K. Polthier, K. Thomas, *Quadro – a Compact Soap Bubble of Genus 4*, 1999, 1:12 min.
Published in: Video and Multimedia at 3ecm, S. Xambo-Descamps, S. Zarzuela (Eds) Springer VideoMATH 2000.
- [V-05] K. Polthier, K. Thomas, *On Gergonne's Problem*, 1999, 0:42 min., in: Video and Multimedia at 3ecm, S. Xambo-Descamps, S. Zarzuela (Eds) Springer VideoMATH 2000.
- [V-04] H.C. Hege, K. Polthier (Eds.), *VideoMath Festival at ICM'98*, Video, Springer Verlag, 1998. 75:00 min., DVD version in Springer VideoMATH series, 2005.
- [V-03] A. Friedrich, K. Polthier, M. Schmies, *Interpolating Triangle Hierarchies*, 1998, 7:14 min.

published in:

- IEEE Visualization'98, Video Review.
- Video and Multimedia at 3ecm, S. Xambo-Descamps, S. Zarzuela (Eds) Springer VideoMATH 2000.

[V-02] K. Polthier, M. Schmies, M. Steffens, C. Teitzel, *Geodesics and Waves*, 1997, 4:40 min

Published in:

- Siggraph'97 Electronic Theatre, Video Review, Issue 120, 1997.
- Video and Multimedia at 3ecm, Springer Verlag, VideoMATH 2000.
- Video Review of the Annual Computational Geometry Conference, 1999.
- VideoMath Festival at ICM'98, Springer Verlag, 1998.
- Sibgrapi'98 Video Festival, Brazil, 1998.

[V-01] A. Arnez, K. Polthier, M. Steffens, C. Teitzel, *Touching Soap Films*, 1995, 41:00 min.

Published in:

English version: Springer Verlag, 1999 in series Springer VideoMATH, and as excerpt in VideoMath Festival at ICM'98, Springer Verlag, 1998.

Portuguese version: Centro de Matemática e Aplicações Fundamentais (CMAF) at University of Lisbon, 2000, for all Portuguese schools.

German version: Bild der Wissenschaft, 1995, and Komplett-Video, 1995.

DVD version in Springer VideoMATH series (to appear 2005).

Comment: The Portuguese version was distributed to all schools in Portugal in 2000.

III 7 Mathematical Software Packages

[S-4] K. Polthier et al., *JavaView* since 1999. 3D geometry and visualization software. <http://www.javaview.de/>

[S-3] S. Dugaro, K. Polthier, *JavaViewLib* since 2001. Maple Research Powertool. <http://www.mapleapps.com/applications/>

[S-2] C. Gunn, K. Polthier et al., *Oorange* (1994-1998). A virtual laboratory for experimental mathematics.

[S-1] K. Polthier, M. Rumpf et al., *Grape* (1990-1994) Continuum mechanics and differential geometry.

