ESI **The Erwin Schrödinger International Institute for Mathematical Physics**

Boltzmanngasse 9
A-1090 Wien, Austria

Scientific Report for the Year 1998

Vienna, ESI-Report 1998

March 15, 1999

Supported by Federal Ministry of Science and Transport, Austria
http://www.esi.ac.at/

ERWIN SCHRÖDINGER INTERNATIONAL INSTITUTE OF MATHEMATICAL PHYSICS, SCIENTIFIC REPORT FOR THE YEAR 1998

ESI, Boltzmanngasse 9, A-1090 Wien, Austria

March 15, 1999

ESI preprints and newsletters are available via 'anonymous ftp' or 'gopher': FTP.ESI.AC.AT and via the URL: http://www.esi.ac.at.

Table of contents

Impressum: Eigentümer, Verleger, Herausgeber: Erwin Schrödinger International Institute of Mathematical Physics. Offenlegung nach §25 Mediengesetz: Verlags- und Herstellungsort: Wien, Ziel der Zeitung: Wissenschaftliche Information, Redaktion: Peter W. Michor

Typeset by $\mathcal{A}\mathcal{M}\mathcal{S}$-TEX

Typeset by $\mathcal{A}\mathcal{M}\mathcal{S}$-TEX

General remarks

In the year 1998 ESI was host to 331 visitors. There were 132 preprints contributed to the preprint series (153 till beginning of February), some of them still belong to programs from 1997, 85 seminar talks or ESI-Colloquia were given outside of conferences, more than 130 lectures were given in conferences at ESI.

ESI has spent AS 4,281 Mio for science which was supplemented by AS 2,309 Mio of foreign support; AS 4,266 Mio were spent for administrative costs including renting the premises and personel cost.

From the preprint server `http://www.esi.ac.at/Preprints` 7011 preprints were downloaded during the year 1998 (January 721, February 376, March 679, April 659, May 414, June 716, July 518, August 362, September 805, October 691, November 546, December 528).

The following conferences were organized in Vienna:

(1) **Workshop in Spectral Geometry and its Applications, Vienna, June 15–19, 1998.** Part of the program 'Spectral Geometry and its applications', see below for more information.

(2) **Conference 'Schrödinger operators with magnetic fields', June 6 - 12, 1998.** Part of the Program 'Schrödinger operators with magnetic fields'. See below for more information.

(3) **Epistemological & Experimental Perspectives on Quantum Physics, September 3-6, 1998.** This conference was organized jointly with the 'Institut Wiener Kreis'.

(4) **Conference on the Riemann zeta-function, September 20 – 25, 1998**. Organized jointly with the American Institute of Mathematics. It was part of the program 'Number theory and Physics II. Quantum Field Theory and the Statistical Distribution of Prime Numbers'. See below for more information. Proceedings of this conference are available in printed form at ESI, and under

`http://www.esi.ac.at/Proceedings/riemannzeta98.html`

(5) **Conference on the classification of filtrations of stochastic processes, November 30 – December 4, 1998**

(6) ESI was host to the following conference: **Bernard Bolzanos geistiges Erbe fuer das 21.Jahrhundert, 18.-19. Dezember 1998**. Symposium im Rahmen des Bolzano-Schwerpunktes der Oesterreichischen Forschungsgemeinschaft. Leitung: Edgar Morscher

ESI took part in the organization of one conference abroad, 'The 18th Winter school on geometry and physics', January 10–17, 1998, in Srni, a small village in the Bohemian forest, Czech republic.

Winter School in Geometry and Physics

The traditional winter school in geometry and physics which takes places for one week each January since 1980 in a picturesque village in the Czech parts of the Bohemian mountains is a joint enterprise of the Czech society of mathematicians and physicists and ESI, from 1994 onwards. Usually there are proceedings, which are published as a supplement of the 'Rendiconti Matematici di Palermo'.

In this year, the 18th Winter school on Geometry and Physics took place in the week January 10–17, 1998. ESI has contributed AS 10.000.– The former conferences with ESI-participation are published in the proceedings volumes:

The proceedings of the Winter school 'Geometry and Physics', Srní, January 1994.
Suppl. Rend. Circ. Mat. Palermo, II. Ser. **39** (1996), 9–148

The proceedings of the 15th Winter school 'Geometry and Physics', Srní, January 14–21, 1995.
Suppl. Rend. Circ. Mat. Palermo, II. Ser. **43** (1996), 9–228

The proceedings of the 16th Winter school 'Geometry and Physics', Srní, January 13–20, 1996.
Suppl. Rend. Circ. Mat. Palermo, II. Ser. **46** (1997), 9–176

The proceedings of the 17th Winter school 'Geometry and Physics', Srní, January 11–18, 1997.

Suppl. Rend. Circ. Mat. Palermo, II. Ser. **54** (1998), 11–124

Contents:

Conference: Epistemological & Experimental Perspectives on Quantum Physics

September 3-6, 1998. This conference was organized jointly with the 'Institut Wiener Kreis' (Institute Vienna Circle Museumstrasse 5/2/19 A-1070 Vienna). ESI has contributed AS 31.974,30 to this conference.

Program:

Abner Shimony (Boston University): Philosophical & Experimental Perspectives on Quantum Physics. '6th Vienna Circle-Lecture'.
Anton Zeilinger (Innsbruck/Vienna): Quantum Superposition and Information.
Jean-Marc Lévy-Leblond (Nice): Quantum Words for a Quantum World?
Don Howard (Notre Dame, IN): A Brief on Behalf of Niels Bohr.
Catherine Chevalley (Tours): On the Difference between Bohr's Epistemology and the so-called Copenhagen Interpretation of Quantum Theory
Kurt Gottfried (Ithaka, NY): My Ongoing Debate with John Bell
GianCarlo Ghirardi (Trieste): The Dynamical Reduction Program: An Example of a Quantum Theory without Observers
Basil Hiley (London): The Bohm Interpretation, Active Information and Teleportation
Roland Omnés (Paris): Decoherence and Irreversibility
Wojciech Zurek (Los Alamos,NM): Decoherence, Einselection and the Existential Interpretation
Walter Thirring (Vienna): Macroscopic Purification of States by Interactions.
Rainer Blatt (Innsbruck): Quantum Optics with Single Atoms
Serge Haroche (Paris): Quantum Engineering with Atoms and Photons in a Cavity
Harry J. Kimble (Pasadena, CA): The Cavity QED Circus - Flying Photons, Juggling Atoms, and Fantastic Finesse
Peter Zoller (Innsbruck): Quantum Repeaters for Communication
Helmut Rauch (Wien): Quantum Physics at Work
Michael Horne (North Easton, MA): Complementarity of Fringe Visibilities in Three-Particle Quantum Mechanics
Yuri Orlov (Ithaka, NY): Quantum and classical Gödelian Indeterminism, Measurement, and Informational Collapse into the Past
Jakob Yngvason (Vienna): Causality Concepts in Local Quantum Physics
Dik Bouwmeester (Innsbruck): Quantum Teleportation and Entanglement Swapping
Erhard Oeser (Vienna): Epistemological Problems of Measurement of Quantum Mechanics and the Appearance of the Classical World of Macroscopic Objects
Charles H.Bennett (New York): Classical, Quantum and Thermodynamic Resources involved in Quantum State Transformations

Conference on the classification of filtrations of stochastic processes

November 30 – December 4, 1998 Erwin Schroedinger Institute, Vienna, Austria. Organizers: Walter Schachermayer, Klaus Schmidt. ESI has contributed AS 25.500.-, Walter Schachermayer has contributed AS 38.800,-.

Program:

A. Vershik: Theory of families of measurable partitions as geometric measure theory.

B. Tsirelson: The five noises.

M. Emery: Pure martingales and the chaotic representation property – is there a link?

J. Kallsen: A stochastic differential equation with a unique — up to indistinguishability — but not strong solution.

B. de Meyer: A simplification of Tsirelson's argument on the non-Brownian feature of the Walsh process.

M. Smorodinsky/J. Feldman: Sufficient conditions for a reverse filtration to admit a standard extension.

J. Warren: The noise made by the Poisson snake.

V. Kaimanovich: Tail sigma-algebras of Markov processes.

W. Schachermayer: Brownian filtrations are not stable under equivalent time changes.

M. Yor: On certain subfiltrations of the Brownian filtration.

M. Malric: Spider-martingales in the filtration of Walsh's Brownian motion.

J.-P. Thouvenot: How to get rid of decreasing sequences of σ-algebras.

Problem session.

PROGRAMS IN 1998

Spectral Geometry and its applications

Organized by Leonid Friedlander and Victor Guillemin. February–July, 1998. ESI budget AS 886.000.–, foreign support AS 16.000,–. 22 preprints contributed: [534], [539], [540], [542], [547], [548], [552], [567], [568], [569], [570], [572], [573], [574], [575], [577] [578], [583], [585], [600], [659], [673]

Several directions of the research in Spectral Geometry were represented in the program. There was a seminar running withing the program, with the meetings on the weekly basis. In addition, there was an enourmous amount of cooperation with the program on the Magnetic Schrödinger Operator that was taking place at the same time.

1) Robert Brooks, who was the first visitor, finished his paper on the Riemann surfaces with the big first eigenvalue. He constructed a family of surfaces of growing genus, the first eigenvalue of which has a uniform positive lower bound.

2) In March–early April, the main concentration was on the Spectral Geometry on singular spaces. Three visitors, Daniel Grieser, Matthias Lesch, and Olga Simek, are working in this area. They had numerous discussios, which were especially beneficial for Olga Simek, who has just got her PhD. Matthias Lesch finished his paper, in collaboration with Marcus Pflaum, on the traces on algebras of parameter dependent pseudodifferential operators.

Alexander Felshtin and Yuri Kordyukov visited the Institute at the same time. Alexander Felshtyn studies the Reidemeister torsion. He had lenthly discussions on the subject with Leonid Friedlander. While staying in the Institute, he finished the paper "Reidemeister Torsion and Integrable Hamiltonian Systems". Yuri Kordyukov was studying the Dirac Operator on the Riemannian foliations. He discussed the problems with Leonid Friedlander and Matthias Lesch.

3) In April–May, the major concentration was in the scattering theory. Three leading experts in the field, Veselin Petkov, Georgi Vodev, and Maciej Zworski were in residence at that time. The major discussions were concentrated around the problem of the distribution of scattering poles. Maciej Zworski finished the paper on the Poisson formula for resonances in even dimensions, and, in this paper, he acknowledges the fruitful discussions with Georgi Vodev that took place in the Institute. Moreover, Vodev and Zworski started collaborating on a new project.

4) Michael van den Berg was working on the heat trace and the heat content for domain with singular boundary, and, in particular, he studied the case of the fractal boundary. There are many exciting problems in the field, and two talks that van den Berg gave resulted in lively discussions.

5) Dan Burghelea, Leonid Friedlander, and Thomas Kappeler have been collaborating for a number of years. They were discussing the problems related to the equivariant torsion, the determinants of elliptic operators in the case when the variables can be separated.

6) Steve Zelditch and Andrew Hassel were working on their project of relating the determinants to the scattering operator. They consider a bounded domain, and the problem is, how the determinant of the Laplacian in the domain is related to the scattering operator in the exterior. This problem is closely related to the Mayer–Vietoris type formula for the determinants that was established by Burgelea, Friedlander, and Kappeler. They discussed their problem with Friedlander. While in the Institute, Steve Zelditch also finished his paper, in collaboration with Bernard Shiffman, on the distribution of zeros of random and quantum chaotic sections of positive line bundles.

7) Dan Burghelea, Michael Farber, Daniele Guido, and Tomasso Isola had numerous discussions about the Novikov–Shubin invariants and related problems in Operator Algebras theory.

8) Leonid Friedlander and Nikolai Nadirashvili worked on the min-max properties of the first eigenvalue of the Laplacian. They considered the supremum of the first positive eigenvalue of the Laplacian over all metrics of volume 1 in a given conformal class, and then the infimum of these supremums over all conformal classes. They proved that the result is non-trivial (neither 0 nor infinity).

In general, the program provided an opportunity for people working in different aspects of Spectral Geometry to learn more about each other's work, to learn new ideas. Several new collaborations were started. Both well established and young mathematicians participated in the program.

Center of this program was the following workshop.

Workshop in Spectral Geometry and its Applications, Vienna, June 15–19, 1998.

Victor Guillemin, MIT, Paired Lagrangian distributions.

Eckhard Meinrenken, University of Toronto, Quantization commutes with reduction for loop groups.

David Borthwick, Emory University, Embedding symplectic manifolds via spectral theory.

Robert Brooks, Technion, Haifa, Riemann surfaces with large λ_1.

Chris Judge, University of Indiana, Large eigenvalues and short geodesics on hyperbolic surfaces

Peter Perry, University of Kentucky, Isoscattering Schottky groups.

Jochen Brüning, Humbold University, On boundary value problems for Dirac type operators.

Horst Knörrer, ETH, Zürich, Asymmetric Fermi surfaces for periodic magnetic Schrödinger operator.

Nicholas Ercolani, University of Arizona, An approach to eigenvalue statistics for coupled invariant random matrix ensembles.

Kate Okikiolu, UCSD, Critical metrics for the determinant of the Laplacian.

Michel Lapidus, UC Riverside, Complex dimensions of fractal strings and oscillatory phenomena, via Zeta-functions.

Michiel van den Berg, University of Bristol, Heat equations on the arithmetic van Koch snowflakes.

Thomas Kappeler, University of Zürich, KAM for KdV.

Evgeni Korotyaev, St. Petersburg, Geometry problems for the Hill operator.

Richard Melrose, MIT, Contact maps and the index of Fourier integral operators.

Thierry Paul, University Paris Dauphine, Perturbation of semiclassical limit.

John Lott, University of Michigan, Invariant currents on limit sets.

Gregory Eskin, UCLA, Inverse scattering problems in anisotropic media.

Mikhail Agranovich, Moscow Institute of Mathematics and Electronics, Spectral problems for the Helmgoltz equation and the Lame system in Lipschitz domains, with the spectral parameter in boundary conditions.

Jared Wunsch, Harvard University, The trace of the harmonic oscillator

Dan Burghelea, Ohio State University, Witten–Helffer-Sjöstrand theorems in the presence of symmetry.

Michael Farber, Tel Aviv University, Ray–Singer metric and torsion of Euler structures.

Peter Kuchment, Wichita State University, Geometry of photonic crystals and spectral geometry.

Matthias Lesch, Humbold University, The inverse spectral problem for Dirac systems on the half-line

Andrew Hassell, Australian National University, The resolvent of scattering Laplacian.

Yoshi Maeda, Keio University, Groups of quantized volume preserving diffeomorphisms.

Steve Zelditch, Johns Hopkins University, Distribution of zeroes of chaotic and random eigenfunctions.

Zeev Rudnick, Tel Aviv University, Level spacing distributions for integrable systems.

Frederic Klopp, University Paris–Nord, Spectral problems in solid state physics.

Anders Melin, Lund Institute of Technology, Exceptional points and normal forms of Schrödinger operators.

Victor Ivrii, University of Toronto, Eigenvalue asymptotics for the neumann Laplacian in domains with ultra-thin cusps.

L. Friedlander

Schrödinger operators with magnetic fields

March 1st to June 30th. This program was organized by Ira Herbst (Charlottesville), Thomas Hoffmann-Ostenhof and Jakob Yngvason (Vienna). There was a conference (June 2nd-12th). ESI budget was AS 582.000,-, foreign support, mainly from the EU-project, was AS 253.000.– There was also one EU financed post doc, so further AS 500.000.–

Simultaneously there was the program "Spectral Geometry" with a substantial scientific overlap, a few colleagues were invited to both programs.

Up to now 29 preprints have been contributed: [527], [550], [559], [560], [562], [563], [564], [567], [568], [569], [571], [580], [582], [591], [597], [603], [604], [606], [607], [608], [643], [652], [657], [658], [665]. Korotyaev ([567], [568], [569]) was also invited to the progam of spectral geometry, and Erdoes in collaboration with Yau contributed a paper [657] which was also was also supported by the program on "kinetic theory".

The topic of Schrödinger operators with magnetic field is a very active subject, both in mathematics and physics. One of the reasons is the fact that many properties of Schrödinger operators without magnetic field only partly carry over to the magnetic case, the mathematics and the underlying physical pictures are only poorly understood. For instance the ground state of a magnetic Schrödinger operator is not necesarily unique in contrast to the case without magnetic field.

Some of the topics and problems which have been intensively discussed during the progam are:

Scattering theory: Gerard, Herbst, Korotyaev, Laba, Skibsted...

Periodic Schrödic operators with magnetic fields: Birman, Cornean, Gruber, Hempel, Korotyaev, Macris, Shen, Sobolev, Suslina...

Semiclassical problems (also Pauli operators): Erdoes, Fournais, Ivrii, Herbst, Laptev, Lewis, Nakamura, Weidl, Yngvason...

General problem concerning eigenvalues and eigenfunctions: Birman, Hoever, Helffer, M. and T. Hoffmann-Ostenhof, Kurata, Laptev, Solovej, Laptev, Nenciu, Solovej, Weidl...

Relativistic problems and quantum field problems: Bach, Balinsky, Evans, Bugliaro, Lieb, Loss, Ostergaard, Siedentop...

Atomic problems: Balodis, Brummelhuis, Ivrii, Ruskai, Vugalter, Yngvason, Zhislin...

These problems certainly overlap and the discussions also with the participants of the spectral geometry program led to new insights.

The conference had 42 talks and due to the fact that it was scheduled fortunately for two weeks there was time left for discussions.

About one third of the participants were not supported by the ESI. In particular an EU program made it possible for some Post Docs to participate in the workshop.

The following conference had 42 talks and due to the fact that it was scheduled fortunately for two weeks there was time left for discussions.

Conference "Schrödinger operators with magnetic fields", 2.6 - 12.6.1998.

