CURRICULUM VITA



HASAN GÜMRAL

- February 11, 1963, Mersin, TURKEY.
- Addresses: Yeditepe University, Faculty of Science and Letters, Department of Mathematics, 34755 Ataşehir, Istanbul, Turkey.
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1 Education and academic degrees

1. Ph.D, Feb 3, 1993, (3.65/4.00) Department of Mathematics, Bilkent University, Ankara, Turkey

Dissertation: Poisson structures of dynamical systems and equations of hydrodynamic type, supervisor: Prof. Dr. Yavuz Nutku.

 M.S, Sep 22, 1988 (28080), Department of Physics, Middle East Technical University, Ankara, Turkey,

Dissertation: Symmetries, conservation laws and multi-Hamiltonian structure of equations of hydrodynamic type, supervisor: Assoc. Prof. Dr. Ahmet Eriş. B.S, July 11, 1986 (22447), Department of Physics, Middle East Technical University, Ankara, Turkey,

2 Work Experiences

- Jun 2003—, Professor, Department of Mathematics, Yeditepe University, İstanbul.
- Aug 2014- May 2018, Professor, Department of Mathematics, Australian College of Kuwait.
- Sep 2014-Jul 2015, Professor and Acting Head of Department of Mathematics, Australian College of Kuwait.
- Dec 2001-Jun 2003, Assoc. Professor, Department of Mathematics, Yeditepe University, İstanbul.
- May 2003- Oct 2011, Professor and Chairman of Department of Mathematics, Yeditepe University, İstanbul.
- Sep 2008-Feb 2009, Visiting Researcher (to Massimo Tessarotti), Dipartimento di Matematica e Informatica, Universita degli Studi di Trieste, Italia.
- Jun 1997-Nov 2001, Senior Researcher and Assoc. Professor (Nov 1998) at Feza Gürsey Institute (for research in mathematics and theoretical physics), İstanbul, Turkey.
- Jul-Oct 2001, Visiting Senior Researcher (to Phil Morrison), Department of Physics and Institute for Fusion Studies, University of Texas at Austin, Texas, USA.
- Sep 2000-Feb 2001, Part-time Lecturer, Department of Mathematics, Boğaziçi University, Istanbul.
- Jul 1993-Feb 1994, Visiting Researcher (to Jerry Marsden), Department of Mathematics, University of California at Berkeley, California, USA.
- Apr-Jul 1993, Visiting postdoctoral fellow (to Jerry Marsden), Fields Institute For Research in Mathematical Sciences, Waterloo, Canada.
- Feb 1993-Jun 1997, Researcher, Department of Physics, Tübitak, Marmara Research Center, Gebze, Kocaeli, Turkey.
- Oct 1990-Jan 1993, Research Assistant, Department of Mathematics, Bilkent University, Ankara, Turkey.
- Sep 1989-Sep 1990, Research Assistant, Department of Physics, Istanbul Technical University, Istanbul, Turkey.

- Feb 1989-Aug 1989, Visiting researcher (to Yavuz Nutku), Department of Physics, Research Institute for Basic Sciences, Tübitak, Gebze, Kocaeli, Turkey
- Sep 1988-Feb 1989, Science Teacher, Tarsus Private Lyceè, Tarsus, Mersin, Turkey.
- Dec 1986-Sep 1988, Research Assistant, Department of Physics, Middle East Technical University, Ankara, Turkey.