IV Invited Talks

- 2011 *Hexahedral Remeshing* (Minisymposium), SIAM Conference on Geometric and Physical Modeling, Orlando, USA
- Parametrization of Simplicial Surfaces and Volumes, Instituts-Kolloquium Univ. Mainz, Mainz, Germany
- 2010 *A Mathematical Picturebook*, Raising the Public Awareness of Mathematics, Obidos, Portugal
- Images of Mathematics - a mathematical picture book*, Math&Arts, Paris, France
- Branched Covering Surfaces – Geometry, Visualization and Applications - 2010 Shape Modeling International (SMI) Conference*, Aix-en-Provence, France
- From discrete soap films to industrial geometry processing*, Colloquium Univ. Lyon 1, France
- 2009 *MathFilm Festival 2008*, Matematica e Cultura 2009, Venedig, Italy
- Parameterizing Singularities of Positive Integral Index*, Mathematics Surfaces XIII: 13th IMA International Conference, York, Großbritannien
- Combinatorial aspects of discrete differential geometry - 13th International Workshop on Combinatorial Image Analysis IWCIA'09*; Cancun, Mexico
- 2008 *Diskrete Geometrie für virtuelle Welten - Vortrag zu MathFilm Festival 2008*, Univ. Kassel
- Automatische Flächenparametrisierungen – GRIS*, Univ. Tübingen
- Diskrete Geometrie für virtuelle Welten - Vortrag zu MathFilm Festival 2008*, Univ. Regensburg
- Diskrete Geometrie für virtuelle Welten - Vortrag zu MathFilm Festival 2008*, Univ. Erlangen
- Geometric Design in Industrial Applications – SIAM 2008*, San Diego
- MESH - eine Reise durch die diskrete Geometrie - Tag der Mathematik*, Univ. Hamburg
- Einführung zum Film Möbius - Filmvorführung zum Wissenschaftssommer in Leipzig*, Wissenschaft im Dialog / Leipzig
- Diskrete Geometrie für virtuelle Welten – Vortrag zu MathFilm Festival 2008*, Univ. Karlsruhe
- Digitale Geometrie für Virtuelle Welten - Vortragsreihe "Der Mathematische Blick"*, Univ. Magdeburg
- MathFilm Festival 2008 - Vortrag zu MathFilm Festival 2008, Univ. Bonn
- Mesh Parametrization - Symmetry Awareness - Symposium on Geometric Modelling*, Dagstuhl

- Geometrie für digitale Welten* - Symposium "Raumdenken - Konstruktion des Virtuellen in der Kunst und in den Naturwissenschaften", Univ. Jena
- 2007 *QuadCover - Surface Parametrization using Branched Coverings* - Minisymposium on "Effective Processing of Surface Meshes" at SIAM Geometric Design, San Antonio, Texas
- FreeLence - Coding with free valences* - Seminar zur Geometrie, Institut für Geometrie, TU Graz
- Global Parameterization of Surface Meshes* - Minisymposium on "Geometric PDEs", ENUMATH Konferenz, Univ. Graz
- Global Parameterization of (Minimal) Surfaces* - International Congress on Minimal and Constant Mean Curvature Surfaces, Buzios, Rio de Janeiro
- Global Parameterization of Surface Meshes using Branched Coverings* - Conference on "Discrete Differential Geometry", FG Polyhedral Surfaces, TU Berlin
- Surface Parametrization - Guided by Curvature* - Conference on "Trends in Mathematica Imaging and Surface Processing", Oberwolfach
- 2006 *Optimale Geometrien im industriellen Design*, MATHEreadaktiON für Redakteuren von Schülerzeitungen, Zuse Institute Berlin
- Schöne Formen - Schöne Autos*, Studienberatung der FU Berlin, FU Berlin
- UNI IM GESPRÄCH - Mathematik studieren!, Studienberatung der FU Berlin, FU Berlin
- Geometry on Polyhedral Meshes*, Siggraph Course on "Discrete Differential Geometry", Boston
- Geometry Processing*, AIM@SHAPE Summer School, Tallinn Univ. of Technology
- Compression of Large Geometry Meshes*, Workshop on "Industrial Challenges in Geometric Modeling and Simulation" Fraunhofer Institute of Computer Graphics
- MESH - Ein Film zur Visualisierung der Geometrie* - Schülerkongress "KISS" at FU Berlin, Institute of Computer Science, FU Berlin
- 2005 Colloquium Jacques Morgenstern at INRIA Sophia Antipolis (colloquium talk)
- Lecture series (5 days) at international summer school *Mathematical Visualization*, Univ. of Maubeuge and Valenciennes, France. (invited lecture series)
- Institute of Computer Science, Free Univ. Berlin (colloquium talk)
- Institute of Mathematics, International Univ. Bremen (invited talk)
- 2004 Institute of Computer Graphics, Univ. Bonn (colloquium talk)