G. Nenciu: Magnetic Schrödinger operators: Perturbation theory and enhancement of eigenfunction decay

H. Cornean: 2-dimensional magnetic Schrödinger operators: width of minibands in the tight binding approximation

R. Zhdanov: On separation of variables in the Schrödinger equation for a particle interacting with external field

R. Hempel: Periodic Schrödinger operators with magnetic perturbations and eigenvalues in gaps

L. Bugliaro: Lieb-Thirring estimates and stability of matter coupled to QED

Z. Shen: On moments of eigenvalues for the Pauli operator

M. Griesemer: On instability of relativistic matter with self-generated magnetic field

C. Gerard: An introduction to scattering theory of N-particle systems in magnetic fields

I. Laba: Geometric methods in N-body scattering in magnetic fields

E. Korotyaev: Scattering of three particles in a homogeneous time periodic magnetic field

A. Sobolev: Absolute continuity of the magnetic Schrödinger operator

E. Skibsted: Completeness for particles in combined constant electric and magnetic field

G. Zhislin: Spectral properties of many-particle Hamiltonians with a homogeneous magnetic field with fixed pseudomomentum

M. Gruber: Noncommutative Bloch theory and gauge-periodic magnetic Schrödinger operators

R. Lewis: Eigenvalue estimates in the semiclassical limit for Pauli and Dirac operators with a magnetic field

J. Solovej: Constructing zero eigenfunctions for magnetic Dirac operators on S^3 and $\mathbb{R}^3$

A. Laptev: The negative discrete spectrum of a class of 2-dimensional Schrödinger operators with magnetic fields
T. Suslina: 2-dimensional periodic Pauli operator. Effective masses at the lower point of the spectrum
M. Birman: The periodic Schrödinger operator and Dirac operator. Sufficient conditions for the absolute continuity
J.M. Combes: About spectral gaps for Maxwell equations in periodic dielectric media
V. Bach: Stability of the groundstate and instability of excited levels for an atom minimally coupled to the quantized electro-magnetic field
B. Helffer: Nodal sets for the groundstate of the Schrödinger operator with zero magnetic field in a non simply connected domain
W. Evans: Stability of 1-electron molecules in the Brown-Ravenhall model I
A. Balinsky: Stability of 1-electron molecules in the Brown-Ravenhall model II
H. Siedentop: On the stability of the relativistic electron-positron field
P. Balodis: On the asymptotic exactness of Thomas-Fermi Theory in the thermodynamical limit
P. Kerdelhue: Rsonances generated by a critical point of the potential
G. Hoever: On the spectrum of a special magnetic Schrödinger operator
N. Macris: Recent results on the localisation length for Quantum Hall systems
G. Raikov: Asymptotic properties of the magnetic integrated density of states
K. Kurata: An estimate of the heat kernel of magnetic Schrödinger operators and uniformly elliptic operators with non negative potentials
I. Herbst: Generalized Fourier transform for Schrödinger operators with potentials of order zero
A. Suzko: Exact solutions for Schrödinger equations
S. Fournais: Semiclassics of the quantum current in weak and strong magnetic fields
B. Ruskai: A bound on the maximum negative ionisation of 1-dimansional models for many electron atoms in extremely strong magnetic fields
R. Brummelhuis: title to be announced
S. Nakamura: Tunnelling estimates for magnetic Schrödinger operators
L. Erdös: Lifschitz tail in a magnetic field: the non classical regime
T. Weidl: Virtual boundstates and Schrödinger type operators with magnetic fields
T. Ostergaard: The relativistic Scott correction
V. Ivrii: Atoms and molecules in the strong magnetic field
J. Yngvason: Temperature dependent Thomas Fermi theory with a magnetic field

Thomas Hoffmann-Ostenhof

Number theory and Physics I. Convexity

Autumn 1998, organized by Peter M. Gruber. The ESI budget was AS 281.000,-, foreign support was AS 25.000,–.

1 preprint contributed: [637]

The participants N.Dolbilin (Moscow), R.Erdahl (Kingston/Ont.), M.Henk (Berlin), J.Martinet (Bordeaux), L.Michel (Paris), H.-G.Quebbemann (Oldenburg), S.Ryskov (Moscow), R.Scharlau (Dortmund), M.Senechal (Northampton, MA), B.Venkov (St. Petersburg), J.Wills (Siegen) worked on the following topics:

Dolbilin: Criterion for a convex polytope to be a cell of an isohedral tiling. A special case is the Venkov-Alexandrov-McMullen theorem on parallelohedra. Joint work with Michel, Senechal and Erdahl on parallelohedra. Article: "The extension theorem".

Erdahl: Investigation of perfect ellipsoids and their relations to lattice coverings and Delone tilings. Joint work with Senechal on zonotopes and with Senechal and Dolbilin on Voronoi's conjecture.

Henk: Algorithm for the determination of densest lattice packings of 3-polytopes. Special cases: dodekahedron, ikosahedron, Archimedean solids. Article: "Densest lattice packings of 3-polytopes" with U. Betke. Book: "Finite and infinite packings" with J. Wills.

Martinet: Classification of integral lattices, continuing work of B. Venkov. Article: "Sur certains designs speriques lies a des reseaux entiers."

Michel: Can one choose a basis of a lattice from the facet vectors of the corresponding Dirichlet-Voronoi cells? Discussions and joint work with Senechal, Dolbilin and Ryskov on lattice tilings and quadratic forms. Article: "The invariance"

Quebbemann: Modularities of integer lattices and applications to theta functions. Joint work with Dolbilin, Erdahl, Scharlau and Venkov.

Ryskov: Investigation of Voronoi polytopes. Collaboration with Michel and Senechal on parallelohedra.

Senechal: Investigation of space filling zonotopes and lattice dicing with Erdahl. Problem, whether from the facet vectors of a Voronoi cell of a lattice one can choose a basis. Joint work with Michel and Ryskov. Book: Monograph on "Lattice geometry" with Michel.

Wills: Articles: "Densest packings of more than three d-spheres are non-planar" with U.Schnell. "Quasicristals, parametric density and Wulff shape" in "Handbook of quaicristals" with K. Boeroezcky, U. Schnell.

The participants appreciated the excellent athmosphere at the Schrödinger Institute which promoted discussions and joint work.

P. Gruber

Number theory and Physics II. Quantum Field Theory and the Statistical Distribution of Prime Numbers

September 1 - November 30, 1998. This program was organized by Ivan Todorov. ESI budges was AS 347.000, foreign support (mainly from the American Institute of Mathematics) was AS 240.000,–

10 preprints contributed: [605], [609], [611], [617], [619], [620], [621], [623], [653], [673]

There have been 49 participants outside of Austria; 29 of them were supported (in part) by ESI.

The aim of the activity has been to encourage contacts and interaction between mathematicians working on advanced topics centred around number theory and theoretical physicists interested in the applications of modern mathematical methods. It has been the second major gathering of this type after the 1989 Les Houches meeting. One can single out several directions of activity which will be listed in, roughly, chronological order.

1. Victor Kac (who was at ESI through the month of September together with his graduate student B. Bakalov, supported in part by US funds) helped organize an activity on infinite dimensional (conformal, vertex operator, and supersymmetry) algebras. He reported his major work on the classification of simple infinite dimensional groups of supersymmetry which appeared as an ESI preprint with an addendum concerning a possible application to "grand unified" models in particle physics triggered by discussions at ESI after his talk. Other high points on the mathematics side of this part of the program included a talk by Don Zagier modular forms and one by Terry Gannon on monstrous moonshine. Physical applications of conformal current algebras and $W_1+\infty$ symmetry were centered around the fractional quantum Hall effect. A work (by Cappelli et al.) based on an earlier study of affine orbifolds (by Kac and Todorov at a 1996 ESI program) was completed during the workshop and appeared as an ESI report.

2. The central event of the entire program was the Conference on the Riemann Zeta Function (September 21-25) organized jointly with the American Institute of Mathematics (which covered the expenses of all 19 invited speakers during their entire - up to 12 days - stay at ESI). See below for the program. It was anticipated by talks on the same subject by Michael Berry, Paula Cohen and Michel Lapidus during the first and the third week of September. A closely related development on the Hopf algebra structure of quantum field theoretic renormalization and the appearance of multiple zeta values in divergent integrals associated with Feynman graphs deserves mentioning: it involved joint work (and seminar talks) at ESI of David Broadhurst and Dirk Kreimer which started prior to the conference and the continuation of a collaboration between Connes and Kreimer which revealed a common (Hopf algebra) structure in renormalization theory and noncommutative geometry. A high point of the conference was the talk of its initiator and coorganizer Alain Connes "Trace formula, absorption spectra and the zeros of the Riemann zeta function" based on his recent work which first appeared as an ESI preprint. The level of the entire meeting, marked by the presence of a grand master in the subject, Atle Selberg, can be hardly overstated.

3. A small scale activity that took place in mid November was helped by Boris Dubrovin (SISSA, Trieste) who not only gave a memorable talk on "Reflection groups and Frobenius

manifolds" but also attracted other participants. ESI support and the creative atmosphere at the Institute made possible a fruitful interaction between Klaus Wirthmueller (Kaiserslautern) and Dubrovin and his student M. Bertola on problems related to elliptic meromorphic structures and Jacobi forms. Discussions with participants of the part of the program organized by Peter Gruber during this period (in particular, with Boris Venkov) were very useful, too. Interactions with participants in other ESI programs appeared in previous months as well. Thus, Juergen Fuchs (who took part in the program on anomalies) presented a talk on "Galois symmetries in conformal field theory" at the Number Theory and Physics workshop in October. Mixing between programs also led to a joint work started during a 1997 ESI program by H. Grosse (Vienna), M. Oberguggenberger (Innsbruck) and I. Todorov which was completed in November 1998 (and reflected in an ESI report).

Conference on the Riemann zeta-function, September 20 – 25, 1998. This conference is part of the activity on Quantum Field Theory and the Statistical Distribution of Prime Numbers in the program Number Theory and Physics. It is sponsored by the ESI and the American Institute of Mathematics.

S. Patterson: The Riemann zeta function and Hamburger's theorem
D. Zagier: The Selberg zeta function, transfer operators, and periods of Maass wave forms
C. Deninger: Motivic and dynamical cohomologies
B. Julia: "Physical" parameters in zeta functions
J. Keating: Random matrix theory and some zeta-function moments
S. Haran: The mysteries of the real prime
A. Knauf: Number theory, dynamical systems and statistical mechanics
Z. Rudnick: Poisson spacing statistics in number theory and mathematical physics
B. Conrey: Mollifying the zeta-funtion
H. Iwaniec: The cubic moment of central values of automorphic L-functions
C. Soule: On zeros of automorphic L-functions
Yu. I. Manin: Quantum computing and factorization of large integers
A. Odlyzko: The 10^{21}-st zero of the Riemann zeta function
D. Goldfeld: Integral operators and zeros of the zeta function
E. Saias / M. Balazard: The Nyman-Beurling equivalent form for the Riemann hypothesis
A. Connes: Trace formula, absorption spectra and the zeros of the Riemann zeta function
D. Hejhal: On the zeros of linear combinations of Euler products
P. Sarnak: Zeros of zeta functions and symmetry
A. Selberg: Zeros of linear combinations of L-functions

Proceedings of this conference are available in printed form at ESI, and under
`http://www.esi.ac.at/Proceedings/riemannzeta98.html`

The contents of the proceedings are:

Alain Connes: Trace Formula in Noncommutative Geometry and the zeros of the Riemann Zeta Function. ESI-preprint [620].
J.B. Conrey: Mollifying the Riemann Zeta-Function.
Christopher Deninger: Some Ideas on Dynamical Systems and the Riemann Zeta Function.
Andreas Knauf: Number Theory, Dynamical Systems and Statistical Mechanics.
Pär Kurlberg, Zeev Rudnick: The Distribution of Spacings between Quadratic Residues. ESI-preprint [609].
John Lewis, Don Zagier: Period Functions and the Selberg Zeta Function for the Modular Group (has appeared in "The Mathematical Beauty of Physics, A Memorial Volume for Claude Itzykson", eds. J.M. Drouffe und J.B. Zuber, World Scientific, Singapore (1997) 83-97)
Yuri I. Manin: Quantum Computing and Shor's Factoring Algorithm.
Andrew Odlyzko: The 10^{21}-st Zero of the Riemann Zeta Function.
S.J. Patterson: The Riemann Zeta Function and Hamburger's Theorem.

Quantization, generalized BRS cohomology, and anomalies

Organized by R.A. Bertlmann, M. Kreuzer, W. Kummer, A. Rebhan, M. Schweda. September 28 – December 31, 1998. ESI budget was AS 795.000,–, foreign support was AS 84.000,–.

8 preprints contributed: [625], [629], [638], [639], [644], [647], [651], [664]. About 7 more preprints are in preparation.

The program was devoted to three deeply interrelated subjects of mathematical physics and phenomenology: quantization of field theory, generalized BRS cohomology and anomalies, and thermal quantum field theory. More than 70 experts in this area participated and worked together in this project for 3 months. The program was focused in an intensive 10 days workshop

at the beginning where also scientists from the universities of Vienna and from abroad participated. This activity was followed by a program which included about 2 talks and/or discussion sessions per week in the months October, November, December.

I. Algebraic Methods: 1. Algebraic Renormalization. The presentation of the talk by F.Gieres on gauge fixing and BRS-quantization of local Lagrangian field theories initiated a collaboration with the Brazilian group (Piguet, Sorella).

L. Baulieu reported on topological field theories in higher space-time dimensions with encoded duality properties. As a consequence of this report the question of the existence of the topological linear vector symmetry will be discussed in collaboration with H. Ita, K. Landsteiner, T. Pisar, J. Rant and M. Schweda. It is planned to invite also L. Baulieu to join this collaboration.

S.P. Sorella presented some novel results concerning the unification of topological field models and ordinary gauge field models leading directly to two international collaborations where papers have been already submitted for publication: hep-th/9902154, hep-th/9812040.

The talk of O. Piguet initiated two international collaborations with the Vienna group (O.M. Del Cima, M. Schweda) and the Brazilian group (D.N.T. Franco, L.P. Colatto, O. Piguet) on superspace renormalization in 3-dimensions at space-time and IR-anomalies. Parts of these results appeared already in hep-th/9902084.

The talk on the conformal transformation properties of the supercurrent given by K. Sibold entailed fruitful discussions with P. van Nieuwenhuizen and A. Schwimmer. The information of some work in progress has led to an invitation to Stony Brook.

During the workshop A. Schwimmer collaborated intensely with M. Henneaux on extended superconformal algebra in 3d-gravity in the Chern-Simons realization. A corresponding paper is in preparation.

I. Algebraic Methods, 2: Wess-Zumino Terms and Quantization of Anomalous Theories. L. Bonora finished during his presence at the workshop the paper on matrix string theory and its moduli space, (hep-th/9901093) which was an outcome of discussions with M. Asorey. Considerations on anomalies in theories with branes are not yet finished. L. Bonora acknowledged fruitful discussions with P. van Nieuwenhuizen and R. Stora.

I. Algebraic Methods, 3: Batalin-Vilkovisky / Antifield Quantization.

In his talk Friedemann Brandt reported on his results on the local BRS cohomology in supergravity theories. His methods are useful for a wide class of problems, including the Dirichlet string analysis that Joaquim Gomis reported on in his talk. The supersymmetric extension of the analysis of the D-string is the subject of an ongoing collaboration of F. Brandt with A. Kling and M. Kreuzer, which has been started during our program and is expected to result in an ESI preprint in the near future.

Glen Barnich appreciated the chance to interact with a number of long-term collaborators and also started a new collaboration with P.A. Grassi from the MPI in Munich. In addition, his discussions helped to complete his paper on a very interesting non-renormalization theorem in the antifield formalism, which appeared as ESI-preprint [625] and was published in JHEP 12 (1998).

Mark Henneaux completed his work on p-form gauge theories, which appeared as ESI-preprint [644].

G.A. Vilkovisky took the research program as an occasion to revisit a long-standing unsolved problem in the theory of the Batalin-Vilkovisky, that of quantizing the master equation in the most general gauge. The solution was the topic of intense discussions, in particular with A. Rebhan, and is now published as ESI preprint [664]. The new ideas developed in this case could turn out to be fruitful in other examples of infinitely reducible gauge theories such as the covariantly quantized Green-Schwarz superparticle and superstring.

II. Geometric Methods. 1. Topological and Geometric Aspects of Anomalies. R. Stora found a link between the covariant anomaly (or chiral Bose-Einstein anomaly) of quantum field theory and the local form of the family's index theorem of Bismut. He also presented his view on Cheeger-Simons differential characters and the Beilinson-Deligne cohomology. Furthermore he was engaged in clarifying the work of T. Hurth and M. Skenderis on the quantum Noether method and in discussing specific problems of branes with L. Bonora and R. Minasian.

M. Asorey analyzed the topology of gauge orbit space, specifically, the features of a fundamental domain, of Gribov copies and of a Gribov horizon. This work has appeared already as ESI preprint [651]. His discussions on problems like global gauge fixing, integrable systems and matrix string models with other participants, notably with L. Bonora, initiated further work on this subject.

The theory of bundle gerbes applied to quantum field theory has been the research topic of J. Mickelsson. He showed how the Atiyah-Patodi-Singer index theory construction of the fermionic Fock space bundle leads to the known Schwinger terms, the Faddeev-Mickelsson cocycles, for the gauge group action. He also acknowledged the many discussions with R. Stora and R.A. Bertlmann on the possible inclusion of gravitation. These results will soon appear as an ESI preprint.

The subject of Schwinger terms (or anomalous commutators) has been addressed also by L. Faddeev. He presented a functional integral method for calculating the anomalous commutators of Gauss law operators in the theory of interacting chiral fermions with Yang-Mills fields.

In another project L. Faddeev and A.J. Niemi investigated the partial duality in SU(N) Yang-Mills theory. Their presentation in discussions with W. Kummer has resulted in an improved understanding of the soliton aspects of their approach. Their work has appeared already as ESI preprint [656].

The presentation of A.Vinogradov of his theory of secondary calculus found considerable interest, especially among the experts of BRS cohomology in QFT. The discussions with C.Becchi, R.Stora and M.Henneaux led to a better understanding of this field. The participation of J.Krasil'shchik with his contribution on SUSY and integrability resulted in ESI preprint [639], and the contributions of A. Verbovetsky on computing the horizontal cohomology will appear as a paper soon. Specific model calculations of the several types of anomalies have been performed by C.Adam, J.M.Pawlowski, J.Horejsi and M.Schnabl. The discussions with R.A.Bertlmann on a possible inclusion of gravitation into the approach of dispersion relations led to a joint project.

Mario Tonin of Padua reported on his new method to find invariant actions for chiral bosons and the relation to gravitational anomalies. This method is of great importance for the most recent research on branes and, therefore, was the subject of much clarifying discussions.

The new results of P. Grassi on renormalization with non-semisimple gauge theories close an old gap in the theory of renormalization.

D.Vassilevich together with W.Kummer wrote a paper which appeared already as ESI preprint [629]. It clarifies the relation of the four-dimensional scaling anomaly from scalars in Einstein gravity with one in the spherically reduced 2d case. In this manner the first calculation of Hawking flux without using the effective action approach was possible, avoiding uncertainties related to the latter approach. D.Vassilevich is also about to finish a paper with P.Gilkey who was a guest of ESI at the time of the workshop in another program.

II. Geometric Methods. 2. Anomalies in Strings and Supersymmetry. K.Skenderis and T.Petkou as a consequence of their talks initiated a project with M.Henneaux and T.Hurth on counterterms in gauge fixed gauge theories which is expected to lead to a future publication.

A.Van Proeyen with J.Gomis as result of discussions on BPS-states intend to start a collaboration. A.Van Proeyen also appreciated the chance to have discussions with several leading experts (J.Gomis, R.Stora, M.Henneaux) for his ongoing research on N=2 supergravity.

The paper being prepared to write now on topological strings, contact terms and the holomorphic anomaly by C. Becchi and collaborators will be the consequence of the talk of Becchi at the workshop.

A number of interesting new types of anomalies came under considerations with the progress in non-perturbative string theory, where quantum field theories on solitonic objects (branes) of various dimensions and on boundaries thereof combine with the contributions of 'elementary' degrees of freedom in a generalized Green-Schwarz cancellation mechanism. These issues were discussed in the talks by Ruben Minasian and by Loriano Bonora, and were the subject of many discussions including also Jürgen Fuchs, Christoph Schweigert and Bert Schellekens, who is a specialist in the role of the elliptic genus in anomaly cancellation. Progress in the understanding of boundary conditions in exactly solvable conformal field theories resulted in the ESI-preprint [638]. A proper understanding of the relation between anomalies and tadpole cancellation,

however, is still a challenging open problem. Schweigert and Minasian also considered anomaly cancellation and the role of K-theory for the M-theory five-brane.