3 Publication List

3.1 Articles in International Refereed Journals

- H. Gümral, Y. Nutku, Multi-Hamiltonian structure of equations of hydrodynamic type, J. Math. Phys. 31(11) 1990, 2606-2611.
- H. Gümral, Bi-Hamiltonian structure of N-component Kodama equations, J. Phys. A: Math. Gen. 25 (1992) 5141-5149.
- H.Gümral, Y. Nutku, Poisson structure of dynamical systems with three degrees of freedom, J. Math. Phys. 34 (1993) 5691-5723.
- H.Gümral, Y. Nutku, Bi-Hamiltonian structures of dispersionless-Boussinesq and Benney equations, J. Phys. A: Math. Gen. 27 (1994) 193-200.
- H.Gümral, Contravariant geometry of time-dependent dynamical systems, Phys. Lett. A 218 (1996) 235-239.
- H.Gümral, Lagrangian description, symplectic structure, and invariants of 3D fluid flow, Phys. Lett. A 232 (1997) 417-424.
- H.Gümral, A time-extended Hamiltonian formalism, Phys. Lett. A 257 (1999) 43-52.
- H.Gümral, Kinematical symmetries of 3D incompressible flows, Physica D 135 (2000) 117-136.
- H.Gümral, Helicity invariants in 3D: Kinematical aspects, Physica D 139 (2000) 335-359.
- E. Abadoğlu, H. Gümral, Bi-Hamiltonian structure in Frenet-Serret frame, Physica D 238 (2009) 526-530.
- 11. H. Gümral, Existence of Hamiltonian Structure in 3D, Adv. in Dyn. Sys. and Appl., 5 (2010) 159-171.
- H. Gümral, Geometry of Plasma Dynamics I: Group of Canonical Diffeomorphisms, J. Math. Phys. 51 (2010) 083501 (23pages).
- O. Esen, H. Gümral, Lifts, Jets and Reduced Dynamics, Int. J. of Geom. Meth. in Mod. Phys. 8 (2011) 331-344.
- E. Abadoğlu, H. Gümral, Poisson Structures for the Aristotelian Model of Three-Body Motion, J. Phys. A: Math. Theor. 44 (2011) 325204 (15pages).
- O. Esen, H. Gümral, Geometry of Plasma Dynamics II: Lie Algebra of Hamiltonian Vector Fields, J. Geom. Mech. 4 (2012) 239-269.
- O. Esen, H. Gümral, Tulczyjew Triplets for Lie Groups I: Trivializations and Reductions, J. Lie Theory 24 (2014) 1115-1160.

- H. Gümral, Lagrangian Description, Symplectisation and Eulerian Dynamics of Incompressible Fluids, Turkish J. Math. 40 (2016) 925-940.
- O. Esen, A Ghose Choudhury, Partha Guha, H. Gümral, Superintegrable Cases of Four Dimensional Dynamical Systems, Regular and Chaotic Dynamics 21 (2016) 175-188.
- O. Esen, H. Gümral, Tulczyjew Triplets for Lie Groups II: Dynamics, Journal of Lie Theory 27 (2017) 329-356.
- F. Çağatay-Uçgun, O. Esen, H. Gümral, Reductions of Topologically Massive Gravity I: Hamiltonian Analysis of Second Order Degenerate Lagrangians, J.Math.Phys. 59 (2018) 013510 (16 pages)
- Oğul Esen, Miroslav Grmela, Hasan Gümral and Michal Pavelka, Lifts of Symmetric Tensors: Fluids, Plasma and Grad Hierarchy, Entropy 21 (2019) 907 (33 pages)
- F. Çağatay-Uçgun, O. Esen, H. Gümral, Reductions of Topologically Massive Gravity II: First Order Realizations of Second Order Lagrangians, J. Math. Phys. 61 (2020) 073504 (30 pages)
- O. Esen, H. Gümral, S. Sütlü, Tulczyjew Triplets for Lie Groups III: higher order dynamics and reductions on iterated bundles, Theoretical and Applied Mechanics 48 (2021) 201-236. https://doi.org/10.2298/TAM210312009E
- 24. H. Gümral, Dirac's Analysis and Ostrogradskii's theorem for a Class of Second Order Degenerate Lagrangians, Int. J. of Geom. Meth. in Mod. Phys. 19 (2022) 2250008 (24pages). WOS:000733361600002
- O. Esen, P.Guha, H. Gümral, 3D-fows Generated by the Curl of a Vector Potential and Maurer-Cartan Equations, Turkish J. Math. 46 (2022) 3234-3244 WOS:000890825900011
- H Gümral, Symmetry and reduction for second order degenerate Lagrangians, J. of Phys.: Conf. Series 2667 (2023) 012073 doi:10.1088/1742-6596/2667/1/012073
- 27. H. Gümral, Oscillator algebra of chiral oscillator, submitted, Rep. on Math. Phys.
- 28. O. Esen, P.Guha, H. Gümral, On geometrical couplings of dissipation and curl forces, submitted to Math. Phys. Anal. and Geom.
- Ogul Esen, Ayten Gezici, Hasan Gümral, Miroslav Grmela, Michal Pavelka and Serkan Sütlü, Conformal and Contact Kinetic Dynamics and Their Geometrization, July 3, 2023