- Tokyo Metropolitan University, Workshop on Geometry, Japan (invited talk)
- Video presentation of MESH at Faculty of Science, Kobe University, Japan (invited presentation)
- International conference on *Integrable systems, Geometry and Visualization* at Kyushu Univ. in Fukuoka, Japan, (plenary talk)
- BIRS Workshop on Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration, Banff (invited talk)
- Workshop of EU Thematic Network MACSINET, Darmstadt (invited talk)
- Lecture series (5 days) at international summer school *Geometry and Visualization*, Univ. of Maubeuge and Valenciennes, France. (invited lecture series)
- Lecture series (3 days) at autumn school of Institute of Computer Science, Univ. Konstanz, in St. Vigil (Tirol). (invited lecture series)
- INRI, Paris, EU-Workshop *Effective Computational Geometry* (plenary talk)
- 2003 8th SIAM Conference on “Geometric Design and Computing”, Seattle (plenary talk)
- ICIAM 2003 Minisymposium “Advanced Collaborative and Visualization Environments”, Sydney (two invited talks)
- International workshop “Geometric Modelling and Differential Geometry”, Erbach (invited talk)
- International conference “Conformal Geometry of Surfaces”, Knoxville/Tennessee (plenary talk)
- Dagstuhl Seminar on “Scientific Visualization” (invited talk)
- Industry presentation on “Visualization and Mathematics”, Mauberge and Univ. of Valenciennes, France (main speaker)
- Institut für Mathematik, Universität Köln (invited talk)
- 2002 Bienal da Sociedade Brasileira de Mathematica (plenary talk)
- Colloquium talks at the departments of Mathematics of Fudan University (Shanghai), Zhejiang University (Hangzhou), Guangxi Normal University (Guilin) and Chinese Academy of Science (Beijing).
- Special Lecture Series “Mathematics in Science and Society”, Univ. of Urbana-Champaign. (invited talk)
- Wolfram Research Inc., Urbana-Champaign (invited talk)
- AMS Special Session “Optimal Geometry of Curves and Surfaces”, Madison (invited talk)

Talk in Special Lecture Series: “Da Matemática, Faces por Dobrar”, Mathematics Research Centre of Coimbra University (CMUC), Portugal (invited talk)

Artificial Intelligence and Computer Science Laboratory at University of Porto, Portugal (invited talk)

Workshop “Geometry”, Oberwolfach (invited talk)

Institut für Informatik, Universität Kaiserslautern (invited talk)

Minisymposium at the Dutch Mathematical Congress, Eindhoven, Netherlands (invited talk)

2001 AT&T “Visualization Days 2001”, Florham Park, NJ (main speaker)

Dagstuhl Seminar on “Integration of Algebra and Geometry Software Systems”

Graduiertenkolleg “Combinatorics, Geometry, Computation”, Berlin-Zürich.

Lecture Series (3 talks) within the Summerschool “Global Theory of Minimal Surfaces” of the Clay Mathematics Institute at MSRI, Berkeley (invited lecture series)

Minisymposium at SIAM meeting “Geometric Design”, Sacramento (invited talk)

Institut für Informatik, Universität Tübingen (invited talk)

Workshop “Electronic Media in Mathematics”, University of Coimbra, Portugal (invited talk)

Scientific Computing Institute (SCI) at University of Salt Lake City (invited talk)

2000 Dagstuhl Seminar on “Scientific Visualization” (invited talk)

Conference “Geometry and Applications” in Novosibirsk (invited talk)

Colloquium on “Mathematics and Arts” in Mauberge, France (plenary talk).