Another collaboration that was initiated by the ESI program is the construction and cohomological analysis of toric complete intersections by David Sahakian and M.Kreuzer. These varieties are an important ingredient of realistic string models, which need to be based on a complicated balance among perturbative and non-perturbative contributions if the unification of all fundamental interactions is required to produce a reasonable value for the gravitational constant. The results will be published as an ESI preprint.

Among the guests who contributed most to the lively discussions was especially Peter van Nieuwenhuizen. He wrote after the conference that 'almost all the active people in the field were present' and praised the organisers for leaving enough time between the talks for further detailed discussions. In his talk he reported on new results on anomalies in strings, which was of high interest and stimulated further investigations in this field.

III. Anomalies at Finite Temperature. 1. Algebraic Aspects. A thorough overview of algebraic aspects of thermal quantum field theories was given by C.Jaekel, in extension of earlier work that has already appeared as an ESI preprint. J.Yngvason presented new work on modular groups of quantum fields in thermal states, which also is the subject of an existing ESI preprint, initiating interesting discussions with ramifications that include effects like Unruh and Hawking temperature.

W.Thirring presented a historical overview of the Thirring Model with special emphasis of recent developments that are of particular relevance in thermal QFT.

On the formalistic side, there was also agitated discussion about a proposal by C.Lucchesi on implementing a superspace formulation, reviewed in generality by S. Joglekar, also in a thermal context. This approach aims at preserving the advantages of a superspace formulation at finite temperature, where the different statistics of Bose and Fermi particles ordinarily spoils supersymmetry.

III. Anomalies at Finite Temperature. 2. Phenomenological Aspects. R.Baier, F.Gelis, and M.Tytgat discussed the technical details of the chiral anomaly at finite temperature, their phenomenological implications, and a resolution of some recent controversy. This was met with considerable interest from theorists with profound phenomenological background such as H.Leutwyler, as well as from more 'theoretical' theorists, notably P.Van Nieuwenhuizen, who greatly contributed to the synthesis achieved in these discussions. D.Miller reported on nonperturbative aspects of anomalies in QCD at finite temperature, in particular of the role of a gluon condensate on the trace anomaly, which will be elaborated further in a forthcoming ESI preprint. The connection of the trace anomaly with the thermodynamic pressure of QCD is also the central theme of a collaboration initiated later in the research program by P.Landshoff and A.Rebhan, with an ESI preprint currently in preparation. This new approach might have the potential to establish a novel nonperturbative basis for practical calculations of the QCD pressure, where conventional thermal perturbation theories have run into seemingly insuperable problems. A.Petkou with M.Silva Neto contributed a closely related work, already published as ESI preprint [647], which ties thermodynamic quantities, phase transitions, and scaling behaviour to formal properties of three-dimensional conformal field theory, making use of hitherto unexploited polylogarithmic identities. The ensuing discussions benefited among others by I.T.Todorov, who was present as participant of a different ESI research program.

Supplementary information on the research program including transparencies of talks can be obtained from our homepage: http://tph16.tuwien.ac.at/ano98.html

Workshop on Quantization, generalized BRS cohomology, and anomalies. September 28 - October 7, 1998.

R. Stora (Annecy): Two mathematical constructions related to anomalies
L. Bonora (Trieste): M-theory anomalies (hep-th/9712205)
F. Gieres (Lyon): Gauge fixing and BRS quantization of local Lagrangian field theories
G. Barnich (Brussels): A cohomological approach to the quantum Batalin-Vilkovisky formalism (hep-th/9710162)
L. Baulieu (Paris): Batalin-Vilkovisky ghost unification and Seiberg-Witten duality
F. Brandt (Hannover): (Extended) BRST cohomology in super-symmetric theories
M. Tonin (Padova): Covariant actions for chiral bosons and gravitational anomalies
P. van Nieuwenhuizen (Stony Brook): New anomalies in strings?

M. Asorey (Zaragoza): Gribov horizon and cohomology of orbit spaces
C. Becchi (Genova): The BRS cohomology in topological sigma models
O. Piguet (Vitoria): Nonrenormalization theorems for 3-d gauge theories with topological terms
S. Sorella (Rio de Janeiro): Remarks on Chern-Simons field theories
S. Wolf (Geneva): The supercurrent trace identities of the N=1 D=4 SYM theory in the Wess-Zumino gauge
V. Aldaya (Andalucia): Group approach to quantization, anomalies, constraints, and dynamical symmetry breaking
A. Vinogradov (Salerno): Elements of secondary calculus and some expectations
L. Vilar (Rio de Janeiro): A no-go theorem for the nonabelian topological mass mechanism in four dimensions
M. Henneaux (Brussels): Consistent interactions between exterior form gauge fields: the BRST approach
W. Thirring (Vienna): The Thirring model 40 years later
C. Jaekel (Roma): Algebraic aspects of thermal quantum field theories
J. Yngvason (Vienna): Modular groups of quantum fields in thermal states
D. Miller (Hazleton): Anomalous currents and gluon condensates in QCD at finite temperature
S. Joglekar (Kampur): Superspace formulation of gauge theories
P. Grassi (Munich): Renormalization of non-semisimple gauge
R. Baier (Bielefeld): Anomalous processes at high temperature
F. Gelis (Annecy): Ambiguities in the zero-momentum limit of the thermal triangle diagam
M. Tytgat (Brussels): Chiral dynamics and anomalous amplitudes at finite temperature
J. Gomis (Barcelona): D-branes and BRST cohomology
R. Minasian (New Haven): Anomalies for nonabelian tensor multiplets
C. Schweigert (CERN): Boundary conditions for open strings and tadpole cancellation
C. Lucchesi (Neuchatel): Thermal supersymmetry in thermal superspace
A. Schwimmer (Rehovot): Aspects of 3-d gravity with extended supersymmetry in the CSW formulation
T. Hurth (Munich): Quantum Noether method
K. Sibold (Leipzig): The conformal transformation properties of the supercurrent
I. Krasil'shchik (Moscow): Supersymmetry and integrability
A. Verbovetsky (Moscow): On computing the horizontal (characteristic) cohomology
H. Grosse (Vienna): Noncommutative manifolds as a regularization preserving symmetries
J. Mickelsson (Stockholm): From euclidean Dirac determinants to hamiltonian anomalies
J. Pawlowski (Dublin): On consistent and covariant anomalies in chiral gauge theories
C. Adam (Dublin): Consistent and covariant commutator anomalies in the chiral Schwinger model
J. Horejsi (Prague): Dispersive approach to anomalies
M. Schnabl (Prague): Some aspects of the trace anomaly

Charged particle kinetics

October 5 - January 31, 1999. This program was organized by Christian Schmeiser and Peter Markowich. ESI budget for 1998 was AS 325.000,–, foreign support was AS 473.000,–.

9 preprints contributed: [631], [633], [634], [646], [648], [655], [657], [661], [662],

The program started with a workshop on ANALYTICAL TECHNIQUES AND ASYMPTOTIC METHODS FOR KINETIC EQUATIONS (Oct.5-8 1998), cosponsered by the EC-funded TMR Network on ASYMPTOTIC METHODS IN KINETIC EQUATIONS and by the ESI. The first day of the meeting was filled by invited one-hour presentations of leading scientists in the field. Carlo Cernignani (Milano) discussed new results in renormalized solutions of the Boltzmann equation, Giuseppe Toscani (Pavia) talked about the use of convex Sobolev-inequalities in the analysis of long time behaviour of nonlinear diffusion processes (e.g. porous media and fast diffusion flow), Patrick Gerard (Orsay) lectured about semiclassical limits in the presence of energy band degeneracies and Pierre Degond (Toulouse) presented asymptotic techniques for superlattice semi- conductor models. The remaining 3 days of the meeting were devoted to 1/2 hour talks on more specialised new developments in the field and to discussions on the strategic future of kinetic theory. In particular, there was total agreement that the derivation of single particle kinetic models from multi-particle dynamics is to be considered as one of the most significant future challenges in the field (mathematical understanding of the onset of irreversilbility, dissipation....). Another highlight of the meeting was the second presentation of Carlo Cercignani, which focused on the life and scientic work of Ludwig Boltzmann. This talk was extremely well received not only by invitees of the ESI-program, but also by mathematics and physics faculty of the University of Vienna due to its historic perspective. The total number of participants of the first meeting was about 40.

Thereafter the program continued in the form of short term visits (1-2 weeks) of main researchers in the field. Beyond that there were five long term participants:

Pierre-Emmanuel Jabin (Predoc from ENS Paris, ESI financed, October-December 1998)
Florian Frommlet (Predoc from TU-Berlin, TMR financed, October 1998- March 1999)
Christian Ringhofer (ASU, September 1998 - Februar 1999,partially ESI financed)
Paola Pietra (Univ.Pavia, September 1998 - Februar 1999,partially ESI financed)
Francois Castella (C.n.r.s. Rennes, October 1998 - Februar 1999, TMR - ESI financed)

Jabin worked mainly on granular flow problems (with Pietra and Perthame), Frommlet and Castella interacted with Markowich and Ringhofer on the derivation of Lindblad models in Fokker-Planck form for electron- phonon interaction and Pietra also analysed numerical methods for dispersive equations (with Markowich).

The second meeting of the program (again cosponsored by the TMR network on kinetic theory) , on QUANTUM TRANSPORT MODELS AND DISPERSIVE EQUATIONS, took place at the ESI from January 11-13, 1999. As in the first meeting, the first day was again devoted to one-hour overview talks of very senior experts. The first lecturer was Claude Bardos (ENS Cachan) discussing scaling limits of kinetic systems. He was followed by David Levermore (Tuscon) lecturing on the derivation of fluid dynamics from the Boltzmann equation, by Peter Deuflhard (Berlin) discussing computational quantum chemistry, by Benoit Perthame (ENS Paris) presenting an exciting new methodology to obtain (dispersion) estimates for the Helmholtz equation by means of Wigner transforms, and by David Mclaughlin (New York), who focused on the dispersive limit of nonlinear Schroedinger equations. The second day of the meeting was started by H.T.Yau (New York) presenting new work on the derivation of the elasic-scattering Boltzmann equation from the Schroedinger equation with a random potential (joint work with L. Erdoes, who also participated in the ESI program). Yau's talk was followed by 1/2 hour lectures mainly on integrable dispersive equations and local results for nonintegrable systems. A main 'result' of the meeting was the need to go beyond the existing (and already aging) theory of dispersive limits of totally integrable equations initiated by P.Lax and D.Levermore in the early 80' and to start to tackle nonintegrable highly nonlinear dispersive problems. It seems that the by now well-developed theory of Wigner transforms and Wigner measures is an ideal tool for this task, but it will take another quantum leap. Actually, this topic is a main point of a proposal for a new ESI program for the year 2001, which was submitted to the ESI directors in these days.

Important scientific interactions happened in January 1999. Of great significance for the program is the work on quasineutral limits for drift-diffusion systems (Gasser, Levermore, Markowich, Schmeiser), on discrete dispersive problems (Bertoluzza, Pietra), on the derivation of mean field quantum equations with singular interactions (Bardos, Markowich, Mauser, Yau), on analytical properties of quantum Fokker Planck systems (Arnold, Lopez, Markowich, Soler) and on convex Sobolev inequalities for nonlinear diffusion equations (Carrillo, Juengel, Markowich, Toscani).

Continuation programs from 1997 and earlier

Mathematical Problems of Quantum Gravity. Continuation of the 1996 program, organized by A. Ashtekhar and P. Aichelburg. ESI budget AS 21.000,–, foreign support AS 13.000,-.

No preprint.

Hyperbolic Systems with Singularities. A 1996 program, organized by D. Szasz. No money spent.

2 preprints contributed: [532]?, [543].

Program on Mathematical Relativity 1997. Organized by B. Beig. ESI budget was AS 19.000,-, foreign support AS 8.000,–

1 Preprint contributed: [524],

Spaces of geodesics and complex structures in general relativity and differential geometry 1997. Organized by Lionel Mason, Pawel Nurowski, Helmuth Urbantke. No money spent.

4 Preprints contributed: [521], [535], [590], [624]

Nonlinear theory of generalized functions. Organized by M. Oberguggenberger (Innsbruck). ESI budget 27.000,–, no foreign support.

8 Preprint contributed: [531], [533], [558], [565], [566], [627], [653], [666]

Guests via Director's shares

Guests of Walter Thirring.

Money spent: AS 84.000.– (ESI), 60.000.– (foreign).

5 Preprints contributed: [536], [553], [587], [626], [635]

Guests of Jakob Yngvason. This includes the continuation of the 1997 program on 'Local Quantum Physics' which was organized by D. Buchholz, H. Narnhofer, J. Yngvason. ESI budget AS 166.980,– foreign support AS 200.000,–.

11 preprints contributed: [528], [529], [538], [541], [551], [555], [557], [589], [642], [643], [650],

Guests of Klaus Schmidt. Here also the continuation of the 1997 program 'Ergodic theory and dynamical systems' is included, which was organized by A. Katok, K. Schmidt, G. Margulis. ESI budget was 127.000,–, foreign support was 187.925,–.

20 Preprints contributed: [522], [530], [544], [592], [593], [594], [595], [596], [598], [599], [601], [602], [610], [612], [618], [640], [645], [654], [660], [667]

Guests of Peter Michor.

Money spent: AS 450.500.–(ESI), AS 172.500.–(foreign)

21 preprints contributed: [523], [545], [576], [579], [581], [584], [586], [614], [615], [616], [628], [630], [632], [636], [641], [649], [663], [668], [669], [670], [672],

Guests of H. Grosse. Money spent: AS 118.000.—(foreign)

9 preprints contributed: [525], [526], [537], [546], [554], [556], [561], [588], [653].

Guests of A. Cap.

Money spent: AS 33.000.–(ESI).

2 preprint contributed: [549], [613]

List of Preprints

We try to keep track of the bibliographical data of the published versions of the preprints – this is incomplete and we are constantly updating it. The most complete list can always be found on the ESI server `http://www.esi.ac.at/ESI-Preprints.html`.

Here we no longer give the full list of all preprints, just the last 3 years.

1996

295. Alexander Kiselev, *Some Examples in One–dimensional "Geometric" Scattering*, J. Math. Anal. Appl. **212, 1** (1997), 263-280.
296. Thierry Masson, *Géométrie non commutative et applications à la théorie des champs* (1996), 245 pp..
297. András Sütő, *On the Flux–phase Problem* (1996), 16 pp..
298. Carlangelo Liverani, *Central Limit Theorem for Deterministic Systems*, 1st international conference on dynamical systems, Montevideo, Uruguay, 1995 (F. Ledrappier et. al., eds.), Pitman Res. Notes Math. Ser. 362, 1996, pp. 56–75.
299. A.P. Balachandran, G. Bimonte, G. Landi, F. Lizzi, P. Teotonio-Sobrinho, *Lattice Gauge Fields and Noncommutative Geometry* (1996), 34 pp..
300. Klaus Schmidt, *On the Cohomology of Algebraic Z^d-actions with Values in Compact Lie Groups* (1996), 20 pp..
301. Klaus Schmidt, *Invariant Cocycles, Random Tilings and the Super-K and Strong Markov Properties*, Trans. Amer. Math. Soc. **349** (1997), 2812–2825.
302. Alexander Moroz, *Upper and Lower Bounds on the Partition Function of the Hofstadter Model*, Mod. Phys. Lett. B, 9 pp. (to appear).

303. Editors: Walter Thirring, Thomas Hudetz, Stepan Moskaliuk, *Collection of Abstracts of all Lectures given at the XII International Hutsulian Workshop "Methods of Mathematical Physics" Rakhiv, Ukraine, September 11–17, 1995* (1996), 23 pp..
304. Peter W. Michor, *Addendum to "Basic Differential Forms for Actions of Lie Groups"*, appears as "Basic Differential Forms for Actions of Lie Groups II", Proc. AMS **125, 7** (1997), 2175–2177.
305. M. Krishna, V.S. Sunder, *Schrödinger Operators with Fairly Arbitrary Spectral Features* (1996), 24 pp..
306. J. Sjöstrand, G. Vodev, *Asymptotics of the Number of Rayleigh Resonances* (1996), 18 pp..
307. F. Schein, P.C. Aichelburg, W. Israel, *String Supported Wormhole Spacetimes and Causality Violations* (1996), 12 pp..
308. Vincenzo Grecchi, Andrea Sacchetti, *Lifetime of the Wannier–Stark Resonances and Perturbation Theory* (1996), 26 pp..
309. G. Bimonte, A. Stern, P. Vitale, $SU_q(2)$ *Lattice Gauge Theory* (1996), 26 pp..
310. S.G. Rajeev, A. Stern, P. Vitale, *Integrability of the Wess–Zumino–Witten Model as a Non–Ultralocal Theory* (1996), 13 pp..
311. Giuseppe Marmo, Giovanna Mendella, Włodzimierz M. Tulczyjew, *Constrained Hamiltonian Systems as Implicit Differential Equations*, appeared as "Integrability of implicit differential equations", J. Phys. A, Math. Gen. **28, 1** (1995), 149–163.
312. N.A. Gromov, S.S. Moskaliuk, *Irreducible Representations of Cayley–Klein Unitary Algebras* (1996), 31 pp..
313. Pierluigi Contucci, Andreas Knauf, *The Low Activity Phase of Some Dirichlet Series*, J. Math. Phys., 27 pp. (to appear).
314. Dmitri Alekseevsky, Andreas Kriegl, Mark Losik, Peter W. Michor, *Choosing Roots of Polynomials Smoothly*, Israel J. Math. **105** (1998), 203–233.
315. H. Grosse, C. Klimčík, P. Prešnajder, *Finite Gauge Model on the Truncated Sphere* (1996), 5 pp..
316. H. Grosse, C. Klimčík, P. Prešnajder, *Towards Finite Quantum Field Theory in Non-Commutative Geometry* (1996), 16 pp..
317. H. Grosse, C. Klimčík, P. Prešnajder, *Field Theory on a Supersymmetric Lattice* (1996), 32 pp..
318. H. Grosse, C. Klimčík, P. Prešnajder, *Topologically Nontrivial Field Configurations in Noncommutative Geometry*, Commun. Math. Phys. **178, 2** (1996), 507–526.
319. H. Grosse, C. Klimčík, P. Prešnajder, *Simple Field Theoretic Models on Noncommutative Manifolds* (1996), 15 pp..
320. H. Grosse, C. Klimčík, P. Prešnajder, *On Finite 4D Quantum Field Theory in Non-Commutative Geometry*, Commun. Math. Phys. **180, 2** (1996), 429–438.
321. H. Grosse, C. Klimčík, P. Prešnajder, *N=2 Superalgebra and Non-Commutative Geometry* (1996), 11 pp..
322. Fernando Falceto, Krzysztof Gawędzki, *Unitarity of the Knizhnik-Zamolodchikov-Bernard Connection and the Bethe Ansatz for the Elliptic Hitchin Systems* (1996), 24 pp..
323. O. Babelon, D. Bernard, F.A. Smirnov, *Quantization of Solitons and the Restricted Sine–Gordon Model* (1996), 29 pp..
324. V. Futorny, V. Mazorchuk, *Structure of α–stratified Modules for Finite-dimensional Lie Algebras II. BGG-resolution in the Simply–laced Case* (1996), 12 pp..
325. V. Futorny, *Irreducible Level Zero $A_n^{(1)}$–Modules with Finite–dimensional Weight Spaces* (1996), 15 pp..
326. J. Bochnak, W. Kucharz, *Vector Bundles, Algebraic Morphisms, and Realification of Complex Algebraic Varieties* (1996), 40 pp..
327. Anton Yu. Alekseev, Ludwig D. Faddeev, Jürg Fröhlich, Volker Schomerus, *Representation Theory of Lattice Current Algebras* (1996), 34 pp..
328. D.V. Alekseevsky, A.M. Perelomov, *Poisson and Symplectic Structures on Lie Algebras. I.*, J. Geom. Phys. **22, 3** (1997), 191–211.
329. Robert Beig, Piotr T. Chruściel, *Killing Initial Data*, Classical Quantum Gravity **14, 1A** (1997), A83–A92.
330. I. Krichever, O. Lipan, P. Wiegmann, A. Zabrodin, *Quantum Integrable Models and Discrete Classical Hirota Equations* (1996), 33 pp..
331. V. Popkov, B. Nienhuis, *Phase Diagram of 3D Multi–Layered Solvable 6–Vertex Model* (1996), 20 pp..
332. Maxim Nazarov, *Yangians and Capelli Identities*, Kirillov's seminar on representation theory (G.I. Olshanski, eds.), Amer. Math. Soc. Transl. 181, 1997, pp. 139–164.
333. Andrei Okounkov, Anatoly Vershik, *A New Approach to Representation Theory of Symmetric Groups* (1996), 21 pp..
334. E.I. Gordon, A.M. Vershik, *The Groups, Locally Embeddeble into the Class of Finite Groups* (1996), 7 pp..
335. L. Bonora, S. Krivonos, A. Sorin, *Towards the Construction of N=2 Supersymmetric Integrable Hierarchies* (1996), 18 pp..
336. A. Levin, M. Olshanetsky, *Double Coset Construction of Moduli Space of Holomorphic Bundles and Hitchin Systems* (1996), 19 pp..
337. Nándor Simányi, Domokos Szász, *The Boltzmann-Sinai Ergodic Hypothesis for Hard Ball Systems* (1996), 34 pp..
338. Toby N. Bailey, Michael G. Eastwood, *Zero–energy Fields on Real Projective Space*, Geometrieae Dedicata, 11 pp. (to appear).
339. Manfred Salmhofer, *Improved Power Counting and Fermi Surface Renormalization*, Rev. Math. Phys. **10** (1998), 553–578.

