

# Texas Geometry and Topology Conference

## Summary of Previous Meetings

National speakers are indicated by (\*).

### Meeting 1: University of Houston, March 10-12, 1989

Jeff Cheeger\*, State University of New York, Stony Brook

*Complete manifolds of bounded curvature and finite volume*

S. S. Chern\*, University of California, Berkeley

*Dupin submanifolds*

L. Zhiyong Gao, Rice University

*Convergence theorems for Riemannian manifolds*

Robert Gompf, The University of Texas, Austin

*Topology of algebraic surfaces*

Robert Hardt, Rice University

*Symmetric and asymmetric harmonic maps*

Jon Pitts, Texas A&M University

*Applications of geometric variational methods in the large*

Karen Uhlenbeck, The University of Texas, Austin

*Non-minimal solutions to Yang-Mills equations*

### Meeting 2: University of Texas, Austin, December 1-3, 1989

Jaigyoung Choe, Rice University

*Isoperimetric inequality, index and stability of a minimal surface*

Ezra Getzler\*, Massachusetts Institute of Technology

*Analysis on loop groups*

Robion Kirby\*, University of California, Berkeley

*Witten-Reshetikin-Turaev invariants of 3-manifolds*

Raymond Lickorish, Visiting The University of Texas, Austin

*3-manifold invariants from the combinatorics of the Jones polynomial*

Frank Quinn\*, Virginia Polytechnic Institute and State University

*Gromov convergence of stratified sets*

Michael Wolf, Rice University

*Harmonic maps and Teichmüller theory*

Phillip Yasskin, Texas A&M University

*The diffeomorphism group as a partial indirect product*

### Meeting 3: Rice University, March 30 - April 1, 1990

David Bao, University of Houston

*The geometric origin of a highly degenerate Monge-Ampère equation*

Robert Bryant\*, Duke University

*Twistors and holonomy*

Robin Forman, Rice University

*Torsion and a theorem of Milnor*

Dan Freed, The University of Texas, Austin  
*Finite quantum field theories*  
Cameron Gordon, The University of Texas, Austin  
*Dehn surgery*  
Reese Harvey, Rice University  
*Chern currents*  
Shangyu Ji, University of Houston  
*Kähler currents on compact complex manifolds*  
Leon Simon\*, Stanford University  
*Asymptotics near singular points*

**Meeting 4: North Texas State University, November 6-8, 1990**  
**American Mathematical Society, Regional Meeting, Special Session**

Ara Basmajian, University of Oklahoma  
*The orthogonal spectrum of a hyperbolic manifold*  
Charles P. Boyer, University of New Mexico  
*The hyperkähler geometry of instanton moduli*  
A. Delshams, University of Barcelona & R. de la Llave, University of Texas, Austin  
*Convergent perturbation theories for volume preserving flows and maps*  
Reinhard O. W. Franz, University of Bielefeld)  
*Counting periodic tilings of the plane*  
Brian Kasper, University of Texas, Austin  
*Examples of symplectic structures of fiber bundles*  
Daniel P. Lathrop, University of Texas, Austin  
*The observation of saddle periodic orbits in physical systems*  
Terry Lohrenz, Rice University  
*Determinants on CR manifolds*  
Benjamin M. Mann, University of New Mexico  
*The total Chern class is an infinite loop*  
R. Daniel Mauldin, University of North Texas  
*Topological properties of some attractors for cylinder maps*  
Alec Norton, University of Texas, Austin  
*The Denjoy problem in two dimensions*  
Thomas Otway, University of Texas, Austin & Karen Uhlenbeck, University of Texas, Austin  
*The p-Yang-Mills equations*  
Johan Råde, University of Texas, Austin  
*The gradient flow for the Yang-Mills functional in two and three dimensions*  
Daniel B. Swearingen, Rice University  
*On the geometry of the moduli space of flat tori*  
Marty Ross, Rice University  
*Schwarz' P-surface is stable*  
Daniel S. Silver, University of South Alabama  
*Growth rates and knots*  
Laurette S. Tuckerman, University of Texas, Austin  
*Bifurcation analysis of the Eckhaus instability*

S. Walter Wei, University of Oklahoma  
*Some Quasilinear systems with a lack of ellipticity*  
Susan G. Williams, University of South Alabama  
*Lattice Invariants for Sofic Shifts*

