

Biographical Sketch Shmuel Friedland

Professional Preparation

Israel Institute of Technology	Mathematics, B.Sc., 1967
Israel Institute of Technology	Mathematics, M.Sc., 1969
Israel Institute of Technology	Mathematics, D.Sc., 1971
Israel Institute of Technology	Postdoc in Mathematics, 1971–72
Weizmann Institute of Science	Postdoc in Mathematics, 1972–73
Stanford University	Postdoc in Mathematics, 1973–74
IAS, Princeton	Postdoc in Mathematics, 1974–75

Appointments

Regular

- 1985–, Professor, University of Illinois at Chicago
- 1982–85, Professor, Hebrew University
- 1978–82, Associate Professor, Hebrew University
- 1975–78, Senior Lecturer, Hebrew University

Visiting

- 2007–08, Visiting Professor in Berlin Mathematical School, Berlin, Germany
- 2003–04, New Directions Professor, IMA, University of Minnesota
- 9/00–12/00, Visiting Professor, Technion, Israel
- 1/94–6/94, Visiting Professor, IHES, France
- 9/91–12/91, Visiting Professor, IMA, University of Minnesota
- 9/89–3/90, Visiting Professor, Northwestern University
- 9/78–8/80, Visiting Professor, University of Wisconsin

Prizes

- The first Hans Schneider prize in Linear Algebra awarded by ILAS (International Linear Algebra Society) in 1993

Memberships in Prize Committees

- Hans Schneider prize in Linear Algebra committee, 1995–98.
- Householder prize committee, 1984–87.

Organizer of Meetings, Conferences and Workshops

- Minisymposium: Application of Linear and Multilinear Algebra in Life Sciences and Engineering, 16th ILAS Conference, Pisa, Italy, June 21-25, 2010, (jointly with Amir Niknejad).
- Minisymposium: Combinatorial and Computational Aspects of the Monomer-Dimer Problem, Seventh IMACS International Symposium on Iterative Methods in Scientific Computing May 5-8, 2005, The Fields Institute for Research in the Mathematical Sciences and the University of Toronto.
- Organizer of two sessions on "Capacity of multi-dimensional codes", Mini-Symposium on communications, MTNS02, Notre Dame, IN, USA, August 12-16, 2002.
- Special Session on Complex Dynamics, AMS Meeting 935, Chicago, Illinois, September 12-13, 1998.
- H. Schneider Conference of ILAS, June 3-6, 1998, Madison, Wisconsin, USA.
- IMA workshop on Combinatorial & Graph - Theoretic Problems in Linear Algebra, IMA, University of Minnesota, Minneapolis, Minnesota, November 11 - 15, 1991.

Distinguished Long Term Visits since 1987

- School of Mathematics, Tata Institute for Fundamental Research, Mumbai, India, December 2009.
- Visiting Professor in Berlin Mathematical School (BMS), October 1, 2007 - March 30, 2008.
- New Directions Professor, (supported by NSF), IMA, Probability and Statistics in Complex Systems, University of Minnesota, Minneapolis, Minnesota, AY 2003-4.
- Lady Davis Fellow, Technion, Haifa, Israel October-December 2000.
- Algebra Center of Lisbon University, Portugal, June 1997.
- SFB 343 - Bielefeld University, Germany, July - August 1994.
- IAS in Technion, Israel, May 15-June 15, 1993.
- Visiting Professor, (supported by NSF), IMA, Semester of Combinatorial and Applied Linear Algebra, University of Minnesota, Minneapolis, Minnesota, Fall 1991.