340. A.L. Onishchik, A.A. Serov, *On Isotropic Super-Grassmannians of Maximal Type Associated with an Odd Bilinear Form* (1996), 18 pp..
341. Ivan Penkov, *Characters of Strongly Generic Irreducible Lie Superalgebra Representations*, Int. J. of Mathematics **9, 3** (1998), 331–366.
342. Joseph A. Wolf, *Flag Manifolds and Representation Theory* (1996), 50 pp..
343. H. Narnhofer, W. Thirring, *Why Schrödinger's Cat is Most Likely to be Either Alive or Dead* (1996), 9 pp..
344. Vladimir L. Popov, *On Closedness of Orbits of Algebraic Groups* (1996), 7 pp..
345. Hieu Nguyen, *Weakly Symmetric Spaces and Bounded Symmetric Domains* (1996), 16 pp..
346. Petr Holický, Miloš Zahradník, *Stratified Low Temperature Phases of Stratified Spin Models. A General Pirogov – Sinai Approach* (1996), 65 pp..
347. Anton Bovier, Miloš Zahradník, *The Low–Temperature Phase of Kac–Ising Models* (1996), 19 pp..
348. Yu.A. Neretin, *Hinges and Geometric Constructions of Boundaries of Riemann Symmetric Spaces* (1996), 24 pp..
349. Boris Feigin, Feodor Malikov, *Modular Functor and Representation Theory of $\widehat{\mathfrak{sl}}_2$ at a Rational Level* (1996), 52 pp..
350. M. Asorey, F. Falceto, *Vacuum Nodes in QCD at $\theta = \pi$: Exact Results* (1996), 12 pp..
351. S. Deser, M. Henneaux, C. Teitelboim, *Electric–Magnetic Black Hole Duality* (1996), 8 pp..
352. Italo Guarneri, *Singular Continuous Spectra and Discrete Wave Packet Dynamics*, J. Math. Phys. **37** (1996), no. 10, 5195–5206.
353. Alice Fialowski, Dmitry Fuchs, *Singular Deformations of Lie Algebras on an Example* (1996), 18 pp..
354. Alexei Rudakov, *Algebraic Stability: Schur Lemma and Canonical Filtrations* (1996), 10 pp..
355. R. Dobrushin, O. Hryniv, *Fluctuations of the Phase Boundary in the 2D Ising Ferromagnet*, Commun. Math. Phys. **189** (1997), 395–445.
356. Elisa Ercolessi, Giovanni Landi, Paulo Teotonio–Sobrinho, *Noncommutative Lattices and the Algebras of their Continuous Functions* (1996), 32 pp..
357. Joseph A. Wolf, Roger Zierau, *Linear Cycle Spaces in Flag Domains, I: Flags Corresponding to the Classical Groups* (1996), 15 pp..
358. Evgeni Korotyaev, *The estimates of Periodic Potentials in Terms of Effective Masses* (1996), 19 pp..
359. Evgeni Korotyaev, *The Uniform Estimates for the Hill Operator* (1996), 21 pp..
360. V.A. Malyshev, F.M. Spieksma, *Dynamics in Binary Neural Networks with a Finite Number of Patterns. Part 1. General Picture of the Asynchronous Zero Temperature Dynamics.* (1996), 35 pp..
361. A.L. Onishchik, *A Construction of Non-split Supermanifolds*, Ann. Global Anal. Geom., 21 pp. (to appear).
362. P. Furlan , A.Ch. Ganchev , V.B. Petkova, *$\widehat{sl(2)}$ Admissible Representations – Fusion Transformation and Local Correlators*, Nucl. Phys. B **491** (1997), 635–658.
363. Abhay Ashtekar, Alejandro Corichi, *Photon Inner–product and the Gauss Linking Number* (1996), 14 pp..
364. A. Ashtekar, J. Lewandowski, D. Marolf, J. Mourão, T. Thiemann, *SU(N) Quantum Yang–Mills Theory in Two Dimensions: A Complete Solution* (1996), 36 pp..
365. Abhay Ashtekar, Jiří Bičák, Bernd G. Schmidt, *Asymptotic Structure of Symmetry Reduced General Relativity* (1996), 39 pp..
366. Abhay Ashtekar, Jiří Bičák, Bernd G. Schmidt, *Behavior of Einstein–Rosen Waves at Null Infinity* (1996), 16 pp..
367. Abhay Ashtekar, Jerzy Lewandowski, *Quantum Theory of Geometry I: Area Operators*, Classical Quantum Gravity **14, 1A** (1997), A55–A81.
368. Hugo Fort, Rodolfo Gambini, Jorge Pullin, *Lattice Knot Theory and Quantum Gravity in the Loop Representation* (1996), 23 pp..
369. Carlo Rovelli, *Loop Quantum Gravity and Black Hole Physics* (1996), 33 pp..
370. Bert Schroer, *Notes on the Wigner Representation Theory of the Poicaré Group, Localization and Statistics* (1996), 28 pp..
371. Bert Schroer, *Motivations and Physical Aims of Algebraic QFT* (1996), 40 pp..
372. Simon Gindikin, *Penrose transform at flag domains* (1996), 10 pp..
373. Michael P. Reisenberger, *A Left–handed Simplicial Action for Euclidean General Relativity*, Classical and Quantum Gravity, 25 pp. (to appear).
374. Terrence M. Adams, Karl E. Petersen, *Binomial–coefficient Multiples of Irrationals* (1996), 10 pp..
375. Shahn Majid, *Classification of Bicovariant Differential Calculi* (1996), 25 pp..
376. Michael Eastwood, Jan Slovák, *Semi–holonomic Verma Modules*, J. of Algebra, 27 pp. (to appear).
377. Klaus Schmidt, *Tilings, Fundamental Cocycles and Fundamental Groups of Symbolic $\mathbb{Z}^d$-actions*, Ergod. Th. & Dynam. Sys. **18** (1998), 1473–1525.
378. Jacek Pawełczyk, *Rigid String Instantons are Pseudo–holomorphic Curves* (1996), 19 pp..
379. Jerzy Lewandowski, Jacek Wiśniewski, *2+1 Sector of 3+1 Gravity* (1996), 12 pp..
380. V.M. Buchstaber, V.Z. Enolskiĭ, D.V. Leĭkin, *Hyperelliptic Kleinian Functions and Applications*, Proceedings of S.P.Novikov seminar II, AMS Translations, Amer. Math. Soc., 1997, pp. 33 pp. (to appear).
381. Simon Gindikin, *Real Integral Geometry and Complex Analysis* (1996), 29 pp..
382. Pierre Gaspard, *Entropy Production in Open Volume–Preserving Systems* (1996), 29 pp..
383. Michael Loss, Bernd Thaller, *Optimal Heat Kernel Estimates for Schrödinger Operators with Magnetic Fields in Two Dimensions*, Commun. Math. Phys. **186, 1** (1997), 95–107.

384. R.A. Minlos, E.A. Pechersky, Yu.M. Suhov, *Remarks on the Life and Research of Roland L. Dobrushin* (1996), 45 pp..
385. V. Gerasimenko, D. Petrina, *Rigorous Derivation of Generalized Kinetic Equation* (1996), 7 pp..
386. Harald Grosse, Edwin Langmann, Ernst Raschhofer, *The Luttinger–Schwinger Model* (1996), 19 pp..
387. József Fritz, Carlangelo Liverani, Stefano Olla, *Reversibility in Infinite Hamiltonian Systems with Conservative Noise* (1996), 16 pp..
388. Gerhard Keller, *Mixing for Finite Systems of Coupled Tent Maps* (1996), 8 pp..
389. Anton Yu. Alekseev, Andreas Recknagel, Volker Schomerus, *Generalization of the Knizhnik-Zamolodchikov-Equations*, Lett. Math. Phys. **41, 2** (1997), 169–180.
390. A.O. Barvinsky, *Geometry of the Dirac Quantization of Constrained Systems* (1996), 20 pp..
391. D.P. Zhelobenko, *Hypersymmetries of Extremal Equations* (1996), 14 pp..
392. Kirill V. Krasnov, *Geometrical Entropy from the Loop Quantum Gravity* (1996), 21 pp..
393. Abhay Ashtekar, *Large Quantum Gravity Effects: Unexpected Limitations of the Classical Theory* (1996), 8 pp..
394. Robert Beig, Piotr T. Chruściel, *The Isometry Groups of Asymptotically Flat, Asymptotically Empty Space–Times with Timelike ADM Four–Momentum*, Commun. Math. Phys. **188** (1997), 585–597.
395. Hideki Omori, Yoshiaki Maeda, Naoya Miyazaki, Akira Yoshioka, *Noncommutative Contact Algebras* (1996), 6 pp..
396. Ostap Hryniv, Rostyslav Hryniv, *Square Ice: Justification of Thermodynamic Limit and Some Properties of the Transfer Matrix* (1996), 21 pp..
397. Krzysztof A. Meissner, *Symmetries of Higher–Order String Gravity Actions* (1996), 10 pp..
398. Maxim Nazarov, *Capelli Identities for Lie Superalgebras*, Ann. Sci. Ec. Norm. Sup. **30** (1997), 847–872.
399. Janusz Grabowski, *$\mathbb{Z}$–graded Extensions of Poisson Brackets*, Rev. Math. Phys. **9, 1** (1997), 1–27.
400. Ostap Hryniv, *On a Conditional Invariance Principle for Random Walks*, Matem. Studii **9** (1998), 102–109.
401. Klaus Schmidt, *Tail–Fields of Products of Random Variables and Ergodic Equivalence Relations* (1996), 16 pp..
402. Peter W. Michor, Alexandre M. Vinogradov, *n–ary Lie and Associative Algebras*, Rend. Sem. Mat. Univ. Pol. Torino **54, 4** (1996), 373–392.
403. Andreas Kriegl, Peter W. Michor, *Product Preserving Functors of Infinite Dimensional Manifolds*, Archivum Mathematicum (Brno) **32,4** (1996), 289–306.
404. Dmitri V. Alekseevski, Stefano Marchiafava, Massimiliano Pontecorvo, *Compatible Complex Structures on Almost Quaternionic Manifolds* (1996), 18 pp..
405. Andreas Čap, *Translation of Natural Operators on Manifolds with AHS–Structures*, Archivum Mathematicum (Brno) **32,4** (1996), 249–266.
406. Peter W. Michor, *The Jacobi Flow*, Rend. Sem. Mat. Univ. Pol. Torino **54, 4** (1996), 365–372.
407. Victor G. Kac, Ivan T. Todorov, *Affine Orbifolds and Rational Conformal Field Theory Extensions of $W_{1+\infty}$* (1996), 64 pp..
408. S. N. Melikhov, S. Momm, *Analytic solutions of convolution equations on convex sets with an obstacle in the boundary* (1996), 26 pp..
409. Carlangelo Liverani, *Flows, Random Perturbations and Rate of Mixing* (1996), 28 pp..
410. Nicolai Chernov, *Entropy, Lyapunov Exponents and Mean Free Path for Billiards* (1996), 26 pp..
411. Douglas Lind, Klaus Schmidt, *Homoclinic Points of Algebraic Z^d–Actions* (1996), 29 pp..
412. N. Chernov, R. Markarian, S. Troubetzkoy, *Conditionally Invariant Measures for Anosov Maps with Small Holes* (1996), 27 pp..
413. Carlangelo Liverani, Benoit Saussol, Sandro Vaienti, *Conformal Measure and Decay of Correlation for Covering Weighted Systems* (1996), 20 pp..
414. Ph. Choquard, *Lagrangian Formulation of Nosé-Hoover and of Isokinetic Dynamics* (1996), 7 pp..

1997

415. D.V. Alekseevsky, *Flag Manifolds* (1997), 32 pp..
416. S. Ruffo, *Lyapunov Spectra in Spatially Extended Systems* (1997), 23 pp..
417. R. Loll, *Further Results on Geometric Operators in Quantum Gravity* (1997), 25 pp..
418. R. Loll, *Latticing Quantum Gravity*, Proc. of the 2nd Conference on Constrained Dynamics and Quantum Gravity, Santa Margherita, Italy, pp. 7 pp. (to appear).
419. D.V. Alekseevsky, S. Marchiafava, M. Pontecorvo, *Compatible Almost Complex Structures on Quaternion–Kähler Manifolds* (1997), 33 pp..
420. Editors: Peter Aichelburg, Abhay Ashtekar, *Abstracts of Seminars given at the Workshop on Mathematical Problems of Quantum Gravity held at the Erwin Schrödinger Institute, Vienna* (1997), 26 pp..
421. Ari Laptev, *Dirichlet and Neumann Eigenvalue Problems on Domains in Euclidean Spaces* (1997), 13 pp..
422. J. Gegenberg, G. Kunstatter, T. Strobl, *Edge States and Entropy of 2d Black Holes* (1997), 13 pp..
423. A. Bäcker, N. Chernov, *Generating Partitions for Two-dimensional Hyperbolic Maps* (1997), 12 pp..
424. A. Katok, R. J. Spatzier, *Differential Rigidity of Anosov Actions of Higher Rank Abelian Groups and Algebraic Lattice Actions*, Proc. of the Steklov Institute, Vol. 216, pp. 32 pp. (to appear).

425. O. Hryniv, *On Local Behaviour of the Phase Separation Line in the 2D Ising Model*, Probab. Theory Relat. Fields **110** (1998), 91–107.
426. Henrik Pedersen, Yat Sun Poon, Andrew Swann, *Hypercomplex Structures Associated to Quaternionic Manifolds* (1997), 21 pp..
427. Maciej Wojtkowski, Carlangelo Liverani, *Conformally Symplectic Dynamics and Symmetry of the Lyapunov Spectrum* (1997), 15 pp..
428. Mariusz Lemańczyk, *Entropy of Gaussian Actions for Countable Abelian Groups* (1997), 9 pp..
429. Maciej P. Wojtkowski, *Hamiltonian Systems with Linear Potential* (1997), 34 pp..
430. John C. Baez, Kirill V. Krasnov, *Quantization of Diffeomorphism-Invariant Theories with Fermions* (1997), 28 pp..
431. S. Moskaliuk (Editor), *Collection of Abstracts of the Lectures which will be given at the International Workshop "Mathematical Physics — today, Priority Technologies — for tomorrow" 12–17 May 1997, Kiev, Ukraine* (1997), 38 pp..
432. Paweł Nurowski, *On a Certain Formulation of the Einstein Equations*, J. Math. Phys. **39** (1998), 5477–5480.
433. T.B. Ward, *Almost All S–Integer Dynamical Systems Have Many Periodic Points*, Ergodic Theory and Dynamical Systems **18** (1998), 471–486.
434. L.J. Mason, *The Asymptotic Structure of Algebraically Special Space–times* (1997), 10 pp..
435. Simon Gindikin, *SO(1;n)-twistors* (1997), 10 pp..
436. Nándor Simányi, Domokos Szász, *Hard Ball Systems Are Fully Hyperbolic* (1997), 48 pp..
437. A. Latz, H. van Beijeren, J. R. Dorfman, *Lyapunov Spectrum and the Conjugate Pairing Rule for a Thermostated Random Lorentz Gas: Kinetic Theory*, Phys. Rev. Lett. **78** (1997), 207–210.
438. Thierry Dauxois, Stefano Ruffo, Alessandro Torcini, *Modulational Lyapunov Estimate for FPU–chains* (1997), 13 pp..
439. Manfred Einsiedler, Klaus Schmidt, *Markov Partitions and Homoclinic Points of Algebraic Z^d–actions*, Dynamical Systems and Related Topics, Proc. Steklov Inst. Math. 216, Interperiodica Publishing, Moscow, 1997, pp. 259–279.
440. N.A. Gromov, S.S. Moskaliuk, *Irreducible Representations of Cayley–Klein Orthogonal Algebras* (1997), 20 pp..
441. Robert Bartnik, *The Structure of Spherically Symmetric su(n) Yang–Mills Fields* (1997), 25 pp..
442. C. Appert, M.H. Ernst, *Chaos Properties and Localization in Lorentz Lattice Gases* (1997), 49 pp..
443. N.A. Gromov, S.S. Moskaliuk, *Induced Representations of Cayley–Klein Orthogonal Groups* (1997), 16 pp..
444. Eduardo Canale, Roberto Markarian, Sylvie Oliffson Kamphorst, Sônia Pinto de Carvalho, *A Lower Bound for Chaos on the Elliptical Stadium* (1997), 13 pp..
445. Lai–Sang Young, *Statistical Properties of Dynamical Systems With Some Hyperbolicity* (1997), 61 pp..
446. H.J. Borchers, *Half–sided Translations in Connection with Modular Groups as a Tool in Quantum Field Theory* (1997), 17 pp..
447. G. Rozenblum, M. Solomyak, *CLR-estimate for the Generators of Positivity Preserving and Positively Dominated Semigroups* (1997), 19 pp..
448. Dirk Schlingemann, *Construction of Kink Sectors for Two–Dimensional Quantum Field Theory Models (An Algebraic Approach)* (1997), 46 pp..
449. Hendrik Grundling, C.A. Hurst, *Constrained Dynamics for Quantum Mechanics I. Restricting a Particle to a Surface*, J. Math. Phys **39, 6** (1998), 3091–3119.
450. Andreas Čap, Hermann Schichl, *Parabolic Geometries and Canonical Cartan Connections* (1997), 34 pp..
451. Simonetta Frittelli, Ezra T. Newman, *Poincaré Pseudo–symmetries in Asymptotically Flat Spacetimes* (1997), 10 pp..
452. D. V. Alekseevsky, J. Grabowski, G. Marmo, P. W. Michor, *Completely Integrable Systems: A Generalization*, Mod. Phys. Lett. A **12, 22** (1997), 1637–1648.
453. Peter W. Michor, Hermann Schichl, *No Slices on the Space of Generalized Connections*, Acta Math. Univ. Commenianae **66, 2** (1997), 221–228.
454. Peter W. Michor, Tudor Ratiu, *On the Geometry of the Virasoro–Bott Group*, J. Lie Theory **8** (1998), 293–309.
455. Leonid A. Bunimovich, Jan Rehacek, *How High–Dimensional Stadia Look Like* (1997), 25 pp..
456. Abhay Ashtekar, Troy A. Schilling, *Geometrical Formulation of Quantum Mechanics* (1997), 41 pp..
457. Rodolfo Gambini, Jorge Griego, Jorge Pullin, *Chern–Simons States in Spin–Network Quantum Gravity* (1997), 8 pp..
458. Rodolfo Gambini, Jorge Pullin, *Large Quantum Gravity Effects: Backreaction on Matter* (1997), 5 pp..
459. J.M. Aroca, Hugo Fort, Rodolfo Gambini, *On the Path Integral Loop Representation of (2+1) Lattice Non–abelian Gauge Theories* (1997), 16 pp..
460. R. Beig, N. Ó Murchadha, *Late Time Behaviour of the Maximal Slicing of the Schwarzschild Black Hole* (1997), 19 pp..
461. K.P. Tod, *Four–dimensional D'Atri Spaces with Extra Conditions* (1997), 10 pp..
462. Ingemar Bengtsson, Ted Jacobson, *Degenerate Metric Phase Boundaries*, Classical Quantum Gravity **14** (1997), 3109–3121.
463. Michael P. Reisenberger, Carlo Rovelli, *"Sum over Surfaces" Form of Loop Quantum Gravity* (1997), 27 pp..