### **Meeting 5: Texas A&M University, April 12-14, 1991**

Ilya Bakelman, Texas A&M University  
*Hypersurfaces with prescribed mean curvature in Riemannian spaces*  
Tim Cochran, Rice University  
*Homology cobordism and links*  
Robert Gompf, University of Texas, Austin  
*Irreducible 4-manifolds need not be complex*  
Paul Goodey, University of Oklahoma  
*Radon transforms and the geometry of convex sets*  
Richard Schoen\*, Stanford University  
*Some new applications of harmonic maps to rigidity problems*  
Stephen Semmes, Rice University  
*A generalization of Riemann mappings to several complex variables*  
Peter Stiller, Texas A&M University  
*On the geometry and arithmetic of elliptic surfaces*  
Clifford Taubes\*, Harvard University  
*Stable uniformization of 4-dimensional manifolds*

### **Meeting 6: University of Texas, Austin, October 18-20, 1991**

David Bao, University of Houston  
*A Harnack inequality for the  $p$ -Laplacian diffusion equation*  
Michael Freedman\*, University of California at San Diego  
*From annulus conjecture to signal processing*  
John Hempel, Rice University  
*Positive diagrams for 3-manifolds*  
Ben Mann, University of Texas, Austin  
*The topology of moduli spaces and the Atiyah-Jones conjecture*  
Dusa McDuff\*, New York University  
*Pseudo-holomorphic curves in symplectic 4-manifolds*  
Karen Uhlenbeck, University of Texas, Austin  
*Global Analysis: A subject before its time?*  
Tom Vogel, Texas A&M University  
*Capillary surfaces in wedges and cones*

### **Meeting 7: The University of Houston, February 7-9, 1992**

Dan Burns\*, University of Michigan  
*Development maps in CR and complex hyperbolic geometry*  
S. S. Chern\*, University of California at Berkeley  
*Closed  $W$ -surfaces*  
Mike Field\*, Sydney University

*Geometric and topological methods in the analysis of symmetry breaking*  
Robin Forman, Rice University

*Spectral sequences via harmonic forms*  
Dan Freed, University of Texas, Austin

*Variations on the Chern-Simons form*  
Shanyu Ji, University of Houston

*Currents, Metrics and Moishezon manifolds*  
Robert Kusner\*, University of Massachusetts

*The geometry of constant mean curvature surfaces*  
Sheldon Newhouse\*, University of North Carolina

*Symbolic dynamics in low-dimensional systems*  
Chris Pope, Texas A&M University

*W-algebras and W-strings*  
Leon Simon\*, Stanford University

*The singular set of minimal surfaces and harmonic maps*

## **Meeting 8: San Antonio, Texas, January 13-16, 1993** **American Mathematical Society, Winter Meeting, Special Session**

James W. Anderson

*Intersections of topologically tame Kleinian groups*

Dave Auckly, University of Texas, Austin

*Topological methods to compute Chern-Simons invariants*

J. Scott Carter, University of South Alabama & Masahico Salto, University of Texas, Austin

*Movie diagrams and simplex equations*

Edward G. Dunne, Oklahoma State University

*Twistor theory for indefinite Kähler manifolds*

Mario Eudave-Muñoz, Ciudad University, Mexico

*Non-hyperbolic manifolds obtained by Dehn surgery on an hyperbolic knot*

Dana S. Fine, University of Massachusetts

*Chern-Simons theory via path integrals*

Patrick M. Gilmer, Louisiana State University

*Floppy curves and applications to nonsingular real algebraic curves*

William C. Jagy, Midwestern State University

*Classifying sphere-foliated CMC submanifolds of space forms*

Amelia C. Jones, University of Oregon

*Two-generator links*

Kerry N. Jones, University of Texas, Austin & Alan W. Reid, University of Texas, Austin

