

Lavi Karp

CONTACT INFORMATION

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RESEARCH INTERESTS

Einstein equations are the cornerstone of General Relativity. They are non-linear partial differential equations (PDE). The research in this field has a long history, and a longstanding interest in both mathematics and physics. My own interest lies within the mathematical aspects, and in particular with Einstein Equations that are coupled with a perfect fluid (relativistic flows). The main means to analyze this type of flows is to transfer them into a system of PDE, which results in a convoluted system consisting of both elliptic and hyperbolic types of equations. A major difficulty is that the density is not strictly positive in many situations. This phenomenon is called a physical vacuum and it causes substantial mathematical challenges that require novel approaches to investigate them.

I am also studying the topic of free boundary problems. The free refers here to an overdetermined system of equations and therefore the boundary of a domain, or the shape of a body, cannot be arbitrary. Such type problems arising from example in ice-melting, the evolution of oil spot surrounding by water and Hele-Shaw flows. These types of problems are related to potential theory and Quadrature Domains. A challenging open problem is the classification of Null quadrature domains, which means the classification of all domains such that the integral of all harmonic and integrable functions over them is zero. This topic actually goes back to Newton era and it is related to a classical theorem of Newton that an elliptical shell induces no gravitational force in the cavity. The classification in the plane has been known since the early eighteens of the last century, but in higher space dimensions it remains an open problem.

EDUCATION

1987-1992 D.Sc., Pure Mathematics, Technion–Israel Institute of Technology
I started M.Sc. degree that was accomplished to a D.Sc. degree

1982-1985 B.Sc., Pure Mathematics, Uppsala University, Sweden

ACADEMIC APPOINTMENTS

2020–present Professor, ORT Braude College

2011–2019 Associate Professor, ORT Braude College

2002–2011 Senior Lecturer, ORT Braude College

2001–2007 Adjunct Senior Lecturer, Technion

1998–2001 Adjunct Lecturer, Technion

1998–2001 Lecturer, ORT Braude College

1995–1997 Research Fellow, Department of Mathematics, Stockholm University

1994-1995 Post Doctoral Fellow, Department of Mathematics, Weizmann Institute of Science

1993-1994 Adjunct lecturer, Department of Mathematics, Technion

1992–1993 Research Fellow, Department of Mathematics, Technion

OFFICES IN ACADEMIC ADMINISTRATION	2019–present	Head The Galilee Research Center for Applied Mathematics of ORT Braude College
	2012–2016	Head of the Mathematics Department, ORT Braude College
	2011–Present	Member of the academic council of ORT Braude College
	2008	Head of ORT Braude College’s Excellence Program (This program was established in order to stimulate excellence among the students of the college and elevating outstanding undergraduates in all fields of science and technology).
SCHOLARSHIPS AND AWARDS	1992	The Zabontinski Award for excellence; given once a year for the best doctoral mathematical theses in the Technion
	1994–199	Koret Foundation postdoctoral fellowship, Weizmann Institute of Science
	1990–2002	Rachi’s Foundation, Gaustela scholarship, 60,000 \$
	2006	DFG, Deutsche Forschungsgemeinschaft, Research visit at the University of Potsdam
	2008	DFG, Deutsche Forschungsgemeinschaft, Research visit at the University of Potsdam
	2010	DFG, Deutsche Forschungsgemeinschaft, Research visit at the University of Potsdam

TEACHING

CURRICULA

- 2016: I initiated and led major revisions of the mathematics curriculum for Electrical Engineerings. The principal guidelines were to adapt the contents of the courses to the needs of electrical engineerings and to merge various topics in extended courses.
- 2016: I did a substantial revision of the curriculum of the B.Sc. program in applied mathematics at ORT Braude College.
- 2020: Head subcommittee for the proposal for M.Sc. in applied mathematics at ORT Braude College.

DEVELOPMENT OF COURSES

- Linear algebra II for computer science.
- Partial Differential Equations for applied mathematics.
- Partial Differential Equations and Fourier Series for electronic engineerings.
- Fourier series and integral transformations for applied mathematics.

PREPARATION OF EXERCISES BOOKLETS AND LECTURES NOTES

- Partial Differential Equations and Fourier Series
- Partial Differential Equations for applied mathematics.
- Applied Linear Algebra.
- Fourier series and integral transformations for applied mathematics.
- Ordinary Differential Equations and Laplace Transform.