Invited Visits, Conferences and Workshops since 1990

- AIM workshop: Stability, hyperbolicity, and zero localization of functions, American Institute of Mathematics, Palo Alto, CA, December 5-9, 2011.
- Mini symposium *Algebraic Geometry of Tensor Decompositions*", SIAM Conference on Applied Algebraic Geometry, North Carolina State University, Raleigh, NC, October 07, 2011.
- Directions in Matrix Theory 2011, Coimbra University, Portugal, July 9-10, 2011. <http://www.mat.uc.pt/cmfdirections2011/dmt2011.htm>
- Invited visit TU, Technical University of Berlin, Germany, July 1-4, 2011.
- Invited visit to University of Birmingham and to *Tropical Mathematics and its Applications*, Meeting of the LMS Joint Research Group, Birmingham, England, June 28, 2011. <http://web.mat.bham.ac.uk/tropical/>
- Householder Symposium XVIII, Tahoe City, California. <https://outreach.scidac.gov/HH11/>

Invited Visits, Conferences and Workshops since 1990 (continued)

- Quantum Information Science Institute, University of Calgary, February 04, 2011.
- BIRS Workshop 11w5033 Linear Algebraic Techniques in Combinatorics/Graph Theory, January 31–February 3, 2011.
- 2010 Western Canada Linear Algebra Meeting, Banff International Research Station, May 7-9, 2010.
- Workshop in Graph Theory and Combinatorics in Memory of Uri Peled, Department of Mathematics, UIC, February 21-22, 2010.
- INDIAN STATISTICAL INSTITUTE DELHI CENTRE, December 7 - 11, 2009.
- Dept. of Combinatorics & Optimization, November 18-20, 2009. University of Waterloo, Canada. Departments of Mathematics, University of Michigan, Ann Arbor, November 12-13, 2009.
- SIAM conference on applied linear algebra, Monterey, CA, October 27-28, 2009.
- LINEAR AND NUMERICAL LINEAR ALGEBRA: THEORY, METHODS, and APPLICATIONS, Northern Illinois University, August 12–14, 2009.
- 2009 Haifa Matrix Theory Conference, Haifa, Israel, May 18–21, 2009.
- University of British Columbia, Canada, March 5-6, 2009.
- NSF workshop: Future Directions in Tensor-Based Computation and Modeling, National Science Foundation, Room 110, 4201 Wilson Blvd., Arlington, VA 22230, February 20–21, 2009.
- Department of Mathematics and Center for Quantum Computing, The University of Calgary, Calgary, Canada, January 9–9, 2009.
- Workshop on "Nonnegative Matrix Theory: Generalizations and Applications", American Institute of Mathematics in Palo Alto, California, December 1-5, 2008.
- 3rd Hamilton Workshop on Nonnegative Matrices and Related Topics, Hamilton Institute, NUI, Maynooth, Ireland August 5 - 7, 2008.
- Workshop on "Geometry and representation theory of tensors for computer science, statistics and other areas, American Institute of Mathematics in Palo Alto, California, July 21-July 25, 2008.
- "Low Rank Approximations of Matrices and Tensors", MS102 Numerical Multilinear Algebra, 2008 Annual SIAM meeting, July 7-11.
- Invited visit to Newton Institute, Cambridge, UK, May 1-9, 2008. Declined.
- Invited visit to Sweden: Umea University, April 8-12, Stockholm University, April 13-17, 2008.
- Invited visit to Erwin Schrödinger International Institute for Mathematical Physics, Vienna, February 16-23, 2008.
- "Fast low rank approximations of matrices and tensors, 24-GAMM-Seminar on Tensor Approximations, January 25-26, 2008.
- "Fast low rank approximations of matrices and tensors", MACIS 2007, Mathematical Aspects of Computer and Information Sciences 2007, Paris, France, December 5-7, 2007.
- Invited visit to University of Pavia, Italy, October 3-10, 2007.
- Workshop on "Polya-Schur-Lax problems: hyperbolicity and stability preservers", American Institute of Mathematics in Palo Alto, California, May 28-June 1, 2007.
- Workshop on "Spectra of families of matrices described by graphs, digraphs, and sign patterns", American Institute of Mathematics in Palo Alto, California, October 23-27, 2006.