*Nonsimple geodesics in hyperbolic 3-manifolds*

Edward C. Keppelmann, Texas A&M University

*The Nielson theory of fibrations*

Georgi Kamberov, Rice University

*Initial boundary value problems for the Ricci flow*

Guojun Liao, University of Texas, Arlington

*Volume preserving diffeomorphisms of a manifold with boundary*

Robert McLean, Texas A&M University

*Recent results in the holonomy manifolds with an affine connection*

Sassan Mohseni, University of Dallas

*Continuity of the Liouville form of metrics of non-positive curvature*

Chris L. Morin, University of Texas, Austin

*Homotopy unknotting number*

Max Neumann-Coto, University Nacional Autonoma de Mexico, Mexico

*Least area tori in 3-manifolds*

Ken Richardson, Rice University

*Critical points of the determinant of the Laplace operator*

Edith Starr, Rice University

*Curves in the boundary of a handlebody*

Ying-Quing Wu, University of Texas, Austin

*Unlinked graphs in 3-manifolds*

### **Meeting 9: Rice University, April 16-18, 1993**

Mark Brittenham, University of Texas, Austin

*Essential laminations in non-Haken 3-manifolds*

Huai-Dong Cao, Texas A&M University

*Harnack estimates for heat flows*

Yakov Eliashberg\*, Stanford University

*Topology of 2-knots and symplectic geometry*

Rick Litherland, Louisiana State University

*Numerical invariants for knotted graphs*

Howard Masur\*, University of Illinois, Chicago

*A random walk on the mapping class group and the boundary of Teichmüller space*

Matthew Nicol, University of Houston

*Detecting the symmetry of attractors: an approach based on ergodicity*

Amy Radunskaya, Rice University

*Detecting geometric and statistical properties of attractors*

Walter Wei, University of Oklahoma

*p-harmonic maps with applications to topology geometry, and PDE's*

Shiah-Sen Wang, Rice University

*Energy minimizing sections of bundles*

John Zweck, Rice University

*Chern currents of singular connections associated with a compactified bundle*

### **Meeting 10: Texas A&M University, October 22-23, 1993**

#### **American Mathematical Society, Regional Meeting, Special Session**

James Anderson, Rice University

*Defects of Schottky groups*

Dave Auckly, University of Texas, Austin

*An irreducible homology sphere which is not Dehn*

T. David Hendricks, Texas A&M University

*Existence of hypersurfaces of prescribed mean curvature*

Paulo Lima-Filho, Texas A&M University

*Algebraic cycles as a topological group functor*  
Terry Lohrenz, Rice University  
*the spectrum of the number operator in path space*  
Lorenzo Sadun, University of Texas, Austin  
*Moduli of singular Yang-Mills fields*  
Yoshi Tonegawa, Rice University  
*Complete constant mean curvature surfaces in hyperbolic space*  
Karen Uhlenbeck, University of Texas, Austin  
*Dipole solutions to the meron problem*  
Louis Zulli, Rice University  
*A matrix for computing the Jones polynomial of a knot*

### **Meeting 11: University of Texas, April 15-17, 1994**

Martin Betz, University of Texas, Austin  
*Symplectic Floer homology operations*  
Robert Fintushel\*, Michigan State University  
*2-spheres and the Donaldson series*  
Martin Golubitsky, University of Houston  
*Symmetry attractors*  
Ruth Gornet, Texas Tech University  
*Spectral geometry on Riemannian nilmanifolds*  
James Milgram\*, University of New Mexico  
*The geometry of instanton moduli spaces on spheres and ruled surfaces*  
Dan Pollack, Mathematical Sciences Research Institute  
*Singular Yamabe metrics and constant mean curvature*  
Richard Stong, Rice University  
*Topological embeddings of 2-spheres in 4-manifolds*  
Panel Discussion: *Undergraduate research*  
Moderator: Hugo Rossi\*, University of Utah  
Murad Ozaydin, University of Oklahoma  
Alice Underwood, University of North Texas  
Phil Yasskin, Texas A&M University

### **Meeting 12: Texas A&M University, November 11-13, 1994**

Andrew Casson\*, University of California, Berkeley  
*A possible approach to the geometrization conjecture*  
Davide Cervone\*, The Geometry Center  
*The National Science and Technology Research Center for Computation  
and Visualization of Geometric Structures: a postdoc's perspective*  
Dan Freed, University of Texas, Austin  
*Late breaking news in gauge theory*  
Robert Gompf, University of Texas, Austin  
*Cutting and pasting symplectic manifolds*  
Richard Hamilton\*, University of California, San Diego  
*Problems on the Ricci flow on 3-manifolds*

Shanyu Ji, University of Houston

*On Riemann's mapping problem*

Blaine Lawson\*, SUNY at Stony Brook

*On moving families*

Jean Taylor\*, Rutgers University

*Crystalline surface diffusion*

DaGang Yang, Tulane University

*Bounded harmonic forms on complete manifolds*

### **Meeting 13: Rice University, April 7-9, 1995**

Pawel Gajer, Texas A&M University

*A geometric interpretation of smooth Deligne cohomology*

Cameron Gordon, University of Texas, Austin

*Which knot has the most exceptional surgeries?*

Steve Hurder\*, University of Illinois, Chicago

*Coarse chaos*

Tom Mrowka\*, California Institute of Technology

*The Seibert-Witten equations and the topology of four-manifolds*

Efton Park, Texas Christian University

*Index theory on odd-dimensional manifolds*

Vern Paulsen, University of Houston

*Von Neumann's inequality, completely bounded maps, and the*

*Caratheodory and Kobayashi metrics*

William Veech, Rice University

*Delaunay partitions*

Panel Discussion: *Helping minorities and first generation collegians succeed in freshman mathematics*