PUBLICATIONS

ARTICLES IN REFEREED JOURNALS

1. L. Karp, *Construction of quadrature domains \mathbb{R}^4 in from quadrature domains in \mathbb{R}^2* , *Complex Variables and Elliptic Equations* **17** (1992), 179–189.
2. L. Karp, *Generalized Newton potential and its applications*, *Journal of Mathematical Analysis and Applications* **174** (1993), 480–497.
3. L. Karp, *On the Newtonian potential for ellipsoids*, *Complex Variables and Elliptic Equations* **25** (1995), 367–372.

4. L. Karp, *Liouville-type theorems for second order elliptic differential equations*, Annali Della Scuola Normale Superiore Di Pisa **22** (1995), 275–298.
5. L. Karp and A. Margulis, *Newtonian potential theory for unbounded sources and applications to free boundary problems*, Journal d’Analyse Mathématique **70** (1996), 1–63.
6. L. Karp and H. Shahgholian, *Regularity of a free boundary problem*, Journal of Geometrical Analysis **9**, No. 4 (1999), 653–669.
7. L. Karp and H. Shahgholian, *On the optimal growth of functions with bounded Laplacian*, Electronic Journal of Differential Equations **2000** No. 03(2000), 1–9.
8. L. A. Caffarelli, L. Karp and H. Shahgholian, *Regularity of a free boundary problem with application to the Pompeiu problem*, Annals of Mathematics **151**, No.1 (2000), 269–292.
 - Annals of Mathematics was ranked first among the mathematical journals when the paper was published.
9. L. Karp, T. Kilpeläinen, A. Petrsyan and H. Shahgholian, *On the porosity of Free boundaries in degenerate variational inequalities*, Journal of Differential Equations **164**, No. 1(2000), 110–117.
10. L. Karp and H. Shahgholian, *Regularity of a free boundary problem near the infinity point*, Communications in Partial Differential Equations **25**, No.11–12 (2000), 2055–2086.
11. W. K. Hayman, L. Karp and H.S. Shapiro, *Newtonian capacity and quasi balayage*, Rendiconti di Matematica e delle sue Applicazioni. **20**, No. 7(2000), 93–129.
12. L. Karp and H.S. Shapiro, *Isolated singularities of harmonic functions*, in Modern Developments in Multivariate Approximation, edit by W. Hausmann, K. Jetter, M. Reimer and J. Stöcker editors, Birkhäuser (2003), 165–174.
13. L. Karp, *Multivalid analytic continuation of the Cauchy transform*, Potential Analysis **24** (2006), 1–13.
14. U. Brauer and L. Karp, *Local existence of classical solutions for the Einstein–Euler system using weighted Sobolev spaces of fractional order*, Comptes Rendus Mathématique **345**, Issue 1 (2007), 49–54.
15. L. Karp, *On null quadrature domains*, Computational Methods and Function Theory, **8** (2008) No. 1, 57–72.
16. L. Karp, *On the well-posedness of the vacuum Einstein’s equations*, Journal of Evolution equations **11** (2011), 641–673.
17. U. Brauer and L. Karp, *Well-posedness of the Einstein-Euler system in asymptotically flat spacetimes: The constraint equations*, Journal of Differential Equations **251**(2011), 1428–1446.
18. L. Karp, *Global solutions to bubble growth in porous media*, Journal of Mathematical Analysis and Applications **382** (2011), 132–139.
19. L. Karp and A. Margulis, *Null quadrature domains and a free boundary problem for the Laplacian*, Indiana University Mathematics Journal **61**, No. 2 (2012), 859–882.
- U. Brauer and L. Karp, *Local existence of solutions of self gravitating relativistic perfect fluids*, Communications in Mathematical Physics **325** (2014), 105–141.
20. L. Karp, *Asymptotic properties of unbounded quadrature domains the plane*, European Journal of Applied Mathematics **26** (2015), 175–191.
21. U. Brauer and L. Karp, *Elliptic equations in weighted Besov spaces on asymptotically flat Riemannian manifolds*, manuscripta mathematica, **148** (2015), 59–97.
22. A. Goldvard and L. Karp, *On the composition of finite rotations in \mathbb{R}^4* , Journal Geometry and Symmetry in Physics, **39** (2015), 33–43.
23. L. Karp and E. Lundberg, *A four-dimensional Neumann ovaloid*, Arkiv för Matematik, **55** (2017), 185–198.