Conference “Math+Art+Technology” at University of Bologna (invited talk)

Centre for Experimental and Constructive Mathematics (CECM) at SFU, Vancouver (invited talk)

Special Session “Mathematics on the Internet” of Math2000 meeting of the Canadian Math. Society in Hamilton, Ontario (invited talk)

Institut für Mathematik und Informatik, Saarbrücken (invited talk)

Center for Mathematics and Applications (CMAF) at University of Lisbon (invited talk)

V Recent Grants and Industrial Research Cooperation

2011	Exist-Gründerstipendium: QuadCover GmbH
2011	Exist-Gründerstipendium: Uplivion GmbH
Since 2011	Chair of SIAM Activity Group “Geometric Design”
Since 1.7.2010	Chair of BMS (Berlin Mathematical School) Executive Board
Since 2009	Member of Executive Board (MATHEON)
Since 2009	Member of Executive Board (Berlin Mathematical School)
2010	Head of project F11 “Accelerating Curvature Flows on the GPU” of MATHEON research center (with H. Chr. Hege)
2010	Exist-Gründerstipendium: vismath GmbH
2010	Exist-Gründerstipendium: Laubwerk GmbH
2009-2011	BMBF – Forschungsförderung: <i>Transfer an der Schnittstelle zwischen mathematischer Geometrieverarbeitung und CAD</i>
2008	BMBF – MathFilm Festival 2008
Since 2008	Head of project F9 “Geometric Shape Optimization” of MATHEON research center (with M. Weiser)
2007	Research cooperation with ThyssenKrupp AG
2006-2007	Research cooperation with TubeExpert GmbH
Since 2005	Head of project F6 “Multilevel Methods on Surface Meshes” of MATHEON research center (with R. Kornhuber, H. Yserentant)
2004-2007	Research cooperation with Tebis AG München (CAD / CAM)
2004-2005	Software cooperation with SciFace AG Paderborn (MuPAD Computer Algebra System)
2004	Research cooperation with DaimlerChrysler AG Stuttgart (CAD / CAM), Joint Patent
2004-2010	Research cooperation with Mental Images Berlin (Geometric Modeling, Animation) /
2004-2008	DAAD cooperation within the Stability Pact South East Europe (DAAD Sonderprogramm “Akademischer Neuaufbau Südosteuropa”) with geometry groups at the Universities in Belgrade, Nis, Sofia and Budapest on <i>Multimedia Technologies for Mathematics and Computer Science Education</i>
Since 2002	Scientist in Charge of application area “Visualization”, DFG Research Center MATHEON

- 2002-2006 Head of project F1 “Discrete Differential Geometry” of MATHEON research center (with A. Bobenko, U. Pinkall and G. Ziegler)
- Since 2001 Software cooperation with Maplesoft, Waterloo, Canada, on research powertool *JavaViewLib*.
- 2002-2003 DAAD cooperation with University of Belgrade (with Prof. B. Wegner).
- 2001-2002 Head of project “Geometry Unheard Of” funded by Volkswagen Foundation.
- 2000-2002 DAAD cooperation with University of Budapest (with Prof. U. Simon).
- 1994-2003 Head of project “Experimental Mathematics and Visualization”, SFB 288 “Differential Geometry and Quantum Physics”