Invited Visits, Conferences and Workshops since 1990 (continued)

- "Matchings and Independent Sets: Problems, Conjectures and Results", 2nd Hamilton Workshop on Nonnegative Matrices and Related Topics, Hamilton Institute, NUI,
- Maynooth, Ireland July 9 - 12, 2006.
- "3-Tensors: ranks and approximations", Workshop on Algorithms for Modern Massive Data Sets, sponsored by Computer Forum of the Stanford Computer Science Department, NSF and Yahoo! Research. June 21-24, 2006.
- "Entropy of holomorphic and rational maps", Complex Analysis & Dynamical Systems III, in honor of D. Aharonov, L. Aizenberg, S. Krushkal and U. Srebro, Nahariya, Israel, January 2-6, 2006.
- Seventh IMACS International Symposium on Iterative Methods in Scientific Computing May 5-8, 2005, The Fields Institute for Research in the Mathematical Sciences and the University of Toronto. Me and my Ph.D. Student Elliot Krop giving each 25 minutes presentations on "Combinatorial and Computational Aspects of the Monomer-Dimer Problem".
- "Singular value decomposition: mathematical and numerical challenges", Haifa Matrix Conference, January 3 - 7, 2005, Haifa, Israel
- "Convergence of products of matrices", Plenary speaker 11th Conference of the International Linear Algebra Society, 19-22 July, 2004, Coimbra, Portugal.
- "Combinatorial and Computational Aspects of the Monomer-Dimer Problems", SIAM Workshop on Combinatorial Scientific Computing, San Francisco, CA, February 28, 2004. "Applications of Geometry and Topology to Matrices", MSRI workshop, February 27, 2004.
- "Computation of entropy in statistical mechanics and information theory", Maryland-Penn State Dynamics Workshop, Univ. of Maryland, College Park, March 23, 2003.
- "Multi-dimesional capacity, pressure and Hausdorff dimension", 2 hours talk in MTNS02, Notre Dame, IN, USA, August 12, 2002.
- Mittag-Leffler Institute, Stockholm, Sweden, May 15 - June 4, 2002.
- "Numerical computation of entropy", Dynamics of Numerics Workshop at Fields Institute, August 2001, declined.
- "Generalized interval exchanges and 2-3 conjecture", AMS-SMF Joint International Meeting, Lyon, France, July 17-20, 2001.
- "Generalizations of the odd degree polynomial theorem and applications", 9th ILAS Conference, 25-29 June, 2001.
- "Entropy, pressure and Hausdorff dimension of Z^d subshifts", 20th Annual Western States Math. Physics meeting, Caltech, Feb. 19-20, 2001.
- Oberwolfach Meeting in Nonnegative matrices, November 26 - December 2, 2000, declined. IHES, Bur-sur-Ivette, France, September 1-17, 2000.
- University of Bielefeld: Conference for the final year of SFB 343 and visit: June 20-July 20, 2000.
- " Z^d -subshifts of finite type", Newton Institute and University of Warrick joint workshop on Z^d action, Coventry, England, April 3-7, 2000.
- "Computing Hausdorff dimension of subshifts using matrices", Workshop on "Diagonal matrix scaling and its generalizations and their applications in convex programming over cones", DIMACS, Rutgers University, New Jersey, August 25, 1999.

Invited Visits, Conferences and Workshops since 1990 (continued)