24. U. Brauer and L. Karp, *Local existence of solutions to the Euler–Poisson system, including densities without compact support*, Journal of Differential Equations, **264** (2018), 755–785.
25. U. Brauer and L. Karp, *Continuity of the flow map for symmetric hyperbolic systems and its application to the Euler–Poisson system*, Accepted to Journal d’Analyse Mathématique, 42 pages.
26. U. Brauer and L. Karp, *The non-isentropic Euler–Einstein system written in a symmetric hyperbolic form*, Accepted to Springer INdAM Series.
27. U. Brauer and L. Karp, *Local existence of solutions to the Euler–Poisson system, including densities without compact support*, Proceedings of the 12th ISAAC Congress in Aveiro, Portugal, Birkhäuser “Research Perspectives” series (accepted).

EDIT BOOKS

1. M. Agranovsky, L. Karp, D. Shoikhet and L. Zalcman, *Proceedings of an international conference, Complex Analysis and Dynamical Systems*, Contemporary Mathematics Vol. 364, American Mathematical Society, 2004.
2. M. Agranovsky, L. Karp and D. Shoikhet, *Proceedings of a international conference Complex Analysis and Dynamical System II*, conference in honor of Professor Lawrence Zalcman 60th birthday, Contemporary Mathematics, Vol. 382, American Mathematical Society, 2005.
3. M. Agranovsky, D. Bshouty, L. Karp, S. Reich, D. Shoikhet and L. Zalcman, *Proceedings of an international conference Complex Analysis and Dynamical System III, a conference in honor of the Retirement of Dov Aharonov, Lev Aizenberg, Samuel Krushkal, and Uri Srebro*, Contemporary Mathematics, vol. **455**, American Mathematical Society, 2008.
4. M. Agranovsky, M. Ben–Artzi, G. Galloway, L. Karp, S. Reich, D. Shoikhet, G. Weinstein and L. Zalcman, *Complex Analysis and Dynamical Systems IV: Part 1. Function Theory and Optimization*, Contemporary Mathematics vol. 553, American Mathematical Society, 2011.
5. M. Agranovsky, M. Ben–Artzi, G. Galloway, L. Karp, S. Reich, D. Shoikhet, G. Weinstein and L. Zalcman, *Complex Analysis and Dynamical Systems IV: Part 2. General Relativity, Geometry, and PDE*, Contemporary Mathematics vol. **554**, American Mathematical Society, 2011.
6. M. Agranovsky, M. Ben–Artzi, G. Galloway, L. Karp, V. Maz’ya, S. Reich, D. Shoikhet, G. Weinstein and L. Zalcman, *Complex Analysis and Dynamical Systems V*, Contemporary Mathematics vol. **591**, American Mathematical Society, 2013.
7. M. Agranovsky, M. Ben–Artzi, G. Galloway, L. Karp, D. Khavinson, S. Reich, G. Weinstein and L. Zalcman, *Complex Analysis and Dynamical Systems VI Part 1: PDE, Differential Geometry, Radon Transform*, Contemporary Mathematics vol. **653**, American Mathematical Society, 2015.
8. M. Agranovsky, M. Ben–Artzi, G. Galloway, L. Karp, D. Khavinson, S. Reich, G. Weinstein and L. Zalcman, *Complex Analysis and Dynamical Systems VI Part 2: Complex analysis, quasiconformal mapping, complex dynamic*, Contemporary Mathematics vol. **667**, American Mathematical Society, 2016.
9. M. Agranovsky, M. Ben–Artzi, C. Bénéteau, L. Karp, D. Khavinson, S. Reich, D. Shoikhet, G. Weinstein, L. Zalcman, *Complex Analysis and Dynamical Systems VII*, Contemporary Mathematics vol. **699**, American Mathematical Society, 2017.

SUBMITTED

- U. Brauer and L. Karp, *Global existence of a nonlinear wave equation arising from Nordström’s theory of gravitation*, 26 pages.