464. Paweł Nurowski, *Elliptic Fibrations Associated with the Einstein Spacetimes*, J. Math. Phys. **39** (1998), 5481–5490.
465. D. Alekseevsky , J. Grabowski , G. Marmo , P.W. Michor, *Poisson Structures on Double Lie Groups*, J. Geom. Physics **26** (1998), 340–379.
466. D.V. Alekseevsky, F. Podestà, *Compact Cohomogeneity One Riemannian Manifolds of Positive Euler Characteristic and Quaternionic Kähler Manifolds* (1997), 32 pp..
467. Robert Beig, László B. Szabados, *On a Global Conformal Invariant of Initial Data Sets*, Classical Quantum Gravity **14** (1997), 3091–3107.
468. H. van Beijeren, J.R. Dorfman, H. A. Posch, Ch. Dellago, *The Kolmogorov–Sinai Entropy for Dilute Gases in Equilibrium*, Phys. Rev. E, 10 pp. (to appear).
469. Elliott H. Lieb, Jakob Yngvason, *The Physics and Mathematics of the Second Law of Thermodynamics* (1997), 101 pp..
470. Andrzej Trautman, *On Complex Structures in Physics* (1997), 16 pp..
471. Jerzy F. Plebański, Maciej Przanowski, *A New Version of the Heavenly Equation*, Engelbert Schucking Festschrift, Springer, pp. 26 pp. (to appear).
472. James B. Hartle, Donald Marolf, *Comparing Formulations of Generalized Quantum Mechanics for Reparametrization Invariant Systems* (1997), 21 pp..
473. Donald Marolf, José Mourão, Thomas Thiemann, *The Status of Diffeomorphism Superselection in Euclidean 2+1 Gravity* (1997), 14 pp..
474. Gary T. Horowitz, Donald Marolf, *Where is the Information Stored in Black Holes?* (1997), 21 pp..
475. V. Moncrief, J. E. Nelson, *Constants of Motion and the Conformal Anti - de Sitter Algebra in (2+1)-Dimensional Gravity*, Int. J. Mod. Phys. D **6, 5** (1997).
476. A.O. Barvinsky, A.Yu. Kamenshchik, *Quantum Origin of the Early Inflationary Universe* (1997), 44 pp..
477. Paweł Nurowski, Maciej Przanowski, *A Four Dimensional Example of Ricci Flat Metric Admitting Almost-Kahler Non-Kahler Structure* (1997), 8 pp..
478. J. Madore, *Gravity on Fuzzy Space–Time* (1997), 31 pp..
479. Guosong Zhao, *Symmetric Covariant Tensor Fields of Order 2 on Pseudo–Riemannian Manifolds* (1997), 17 pp..
480. M. Hoffmann-Ostenhof, T. Hoffmann-Ostenhof, N. Nadirashvili, *On the Nodal Line Conjecture*, Contemp. Math., 16 pp. (to appear).
481. M. Hoffmann–Ostenhof, T. Hoffmann–Ostenhof, N. Nadirashvili, *Critical Sets of Smooth Solutions to Elliptic Equations* (1997), 18 pp..
482. Simon Gindikin, *Tube Domains in Stein Symmetric Spaces* (1997), 15 pp..
483. Jürgen Vollmer, Tamás Tél, Wolfgang Breymann, *Equivalence of Irreversible Entropy Production in Driven Systems: An Elementary Chaotic Map Approach*, Phys. Rev. Lett. **79** (1997), 2759–2762.
484. Michiko Yuri, *Slow Decay of Correlations for Multi–Dimensional Intermittent Maps* (1997), 10 pp..
485. Guosong Zhao, *Solutions of Finite Type of Sine–Gordon Equation* (1997), 15 pp..
486. Jörg Frauendiener, *On an Integral Formula on Hypersurfaces in General Relativity*, Classical Quantum Gravity **14** (1997), 3421–3423.
487. J. Tafel, D. Wójcik, *Null Killing Vectors and Reductions of the Self-Duality Equations* (1997), 12 pp..
488. Ivan Dimitrov, Ivan Penkov, *Partially Integrable Highest Weight Modules*, Transformation Groups **3, 3** (1998), 241–253.
489. D. Burago, S. Ivanov, *On Asymptotic Isoperimetric Constant of Tori* (1997), 5 pp..
490. H. Narnhofer, W. Thirring, *Spontaneously Broken Symmetries* (1997), 19 pp..
491. D. Burago, S. Ferleger, A. Kononenko, *Unfoldings and Global Bounds on the Number of Collisions for Generalized Semi–Dispersing Billiards* (1997), 14 pp..
492. Ivan Dimitrov, Olivier Mathieu, Ivan Penkov, *On the Structure of Weight Modules* (1997), 15 pp..
493. Rodolfo Gambini, Jerzy Lewandowski, Donald Marolf, Jorge Pullin, *On the Consistency of the Constraint Algebra in Spin Network Quantum Gravity* (1997), 9 pp..
494. Jan Kwiatkowski, *Inverse Limit of M–cocycles and Applications* (1997), 19 pp..
495. Alexander V. Sobolev, *Absolute Continuity of the Periodic Magnetic Schrödinger Operator* (1997), 29 pp..
496. Michel Dubois–Violette, $d^N=0$, appeared as "$d^N = 0$: Generalized Homology", K–Theory **14** (1998), 371–404.
497. Klaus Schmidt, *On Joint Recurrence*, C.R. Acad. Sci. Paris Sér. I Math. **327** (1998), 837–842.
498. Dirk Schlingemann, *From Euclidean Field Theory to Quantum Field Theory* (1997), 35 pp..
499. H.J. Borchers, *On Poincaré Transformations and the Modular Group of the Algebra Associated with a Wedge* (1997), 7 pp..
500. M. Hoffmann–Ostenhof, T. Hoffmann–Ostenhof, N. Nadirashvili, *On the Multiplicity of Eigenvalues of the Laplacian on Surfaces*, Ann. Glob. Analysis and Geom. **17** (1999), 43–48.
501. K.–H. Rehren, *Spin–Statistics and CPT for Solitons* (1997), 10 pp..
502. V.G. Danilov, G.A. Omel'yanov, *Truncation of a Chain Hugoniot–type Conditions for Shock Waves and its Justification for the Hopf Equation* (1997), 35 pp..
503. Anthony Manning, Klaus Schmidt, *Common Homoclinic Points of Commuting Toral Automorphisms* (1997), 9 pp..
504. Viviane Baladi, Mirko Degli Esposti, Stefano Isola, Esa Järvenpää, Antti Kupiainen, *The Spectrum of Weakly Coupled Map Lattices*, J. des Mathématiques Pures et Appliquées **77** (1998), 539–584.

505. R. Steinbauer, *Geodesics and Geodesic Deviation for Impulsive Gravitational Waves*, J. Math. Phys **39, 4** (1998), 2201–2212.
506. Dmitri Alekseevsky, Andreas Kriegl, Mark Losik, Peter W. Michor, *Lifting Smooth Curves over Invariants for Representations of Compact Lie Groups* (1997), 15 pp..
507. R. Beig, *"Special" TT–tensors* (1997), 9 pp..
508. M. Nedeljkov, S. Pilipović, *Approximate Solutions to a Linear Dirichlet Problem with Singular Coefficients* (1997), 15 pp..
509. Abhay Ashtekar, Jerzy Lewandowski, *Quantum Theory of Geometry II: Volume operators* (1997), 25 pp..
510. A. Ashtekar, J. Baez, A. Corichi, K. Krasnov, *Quantum Geometry and Black Hole Entropy* (1997), 5 pp..
511. Yu.V. Egorov, V.A. Kondratiev, *On Asymptotic Behavior of Solutions of Semi–linear Parabolic Boundary Value Problems* (1997), 45 pp..
512. Hebe A. Biagioni, Todor Gramchev, *Multidimensional Kuramoto–Sivashinsky Type Equations: Singular Initial Data and Analytic Regularity* (1997), 19 pp..
513. Nikolai Ya. Radyno, *Some Questions of a General Spectral Theory of Banach Modules* (1997), 15 pp..
514. Thomas Hoffmann–Ostenhof, Peter W. Michor, Nikolai Nadirashvili, *Bounds on the Multiplicity of Eigenvalues for Fixed Membranes* (1997), 17 pp..
515. Edward Malec, Niall Ó Murchadha, Tadeusz Chmaj, *Spherical Scalar Waves and Gravity – Red Shift and Backscattering* (1997), 16 pp..
516. Robert Low, *Stable Singularities of Wave Fronts in General Relativity*, J. Math. Phys. **39, 6** (1998), 3332–3335.
517. Abhay Ashtekar, Alejandro Corichi, Monica Pierri, *Geometry in Color Perception* (1997), 14 pp..
518. T.R. Field, R.J. Low, *Causal Relations via Linking in Twistor Space*, J. Geom. Phys. **28** (1998), 339–348.
519. A.N. Starkov, *First Cohomology Group, Mixing, and Minimal Sets of Commutative Group of Algebraic Actions on Torus* (1997), 8 pp..
520. Zoltán Perjés, George Sparling, *The Abstract Twistor Space of the Schwarzschild Space–Time*, 9 pp..

1998

521. L.J. Mason, J.P. Nicolas, *Global Results for the Rarita-Schwinger Equations and Einstein Vacuum Equations* (1998), 24 pp..
522. D.C. Robinson, *Chiral Actions and Einstein's Vacuum Equations* (1998), 15 pp..
523. D.V. Alekseevsky, *Isotropy Representation of Flag Manifolds* (1998), 12 pp..
524. Jacques Lafontaine, *A Remark About Static Space Times* (1998), 6 pp..
525. L.K. Hadjiivanov, A.P. Isaev, O.V. Ogievetsky, P.N. Pyatov, I.T. Todorov, *Hecke Algebraic Properties of dynamical R–Matrices. Application to Related Quantum Matrix Algebras* (1998), 28 pp..
526. Frank Leitenberger, *Quantum Theory of the Projective Line*, J. Math. Phys. **39** (1998), 802-817.
527. M. P. Owen, *A Riemannian Off–Diagonal Heat Kernel Bound for Uniformly Elliptic Operators* (1998), 29 pp..
528. Christian D. Jäkel, *Decay of Spatial Correlations in Thermal States* (1998), 13 pp..
529. Christian D. Jäkel, *The Relation between KMS–States for Different Temperatures* (1998), 27 pp..
530. A.M. Stepin, Ya.B. Vorobets, *Isospectrality and Projective Geometries* (1998), 17 pp..
531. A. Antonevich, *The Schrödinger Equation with Point Interaction in an Algebra of New Generalized Functions* (1998), 14 pp..
532. J.E. Rubio, *The Global Control of Shock Waves* (1998), 18 pp..
533. M. Kunzinger, M. Oberguggenberger, *Group Analysis of Differential Equations and Generalized Functions* (1998), 24 pp..
534. Robert Brooks, Eran Makover, *Riemann Surfaces with Large First Eigenvalue* (1998), 18 pp..
535. Timothy R. Field, *Geometrical aspects of the Kähler Structure for the quantum state space of zero rest-mass fields* (1998), 19 pp..
536. S.S. Moskaliuk, A.T. Vlassov, *Double Categories in Mathematical Physics* (1998), 12 pp..
537. Karl–Georg Schlesinger, *Towards Quantum Mathematics Part I: From Quantum Set Theory to Universal Quantum Mechanics* (1998), 25 pp..
538. H.J. Borchers, D. Buchholz, *Global Properties of Vacuum States in de Sitter Space* (1998), 15 pp..
539. Alexander Fel'shtyn, *Dynamical Zeta Functions, Nielsen Theory and Reidemeister Torsion* (1998), 119 pp..
540. Alexander Fel'shtyn, Hector Sánchez–Morgado, *Reidemeister Torsion and Integrable Hamiltonian Systems* (1998), 18 pp..
541. Rudolf Haag, *Objects, Events and Localization* (1998), 22 pp..
542. Olga Simek, *Heat Trace Asymptotics for Domains with Singular Boundaries* (1998), 24 pp..
543. Nándor Simányi, Domokos Szász, *Cylindric Billiards and Transitive Lie Group Actions* (1998), 19 pp..
544. Klaus Schmidt, *Remarks on Livšic' Theory for Nonabelian Cocycles* (1998), 18 pp..
545. Tomasz Rybicki, *A Note on Generalized Flag Structures*, Annales Polonici Mathemathici **69** (1998), 89-97.
546. H. Grosse, G. Reiter, *The Fuzzy Supersphere* (1998), 33 pp..
547. Matthias Lesch, Markus J. Pflaum, *Traces on Algebras of Parameter Dependent Pseudodifferential Operators and the Eta–Invariant*, Trans. Amer. Math. Soc., 28 pp. (to appear).

548. G. Popov, G. Vodev, *Distribution of the Resonances and Local Energy Decay in the Transmission Problem* (1998), 12 pp..
549. A. Rod Gover, Jan Slovák, *Invariant Local Twistor Calculus for Quaternionic Structures and Related Geometries* (1998), 44 pp..
550. G.M. Zhislin, *On the Discrete Spectrum of Many–Particle Neutral Systems in Magnetic Field with Fixed Pseudomomentum* (1998), 23 pp..
551. H.J. Borchers, J. Yngvason, *Modular Groups of Quantum Fields in Thermal States* (1998), 28 pp..
552. Matthias Lesch, Mark Malamud, *The Inverse Spectral Problem for First Order Systems on the Half Line* (1998), 29 pp..
553. N. Ilieva, W. Thirring, *Do Anyons Solve Heisenberg's Urgleichung in One Dimension*, Eur. Phys. J. C **6, 4** (1999), 705ff.
554. H. Grosse, P. Prešnajder, *A Treatment of the Schwinger Model within Noncommutative Geometry* (1998), 30 pp..
555. Jacques Bros, Detlev Buchholz, *The Unmasking of Thermal Goldstone Bosons* (1998), 7 pp..
556. Karl–Georg Schlesinger, *Towards Quantum Mathematics Part II: Manifold Notions* (1998), 19 pp..
557. Detlev Buchholz, Olaf Dreyer, Martin Florig, Stephen J. Summers, *Geometric Modular Action and Spacetime Symmetry Groups* (1998), 84 pp..
558. M. Kunzinger, R. Steinbauer, *A Rigorous Solution Concept for Geodesic and Geodesic Deviation Equations in Impulsive Gravitational Waves* (1998), 18 pp..
559. G.D. Raikov, *Asymptotic Properties of the Magnetic Integrated Density of States* (1998), 27 pp..
560. A.A. Balinsky, W.D. Evans, *Stability of One–Electron Molecules in the Brown–Ravenhall Model* (1998), 17 pp..
561. Harald Grosse, Karl-Georg Schlesinger, *Duals for Non–Abelian Lattice Gauge Theories by Categorical Methods* (1998), 20 pp..
562. Kazuhiro Kurata, *Existence and Semi–Classical Limit of the Least Energy Solution to a Nonlinear Schrödinger Equation with Electromagnetic Fields* (1998), 19 pp..
563. Kazuhiro Kurata, *A Remark on Finitness of the Lower Spectrum of Uniformly Elliptic Operators with Singular Potentials* (1998), 9 pp..
564. Kazuhiro Kurata, *An Estimate on the Heat Kernel of Magnetic Schrödinger Operators and Unformly Elliptic Operators with Non–negative Potentials* (1998), 17 pp..
565. J.A.Vickers, J.P. Wilson, *Invariance of the Distributional Curvature of the Cone under Smooth Diffeomorphisms* (1998), 8 pp..
566. J.A. Vickers, J.P. Wilson, *A Nonlinear Theory of Tensor Distributions* (1998), 16 pp..
567. Evgeni Korotyaev, *Lattice Dislocations in a 1–Dimensional Model* (1998), 19 pp..
568. Evgeni Korotyaev, *Estimates of Periodic Potentials in Terms of Gap Lengths*, Commun. Math. Phys., 5 pp. (to appear).
569. Evgeni Korotyaev, *Inverse Problem and the Trace Formula for the Hill Operator, II*, Math. Zeit., 19 pp. (to appear).
570. Maciej Zworski, *Poisson Formula for Resonances in Even Dimensions* (1998), 8 pp..
571. M.Sh. Birman, T.A. Suslina, *Two–Dimensional Periodic Pauli Operator. The Effective Masses at the Lower Edge of the Spectrum* (1998), 19 pp..
572. D. Burghelea, *Lectures on Witten Helffer Sjöstrand theory* (1998), 17 pp..
573. Bernard Shiffman, Steve Zelditch, *Distribution of Zeros of Random and Quantum Chaotic Sections of Positive Line Bundles* (1998), 22 pp..
574. Ursula Porod, Steve Zelditch, *Semi–classical Limit for Random Walks* (1998), 36 pp..
575. Ursula Porod, Steve Zelditch, *Semi-classical Limit of Random Walks II* (1998), 39 pp..
576. Dmitry V. Alekseevsky, Andrea F. Spiro, *Invariant CR Structures on Compact Homogeneous Manifolds* (1998), 44 pp..
577. D. Burghelea, *Removing Metric Anomalies from Ray Singer Torsion* (1998), 9 pp..
578. Michael Farber, *Dirichlet Units and Critical Points of Closed 1–Forms* (1998), 5 pp..
579. Steven B. Bradlow, James F. Glazebrook, Franz W. Kamber, *Reduction of the Hermitian–Einstein Equation on Kählerian Fiber Bundles* (1998), 37 pp..
580. B. Helffer, M. Hoffmann–Ostenhof, T. Hoffmann–Ostenhof, M.P. Owen, *Nodal Sets for the Groundstate of the Schrödinger Operator with Zero Magnetic Field in a non Simply Connected Domain.* (1998), 30 pp..
581. Hideki Omori, Yoshiaki Maeda, Naoya Miyazaki, Akira Yoshioka, *Deformation Quantizations of the Poisson Algebra of Laurent Polynomials*, Lett. Math. Phys., 9 pp. (to appear).
582. F-H Lin, J.X. Xin, *On the Incompressible Fluid Limit and the Vortex Motion Law of the Nonlinear Schrödinger Equation*, Commun. Math. Phys., 32 pp. (to appear).
583. Steve Zelditch, Maciej Zworski, *Spacing between Phase Shifts in a Simple Scattering Problem* (1998), 16 pp..
584. Stefan Haller, Tomasz Rybicki, *On the Perfectness of Nontransitive Groups of Diffeomorphisms* (1998), 16 pp..
585. Daniele Guido, Tommaso Isola, *Novikov–Shubin Invariants and Asymptotic Dimensions for Open Manifolds* (1998), 43 pp..
586. Peter Michor, Josef Teichmann, *Description of Infinite Dimensional Abelian Regular Lie Groups*, J. Lie Theory, 3 pp. (to appear).
587. N. Ilieva, W. Thirring, *The Thirring Model 40 Years Later* (1998), 17 pp..