Moderator: Uri Treisman, University of Texas, Austin

Nancy King, Texas Southern University

Cynthia Lanus, Milby High School, Houston

### **Meeting 14: University of Texas, Austin, November 10-12, 1995**

Mike Anderson\*, State University of New York, Stony Brook

*Scalar curvature and geometrization for 3-manifolds*

Francis Bonahon\*, University of Southern California

*Hyperbolic convex hulls*

Jim Cannon\*, Brigham Young University

*Recognizing constant curvature groups from planar subdivision rules*

Mike Freedman\*, University of California, San Diego

*A nilpotent classification of closed 3-manifolds*

Jon Pitts, Texas A&M University

*Computing least area hypersurfaces spanning arbitrary boundaries*

David Morrison\*, Duke University

*Supersymmetric maps and the topology of Calabi-Yau manifolds*

Hyam Rubinstein\*, University of Melbourne

*Singular incompressible surfaces in 3-manifolds*

**Meeting 15: University of Houston, February 23-25, 1996**

S. S. Chern\*, Mathematical Sciences Research Institute

*Welcoming Remarks*

Robert Bryant\*, Duke University

*The geometry of Finsler surfaces of constant curvature*

Jeff Cheeger\*, Courant Institute

*Manifolds with Ricci curvature bounded below*

Reese Harvy, Rice University

*Atomic sections and Chern currents*

Min Ru, University of Houston

*On the Gauss map of minimal surfaces in  $n$ -dimensional Euclidean space*

Lorenzo Sadun, University of Texas, Austin

*Aperiodic tiling and pinwheel geometry*

Ying Shen, Texas A&M University

*Rigidity of stable minimal hypersurfaces*

Zhongmin Shen\*, I.U.P.U.I.

*Topology of complete manifolds with non-negative Ricci curvature*

Special Presentation: *Teaching ODE's using new technology*

John Polking, Rice University

Martin Golubitsky, University of Houston

**Meeting 16: Rice University, October 11-13, 1996**

Mladen Bestvina\*, University of Utah

*Homotopy hyperbolic 3-manifolds are hyperbolic*

Huai-Dong Cao, Texas A&M University

*Two theorems of Bernstein type*

Toby Colding\*, New York University

*Weyl type bounds for harmonic functions*

Fanghua Lin\*, University of Chicago

*Harmonic and quasi-harmonic spheres*

Robert Meyerhoff\*, Boston College

*Homotopy hyperbolic 3-manifolds are hyperbolic*

Alan Reid, University of Texas, Austin

*Closed essential surfaces in bounded 3-manifolds*

Richard Stong, Rice University

*A maximally contractive map from  $Z^2$  to  $Z^3$*

Karen Uhlenbeck, University of Texas, Austin

*Two interesting geometric evolution equations*

**Meeting 17: Texas Christian University, February 7-9, 1997**

Robin Forman, Harvard University and Rice University

*Combinatorial differential topology and geometry*

Claude LeBrun\*, SUNY Stony Brook

*On 4-dimensional Einstein manifolds*

Paulo Lima-Filho, Texas A&M University

*Generating functions for Euler-Chow invariants of projective varieties*

Darryl McCullough, University of Oklahoma

*Diffeomorphisms of 3-manifolds*

Kate Okikiolu\*, MIT and Princeton University

*The determinant of the Laplacian for 3-manifolds*

Jonathan Rosenberg\*, University of Maryland

*Secrets of the signature operator*

Gerard Walschap, University of Oklahoma

*Metric fibrations in spaces of nonnegative curvature*

Xingru Zhang, Oklahoma State University

*Virtual Haken Dehn surgery on knots in reducible 3-manifolds*

Panel Discussion: *Research Experiences for Undergraduates*

Rhonda Hatcher, Texas Christian University

Ara Basmajian, University of Oklahoma

George Gilbert, Texas Christian University

## **Meeting 18: Rice University, November 14-16, 1997**

Tim Cochran, Rice University

*Finite type invariants for 3-manifolds*

John Lott\*, University of Michigan

*Spinors and collapsing*

Mikhail Lyubich\*, SUNY Stony Brook

*Hyperbolic laminations associated with rational maps*

John Millson\*, University of Maryland, College Park

*On representation varieties of Artin groups, projective arrangements, and the fundamental groups of smooth complex varieties*