- "Discrete groups of biholomorphisms of Siegel upper half plane", AMS summer school on Ergodic Theory and Dynamical Systems, July 26 - August 6, 1999.
- "Finite and infinite dimensional generalizations of Klyachko's theorem", Workshop on "Geometrical and Combinatorial Methods in Hermitian Spectral Sum Problem", Coimbra, Portugal, July 15-16, 1999.
- "Differential equations, monodromy and the Jacobian conjecture", Conference on Polynomial Automorphisms and Related Topics, Krakow, Poland, July 6-11, 1999.
- "Computing Hausdorff dimension of subshifts using matrices", 11-th Haifa Matrix Theory Conference, Haifa, Israel, June 20-25, 1999.
- "Discrete groups of Siegel upper half plane", Multidimensional Complex Analysis Workshop, Bloomington, Indiana, February 6-7, 1999.
- "The limit of the spectral radius of nonnegative Toeplitz matrices", Workshop in Applied Linear Algebra in honor of L. Elsner, Bielefeld Univ., Germany, January 21-23, 1999.
- "Discrete groups of Siegel upper half plane", Special Session on Complex Dynamics, AMS Meeting 935, Chicago, Ill. September 12-13, 1998.
- "Subspaces of symmetric matrices containing matrices of given rank", 7th Conference of ILAS, Madison, WI, June 3-6, 1998.
- "Hausdorff measure for hyperbolic Henon maps and generalizations", Laminations and Foliations in Dynamics, Geometry and Topology, SUNY at Stony Brook, May 18-24, 1998.
- "Differential equations, monodromy and the Jacobian conjecture", Japan-U.S. Workshop and Conference on "Meromorphic Mappings & Intrinsic Metrics in Complex Geometry", John Hopkins Univ., March 23-29, 1998.
- Technion, Haifa, Israel, December 16 - 30, 1996.
- 7th Penn State Workshop in Dynamics and Related Topics, Oct. 3-6, 1996.
- Second Annual Midwest Conference on Complex Dynamics in Higher Dimension, Univ. of Michigan, Ann Arbor, Apr. 19-21, 1996.
- University of Maryland, Symbolic Dynamics Workshop, March 28-April 2, 1996.
- Bielefeld University, December 11-22, 1995.
- Goettingen University, December 5-8, 1995.
- 5th ILAS Conference, Reception of first H. Schneider prize, Atlanta, Georgia, August 16-19, 1995.
- Banach Center Symposium "Ergodic Theory and Dynamical Systems", June 26-July 1, 1995.
- SFB 343- University of Bielefeld, Germany, December 12 - 23, 1994.
- 4th ILAS Meeting in Rotterdam, Netherlands, August 15-19, 1994.
- Workshop on Complex Dynamics in Higher Dimensions, University of Goettingen, Germany, July 29-August 2, 1994.
- University of Marseille, May 30-June 3, 1994.
- Workshop on Ergodic Theory & Number Theory, Warwick Symposium. University of Warwick, England, April 11-15, 1994.
- Workshop on Complex Dynamics, Indiana Univ., Bloomington, November 6-7, 1993.
- J.P. Kahane's conference, Orsay, France, June 28-July 3, 1993. Plenary Speaker, 2nd ILAS meeting, Lisbon, Portugal, August 3-7, 1992.

Invited Visits, Conferences and Workshops since 1990 (continued)

- Workshop on "Computational Linear Algebra in Algebraic and Related Problems", Essen, Germany, July 27 - August 1, 1992.
- Special semester for 100 anniversary of Banach's birth, Banach International Mathematical Center, Warsaw, Poland, May 18-24, 1992.
- Technion, Tel-Aviv University and Hebrew University, June 1991.
- International Conference on Dynamical Systems and Related Topics, Nagoya, Japan, Sep. 3-7, 1990.
- Tel-Aviv Univ., March 1990.

Invited lectures, colloquia and seminars since 2000

- On the Salmon conjecture, Mini symposium "Algebraic Geometry of Tensor Decompositions", at the SIAM Conference on Applied Algebraic Geometry, North Carolina State University, Raleigh, NC, October 07, 2011.
- Some open problems in matchings in graphs, Directions in Matrix Theory 2011, Coimbra University, Portugal, July 9(?), 2011.
- Tensors, Summer School supported by CMUC - Centre for Mathematics, University of Coimbra, Coimbra, Portugal. Six lectures of 90 minutes each from July 6 to July 8, 2011.
- Nonnegative tensors, Tropical Mathematics and its Applications, Meeting of the LMS Joint Research Group, Birmingham, England, June 28, 2011.
- Tensors, Householder Symposium XVIII, Tahoe City, California, June 13 (?) 2011.
- Some open problems in matchings in graphs, Combinatorics Seminar, UIC, February 23, 2011.
- Some results concerning separable states in QIT, Quantum Information Science Seminar Series, Quantum Information Science Institute, University of Calgary, February 4, 2011.
- Some open problems in matchings in graphs, Linear Algebraic Techniques in Combinatorics/Graph Theory, BIRS, February 1, 2011.
- Tensors, Hong Kong Polytechnic University, December 20, 2010.
- Eigenvalue inequalities, log-convexity and scaling: old results and new applications, a tribute to Sam Karlin, City University of Hong-Kong, December 10, 2010.
- The pressure, densities and first order phase transitions associated with multidimensional SOFT, Dynamics Seminar, College Park, University of Maryland, October 28, 2010.
- On $4 \times 4 \times 4$ tensors of border rank 4 at most, Graduate Computational Algebraic Geometry Seminar, UIC, October 14, 2010.
- Tensors, Mathematics and its Applications Seminar, UIC, September 1, 2010.
- Tensors, CAM seminar, University of Kansas, August 20, 2010.
- Phylogenic invariants and tensors of border rank 4 at most in $C^{4 \times 4 \times 4}$, 16th ILAS Conference, Pisa, Italy, June 24, 2010.
- Tensors, Seminar, Centre de Mathématiques Appliquées of École Polytechnique, Paris, France, June 15, 2010.
- Tensors, 2010 Western Canada Linear Algebra Meeting, Banff International Research Station, May 08, 2010:

Invited lectures, colloquia and seminars since 2000 (continued)

- On the eigenvalues of graphs, Workshop in Graph Theory and Combinatorics in Memory of Uri Peled, Department of Mathematics, UIC, February 21, 2010.
- Matchings, permanents and their random approximations, Special Seminar in IIT-Mumbai, Department of Mathematics, IIT Bombay, India, December 24, 2009.
- On the eigenvalues of graphs: results and conjectures, Colloquium in TIFR, Tata Institute of Fundamental Research, School of Mathematics, December 17, 2009.
- Theoretical and computational methods in statistical mechanics, Math-Stat Seminar, INDIAN STATISTICAL INSTITUTE DELHI CENTER, December 09, 2009.
- Matchings, permanents and their random approximations, Stat-Math Seminar, INDIAN STATISTICAL INSTITUTE DELHI CENTER, December 08, 2009.
- Matchings, permanents and their random approximations, Tutte Seminar Series, Dept. of Combinatorics & Optimization, University of Waterloo, November 20, 2009.
- On the eigenvalues of graphs: results and conjectures, U-Waterloo Continuous Optimization Seminar, University of Waterloo, November 19, 2009.
- Matchings, permanents, and their random approximations, The University of Michigan Combinatorics Seminar, University of Michigan, Ann Arbor, November 13, 2009.
- Fixed points theorems for nonnegative tensors and Newton methods, SIAM conference on applied linear algebra, Monterey, CA, October 27, 2009.
- Theoretical and computational methods in statistical mechanics, Scientific Computing and Matrix Computations Seminar, Departments of Mathematics and EECS, UC Berkeley, October 26, 2009.
- Results and problems for 3-tensors, LINEAR AND NUMERICAL LINEAR ALGEBRA: THEORY, METHODS, and APPLICATIONS, Northern Illinois University, August 12, 2009.
- Results and Problems for 3-tensors, 2009 Haifa Matrix Theory Conference, Haifa, Israel, May 20, 2009:
- Counting Matchings in Graphs with Applications to the Monomer-dimer Models, Center for Applied Mathematics, Colloquium, University of Notre Dame, Indiana, April 07, 2009.
- Counting matchings in graphs with applications to the monomer-dimer models, Colloquium, University of British Columbia, Canada, March 06, 2009.
- Tensors: theory and applications, Colloquium, TTI-C, March 2, 2009.
- Eigenvalue inequalities, log-convexity and scaling: old results and new applications, a tribute to Sam Karlin, Colloquium, University of Calgary, Calgary, Canada, January 8, 2009.
- Some linear and multilinear algebra aspects of quantum information theory, Quantum Information Science Seminar Series, The University of Calgary, Calgary, Canada, January 07, 2009.
- Counting matchings in graphs with applications to the monomer-dimer models, Colloquium, Wichita State University, December 12, 2008.
- Approximation of matrices and tensors, KU, December 11, 2008
- Eigenvalue inequalities, scaling and log-convexity: old results and new applications, a tribute to Sam Karlin, Linear Algebra and Optimization Seminar, Stanford University, CA, December 03, 2008.
- 3-Tensors, Geometry and Representation Theory of Tensors, MSRI, July 17, 2008.