588. Frank Leitenberger, *A Quantum Deformation of Invariants of Higher Binary Forms* (1998), 37 pp..
589. Bernd Kuckert, *Spin & Statistics, Localization Regions, and Modular Symmetries in Quantum Field Theory* (1998), 74 pp..
590. Timothy R. Field, Lane P. Hughston, *The Geometry of Coherent States*, J. Math. Phys., 18 pp. (to appear).
591. Renat Zhdanov, *On Separation of Variables in the Schrödinger Equation for a Particle Interacting with External Field* (1998), 8 pp..
592. M. Einsiedler, T. Ward, *Fitting Ideals for Finitely Presented Algebraic Dynamical Systems* (1998), 12 pp..
593. Richard Sharp, *Relative Growth Series in some Hyperbolic Groups*, Mathematische Annalen **312** (1998), 125–132.
594. Mark Pollicott, Richard Sharp, *Asymptotic Expansions for Closed Orbits in Homology Classes* (1998), 31 pp..
595. Charles Radin, Lorenzo Sadun, *An Algebraic Invariant for Substitution Tiling Systems* (1998), 18 pp..
596. D. R. Orendovici, Ya. B. Pesin, *Chaos in Traveling Waves of Lattice Systems of Unbounded Media* (1998), 36 pp..
597. Zhongwei Shen, *On Absolute Continuity of the Periodic Schrödinger Operators* (1998), 26 pp..
598. H. Dickinson, M. M. Dodson, *Extremal manifolds and Hausdorff Dimension* (1998), 11 pp..
599. Michiko Yuri, *On the Speed of Convergence to Equilibrium States for Certain Nonhyperbolic Systems* (1998), 15 pp..
600. Vesselin Petkov, Maciej Zworski, *Breit–Wigner Approximation and the Distribution of Resonances* (1998), 14 pp..
601. Gérard Besson, Gilles Courtois, Sylvestre Gallot, *Lemme de Schwarz Réel et Applications Géométriques* (1998), 27 pp..
602. Geon Ho Choe, Toshihiro Hamachi, Hitoshi Nakada, *Skew Products and Mod 2 Normal Numbers* (1998), 9 pp..
603. M. Sh. Birman, T. A. Suslina, *The Periodic Dirac Operator is Absolutely Continuous* (1998), 18 pp..
604. M. Sh. Birman, T. A. Suslina, *Periodic Magnetic Hamiltonian with a Variable Metric. The Problem of Absolute Continuity* (1998), 31 pp..
605. Victor G. Kac, *Classification of Infinite–Dimensional Simple Linearly Compact Lie Superalgebras* (1998), 65 pp..
606. A. Laptev, O. Safronov, *The Negative Discrete Spectrum of a Class of Two–Dimentional Schrödinger Operators with Magnetic Fields* (1998), 10 pp..
607. Ari Laptev, Timo Weidl, *Hardy Inequalities for Magnetic Dirichlet Forms* (1998), 7 pp..
608. H.D. Cornean, G. Nenciu, *Two Dimensional Magnetic Schrödinger Operators: Width of Minibands in the Tight Binding Approximation*, Ann. Inst. H. Poincaré, Phys. Theor., 18 pp. (to appear).
609. Pär Kurlberg, Zeév Rudnick, *The Distribution of Spacings Between Quadratic Residues* (1998), 37 pp..
610. Dalibor Volný, *Cohomology of Lipschitz and Absolutely Continuous Cocycles over Irrational Circle Rotations* (1998), 33 pp..
611. Terry Gannon, *The Cappelli–Itzykson–Zuber A–D–E Classification* (1998), 9 pp..
612. E. Glasner, J.-P. Thouvenot, B. Weiss, *Entropy Theory without Past* (1998), 15 pp..
613. Andreas Čap, Jan Slovák, Vladimír Souček, *Invariant Operators on Manifolds with Almost Hermitian Symmetric Structures, III. Standard Operators.*, Diff. Geom. Appl., 33 pp. (to appear).
614. Jean–Paul Brasselet, Shoji Yokura, *Remarks on Bivariant Constructible Functions* (1998), 18 pp..
615. M. van den Berg, P. Gilkey, *The Heat Content Asymptotics of a Time Dependent Process* (1998), 5 pp..
616. Peter B Gilkey, Uwe Semmelmann, *Spinors, Self–Duality, and IP Algebraic Curvature Tensors* (1998), 7 pp..
617. Paula B. Cohen, *Dedekind Zeta Functions and Quantum Statistical Mechanics* (1998), 10 pp..
618. A.N. Starkov, *Minimality and Unique Ergodicity for Homogeneous Actions of Split Subgroups* (1998), 6 pp..
619. D.J. Broadhurst, D. Kreimer, *Renormalization Automated by Hopf Algebra* (1998), 22 pp..
620. Alain Connes, *Trace Formula in Noncommutative Geometry and the Zeros of the Riemann Zeta Function* (1998), 87 pp..
621. A. Cappelli, L. S. Georgiev, I. T. Todorov, *A Unified Conformal Field Theory Description of Paired Quantum Hall States* (1998), 42 pp..
622. Dirk Schlingemann, *Constructive Aspects of Algebraic Euclidean Field Theory* (1998), 46 pp..
623. Michel Balazard, Éric Saias, *The Nyman–Beurling Equivalent Form for the Riemann Hypothesis* (1998), 9 pp..
624. Paweł Nurowski, Lane Hughston, David Robinson, *Extensions of Bundles of Null Directions* (1998), 38 pp..
625. Glenn Barnich, *A General Non Renormalization Theorem in the Extended Antifield Formalism*, J. of High Energy Physics, 26 pp. (to appear).
626. Peter V. Golubtsov, Stepan S. Moskaliuk, *Bayesian Decisions and Fuzzy Logic* (1998), 8 pp..
627. Michael Kunzinger, Roland Steinbauer, *A Note on the Penrose Junction Conditions* (1998), 9 pp..
628. D.V. Alekseevsky, S. Marchiafava, M. Pontecorvo, *Spectral Properties of the Twistor Fibration of a Quaternion Kähler Manifold* (1998), 20 pp..
629. W. Kummer, D.V. Vassilevich, *Effective Action and Hawking Radiation for Dilaton Coupled Scalars in Two Dimensions* (1998), 19 pp..
630. Mark Graev, *Intermediate Inversion Formulas in Integral Geometry* (1998), 14 pp..

631. Ansgar Jüngel, Yue-Jun Peng, *Zero–Relaxation–Time Limits in the Hydrodynamic Equations for Plasmas Revisited* (1998), 13 pp..
632. G.L. Litvinov, V.P. Maslov, A.N. Sobolevskiĭ, *Idempotent Mathematics and Interval Analysis* (1998), 16 pp..
633. N. Ben Abdallah, P. Degond, P. Markowich, C. Schmeiser, *High Field Approximations of the Spherical Harmonics Expansion Model for Semiconductors* (1998), 33 pp..
634. P. Degond, A. Nouri, C. Schmeiser, *Macroscopic Models for Ionization in the Presence of Strong Electric Fields* (1998), 12 pp..
635. Valentin Ya. Golodets, Sergey D. Sinel'shchikov, *On the Conjugacy and Isomorphism Problems for Stabilizers of Lie Group Actions* (1998), 20 pp..
636. Stefan Haller, Tomasz Rybicki, *On the Group of Diffeomorphisms Preserving a Locally Conformal Symplectic Structure* (1998), 23 pp..
637. U. Schnell, J.M. Wills, *Densest Packings of More Than Three d–spheres are Nonplanar* (1998), 9 pp..
638. Jürgen Fuchs, Christoph Schweigert, *Orbifold Analysis of Broken Bulk Symmetries* (1998), 14 pp..
639. Joseph Krasil'shchik, Michal Marvan, *Coverings and Integrability of the Gauss–Mainardi–Codazzi Equations* (1998), 13 pp..
640. Brian Marcus, Selim Tuncel, *Resolving Markov Chains onto Bernoulli Shifts* (1998), 72 pp..
641. Izu Vaisman, *Nambu-Lie Groups* (1998), 18 pp..
642. H.J. Borchers, *On the Embedding of von Neumann Subalgebras* (1998), 12 pp..
643. Jakob Yngvason, *Quantum Dots A Survey of Rigorous Results* (1998), 20 pp..
644. Marc Henneaux, Bernard Knaepen, *The Wess-Zumino Consistency Condition for p-Form Gauge Theories* (1998), 46 pp..
645. J. Feldman, *Standardness and Prestandardness in Decreasing Sequences of σ–Fields* (1998), 24 pp..
646. H. Struchtrup, *Kinetic Schemes and Boundary Conditions for Moment Equations* (1998), 20 pp..
647. Anastasios C. Petkou, Marcello B. Silva Neto, *On the Free–Energy of Three–Dimensional CFTs and Polylogarithms* (1998), 11 pp..
648. F. Poupaud, J. Soler, *Parabolic Limit and Stability of the Vlasov–Poisson–Fokker–Planck System* (1998), 19 pp..
649. Izu Vaisman, *A Survey on Nambu–Poisson Brackets* (1998), 34 pp..
650. Hendrik Grundling, Fernando Lledó, *Local Quantum Constraints* (1998), 39 pp..
651. M. Asorey, *Maximal Non–Abelian Gauges and Topology of Gauge Orbit Space* (1998), 31 pp..
652. G. Rozenblum, *Semi–group Domination and Eigenvalue Estimates* (1998), 19 pp..

Until February 1999

653. H. Grosse, M. Oberguggenberger, I.T. Todorov, *Generalized Functions for Quantum Fields Obeying Quadratic Exchange Relations* (1999), 15 pp..
654. Klaus Schmidt, *Algebraic Coding of Expansive Group Automorphisms and Two–Sided Beta–Shifts* (1999), 21 pp..
655. Anton Arnold, Peter Markowich, Giuseppe Toscani, *On Large Time Asymptotics For Drift–Diffusion–Poisson Systems* (1999), 11 pp..
656. Ludvig Faddeev, Antti J. Niemi, *Partial Duality in SU(N) Yang–Mills Theory* (1999), 9 pp..
657. László Erdős, Horng-Tzer Yau, *Linear Boltzmann Equation as the Weak Coupling Limit of a Random Schrödinger Equation* (1999), 72 pp..
658. H.D. Cornean, *On the Essential Spectrum of Two Dimensional Periodic Magnetic Schrödinger Operators* (1999), 16 pp..
659. Daniel Grieser, *Local Geometry of Singular Real Analytic Surfaces* (1999), 20 pp..
660. Oleg N. Ageev, *On the Multiplicity Function of Generic Group Extensions with Continuous Spectrum.* (1999), 18 pp..
661. Pierre Degond, José L. López, Frédéric Poupaud, Christian Schmeiser, *Existence of Solutions of a Kinetic Equation Modelling Cometary Flows* (1999), 15 pp..
662. Christian Schmeiser, *Macroscopic Models for Almost Elastic Nonlinear Electron-Phonon Interaction in Semiconductors* (1999), 17 pp..
663. Peter W. Michor, Izu Vaisman, *A Note on n–ary Poisson Brackets* (1999), 10 pp..
664. G.A. Vilkovisky, *Master Equation in the General Gauge: on the Problem of Infinite Reducibility* (1999), 9 pp..
665. A.A. suzko, *Inverse Problem and Darboux Transformations for Two–Dimensional Finite–Difference Schrödinger Equation* (1999), 12 pp..
666. Sergio Salbany, Todor Todorov, *Nonstandard Analysis in Point–Set Topology* (1999), 59 pp..
667. Emmanuel Lesigne, Dalibor Volný, *Large Deviations for Independent, Stationary, and Martingale Difference Sequences* (1999), 22 pp..
668. J. Grabowski, G. Marmo, *On Filippov Algebroids and Multiplicative Nambu–Poisson Structures*, Diff. Geom. Appl., 22 pp. (to appear).
669. J. Grabowski, G. Marmo, *Generalized n–Poisson Brackets on a Symplectic Manifold*, Mod. Phys. Lett. A, 10 pp. (to appear).

670. J. Grabowski, G. Marmo, *Remarks on Nambu–Poisson, and Nambu–Jacobi Brackets* (1999), 12 pp..
671. Alexandru Nica, Dimitri Shlyakhtenko, Roland Speicher, *R–Diagonal Elements and Freeness with Amalgamation* (1999), 25 pp..
672. M.V. Losik, *Lifts of Diffeomorphisms for Orbit Spaces of Compact Lie Groups* (1999), 17 pp..
673. Michel L. Lapidus, Machiel van Frankenhuysen, *Complex Dimensions of Fractal Strings and Oscillatory Phenomena in Fractal Geometry and Arithmetic*, Spectral Problems in Geometry and Arithmetic (T. Branson, eds.), Contemp. Math., Amer. Math. Soc, pp. 19 pp. (to appear).

List of seminars and colloquia outside of conferences

Frank Leitenberger: Zur Quantendeformation von Invarianten höherer binärer Formen und der Elementargeometrie, 1998 01 29.
Robert Brooks: Riemann Surfaces with Large First Eigenvalue, 1998 02 26.
Oscar Reula: Global existence and behavior for small data of solutions to relativistic dissipative fluids, 1998 02 11.
Bernd Schmidt: On quasinormal modes, 1998 03 12.
Olga Simek: Heat trace asymptotics for Domains with singular boundaries, 1998 03 13.
Gian Michele Graf: Stability of non-relativistic matter and ultraviolet cutoff QED, 1998 03 16.
Gueorgui Raikov: Strong-magnetic-field spectral asymptotics for Schrödinger and Pauli operators, 1998 03 16.
Alexander Fel'shtyn: Analytic torsion and dynamical zeta functions, 1998 03 20.
Matthias Lesch: Heat trance expansions for certain nonocal boundary value problems, 1998 03 23.
Rainer Hempel: Elliptic operators with strongly coupled perturbations, 1998 03 23.
Elliott Lieb: The ground state energy of a dilute Bose gas, 1998 03 31.
Jack Xin: Incompressible Fluid Limit and Vortex Motion Law of the Nonlinear Schrödinger Equation, 1998 03 31.
Walter Thirring: Highlights of Mathematical Physics in the 20th Century, 5 year celebration of ESI, 1998 04 02.
Leonid Friedlander: An Overview over the Status of Research in Geometric Spectral Theory. 5 year celebration of ESI, 1998 04 02.
Michael Loss: Schrödinger – and Dirac Operators in Magnetic Fields. 5 year celebration of ESI, 1998 04 02
Jacques Laskar (Bureau des Longitudes, Paris): Stability of the Solar System. **Third ESI Lecture**. 5 year celebration of ESI, 1998 04 02
Daniel Grieser: Local geometry and spectral geometry of singular surfaces, 1998 04 06.
Yuri Kordyukov: Transversal spectral geometry of foliated manifolds, 1998 04 06.
Gueorgui Vodev: Distribution of the resonances for the transmission problem, 1998 04 21.
Vesselin Petkov: Analytic singularities of the dynamical zeta function, 1998 04 21.
Maciej Zworski: Spacing between phase shifts in a simple scattering problem, 1998 04 28.
Ernest Vinberg: Weakly symmetric spaces, 1998 05 04.
Josef Leydold: A Farber-Krahn-type inequality for regular trees, 1998 05 06.
James Vickers: Canonical Forms of Metrics, 1998 05 12.
Evans Harrell: Optimizing the eigenvalues of Schrödinger equations with potential energy determined by curvature, 1998 05 14.
Michael Reeken: Axiomatic Nonstandard Set Theories, 1998 05 19.
Horia Cornean: Improved resolvent estimates for two dimensional Magnetic SchrödingerOperators, 1998 05 26.
Michiel van den Berg: Heat Flow and Spectral Asymptotics, 1998 05 26.
Alexander Ramm: Inverse scattering with noisy fixed-energy data and inverse scattering with incomplete data, 1998 06 08.
Franz W. Kamber: Reduction of the Hermitian–Einstein equation on Kählerian fiber bundles, 1998 06 24.
Barry Simon: A New Approach to Inverse Spectral Problems on One Dimension, 1998 06 29.
Nikolai Nadirashvilli: On the hot spot conjecture, 1998 07 02.
Daniele Guido: Novikov-Shubin for open manifolds and their interpretation in terms of geometric measure theory I, 1998 07 08.
Tommaso Isola: Novikov-Shubin for open manifolds and their interpretation in terms of geometric measure theory II, 1998 07 08.
Dan Burghelea: Euler structures, a characteristic class and applications to 'torsion', 1998 07 23.
Leonid Friedlander: An invariant of the smooth structure related to the first eigenvalue of the Laplacian, 1998 07 28.
Andrea Cappelli: $W_{1+\infty}$ Minimal Models and their applications to quantum Hall effect, 1998 09 02.
Michael Berry: Quantum mechanics and the Riemann zeros: a speculation, 1998 09 03.
Heide Narnhofer: Equivalence of modular K and Anosov dynamical system (open problems), 1998 09 07.
Victor Kac: Conformal algebras and $W_{1+\infty}$, 1998 09 07.
Bojko Bakalov: On the Lego-Teichmüller Game, 1998 09 11.
Michel Lapidus: The Riemann Zeta-Function, oscillations in spectral and fractal geometry, and complex dimensions of fractal strings, 1998 09 15.