IN PREPARATION

1. L. Karp and M. Reissig, *The Euler–Poisson equations in physical vacuum and with an adiabatic constant equals to 2.*
2. U. Brauer and L. Karp, *Continuous dependence on the initial data for the Cauchy problem for Einstein equations.*
3. U. Brauer and L. Karp, *Global existence of the Nordström–Euler system.*

CONFERENCES

INTERNATIONAL
CONFERENCES

1. International Symposium on Inverse Problems for Potential Fields and Applications in Geophysics, Sophia, Bulgaria (October 1990), *Characterization of ellipsoids in by means of newton potential.*
2. French-Israeli Conference on Partial Differential Equations, Ecole Normale Superior, Paris, France (June 1992), *A Weighted $L^p(\mathbb{R}^n)$ estimate for second order elliptic partial differential operators.*
3. Workshop on Irregular Free Boundaries, KTH, Stockholm, Sweden (May 1996), Invited lecture, *Potential of a cone and singular Points of free boundaries.*
4. International Conference on Multivariate Approximation, University of Dortmund, Dortmund, Germany (October 1996) *Approximation of harmonic functions in the metric and The Cauchy problem for the Laplace operator.*
5. International Conference on Multivariate Approximation, University of Dortmund, Dortmund, Germany (October 1998), Invited lecturer, *Generalized Newtonian potential and its applications.*
6. Symposium Geometry and Regularity of Free Boundaries, Mittag-Leffler Institute, Stockholm, Sweden (February 2000), Invited lecturer, *Newtonian potential and free boundaries.*
7. International Conference on Multivariate Approximation, University of Dortmund, Dortmund, Germany (September 2002), *On analytic continuation of the Cauchy transform.*
8. Quadrature Domains and its Applications, University of California at Santa Barbara (March 2003), Invited lecture, *Unbounded quadrature domains.*
9. International Conference: Operator Algebra, Singularities, Deformation Quantization, Potsdam University, Potsdam, Germany (March 2004) *Nonlinear hyperbolic systems in weighted fractional spaces.*
10. The 5th Isaac Congress, Catania, Italy (July 2005), *Initial Value Problem for the Einstein Euler system in weighted fractional Sobolev spaces.*
11. Partial Differential Equations on Non-compact and Singular Manifolds, Potsdam University, Potsdam, Germany (August 2006), *Einstein constraint equations in weighted fractional Sobolev spaces.*
12. Quadrature Domains and Laplacian Growth in Modern Physics, Banff International Research Center Station for Mathematical Innovation and Discovery, Canada (July 2007), Invited lecturer *Self similar solutions of Hele-Shaw flows.*
13. The 7th ISAAC Congress, Imperial College London, UK, (July 2009), *On the well-posedness of the vacuum Einstein's equations.*
14. The 8th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Dresden University of Technology, Dresden, Germany (May 2010), *Null quadrature domains and a free boundary problem for the Laplacian.*
15. The 8th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Dresden University of Technology, Dresden, Germany (May 2010), *Einstein-Euler systems with polytropic equations of state.*
16. 2011 SIAM Conference on Analysis of Partial Differential Equations, San Diego, USA (November 2011), *Global solutions to bubble growth in porous media.*

17. The 9th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida (July 2012), *Local existence of solutions of self gravitating relativistic perfect fluids.*
18. The 9th International ISAAC Congress, Krakow, Poland, (August, 2013), *Well-posedness of coupled first and second order hyperbolic systems.*
19. Nonlinear Partial Differential Equations 2013, Institute of Applied Mathematics and Mechanics of National Academy of Sciences of Ukraine, Donetsk, Ukraine (September, 2013), Invited lecturer, *On the characterization of global solutions to a free boundary problem.*
20. Workshop Geometric and Singular Analysis, Potsdam University, Potsdam, Germany, (March 2014), *Elliptic equations in Weighted Besov spaces on asymptotically flat Riemannian manifolds.*
21. The 10th International ISAAC Congress, Macao (August 2015), *Asymptotic properties of quadrature domains in the plane.*
22. The 10th International ISAAC Congress, Macao (August 2015), *On the Euler-Poisson equations.*
23. Recent progress in evolution equations, Guangdong University of Finance, Guangzhou, China (August, 2015), Invited lecturer, *Some remarks on evolutions equations in General Relativity.*
24. The 11th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA, (July 2016), *Global aspects of a free boundary problem for the Laplace operator.*
25. Complex Functions, Operators, Partial Differential Equations, Mittag-Leffler Institute, Stockholm, Sweden (June 2017), Invited lecturer, *The Schwarz potential: an overview of various aspects.*
26. Workshop Geometric and Singular Analysis, Potsdam University, Potsdam, Germany (February 2018), *The continuity of the flow map of first order symmetric hyperbolic systems.*
27. The 12th International ISAAC Congress, Aveiro, Portugal (August 2019), *Continuous dependence on the geometrical initial data for the Einstein vacuum equations.*
28. INdAM Workshop, Anomalies in Partial Differential Equations, , IndAM (Istituto Nazionale di Alta Matematica Francesco Severi) Sapienza Universita di Roma, Italy (September 2019), Invited lecturer, *On the global existence of the NordströmEuler system.*