Invited lectures, colloquia and seminars since 2000 (continued)

- "Counting matchings in graphs, with applications to the monomer-dimer models", The Royal Institute of Technology April 16, 2008.
- "Counting matchings in graphs, with applications to the monomer-dimer models", Umea University, Sweden, April 9, 2008.
- "Fast low rank approximations of matrices and tensors", Gene Golub memorial meeting, Berlin, February 29, 2008.
- "Counting matchings in graphs, with applications to the monomer-dimer models", Erwin Schroedinger Institute, Vienna, February 19, 2008.
- "Counting matchings in graphs, with applications to the monomer-dimer models", BMS Friday Colloquium, February 8, 2008.
<http://www.math-berlin.de/dmdocuments/BMS-Friday26.pdf>
- Fast low rank approximations of matrices and tensors, 24th GAMM-Seminar, Max Planck Institute, Leipzig, January 25, 2008.
- The Role of Singular Value Decomposition in Data Analysis, 18 December, 2007, Kolloquium der Arbeitsgruppe Modellierung, Numerik, Differentialgleichungen, TU Berlin, Institut fr Mathematik.
- "Pressure and phase transition in Potts models in Statistical Mechanics", Seminario di Matematica Applicata, University of Pavia, Italy, October 9, 2007.
- "Entropy of holomorphic and rational maps", Seminar in Algebraic Geometry, October 4, University of Pavia, Italy, 2007.
- "The Role of Singular Value Decomposition in Data Analysis", University of South Australia, August 10, 2007.
- "Analysis of Big Multidimensional Data", Google Tech Talks, June 1, 2007.
<http://video.google.com/videoplay?docid=-2720202179947384722>
- "Pressure and phase transition in Potts models in Statistical Mechanics", Seminar in Ergodic Theory, Hebrew University, Dec. 26, 2006.
- "Matchings and Independent Sets: Problems, Conjectures and Results", Colloquium, Technion, Dec. 25, 2006.
- "Matchings and positive hyperbolic polynomials", Combinatorics Seminar, Tel Aviv University, School of Mathematical Sciences, Dec. 24, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", The Hebrew University CS Theory Seminar, Dec. 21, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", Mathematical Analysis and Applications Seminar, Faculty of Mathematics and Computer Science, The Weizmann Institute of Science, Dec 19, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", Applied Mathematics Seminar, UIC, April 5, 2006.
- "Matchings and Positive Hyperbolic Polynomials", Combinatorics Seminar, UIC, March 8 and March 15, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", Seminar, Toyota Technological Institute at Chicago, January 12, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", Seminar, Computer Science Department, Technion, Israel, January 4, 2006.
- "The Role of Singular Value Decomposition in Data Analysis", Seminar, Computer Science Department, Tel Aviv University, December 29, 2005.

Invited lectures, colloquia and seminars since 2000 (continued)