Paula Cohen: C^* - dynamical systems in number theory, 1998 09 16.
Fumio Hiai: Properties of Free Entropy related to Polar Decomposition, 1998 09 17.
Victor Kac: Classification of simple infinite dimensional groups of supersymmetry, 1998 09 17.
Don Zagier: Modular forms and differential operators, 1998 09 18.
Carlo Cercignani: LUDWIG BOLTZMANN: THE MAN WHO TRUSTED ATOMS, 1998 10 06.
P.C. Aichelburg: Wormholes and Timetravel (What Einstein did not know), ESI Colloquium, 1998 10 06.
Henning Struchtrup: "On boundary conditions for moment equations, 1998 10 12.
W. Schachermayer: Filtrations of Stochastic Processes, 1998 10 12.
Anastasios Petkou: "Conformal Anomalies in the AdS/CFT Correspondence, 1998 10 15.
Reinhard Illner: "Particle Scattering with Attractive Forces: Vlasov, Manev, Boltzmann and Smoluchowski, 1998 10 15.
Anastasios Petkou: What CFT can tell us about finite-size scaling and finite-temperature phase transitions (O(N) vector models in 2<d<4), 1998 10 19.
Julius Wess: " Q - deformed Quantum Mechanics, 1998 10 22.
Ludwig Faddeev: "Derivation of the Schwinger term of chiral fermions by means of functional integral, 1998 10 23.
Antti Niemi: "Partially dual parametrization for Yang-Mills fields, 1998 10 27.
Benoit Perthame: "A limiting case of averaging lemmas, 1998 10 27.
Dayan Verma: A Quick and Direct Construction of the Symmetric Group Representations, 1998 10 28.
Jürgen Fuchs: " Galois symmetries in conformal field theory, 1998 10 29.
Piotr Bizon: "Asymptotic Stability and Quasinormal Modes, 1998 11 03.
Grigori Litvinov: Group algebras and nonunitary representations of smooth groups (including infinite dimensional groups), 1998 11 05.
Heinz-Georg Quebbemann: "Involutions and shadows of lattices, 1998 11 06.
Loriano Bonora: "Strings from Matrices, 1998 11 06.
Nikolai Dolbilin: "New classes of rigid polyhedra, 1998 11 06.
Dmitri Petrina: "The spectrum of BCS Hamiltonians in Finite Domains, 1998 11 09.
Klaus Wirthmueller: "Symmetric Jacobi Forms, 1998 11 12.
Pierre Emmanuel Jabin: "Asymptotic limit of some Vlasov equations for very light particles, 1998 11 12.
Bob Erdahl: "On reduction theory by perfect forms, 1998 11 13.
Jörg Wills: "Finite sphere packings, 1998 11 13.
Martin Henk: "Sausages are good packings, 1998 11 13.
Grigori Litvinov: "Idempotent Mathematics and Classical Mathematical Physics, 1998 11 17.
Boris Dubrovin: "Reflection groups and Frobenius manifolds, 1998 11 18.
Marco Bertola: "Frobenius structures on moduli of elliptic meromorphic functions and Jacobi forms, 1998 11 18.
Grigori Litvinov: "Classical problems of linear analysis an the representation theory, 1998 11 19.
Nikolai Bogolubov: "Derivation of Hartree-Fock-Bogolubov Equations, 1998 11 19.
Boris Venkov: "Spherical designs and perfect Lattices, 1998 11 20.
Louis Michel: Short communication, 1998 11 20.
Dmitri Petrina: Stochastic dynamics and the Boltzmann hierarchy, 1998 11 26.
M. Graev/ G. Litvinov: "Generalized Fourier Transforms and Hypergroups Generated by problems of integral Geometry, 1998 11 26.
Marjorie Senechal: Voronio cells and their relevant vectors, 1998 11 27.
Stéphane Cordier: About the existence of solutions global in time for the Euler-Poisson system, 1998 12 03.
Samuel Lightwood: Two-Dimensional Dynamical Systems: Problems and Examples, 1998 12 07.
Gerhard Rein: Stable Plasmas versus stable Galaxies, 1998 12 10.
Izu Vaisman: Nambu - Poisson - Brackets, 1998 12 17.
Vittorio Penna: Quantization of 3 dim. Vortices, 1998 12 17.

List of all visitors in the year 1998

Abrikossov Alexei A., Inst. for Theoretical and Experimental Physics, 21.09 - 09.10, BK
Adam Christoph, University of Dublin Trinity College School of Mathematics, 29.09 - 16.10, BK
Agranovitch Mikhail , Moscow State Institut of Electronics and Mathematics (MGIEM), 15.06 - 21.06, FG
Aldaya Victor, Instituto de Astrofisica , 28.09 - 06.10, BK
Alexeevski Dmitri, Center "Sophus Lie", 01.01 - 17.01, MI, 02.03 - 30.06, MI, 20.09 - 31.10, MI
Aneva Boyka, Bulgarian Acedemy of Science Institute of Nuclear Research, 02.09 - 03.09, TOD
Arnold Anton, TU - Berlin, MA 6-2, 05.10 - 14.10, SM
Asorey Manuel, Universidad de Zaragoza Departamento de Fisica Teórica Facultad de Ciencias, 29.09 - 18.10, BK
Bach Volker, TU Berlin Fachbereich Mathematik MA 7-2, 08.06 - 11.06, HYH
Bäcker Arnd, Universität Ulm Abteilung für Theoretische Physik, 08.06 - 20.06, FG
Baier Rudolf, Universität Bielefeld Fakultät Physik, 22.09 - 04.10, BK

Bakalov Bojko, MIT, 77 Massachusetts, 02.09 - 30.09, TOD

Balazard Michel, Université Bordeaux CNRS Mathématiques, 13.09 - 26.09, TOD

Balinsky Alexander, University of Wales, Cardiff Scholl of Mathematics , 31.05 - 15.06, HYH

Balodis Pedro, Copenhagen University Dep. of Mathematics, 02.06 - 12.06, HYH

Barnich Glenn, Université Libre de Bruxelles Physique Théorique et Mathématique , 28.09 - 15.10, BK

Barykinski Roman, Moscow State Lomonosov University Mechanical-Mathematical Faculty, 26.11 - 20.12, GRU

Baulieu Laurent, Université Paris 6 LPTHE P6, 28.09 - 05.10, BK

Becchi Carlo, Instituto Nazionale di Fisica Nucleare, 28.09 - 08.10, BK

Benatti Fabio, University of Trieste Department of Theoretical Physics, 22.04 - 28.04, YNG

Berry Michael, Bristol University HH Wills Physics Laboratory, 01.09 - 05.09, TOD

Bertola Marco, SISA, 13.11 - 22.11, TOD

Birman Mikhail, State University of St. Petersburg, 18.05 - 21.06, HYH

Bizoń Piotr, Jagiellonian University Institute of Physics, 03.11 - 07.11, AA

Blasi Alberto, University of Genova Dept. of Physics, 28.09 - 09.10, BK

Bogolioubov Nikolai, Steclov Mathematical Institute Moscow State University, 10.11 - 30.11, SM

Bonora Loriano, SISSA, 27.09 - 03.10, BK, 29.10 - 31.10, BK, 05.11 - 08.11, BK

Borthwick David, Emory University Dept. of Math., 16.06 - 21.06, FG

Brandt Friedemann, Universität Hannover Institut für Theoretische Physik, 29.09 - 10.10, BK

Brenier Yann, Université Paris 6, 07.10 - 11.10, SM

Broadhurst David, Open University Dep. of Physics, 14.09 - 30.09, TOD

Brooks Robert, The Technion Haifa, Israel, 16.02 - 01.03, FG, 15.06 - 17.06, FG

Brummelhuis Raymond, Universite' de Reims Departement de mathematiques, 02.06 - 12.06, HYH

Brüning Jochen, Humbold Universität Institut für Mathematik, 13.06 - 18.06, FG

Bugliaro Luca, ETH-Hönggerberg Institut für Theoretische Physik, 02.06 - 12.06, HYH

Burghelea Dan, Ohio State University Department of Mathematics, 12.06 - 11.08, FG

Cappelli Andrea, INFN , 02.09 - 10.09, TOD

Carlen Eric, School of Mathematics Georgia Institute of Technology, 05.10 - 08.10, SM

Carvalho Maria da Conceicao, Iniversidade de Lisboa Faculdade de Ciências Departamento de Metemática, 04.10 - 08.10, SM

Castella Francois, Université de Rennes I IRMAR - EQUIPE “EDP”, 04.10 - 11.10, SM, 07.11 - 31.12, SM

Cercignani Carlo, Politecnico di Milano, 06.10 - 12.10, SM

Choda Marie, Osaka Kyoiku University, 01.09 - 28.09, THI

Choquet Isabelle, ITWM / Gebaüde 49, 05.10 - 08.10, SM, 16.11 - 26.11, SM

Cohen Paula, University de Lille 1 UFR de Mathematique, 13.09 - 26.09, TOD

Colatto Luiz Paulo, Universidade do Estado do Rio de Janeiro - UERJ, 28.09 - 09.11, BK

Combes Jean Michel, Université de Toulon, 05.06 - 11.06, HYH

Connes Alain, College de France, 20.09 - 02.10, TOD

Conrey Brian, American Institute of Mathematics, 21.09 - 02.10, TOD

Cordier Stéphane, Laboratoire d'Analyse Numerique, 01.12 - 07.12, SM

Cornean Horia, Romanian Academy of Sciences Institut of Mathematics, 05.05 - 07.06, HYH

Cornetti Giovanni, Instituto di Analisi Numerico-C.N.R, 05.10 - 08.10, SM

Cortés Vicente, Universität Bonn Mathematisches Institut, 11.06 - 16.06, MI

Coste Antoine, Orsay - Paris Sud University LPTHE - CNRS, 01.09 - 30.09, TOD

Degond Pierre, Université Paul Sabatier, 06.10 - 14.10, SM

De Meyer Bernard, ESSTIN and IECN Université de Nancy I , 30.11 - 04.12, SS

Deninger Christopher, University of Münster, 20.09 - 25.09, TOD

Desvillettes Laurent, ENS Cahan, 05.10 - 11.10, SM

Dolbeaout Jean, Universite Paris IX Dauphine CEREMADE, 05.10 - 10.10, SM

Dolbilin Nikolai, Steklov Institute of Mathematics, 25.10 - 28.11, GRU

Drago Concettina, University of Catania Department of Mathematics, 03.10 - 08.10, SM

Dubrovin Boris, SISSA, 13.11 - 26.11, TOD

Emch Gerard, University of Florida Dept. of Mathematics, 03.09 - 06.09, THI

Émery Michel, Institut de Recherche Mathèmatique Arancée (IRMA), 30.11 - 04.12, SS

Ercolani Nicholas, University of Arizona Department of Mathematics, 08.06 - 21.06, FG

Erdahl Robert, Queenis University, 03.11 - 16.11, GRU

Erdős László, School of Mathematics, 19.05 - 18.06, HYH, 16.12 - 18.12, SM

Gregory Eskin, UCLA, 19.06 - 25.06, FG

Evans Desmond W., University of Wales, Cardiff School of Mathematics, 31.05 - 15.06, HYH

Faddeev Lioudvig, Russian Academy of Sciences Steklow Mathematical Institute, 21.10 - 30.10, BK

Falk Lennart, Chalmers University & Góteborg Univ. Mathematics Department, 05.10 - 08.10, SM

Farber Michael, Tel Aviv University Dep. of Math., 15.06 - 21.06, FG, 28.06 - 18.07, FG

Feldman Jacob, University of Berkeley Math. Dept., 28.11 - 05.12, SS

Fellner Klemens, TU-Wien Institut für Angewandte und Num. Mathematik, 05.10 - 08.10, SM

Felshtyn Alexander, E-M-Arndt-Universität Greifswald Institut für Mathematik, 10.03 - 23.03, FG, 21.09 - 25.09, TOD

Flaschka Hermann, University of Arizona Department of Mathematics, 17.05 - 14.06, FG

Fournais Soren, Århus University Mathematic Institut, 24.03 - 18.04, HYH, 10.06 - 14.06, HYH

Fancsics Gábor, Columbia University Dep. of Math. , 17.06 - 23.06, FG

Franco Daniel, SISSA, 28.09 - 10.10, BK

Friedlander Leonid, University of Arizona Dept. of Mathematics, 25.02 - 18.05, FG, 23.05 - 01.06, FG, 06.06 - 31.07, FG

Frommlet Florian, TU-Berlin, 05.10 - 31.12, SM

Fuchs Jürgen, CERN, 19.10 - 31.10, BK

Gabetta Ester, Universita di Pavia, 05.10 - 08.10, SM

Gamba Irene, University of Texas at Austin Department of Mathematics, 04.10 - 10.10, SM

Ganchev Alexander, Institute for Nuclear Research and Nuclear Energy, 17.11 - 01.12, TOD

Gannon Terry, University of Alberta Math Dept. , 02.09 - 26.09, TOD

Gasser Ingenium, Universität Hamburg, 03.10 - 09.10, SM

Gelis Francois , Laboratoire de Physique Théorique, 27.09 - 03.10, BK

Gerard Christian, Ecole Polytechnique, 06.06 - 11.06, HYH

Gérard Patrick, Université de Pris Sud, 04.10 - 06.10, SM

Georgiev Lachezar, Institute for Nuclear Research and Nuclear Energy, 02.09 - 15.09, TOD

Gieres Francois, Université Claude Bernard Institut de Physique Nucléare, 28.09 - 08.10, BK

Gilkey Peter, University of Oregon Department of Mathematics , 22.09 - 19.10, MI

Gindikin Simon, Rutgers University Dept. of Mathematics, 25.07 - 15.08, MI

Goldfeld Dorian, Columbia University Dept. of Mathematics, 23.09 - 27.09, TOD

Golodets Valentin, Institute for Low Temperature Physics, 29.08 - 27.09, THI

Gomis Joaquim, Departament d'Estructura i Constituents Matéria, 27.09 - 18.10, BK

Goudon Thierry, Université Nice Sophia Antipolis, 05.10 - 11.10, SM

Gover Rod A., Queensland University of Technology, 02.02 - 06.02, CAP, 17.08 - 04.09, CAP

Graev Mark, Research Institute of System Studies, RAS, Leading scients, 01.10 - 29.11, MI

Graf Gian Michele, ETH Hönggerberg Theoretische Physik, 10.03 - 21.03, HYH

Grassi Pietro Antonio, Max-Planck-Institut für Physik, 29.09 - 09.10, BK

Griesemer Marcel, Universität Regensburg, 01.06 - 06.06, HYH

Grieser Daniel, Humboldt-Universität zu Berlin Institut für Mathematik, 18.03 - 12.04, FG

Guido Daniele, Univ. della Basilicata Dipartamento di Matematica , 29.06 - 12.07, FG

Gruber Michael, Humboldt-Universität zu Berlin Institut für Mathematik , 03.06 - 21.06, HYH

Guillemin Victor, MIT Cambridge , 13.06 - 21.06, FG

Hadjiivanov Ludmil, Bulgarian Academy of Sciences, 12.10 - 18.10, TOD

Hajac Piotr, KMMF Warsaw University, 02.11 - 08.11, YNG

Haran Shai, Technion - Israel Institute of Technology, 20.09 - 03.10, TOD

Harrell Evans M., Georgia Institute of Technology, 04.05 - 20.05, FG

Hasselblatt Boris, Tufts University Department of Mathematics, 14.07 - 12.08, SCH

Hassell Andrew, Australian National University, 15.06 - 21.06, FG

Helffer Bernard, Université Paris-Sud Department de Mathematiqués, 26.02 - 02.03, HYH, 06.06 - 10.06, HYH

Hejhal Dennis A., University of Uppsala Dept. of Mathematics, 20.09 - 03.10, TOD

Hempel Rainer, Institut für Analysis TU Braunschweig, 18.03 - 28.03, HYH, 02.06 - 06.06, HYH

Henneaux Marc, Université Libre de Bruxelles, 02.10 - 06.10, BK, 13.10 - 20.10, BK

Henk Martin, University of Magdeburg Department of Mathematics/IMO, 08.11 - 21.11, GRU

Herbst Ira, University of Virginia Methematics Department Kerchof Hall, 19.05 - 26.06, HYH

Hiai Fumio, Tohoku University Graduate School of Information Sciences , 14.09 - 19.09, THI

Hoever Georg, Universität Regensburg Math. Institut, 08.06 - 12.06, HYH

Horejsí Jirí, Charles Univerity Nuclear Center, 01.10 - 08.10, BK

Hurth Tobias, MPI für Physik, 03.10 - 19.10, BK

Illner Reinhard, University of Victoria Department of Mathematics, 13.10 - 24.10, SM

Isola Tommaso, Iniversitá di Roma "Tor Vergata" , 29.06 - 12.07, FG

Ivrii Victor, University of Toronto Department of Mathematics, 01.06 - 07.06, FG, 08.06 - 21.06, HYH

Iwaniec Henryk, Rutgers University Dept. of Mathematics, 20.09 - 27.09, TOD

Jabin Emmanuel, Ecole Normale Sepérieure , 02.10 - 30.11, SM

Jäkel Christian, Universita di Roma Dipartimento di Matematica, 01.01 - 31.01, BYN, 28.09 - 10.10, BK

Jaramillo José Luis, Instituti Calos I de Fisica Teörica y Computacional/Facultad de Ciencias, 28.09 - 12.10, BK

Joglekar Satish Dinkar, I.I.T. Kanpur , 28.09 - 17.10, BK

Johnsen Kristinn, Technical University of Denmark Microelektronik Centret, 13.06 - 20.06, YNG

Judge Christopher, Indiana University, 14.06 - 20.06, FG

Julia Bernard, ENS, CNRS, 20.09 - 02.10, TOD

Jüngel Ansgar, TU-Berlin , 05.10 - 08.10, SM, 08.11 - 13.11, SM

Kac Victor, MIT, 02.09 - 30.09, TOD

Kaimanovich Vadim, IRMAR, 17.11 - 11.12, SCH

Kallsen Jan, Universität Freiburg Institut für Mathematische Stochastik, 30.11 - 04.12, SS

Kamber Franz W., University of Ilinois Department of Mathematics, 09.06 - 08.07, MI

Kappeler Thomas, University of Zürich, 25.05 - 31.05, FG, 09.06 - 17.06, FG

Katanaev Michael, Steklov Mathematical Institute, 13.11 - 03.12, BK

Katok Anatoly, Pennsylvania State University Dept. of Mathematics, 18.07 - 14.08, SCH

Katok Svetlana, Pennsylvania State University Dept. of Mathematics, 18.07 - 14.08, SCH

Keating Jonathan, University of Bristol School of Mathematics, 21.09 - 23.09, TOD