Dennis Sullivan\*, CUNY Graduate Center and SUNY Stony Brook

*On the smooth continuum model used in geometry and the natural sciences*

Abby Thompson\*, University of California, Davis

*Two parameter graphics for 3-manifolds and knots*

Shmuel Weinberger\*, University of Chicago

*Arithmetic groups and variational problems for Riemannian manifolds*

## **Meeting 19: University of Houston, April 24-26, 1998**

Doug Bullock\*, University of Maryland

*Lattice gauge field theory and quantum invariants*

Marcus Cohen\*, New Mexico State University

*Quadrispin geometry and the dynamics of a unified field*

John Oprea\*, Cleveland State University

*Differential geometry, computers and today's science majors*

Lorenzo Sadun, University of Texas

*Parallel bundles and symmetric spaces*

Barbara Shipman\*, University of Rochester

*The geometry of the honeybee's dance language*

Barbara Shipman\*, University of Rochester

*Convex polytopes and momentum mappings in the geometry of generalized flag manifolds:  
a physical interpretation and connections with honeybee*

Barbara Shipman\*, University of Rochester

*Convex polytopes and torus actions on generalized flag manifolds in the geometry of a  
completely integrable dynamical system*

Jian Zhou, Texas A&M University

*Equivariant Cohomology, Localization and Applications*

## **Meeting 20: University of Texas, October 16-18, 1998**

Dave Auckly\*, Kansas State University

*The geometry of balance*

Helmut Hofer\*, Courant Institute

*The concept of energy in symplectic geometry*

Jacques Hurtubise\*, McGill University

*Integrable systems and surfaces*

Sheldon Katz\*, Oklahoma State University

*Singularities and string theory*

Ken Stephenson\*, University of Tennessee

*A "regular" pentagonal tiling of the plane*

Margaret Symington, University of Texas at Austin

*Symplectic rational blowdowns*

Jon Wolfson\*, Michigan State University

*The Plateau problem for lagrangian surfaces*

## **Meeting 21: Texas Tech University, February 26-28, 1999**

Lisa Traynor\*, Bryn Mawr

*Legendrian Tangles*

Sergio Fenley\*, Washington University in St. Louis

*Immersed surfaces transverse to pseudo-Anosov flows and virtual fibers*

Ken Richardson, Texas Christian University

*Group actions and the heat equation*

Tanya Christiansen\*, University of Missouri - Columbia

*Spectral theory for some noncompact manifolds*

Jim Anderson\*, University of Southampton and Rice University

*Locally free Kleinian groups and hyperbolic manifolds*

Charles Boyer\*, University of New Mexico

*Einstein manifolds via contact geometry*

Patrick Eberlein\*, University of North Carolina - Chapel Hill

*Geometry of two-step nilpotent Lie groups*

Peter Petersen\*, University of California - Los Angeles

*The Hitchin-Thorpe inequality for noncompact 4-manifolds*

## Meeting 22: Texas A&M University, November 12-14, 1999

Dan Freed, University of Texas at Austin

*Actions and anomalies*

Bon Lian\*, Brandeis University

*Potential function of a Calabi-Yau threefold*

Rafe Mazzeo\*, Stanford University

*Singular Monge-Ampere equations and critical exponent problems*

Bill Minicozzi\*, Johns Hopkins University

*Embedded minimal tori in 3-manifolds and applications*

Stephen Semmes, Rice University

*Quasi-minimizing surfaces and applications to sets with topological nondegeneracy*

Ron Stern\*, University of California, Irvine

*Surfaces in smooth and symplectic 4-manifolds*

Chuu-Lian Terng\*, Northeastern University

*Geometry of the  $n$ -wave equation*

Gang Tian\*, MIT

*Kahler Ricci solitons*

## Meeting 23: University of Texas, February 25-27, 2000

Danny Calegari\*, University of California, Berkeley

*Taut foliations with one-sided branching*

Bob Edwards\*, University of California, Los Angeles

*Compact non-Lie group actions*

Bob Gompf, University of Texas, Austin

*Topologically characterizing symplectic manifolds*

John Hempel, Rice University

*Stack intersection numbers as a measure of complexity for splittings of 3-manifolds*

Steve Kerckhoff\*, Stanford University

*A priori bounds for hyperbolic Dehn surgery*

Hyam Rubinstein\*, University of Melbourne and Stanford University

*Recognizing bundle covers of some 3-manifolds*

Peter Teichner\*, University of California, San Diego

*A survey on von Neumann signatures*

Constantin Teleman, University of Texas at Austin

*Quantization of the Hitchin system*

## Meeting 24: Rice University, November 10-12, 2000

Chris Connell\*, University of Illinois, Chicago

*Bounding the degree of maps*

Misha Kapovich\*, University of Utah

*Periods of abelian differentials and dynamics*

Tao Li, The University of Texas, Austin

*Laminar branched surfaces in 3-manifolds*

Kefeng Liu\*, Stanford University

*Heat kernel, symplectic geometry, moduli spaces, and finite groups*

Nikolai Nadirashvili\*, University of Chicago

*Critical points of eigenfunctions*

Andrei Okounkov\*, University of California, Berkeley

*Random trees and moduli of curves*

Karen Vogtmann\*, Cornell University

*The geometry of spaces of finite trees*

Jian Zhou\*, M.I.T.