- "Matchings and Positive Hyperbolic Polynomials", Seminar, Computer Science Department, Hebrew University, Jerusalem, December 28, 2005.
- "The Role of Singular Value Decomposition in Data Analysis", Seminar, Computer Science Department, University of California, Berkeley, December 15, 2005.
- "The Role of Singular Value Decomposition in Data Analysis", Seminar, Computer Science Department, Stanford University, December 14, 2005.
- Elliot Krop, my Ph.D. student, gives a contributed talk on our joint work in Brualdifest: Linear Algebra, Graph Theory & Combinatorics Conference, University of Wisconsin-Madison, April 30-May 1, 2005
- My Ph.D. student Amir Niknejad gave a contributed talk in Haifa Matrix Conference, January 3 - 7, 2005, Israel on our joint paper, which was accepted to the Proceedings of this conference
- "Probabilistic and Deterministic Methods to Compute the Monomer-Dimer Entropies", Probability Seminar, Berkeley Univ., February 25, 2004.
- "Probabilistic and Deterministic Methods to Compute the Monomer-Dimer Entropies", Probability Seminar, Stanford Univ., February 23, 2004.
- "On the monomer-dimer problem", Colloquium, Hebrew Univ., December 18, 2003.
- "On the monomer-dimer problem", Colloquium, Technion, December 15, 2003.
- "On the monomer-dimer problem", Colloquium, Tel Aviv Univ., December 11, 2003.
- "A Simultaneous Reconstruction of Missing Data in DNA Microarrays", Approximation Seminar, Tel Aviv Univ., December 11, 2003.
- "Computation of entropy in statistical mechanics and information theory", Colloquium, Wichita State Univ., Kansas, May 9, 2003.
- "The entropy of the monomer-dimer systems", Probability Seminar, Univ. of Minnesota, April 4, 2003.
- "Computation of entropy in statistical mechanics and information", Math. and Appl. Seminar, Univ. of Illinois at Chicago, April 2, 2003.
- "Entropy of holomorphic and rational maps in several complex variables", Geometric Analysis Seminar, Purdue Univ., Indiana, Feb. 24, 2003.
- "Computation of entropy in statistical mechanics and information", Colloquium, Univ. of Wisconsin, Madison, Jan. 31, 2003.
- "Revisiting Siegel upper half plane", Dynamics Seminar, Hebrew Univ., June 11, 2002.
- "The Golden-Thompson inequalities for compact self adjoint operators", Functional Analysis Seminar, Technion, June 13, 2002.
- "Multi-dimensional entropy in statistical mechanics and information theory", Colloquium, Technion, June 10, 2002.
- "Applications of algebraic geometry and topology to some problems in matrices", Geometric Analysis Seminar, Purdue Univ., March 18, 2002.
- "Multi-dimensional entropy in statistical mechanics and information theory", Math. Physics Seminar, Georgia Tech., March 11, 2002.
- "Revisiting the Siegel upper half plane", Function Theory Seminar, Purdue Univ., Jan. 29, 2002.
- "Concentration of permanent estimators for certain large matrices", Analysis and Probability Seminar, Northwestern Univ., Nov. 19, 2001.

Invited lectures, colloquia and seminars since 2000 (continued)

- "On the graph isomorphism problem", Computer Science Dept. Seminar, Hebrew University, June 27, 2001.
- "On the sum and product of singular values of compact operators", Analysis Seminar, UCLA, Feb. 23, 2001.
- Series of lectures on "Methods of algebraic geometry in matrix theory", Technion, Israel, Fall 2000.
- "Topological pressure and Hausdorff dimension for Z^d subshifts", Ergodic Theory Seminar, Hebrew University, December 5, 2000.
- "Entropy of Z^d subshifts", Combinatorics Seminar in Hebrew University, December 4, 2000.

Graduate Students

- Mechie Nkengla. Dissertation subject: "Approximation of matrices and tensors". Graduated summer 2010.
- Elliot Krop. Dissertation subject: "Matching problems in graphs". Graduated fall 2007.
- Amir Niknejad. Dissertation title: "Applications of singular value decompositions in DNA microarrays". Graduated summer 2005.
- G. Porta. Dissertation title: "The limit of the product of the parametrized exponential of two operators". Graduated summer 1999.
- P. Freitas. Dissertation title: "On the action of the symplectic group on the Siegel upper half plane". Graduated summer 1999.
- S. Hersonsky was under my unofficial Ph.D. supervision. We published a joint paper. He completed his Ph.D. under P. Shalen in summer 1994.

Editorships

- Advisory board of the Electronic Journal of Linear Algebra Society.
- Senior Editor, Linear Algebra and Its Applications.
- Editor of Special Issue of the Proceedings of the conference *Directions in Matrix Theory 2011*, Coimbra University, Portugal, July 9-10, 2011, in Electronic Journal of Linear Algebra, jointly with Oskar Maria Baksalary and C.M. da Fonseca, 2011.
- Editor of Special Issue on Tensors and Multilinear Algebra, LINEAR ALGEBRA AND ITS APPLICATIONS, jointly with T. Kolda, L-H. Lim, E.E. Tyrtyshnikov, 2010.
- Associate Editor, Random and Computational Dynamics, 1992-1997.
- Special Editor of the issue of Linear Alg. Appl. for 8th Haifa Matrix Conference, 1995.
- Special Editor of the issues of Linear Algebra Appl. for the C. Davis, vol 208-209, 1994.
- Editor, IMA volume "Combinatorial and graph theoretic problems in linear algebra", Springer-Verlag, 1993.