VI 1 Organized Events

- 4.10.-6.10.11 VMV 11 (Vision, Modeling, and Visualization Workshop 2011), Co-Organizer, Berlin
- 10.1.-18.3.11 "Symmetrie – Spiele mit Spiegeln" Interaktive Ausstellung zur Mathematik; Organizer; Berlin
- 24.9.10-9.1.11 Beitrag zum Thema „Visualisierung“, WeltWissen, Ausstellung im Martin-Gropius-Bau, Berlin, Organizer
- 14.-16.7.09 7th Symposium on Geometry Processing 2009; Event Chair; Berlin
- 15.-20.2.09 Computational Mathematics of Discrete Surfaces; Co-Organizer; Canada, Birs
- 1.1.-31.12.08 MathFilm Festival 2008 in Germany; Festival Chair; Germany
- 7.-11.7.08 Minisymposium on "Geometric Design in Industrial Applications" at SIAM Annual Meeting; Co-Organizer; San Diego, USA
- 4.-8.11.07 Minisymposium on "Effective Processing of Surface Meshes" at SIAM Geometric Design; Co-Organizer; San Antonio, Texas, USA
- 20.-22.9.07 DAAD workshop "Multimedia Technology for Mathematics and Computer Science Education"; Co-Organizer; Univ. Belgrad, Serbia
- 15.-18.9.07 Polyhedral surfaces and industrial applications; Co-Organizer; Strobl, Austria
- 26.-30.3.07 MathFilm Festival 2007 at Annual Meeting of German Mathematics Society; Co-Organizer; Urania, Berlin
- 21.-23.9.06 DAAD workshop "Multimedia Technology for Mathematics and Computer Science Education"; Co-Organizer; Univ. Belgrad, Serbia
- August 2006 Video Festival at International Congress of Mathematicians (ICM06) in Madrid. Co-Organizer with A. Costa.
- 26.-28.6.06 4th Symposium on Geometry Processing 2006; Paper Co-Chair; Cagliari, Sardinia
- 19.-21.6.06 11th International Workshop on Combinatorial Image Analysis (IWCIA06); Co-Organizer; HU Berlin
- 10.-13.4.06 DAAD Springschool "Geometry and Visualization"; Organizer; FU Berlin
- 30.10.-3.11.05 9th SIAM Conference on Geometric Design and Computing, Phoenix, Arizona. Member of Organizing Committee
- 20.-23.6.05 International Summerschool on "Mathematical Visualization"; Co-Organizer; Univ. of Maubeuge and Valenciennes, France

- 15.-16.7.04 Tandem-Workshop of DFG Reseach Center MATHEON on “Nonlinear Optimization and Discrete Geometry”, Berlin, Co-Organized with G. Ziegler.
- 26.-28.5.03 Tandem-Workshop of DFG Research Center MATHEON on “Geometry, Numerics and Visualization”, Berlin, Co-Organizer.
- 22.-25.5.02 International Workshop “Visualization and Mathematics ‘02”, Berlin, Co-Organizer.
- 29.10.-1.11.01 Autumn School “Geometry Unheard Of” with mathematically gifted pupils, part of the project “Geometry Unheard Of” of Volkswagen Foundation, Berlin, Organizer.
- 2.-6.9.01 SIAM/EMS Conference “Applied Mathematics in Our Changing World”, Berlin, Member of the Local Organizing Committee.
- 23.-25.11.00 International Workshop “Multimedia Tools for Communicating Mathematics”, Centro de Matemática e Aplicações Fundamentais da Universidade de Lisboa, Co-Organizer.
- 20.-27.8.98 Video Festival “VideoMath at ICM’98” in a public cinema during the International Congress of Mathematicians (more than 5000 visitors), Berlin, Co-Organizer.
- 16.-19.9.97 International Workshop “Visualization and Mathematics ‘97”, Berlin, Co-Organizer.
- 23.-27.9.96 Summer School “Scientific and Mathematical Visualization”, Ettenheim, Co-Organizer.
- 29.5.-2.6.95 International Workshop “Visualization and Mathematics ‘95”, Berlin, Co-Organizer.
- 1.6.95 Performance “Cyber Math”, public showing of international mathematical videos in a public cinema (more than 500 visitors), Berlin, Co-Organizer.
- 19.-24.3.95 Workshop “Experimental Methods in Mathematics”, Oberwolfach, Co-Organizer.
- Since August 94 Berlin Colloquium for Scientific Visualization, Co-Organizer.