CONFERENCES IN
ISRAEL

1. Technion, Haifa, Israel Israel Mathematical Union, (May 1989), *Quadrature identities for harmonic functions.*
2. Israel Mathematical Union, Hebrew University, Israel (May 1992), *Null quadrature domains.*
3. Israel Mathematical Union, Tel Aviv University (May 2001), *On analytic continuation of the Cauchy transform.*
4. Israel Mathematical Union, Hebrew University (May 2004), *An overview of the classification of null quadrature domains.*
5. Fifth Holon Workshop in Complex Analysis, Holon Institute of Technology (March 2007), *Around Newton's theorem on the gravitational attraction induced by ellipsoids.*
6. Israel Mini workshop Brauday of Partial Differential Equations II, ORT Bruade College (November 2007), *The Cauchy problem for the Einstein Euler system using weighted Sobolev space of fractional order: Hyperbolic theory and energy estimates.*
7. Mini-Workshop on Applied and Computational Mathematics, Hebrew University, (July 2008), *The initial value problem for Einstein Euler systems.*
8. Israel Mathematical Union 2010 Annual Conference, Kibbutz Shefayim (June 2010), *Null quadrature domains and a free boundary problem for the Laplacian.*

9. Recent Advances in Nonlinear Evolutionary Equations and Analysis of Multi-Scale Phenomena, Weizmann Institute of Science (July 2010), Invited lecturer, *On the well-posedness of the vacuum Einstein's equations.*
10. The Tenth Holon Workshop in Complex Analysis, Holon Institute of Technology (April 2012), *Geometric aspects of a free boundary problem for the Laplace operator.*
11. Harmonic Analysis and PDE, International Conference in honor of Vladimir Maz'ya, Holon Institute of Technology (May 2019), *The continuity of the flow map for quasilinear symmetric hyperbolic systems.*

ORGANIZATION

1. Workshop on Analysis and Dynamical Systems, ORT Braude College (June 1998), *Member of the Organizing and Scientific Committee.*
2. Braude Days of Differential Equations, An international conference, ORT Braude College (May 1999), *Initiator, Member of the Program Committee.*
3. Annual meeting of Israel Mathematical Union, Haifa University (May 2000), *Organizer of the session of Differential equations.*
4. Complex Analysis and Dynamical Systems (An international conference, joint with Bar-Ilan and ORT Braude College), Nehariya, (June 2001), *Member of the Scientific Committee.*
5. Complex Analysis and Dynamical Systems II (An international conference, joint with Bar-Ilan University, Potsdam University and ORT Braude College), Nehariya (June 2003), *Member of the Scientific Committee.*
6. A mini workshop: Brauday of Partial Differential Equations, ORT Braude College (July 2005), *Initiator and organizer.*
7. Complex Analysis and Dynamical Systems III (An international conference, joint with Bar-Ilan University, Technion and ORT Braude College), Nehariya (January 2006), *Member of the Scientific Committee.*
8. A mini workshop Applied Harmonic Analysis, ORT Braude College (May 2007), *Initiator and organizer.*
9. A mini workshop: Brauday of Partial Differential Equations II, ORT Braude Collge (November 2007), *Initiator and organizer.*
10. Workshop on open problems in Complex Analysis and Dynamical Systems, ORT Bruade College (May 2008), *Member of the Scientific Committee.*
11. Complex Analysis and Dynamical Systems IV (An international conference joint with A joint project with Bar-Ilan University, Miami University and ORT Braude College), Nehariya (May 2009), *Member of the Scientific Committee.*
12. Complex Analysis and Dynamical Systems V (An international conference joint with Bar-Ilan University, Miami University and ORT Braude College), Akko (May 2011), *Member of the Scientific Committee.*
13. The Fifteenth Israeli Mini-Workshop in Applied and Computational Mathematics, ORT Braude College (December 2012), *Local organizer.*
14. Complex Analysis and Dynamical Systems VI (An international conference joint with with Bar-Ilan University, Miami University and ORT Braude College), Nehariya (May 2013), *Chairman of the conference.*
15. Workshop on Operator Theory, ORT Braude College (February 2014), *Chairman.*
16. Workshop in Complex and Harmonic Analysis, Holon Institute of Technology (June 2014), *Member of the Scientific Committee.*