*Vertex algebras in differential geometry*

## **Meeting 25: Texas Christian University, February 23-25, 2001**

Ara Basmajian, University of Oklahoma

*A generic geometric property of constant curvature 3-manifolds*

Phil Bowers\*, Florida State University

*Computing conformal structures of curved surfaces*

Leonid Friedlander\*, University of Arizona

*The differential invariant related to the first value of the Laplacian*

Razvan Gelca, Texas Tech University

*Kauffman bracket skein modules and character varieties*

Franz Kamber\*, University of Illinois, Champaign-Urbana

*Equivariant dimensional reduction and the Bott-Borel-Weil theorem*

John Roe\*, The Pennsylvania State University

*Topological implications of amenability*

Machiel van Frankenhuysen\*, Rutgers University

*The ABC Conjecture implies Vojta's height inequality for curves*

Frederico Xavier\*, University of Notre Dame

*Some geometric and analytical questions relating to global injectivity*

## **Meeting 26: Texas A&M University, November 2-4, 2001**

Luis Caffarelli, University of Texas, Austin

*Plane like minimal surfaces in periodic media, and related problems*

Richard Hamilton\*, Columbia University and University of California, Irvine

*Geometric estimates for the logarithmic porous medium equation*

Robert Hardt, Rice University

*Bubbling, bubbles, and scans*

Gerhart Huisken\*, University of Tuebingen

*Neck pinching in mean curvature flow*

Paulo Lima-Filho, Texas A&M University

*Twisted multiplicative transfers and characteristic classes*

Kefeng Liu\*, University of California, Los Angeles

*Mathematical results inspired by physics*

Paul Yang\*, Princeton University

*Conformal invariants and a sphere theorem*

## **Meeting 27: Texas Tech University, April 5-7, 2002**

Ivan Avramidi, New Mexico Institute of Mining and Technology

*Heat kernel asymptotics*

Peter Buser\*, Ecole Polytechnique Federale de Lausanne

*Spectral rigidity of Fuchsian groups of small signature*

Lisa DeMeyer, Oklahoma State University

*Geodesics in nilpotent groups*

Stephen Fulling, Texas A&M University

*Making quantization and pseudodifferential operators geometrically correct*

Rob Kusner\*, University of Massachusetts, Amherst

*Tying knots with spaghetti*

Ernesto Lupercio\*, University of Wisconsin, Madison

*Orbifolds, gerbes, and Deligne cohomology*

Liviu Nicolaescu\*, University of Notre Dame

*Seiberg-Witten invariants and surface singularities*

Peter A. Perry\*, University of Kentucky, Lexington

*Determinants of Laplacians, scattering poles, and isopolar sets of Riemann surfaces*

## **Meeting 28: The University of Texas at Austin, October 11-13, 2002**

Jean Pierre Bourguignon\*, Institut des Hautes Etudes Scientifiques

*Improved Kato inequalities and geometric applications*

Steven Bradlow\*, University of Illinois at Urbana-Champaign

*Moduli spaces of augmented bundles: theory and practice*

Philip Candelas, University of Texas, Austin

*Zeta Function for the Quintic Threefold*

Antonella Grassi\*, University of Pennsylvania

*Geometry of large  $N$ -dualities*

Takashi Kimura\*, Boston University and Institute for Advanced Study

*On integrable systems and cohomological field theories*

Rick Schoen\*, Stanford University

*Yamabe invariants of three-manifolds*

Jalal Shatah\*, Courant Institute of Mathematical Sciences

*Geometric Dispersive Equations*

Clifford Taubes\*, Harvard University

*Instabilities and interquark forces*

## **Meeting 29: University of Houston, February 21-23, 2003**

Michael Gage\*, University of Rochester

*Minkowski geometry, curve shortening, and flow by weighted mean curvature*

Roland Glowinski, University of Houston

*Numerical methods for the Dirichlet problem for the two-dimensional elliptic Monge-Ampere equation: from augmented Lagrangians to incompressible Navier-Stokes equations solution methods*