Kerdelhue Philippe, Universite d' Orsay, 08.06 - 12.06, HYH

Klopp Frederic, Université Paris 13 LAGA, Inst. Galilée, 16.06 - 21.06, FG, 30.06 - 04.07, FG

Knauf Andreas, Max-Planck-Institut for Mathematics , 21.09 - 26.09, TOD

Knörrer Horst, ETH Zürich Institut für Mathematik, 16.06 - 21.06, FG

Kordyukov Yuri, State Aviation Technical University of Ufa, 19.03 - 17.04, FG

Korotyaev Evgeni, Electrotech. University Department of Mathematics 2, 01.06 - 14.06, HYH, 15.06 - 20.06, FG

Krasil'shchik Joseph, Moscow Institute for Municipal Economy, 28.09 - 17.10, BK

Kreimer Dirk, Universität Mainz, 14.09 - 30.09, TOD

Kuchment Peter, Wichita State University Dep. of Math., 18.06 - 21.06, FG

Kurata Kazuhro, Tokyo Metropolitan University, 19.03 - 18.04, HYH, 26.04 - 16.06, HYH

Kurlberg Par, Tel Aviv University School of Mathematics, 21.09 - 27.09, TOD

Laba Izabella, Princeton University Dept. of Mathematics, 30.05 - 10.06, HYH

Lagarias Jeffrey C., AT & T Labs, 21.09 - 24.09, TOD

Landshoff Peter, DAMTP University of Cambridge, 27.11 - 30.11, BK

Lange Horst, Universität Köln Mathematische Institut, 05.10 - 11.10, SM

Lapidus Michael L., University of California Dept. of Mathematics, 15.06 - 05.07, FG, 14.09 - 26.09, TOD

Laptev Ari, Royal Institute of Technology, 31.05 - 18.06, HYH

Laskar Jacques, Astronomie et Systems Dynamiques Buraeu des Longitudes, 01.04 - 03.04, MI

Leichtnam Eric, CNRS and ENS, 17.09 - 26.09, TOD

Leitenberger Frank, Universität Leipzig Mathematisches Institut , 01.01 - 28.02, GRO

Lemou Mohammed, Université Paul Sabatier UMR 5640 - CNRS, 04.10 - 08.10, SM

Lesch Matthias, Humboldt Universität zu Berlin, 16.03 - 12.04, FG, 13.06 - 20.06, FG

Leutwyler Heinrich, Universität Bern Institut für Theoretische Physik , 27.09 - 10.10, BK

Lewis Roger T., UAB Dept. of Mathematics, 02.06 - 13.06, HYH

Lieb Elliott, Princeton University Department of Physics, Jadwin Hall , 29.03 - 04.04, YNG

Lightwood Samuel, , 01.09 - 31.12, SCH

Lind Douglas, University of Washington Dept. of Mathematics, 05.11 - 05.12, SCH

Litvinov Grigori, International Sophus Lie Center Moscow division, 01.10 - 29.11, MI

Losik Mark V. , Saratov State University , 20.09 - 31.10, MI

Loss Michael, Georgia Tech. School of Mathematics, 01.04 - 14.04, HYH

Lott John, University of Michigan, 16.06 - 21.06, FG

Lucchesi Claudio, Université de Neuchatel Institut de Physique, 06.10 - 12.10, BK

Macris Nicolas, Ecole Polytechnique Fédévale de Lausanne Institut de Physique Théoretique, 07.06 - 13.06, HYH

Maeda Yoshiaku, Keio University 3-14-1 Department of Mathematics Faculty of Science and Technology, 13.06 - 23.06, FG

Maggiore Nicola, Universitá di Genova Dept. di Fisica , 28.09 - 09.10, BK

Majorana Armando, Dipartimento di Matematica, 05.10 - 08.10, SM

Manin Yuri, Max-Plank-Institut for Mathematics, 21.09 - 30.09, TOD

Marcati Pierangelo, University of L'Aquila Deapart. of Pure Applied Mathematics, 06.10 - 11.10, SM

Marklof Jens, IHES, 14.06 - 20.06, FG

Malric Marc, Universitè P. et M. Curie Laboratoire de Probabilitès, Tour 56, 3eme ètage, 01.12 - 06.12, SS

Martinet Jacques, Université Bordeaux Insitut de Mathématique, 14.09 - 25.09, GRU

Mauser Norbert, Courant Institute, 06.10 - 16.10, SM

Meinrenken Eckhard, Univ.of Toronto, 14.06 - 21.06, FG

Melgaard Michael, Aalborg University Institute of Electronic Systems Dep. of Mathematics, 03.06 - 08.06, HYH

Melin Anders, Lund Inst. of Technology Dept. of Math., 15.06 - 20.06, FG

Melrose Richard, Mass. Inst. Technology, 15.06 - 21.06, FG

Michel Louis, I. H. E. S., France, 19.10 - 22.11, GRU

Mickelsson Jouko, Kungliga Tekniska Theoretical Physics, 05.10 - 20.10, YNG

Miller David, Pennsylvania State University Dept. of Physics, 29.09 - 03.10, BK

Minasian Ruben, Yale University Dept. of Physics, 30.09 - 24.10, BK

Mityagin Boris, the Ohio State Univ., Dept. Math., 12.06 - 22.06, FG

Moncrief Vincent, Yale University Physics Department, 29.06 - 12.07, AA, 19.11 - 28.11, AA

Monteiro Del Cima Oswaldo, TU-Wien Institut für Theoretische Physik, 28.09 - 09.11, BK

Morija Hajime, Kyoto RIMS, Kyoto University , 02.09 - 26.09, THI

Muscato Orazio, Dipartimento di Matematica, 05.10 - 06.10, SM

Nadirashvilli Nikolai, Institute for Problems of Information Transmission, 25.06 - 15.07, FG

Nakamura Shu, University of Tokyo Graduate School of Mathematical Sciences, 03.06 - 12.06, HYH

Nenciu Gheorghe, University of Bucharest Department of Theor. Physics, 05.05 - 07.06, HYH

Niemi Antti, Uppsala University Dept. of Theoretical Physics, 27.10 - 30.10, BK

Novotny Jiri, Charles University Faculty of Mathematics and Physics Nuclear Center, 28.09 - 03.10, BK

Nurlybayev Nuykhat, Institut of Mathematics, 04.10 - 15.10, SM

Odlyzko Andrew, AT & T Labs Room C225, 21.09 - 25.09, TOD

Okikiolu Kate, UCSD Mathematics Department, 15.06 - 05.07, FG

Ó Murchadha Niall, University College Cork Physics Department, 10.07 - 22.07, BE

Owen Mark Philip, King's College London, 01.01 - 30.09, EU

Panferov Vladislav, Chalmers University of Technology, 05.10 - 10.10, SM

Paul Thierry, CEREMADE Université Paris Dauphine , 15.06 - 21.06, FG

Pareschi Lorenzo, Univeritá d'Ferrara Dipartimento di Matematica, 05.10 - 08.10, SM

Patterson Samuel James, Mathematisches Institut, 17.09 - 25.09, TOD
Pawlowski Jan Martin, Dublin Institute for Advanced Studies, 28.09 - 07.10, BK
Penna Vittorio, Politecnico di Torino Dept. of Physics, 30.11 - 31.12, MI
Perry Peter, University of Kentucky, 15.06 - 28.06, FG
Perthame Benoit, ENS/DMI , 06.10 - 09.10, SM
Pesin Yakov, Pennsylvania State University Dept. of Mathematics, 17.07 - 29.07, SCH
Petkou Anastasios, Dortmund University Dept. of Theorical Physics, 10.10 - 19.10, BK
Petkov Vesselin, University of Bordeaux I Department of Mathematics, 14.04 - 29.04, FG
Petkova Valentina, Institute for Nuclear Research and Nuclear Energy, 07.09 - 07.09, TOD
Petrina Dmitri, Ukraian Academy of Sciences Institute of Mathematics, 01.11 - 29.11, THI, 22.12 - 24.12, SM
Petz Dénes, Technical University of Budapest Mathematical Department, 02.12 - 04.12, THI
Pietra Paola, Ian, Pauia, 02.09 - 31.12, SM
Piguet Olivier, UFES Departmento de Fisica, 29.09 - 09.10, BK
Pohl Carsten, Johannes Kepler University, 05.10 - 08.10, SM
Poupaud Frédéric, Laboratoire Diendonné-UMR 6621 de CNRS, 06.10 - 16.10, SM
Quebbemann Heinz-Georg, Universität Oldenburg Fachbereich 6, Mathematik, 28.10 - 11.11, GRU
Raikov Gueorgui D., Bulgarian Academy of Sciences Institute of Mathematics, 08.03 - 07.04, HYH, 09.06 - 15.06, HYH
Ramm Alexander G., Kansas St. University Math.Dep. , 08.06 - 09.06, THI
Rasulova Mukhaya, Institute of Nuclear Physics Uzbekistan Academy of Science, 04.10 - 18.10, SM
Reeken Michael, Bergische Universität Wuppertal, 18.05 - 19.05, YNG
Rein Gerhard, Universität München Mathematisches Institut, 07.12 - 12.12, SM
Reula Oscar, Universidad Macional Coŕdoba Fa MAF, Civdad Universitaria, 09.02 - 13.02, AA
Ringhofer Christian, Arizona State University Dept. of Mathematics, 07.09 - 31.12, SM
Romano Vittorio, Politecnico di Bari Sede de Taranto, 05.10 - 08.10, SM
Rozenblioum Grigori, Göteborg University Dept. of Mathematics, 01.06 - 14.06, HYH
Rudnick Zeev, Tel Aviv University Dep. of Matematics, 15.06 - 21.06, FG, 20.09 - 26.09, TOD
Ruelle Philippe, Université Catholique Lonvain, 01.09 - 15.09, TOD
Ruskai Mary Beth, Univ. of Massachusets Lowell, 01.06 - 12.06, HYH
Russo Giovanni, University of L'Aquila Department of Mathematics, 05.10 - 08.10, SM
Rybicki Tomasz, Pedagog University Rzeszow , 23.02 - 09.03, MI
Ryshkov Sergei, Steklov Math. Inst. Russian Academy of Sciences, 22.10 - 20.12, GRU
Sahakyan Davit, Joint Institute for Nuclear Research, 26.11 - 23.12, BK
Saias Eric, Univerité Paris La Buratuire de Probabilités, 13.09 - 26.09, TOD
Sarnak Peter, Princeton University Dept. of Mathematics, 23.09 - 27.09, TOD
Scharlau Rudolf, Universität Dortmund Fachbereich Mathematik, 04.10 - 10.10, GRU, 07.11 - 13.11, GRU
Schellekens Norbertus, NIKHEF/FOM, 28.09 - 10.10, BK
Schlesinger Karl-Georg, University of Wuppertal Dept. of Mathematics, 01.01 - 28.02, GRO
Schlingemann Dirk, , 01.01 - 31.08, BYN, 01.09 - 31.12, YNG
Schmidt Bernd, AEI , 10.03 - 23.03, BE
Schnabl Martin, NC MFF UK Faculty of Mathematics and Physics Nuclear Center, 27.09 - 07.10, BK
Schubert Roman, Universität Ulm Abtl. Theoretische Physik, 16.06 - 20.06, FG
Schweigert Christoph, CERN, Theory Division, 05.10 - 18.10, BK
Schwimmer Adam, Weizmann Institute Physics Dept., 02.10 - 21.10, BK
Selberg Atle, The Institution for Advanced Study, 20.09 - 02.10, TOD
Senechal Marjorie, Smith College, 03.11 - 29.11, GRU
Shen Zhongwei, University of Kentucky Department of Mathematics, 17.05 - 13.06, HYH
Sibold Klaus, Institute für Teoretische Physik Universität Leipzig, 01.10 - 09.10, BK
Siedentop Heinz, Universität Regensburg, 05.06 - 08.06, HYH
Simek Olga, University of Arizona Dept. of Mathematics, 03.03 - 31.03, FG
Simon Barry, Caltech Pasadena, 27.06 - 28.06, HYH, 29.06 - 30.06, FG
Skenderis Kostas, Utrecht University Spinoza Institute, 10.10 - 19.10, BK
Skibsted Erik, Aarhus Universitet Institut for Matematishe Fag, 19.05 - 12.06, HYH
Slemrod Marshall, University of Wisconsin, 03.10 - 09.10, SM
Slovák Jan, Masaryk University Department of Algebra and Geometry, 03.02 - 04.02, CAP, 30.10 - 30.10, CAP
Smorodinsky Meir, Tel Aviv University, 29.11 - 05.12, SS
Snaith Nina, University of Bristol School of Mathematics, 20.09 - 27.09, TOD
Sobolev Alexander V., University of Sussex MAPS, Math. and Stat. Subject Group , 01.06 - 10.06, HYH
Soler Juan, Universidad de Granada Facultad de Ciencias, 05.10 - 12.10, SM
Solovej Jan Philip, University of Copenhagen Dept. of Mathematics, 03.06 - 08.06, HYH
Sorella Silvio Paolo, University of the State of Rio de Janeiro Departamento de Fisica Theórica, 27.09 - 10.10, BK
SØrensen Østergaard Thomas, University of Copenhagen Department of Mathematik, 10.06 - 14.06, HYH, 01.10 - 31.12, EU
Soule Christophe, IHES, CNRS, 19.09 - 25.09, TOD
Suslina Tatiana, St. Petersburg State University, 18.05 - 21.06, HYH
Suzko Alina, Joint Inst. for Nuclear Research Labor of Theor. Physics Dubna, Stoitelei 8, 708 Moscow Region Russia, 05.06 - 20.06, HYH

Stanev Yassen, Bulgarian Academy of Sciences Institute for Nuclear Research and Nuclear Energy, 17.11 - 28.11, TOD

Stepin Anatoli, Moscow State University Dept. of Mathematics, 01.01 - 07.01, SCH

Stora Raymond, LAPP BP 110, 28.09 - 21.10, BK

Struchtrup Henning, Universitá di Catania, 04.10 - 17.10, SM

Talon Michel, L. P. T. H. E. Tour 16 1/etage Université Paris VI, 04.10 - 10.10, BK

Thouvenot Jean-Paul, Université Paris 6, 28.11 - 04.12, SS

Tkachuk Volodymyr, Ivan Franko L'viv State University Institute for Theoretical Physics, 16.11 - 13.12, MI

Todorov Ivan, Bulgarian Academy of Sciences Institute for Nuclear Research and Nuclear Energy, 01.09 - 30.11, TOD

Tonin Mario, University of Padova Dipartimento di Fisica , 28.09 - 03.10, BK

Toscani Giuseppe, Universita di Pavia Dipartimento di Matematica, 05.10 - 08.10, SM

Tsirelson Boris, Tel Aviv University, 30.11 - 04.12, SS

Tytgat Michel, Université Libre de Bruxelles Service de Physique Theorique, 28.09 - 11.10, BK

Tzavaras Athanasios, University of Wisconsin Department of Mathematics, 05.10 - 10.10, SM

Unterreiter Andreas, Universität Kaiserlautern, 03.10 - 18.10, SM

Vaisman Izu, University of Haifa Department of Mathematics, 15.11 - 31.12, MI

van den Berg Michiel, School of Mathematics, University of Bristol, 18.05 - 31.05, FG, 14.06 - 24.06, FG

Van Elburg Ronald, ITF/WZI Amsterdam, 07.09 - 11.09, TOD

Van Nieuwenhuizen Peter, State University of New York, 28.09 - 06.10, BK

Van Proeyen Antoine, K.U. Leuven Inst. for Theoretical Physics, 11.10 - 16.10, BK

Vassilevich Dmitri, Leipzig University, 12.10 - 24.10, BK

Vecsernyés Péter, Research Institute for Perticle and Nuclear Physics Dept. of Mathematical Physics , 17.11 - 01.12, TOD

Venkov Boris, University of Geneva Mathematics Department, 03.11 - 23.11, GRU

Ventura Ozemar Souto, Brazilian Centre for Research in Physics, 27.09 - 08.10, BK

Verbovetsky Alexander, Moscow State Technical University, 28.09 - 17.10, BK

Verma Dayanand, School of Mathematics Institute of Fundamental Research, 06.07 - 19.07, MI, 27.10 - 01.11, MI

Vershik Anatoly, Mathematical Institute of Russian Academy of Sciences, 30.11 - 04.12, SS

Viallet Claude M., Université Paris Laboratoire de Physique Théorique et les Hautes Energies, 28.09 - 04.10, BK

Vickers James, University of Southampton, 06.05 - 16.05, OGK

Villani Cedric, Ecole normale sperieure, 04.10 - 18.10, SM

Vilar Luiz Claudio, Universidade do Estrado do Rio de Janeiro Departamento de Fisica Teórica, 29.09 - 10.10, BK

Vilkovisky Grigorii, Lebedev Institute, 11.11 - 10.12, BK

Vinberg Ernest, Moscow State Univesity, 30.04 - 06.05, MI

Vinogradov Alexandre, Universitá di Salerno Dipartimento di Mathematica, 28.09 - 17.10, BK

Vodev Gueorgui, University of Nantes Department of Mathematics, 07.04 - 06.05, FG

Vugalter Simeon, Radiophysical Research Institute, 10.01 - 08.02, HYH

Warren Jonathan, University of Warwick Dept. of Statistics, 30.11 - 04.12, SS

Weidl Timo, Universität Regensburg Royal Institut of Technology, 01.06 - 16.06, HYH

Weisfeld Morris, Duke University, 11.05 - 20.05, SCH

Weizsäcker Heinrich, Universität Kaiserslautern Fachbereich Mathematik, 03.12 - 04.12, SS

Wennberg Bernt, Chalmers University of Technology Department of Mathematics, 05.10 - 08.10, SM

Wess Julius, Universität München, 12.10 - 31.10, THI

Wilson Jonathan, University of Southampton Faculty of Mathematical Studies, 06.05 - 21.05, OGK

Wills Jörg, Universität Siegen ENC, 04.10 - 10.10, GRU, 08.11 - 14.11, GRU

Wip Andreas, Universtät Jena, 05.10 - 10.10, BK

Wirthmüller Klaus, Universität Kaiserslautern, 11.11 - 14.11, TOD

Wolf Marek, Institut of Theoretical Physics University of Wroctaw, 21.09 - 26.09, TOD

Wolf Sylvain, Geneva Université Departement de Physique Théorique, 29.09 - 10.10, BK

Wunsch Jared, Harvard University, 15.06 - 12.07, FG

Xin Jack, University of Arizona Department of Mathematics, 25.03 - 01.04, HYH

Yamaguchi Keizo, Hokkaido University Faculty of Science, Dept. of Mathematics, 19.08 - 24.08, CAP

Yor Marc, Université Paris et Marie Curie Laboratoire de Probabilités , 01.12 - 04.12, SS

Zagier Don, MPI für Mathematik, 17.09 - 26.09, TOD

Zelditch Steve, Johns Hopkins University Dept. of Math., 16.06 - 15.07, FG

Zhdanov Renat, Institut of Mathematics , 02.06 - 07.06, HYH

Zhislin Grigorii, Radio-Physical Research Institute, 23.05 - 21.06, HYH

Zworski Maciej, University of California Department of Mathematics, 14.04 - 05.05, FG