17. Complex Analysis and Dynamical Systems V (An international conference, joint with Bar–Ilan University, University of South Florida and ORT Braude College), Nehariya (May 2015), *Chairman of the conference*.
18. Workshop on Mathematical Education in Science and Technology, ORT Braude College (February 2016), *Chairman*.
19. Workshop in Complex and Harmonic Analysis II, Holon Institute of Technology (April 2016), *Member of the Scientific Committee*.
20. The 20th Israeli Mini-Workshop in Applied and Computational Mathematics, ORT Braude College (December 2017), *Local organizer*.
21. A Workshop on Geometry and its Applications, ORT Braude College (December 2018), *Scientific and organizing committee*.
22. The 15th ORT Braude Interdisciplinary Research Conference, Kfar Blum (October 2019), *Chairman of the conference*.

INVITED LECTURES
AND COLLOQUIUM
TALKS

1. Weizmann Institute of Science, Faculty of Mathematics and Computer Science, Mathematical Analysis and Applications Seminar (May 1994), *Liouville-type theorems for second order elliptic differential equations*.
2. Royal Institute of Technology, Stockholm, Department of Mathematics, Analysis Seminar (February 1995), *Some applications of the Newtonian potential theory to free boundary problems*.
3. Uppsala University, Department of Mathematics, Analysis Seminar (May 1997), *Uniformly fat sets*.
4. Haifa University, Department of Mathematics, Analysis Seminar (December 1999), *Removable singularities for harmonic functions*.
5. Bar-Ilan University, Department of Mathematics, Analysis Seminar (April 2001), *A free boundary problem related to the Pompeiu problem*.
6. Technion-Israeli Institute of Technology, Faculty of Mathematics, Seminar of Applied Mathematics (November 2003), *Nonlinear hyperbolic systems in weighted fractional Sobolev spaces*.
7. Weizmann Institute of Science, Faculty of Mathematics and Computer Science, Mathematical Analysis and Applications Seminar (May 2005), *The initial value problem for the Einstein-Euler system*.
8. Hebrew University Hebrew University, Department of Mathematics, PDE Seminar (June 2006), *Einstein constraint equations in weighted fractional Sobolev spaces*.
9. University of Calgary, Canada, Department of Mathematics, A Colloquium talk (July 2007), *Around Newton's theorem on the gravitational attraction induced by ellipsoids*.
10. Potsdam University, Department of Mathematics, PDE seminar (July 2008), *The Cauchy problem for the Einstein equations in vacuum: a simultaneous study of the constraint and evolution equations*.
11. Max-Planck-Institute für Gravitationsphysik, Albert-Einstein-Institute, Seminar (July 2008), *Well-posedness of Einstein-Euler systems in asymptotically flat Spacetimes*.
12. Swansea University, Department of Mathematics, PDE seminar (July 2009), *On the classification of null quadrature domains*.
13. Potsdam University, Department of Mathematics, PDE seminar (September 2010), *On harmonic continuation of potentials*.
14. KTH-Royal Institute of Technology, Stockholm, Analysis Seminar (February 2012), *Global geometric aspects of the Cauchy problem for the Laplace operator*.
15. Technische Universität Bergakademie Freiberg, Department of Mathematics, PDE Seminar (March 2014), *Hyperbolic Methods for Einstein-Euler Equations*.

16. ORT Braude College, Weekly mathematically seminar (May 2017), *Quadrature domains and conformal mappings*.
17. Technion-Israeli Institute of Technology, Faculty of Mathematics, Seminar of Applied Mathematics (January 2018), *Local existence theorems for the Euler–Poisson equations in a physical vacuum*.
18. Technische Universität Bergakademie Freiberg, Department of Mathematics, PDE Seminar (February 2018), *Local existence theorems for the Euler–Poisson equations in a physical vacuum*.
19. Afeka, Tel–Aviv Academic College of Engineering, Weekly Mathematics seminar (April 2018), *The Cauchy problem for Einstein equations*.
20. Holon Institute of Technology, Geometric Function Theory Seminar (January 2019), *Applications of conformal mappings to the construction of quadrature domains*.