VI 2 Program Committee

- 2012 Symposium on Computational Geometry 2012 (SoCG2012), Member Program Committee
- 2011 International Workshop on Combinatorial Image Analysis (IWCIA 2011), Member of Program Committee, Madrid, Spain
- Symposium on Geometry Processing 2011, Member of Program Committee Lausanne, Switzerland
- SIAM Conference on Geometric and Physical Modeling, Member of Program Committee, Orlando, USA
- TopoInVis 2011, Member of Program Committee, Zurich, Switzerland
- 24th Conference on Graphics, Patterns and Images (Sigrapi 2011), Member of Program Committee, Maceió, Brazil
- IEEE CVPR 2011 Conference, Member of Program Committee, Colorado Springs, USA
- 2010 23. Conference on Graphics, Patterns and Images (Sibgrapi 2010), Member of Program Committee, Rio Grande do Sul, Brazil
3. Workshop on Non-rigid Shape Analysis and Deformable Image Alignment NORDIA, Member of Program Committee, San Francisco, USA
5. ACM Symposium on Solid and Physical Modeling, Member of Program Committee, Haifa, Israel
- International Congress on Mathematical Software, Member of Program Committee, Kobe, Japan
- Geometric Modeling and Processing (GMP), Member of Program Committee, Castro Urdiales, Spain
- 2009 7th Symposium on Geometry Processing 2009 (SGP09), Member of Program Committee, Berlin, Germany
- 14th Vision, Modeling, and Visualization 2009 (VMV09), Member of Program Committee, Braunschweig, Germany
- Brazilian Symposium on Computer Graphics and Image Processing (Sibgrapi 2009), Member of Program Committee, Rio de Janeiro, Brazil
- Eurographics Symposium on Visualization 2009 (EuroVis09), Member of Program Committee, Berlin, Germany
- SIAM/ACM Joint Conference on Geometric and Physical Modeling - Member of Program Committee, San Francisco, USA
3. Workshop on Topological Methods in Data Analysis and Visualization - Member of Program Committee, Snowbird, Utah, USA

- 2008 Brazilian Symposium on Computer Graphics and Image Processing (Sibgrapi 2008) - Member of Program Committee, Campo Grande, Mato Grosso do Sul, Brazil
- Vision, Modeling, Visualisierung - Member of Program Committee, Konstanz, Germany
7. Conference on "Mathematical Methods for Curves and Surfaces" - Member of Program Committee, Toensberg, Norway
- 12th International Workshop on Combinatorial Image Analysis (IWCIA08) - Member of Program Committee, Buffalo, NY, USA
- 6th Symposium on Geometry Processing 2008 (SGP08) - Member of Program Committee, Copenhagen, Denmark
- 2007 5th Symposium on Geometry Processing 2007 (SGP07) - Member of Program Committee, Barcelona, Spain
- NASAGEM 2007 Workshop - Member of Program Committee, Hannover, Germany
- 12th Vision, Modeling, and Visualization 2007 (VMV07) - Member of Program Committee, Saarbrücken, Germany
- Workshop "Educational Multimedia and Multimedia Education" at ACM EMME07 - Member of Program Committee, Augsburg, Germany
- International Conference on Mathematical Aspects of Computer and Information Sciences (MACIS 2007) - Member of Program Committee, Paris, France
- 10th SIAM Conference on Geometric Design and Computing - Member of Scientific Committee, San Antonio, Texas, USA
- 2006 1st IEEE International Workshop on Multimedia Technologies for E-Learning (MTEL) - Member of Program Committee, San Diego, USA
- 11th Vision, Modeling, and Visualization 2006 (VMV06) - Member of Program Committee, Aachen, Germany
- 2005 9th SIAM Conference on Geometric Design and Computing - Member of Scientific Committee, Phoenix, Arizona, USA
- Invitation as Co-Organizer of the Mathematics *Video Festival at ICM 2006*, Madrid.
- 2004 Member of the Organizing Committee, Ninth SIAM Conference on Geometric Design and Computing, in Phoenix, Arizona, in 2005.
- 2002 Member of the Program Committee, International Congress of Mathematical Software, Beijing.

IX Patents

[Pat-01] DE 10 2006 013 860.0. Verfahren und Vorrichtung zur Erzeugung einer räumlichen Darstellung, 04.09.2008. Hahn/Polthier, DaimlerChrysler AG.

IX Spin-Off Companies

2011 Uplivion GmbH

2010 Laubwerk GmbH

2010 vismath GmbH