Brendan Hassett, Rice University

*Flipping the moduli space of curves*

Tamas Hausel, The University of Texas at Austin

*Mirror symmetry, Langlands duality, and representations of finite groups of Lie type*  
Jacob Sturm\*, Rutgers University  
*Scalar curvature and Deligne pairing*  
Jiaping Wang\*, University of Minnesota  
*Geometry and topology of manifolds with positive spectrum*  
Pit-Mann Wong\*, University of Notre Dame  
*p-adic Monge-Ampere equations and related problems*

### **Meeting 30: Rice University, October 31-November 2, 2003**

Daniel Allcock, The University of Texas at Austin  
*The fundamental group of the space of smooth cubic surfaces*  
Richard Kenyon\*, Université Paris-Sud and Princeton University  
*Asymptotics of random discrete interfaces*  
Peter Ozsv'ath\*, Columbia University  
*Geometric transitions and integrable systems*  
Tony Pantev\*, University of Pennsylvania  
*Floer homology and Dehn fillings*  
Mihnea Popa\*, Harvard University  
*Asymptotic intersection numbers and restricted volumes*  
Jason Starr\*, M.I.T.  
*Sections of algebraic fibrations*  
Genevieve Walsh, The University of Texas at Austin  
*Some examples of virtually Haken and virtually fibered three-manifolds*  
Mu-Tao Wang\*, Columbia University  
*Mean curvature flows of Lagrangian submanifolds*

### **Meeting 31: Texas Christian University, February 27-29, 2004**

Cameron Gordon, The University of Texas at Austin  
*Knots with unknotting number 1*  
James Heitsch\*, University of Illinois, Chicago  
*Index theory and non-commutative geometry*  
Theron J. Hitchman, Rice University  
*Rigidity of weakly hyperbolic standard actions of lattices in rank one Lie groups on nil-manifolds*  
John Lott\*, University of Michigan  
*Towards a synthetic notion of Ricci curvature*  
Stephen Semmes, Rice University  
*Happy fractals*  
Krishnan Shankar\*, University of Oklahoma  
*Spherical rank rigidity and Blaschke manifolds*  
Mikhail Shubin\*, Northeastern University  
*Spectral properties of Schrödinger operators*  
Magdalena Toda, Texas Tech University  
*Lorentz conformal structures and the wave equation*

### **Meeting 32: Texas A&M University, October 29-31, 2004**

Charles Boyer, University of New Mexico

*Einstein metrics on spheres*

Simon Brendle\*, Princeton University

*The concentration-compactness principle and the Yamabe flow in conformal geometry*

Huai-Dong Cao\*, Lehigh University

*Second variation of Perelman's entropies and stability of Ricci solitons*

Tobias Colding\*, New York University

*The Calabi-Yau conjectures for embedded surfaces*

Benson Farb\*, University of Chicago

*Hidden symmetry*

Joseph Landsberg\*, Harvard University/Texas A&M University

*On the complexity of matrix multiplication*

Chiu-Chu Liu\*, Harvard University

*Gromov-Witten invariants of toric Calabi-Yau threefolds*

Brian White\*, Stanford University

*New applications of mean curvature flow to minimal surfaces*

### **Meeting 33: Texas Tech University, February 25-27, 2005**

Ruth Gornet, University of Texas at Arlington

*The length spectrum and isospectrality*

Brian Hall\*, University of Notre Dame

*The range of the heat operator*

Klaus Kirsten, Baylor University

*Zeta and eta invariants for Dirac operators with Chiral bag boundary conditions*

John Sullivan\*, Technical University of Berlin

*Geometric knot theory*

Craig Sutton\*, University of Pennsylvania

*Methods for constructing isospectral manifolds*

Alejandro Uribe\*, University of Michigan

*Quantizing (non-Kähler) compact symplectic manifolds*

V. S. Varadarajan\*, University of California at Los Angeles

*Super geometry and modern physics*

Zhenghan Wang\*, Indiana University

*Noncommutative geometry and quantum computing*

### **Meeting 34: The University of Texas at Austin, September 30-October 2, 2005**

David Ben-Zvi, The University of Texas at Austin

*Langlands Duality for Representations of Real Lie Groups*

George Daskalopoulos\*, Brown University

*Harmonic maps on singular domains and geometric rigidity*

John Etnyre\*, University of Pennsylvania

*Contact geometry and open book genus*

Nancy Hingston\*, College of New Jersey

*Periodic Solutions of Hamilton's Equations on Tori*  
Sheldon Katz\*, University of Illinois  
*Donaldson-Thomas invariants of complex projective threefolds*  
Rafe Mazzeo\*, Stanford University  
*Some linear and nonlinear elliptic problems in higher rank geometries*  
Dennis Sullivan\*, SUNY at Stony Brook  
*The free loop space of a manifold and the moduli space of Riemann surfaces*  
Paul Seidel\*, University of Chicago  
*Khovanov meets Ozsvath-Szabo*

### **Meeting 35: University of Houston, February 17-19, 2006**

(Note: This meeting was a special themed conference in memory of Professor S. S. Chern.)

Robert L. Bryant\*, Duke University  
*Finsler 2-spheres of constant curvature*  
Brendan Hassett, Rice University  
*Compact moduli spaces for surfaces of general type*  
Shanyu Ji, University of Houston  
*Rigidity problems for proper holomorphic maps between balls*  
Dan Knopf, The University of Texas at Austin  
*Ricci flow with surgery, as applied to Poincaré*  
Zhongmin Shen\*, NSF and IUPUI  
*Randers metrics of scalar flag curvature*  
Yum-Tong Siu\*, Harvard University  
*Multiplier ideals – a new technique linking analysis and algebraic geometry*  
Shoucheng Zhang\*, Stanford University  
*Chern numbers and Chern–Simons terms in physics*

### **Meeting 36: Rice University, October 27-29, 2006**

Joan Birman\*, Columbia University  
*Invariants of Heegaard splittings and of 3-manifolds*  
Elisenda Grigsby\*, Columbia University  
*A combinatorial description of the knot Floer homology of cyclic branched covers*  
Richard Hain\*, Duke University  
*Relative weight filtrations on completions of mapping class groups*  
Ko Honda\*, University of Southern California  
*Reeb vector fields and open book decompositions*  
Eleny Ionel\*, Stanford University  
*Singular spaces and Gromov-Witten invariants*  
Mikhail Kovanov\*, Columbia University  
*Braid cobordisms and triangulated categories*  
Feg Luo\*, Rutgers University  
*Volume and angle structures on 3-manifolds*  
Daniel Ruberman\*, Brandeis University  
*Periodic Dirac operators and positive scalar curvature on 4-manifolds*

### **Meeting 37: Texas Christian University, March 23-25, 2007**

Tara Brendle, Louisiana State University

*Wicket groups and ring groups*

Richard Canary\*, University of Michigan

*Introductory bumponomics: deformation theory of Kleinian groups*

Christina Sormani\*, CUNY Graduate Center and Lehman College

*The covering spectrum of a Riemannian manifold*

Steve Ferry\*, Rutgers University

*Higson's compactification and the Novikov Conjecture*

Payl Loya\*, Binghamton University

*Gluing formulas for the spectral invariants of Dirac operators*

Greg Friedman, Texas Christian University

*Intersection homology and Poincaré duality on homotopically stratified spaces*

J. M. Landsberg, Texas A&M University

*Projective rigidity and flexibility of homogeneous varieties*

Robin Hartshorne\*, University of California, Berkeley

*Gorenstein liaison of algebraic varieties*

### **Meeting 38: Texas A&M University, October 19-21, 2007**

Simon Brendle\*, Stanford University

*1/4-pinched manifolds are space forms*

Jean-Pierre Demailly\*, Université de Grenoble

*On compact complex manifolds covered by a torus*

Michael Eastwood\*, University of Adelaide

*The X-ray transform on complex projective space*

Yakov Eliashberg\*, Stanford University

*Orderability of groups of contact transformations and related topics*

Dan Freed, University of Texas at Austin

*Remarks on topological field theory*

Bruce Kleiner\*, Columbia University

*BiLipschitz embedding in Banach spaces*

Ngaiming Mok\*, University of Hong Kong

*Analytic continuation of local holomorphic maps isometric with respect to the Bergman metric*

Natasa Sesum\*, Columbia University

*Compactness results for the Kähler-Ricci flow*

### **Meeting 39: Texas Tech University, February 22-24, 2008**

Ian Anderson\*, Utah State University

*Superposition formulas for differential systems*

Ian Anderson\*, Utah State University

*Differential geometry with Maple*

Sun-Yung Alice Chang\*, Princeton University

*Compactness of conformally compact Einstein manifolds of dimension  $(3+1)$*

*Vladimir Chernov\*, Dartmouth College*

Causality and linking in spacetimes

*Richard Melrose\*, MIT*

Theta functions and isospectral manifolds

*Emma Previato\*, Boston University*

Theta functions and isospectral manifolds

*Ken Richardson, Texas Christian University*

Desingularizing compact Lie group actions

*Colleen Robles, Texas A&M University*

Rigidity of projective homogeneous varieties

*Adam Sikora\*, SUNY Buffalo*

Quantizations of character varieties and knot theory