(First four publications are from PhD Thesis)

3.2 Articles in Turkish

- Kontakt Parçacıkların Kinetik Denklemleri, "XVII. Ulusal Mekanik Kongresi, Elazığ Fırat Üniversitesi, 5–9 Eylül 2011, bildiriler-" (Yayına hazırlayanlar: Hasan Engin, Mehmet Hakkı Omurtag, Can Fuat Delale ve Nalan Antar) (2013) 370-378 (O. Esen ile).
- Kanonik Dönüşümler Grubu ve Plazma Dinamiği, "XVI. Ulusal Mekanik Kongresi, Kayseri Erciyes Üniversitesi-bildiriler-" (Yayına hazırlayanlar: A.Y. Aköz, H. Engin, Ü. Gülçat, A. Hacınlıyan) (Nisan 2010) 631-649.
- Yavuz Nutku, "Anılarla/With Memories Yavuz Nutku", (Yayına hazırlayan: Yılmaz Akyıldız) Uygulamalı Matematik Enstitüsü, ODTÜ (Ankara, 2010) 3-16.
- 4. Halkın ve Yöneticilerin Trajedisi, Nisan 2012 (unpublished).
- 5. Marks ve sonsuz küçükler sorunu, Ekim 2017 (unpublished).
- Kopernik devrimi, Mayıs 2023 (unpublished)
 All available on https://www.researchgate.net/profile/Hasan_Guemral

4 Research Interests

Geometric mechanics: symplectic, multi-symplectic, Poisson, contact, Jacobi and multi-Hamiltonian structures with applications to geometry and integrability of non-linear differential equations of physical importance, in particular, to fluids and plasmas. Tulczyjew's construction of generalized Legendre transformations for theories on diffeomorphism groups and, for higher order and degenerate Lagrangian theories, dynamics on higher order tangent and cotangent bundles and their reductions. Geometry of manifolds of maps in connection with Tulczyjew construction and diffeomorphism groups.

Areas of applications: hydrodynamic type equations, dispersionless limits of soliton equations, gas dynamics hierarchy, quasilinear second order pdes, epidemiology, atomic physics, equations arising from general relativity and topologically massive gravity, Vlasov-Poisson equations of plasma, kinetic theories, Euler equations of fluid.

4.1 Research Summary

The published works may be grouped under six headings:

1) geometry of plasma dynamics and kinetic theories, including infinite dimensional Lie theory,

2) Tulczyjew's construction of Legendre transformations and higher order dynamics on Lie groups,

3) Hamiltonization methods for higher order Lagrangian theories (Dirac, Legendre a la Tulczyjew, Skinner-Rusk, etc with applications to gravity theories),

4) generalized Hamiltonian formulation for non-autonomous dynamical systems with applications to (magneto-)hydrodynamic motions in Lagrangian description,

5) local and global aspects of Poisson structures in three and four dimensions with applications to dynamical systems,

6) multi-Hamiltonian structure of equations of hydrodynamic type in one space dimension.

5 Conferences, Seminars, Meetings

- *: participation with invited talks, lectures or anouncements
 - *Symplectic reduction of a second derivative Lagrangian, IV. Workshop on Nonlinear Systems, Department of Mathematics, Gebze Technical University, Jan 2-4, 2024, Kocaeli.
 - 2. *Copernican Revolution (in Turkish), Colloqium talk for science club students of Yeditepe University, Dec 22, 2023, İstanbul.
 - 3. *From Maraga to Copernican Revolution (in Turkish), 35. National Mathematics Symposium Sep 4-8, 2023, Trakya University, Edirne.
 - 4. *Symmetry and reduction for second order degenerate Lagrangians, XII. International Symposium on Quantum Theory and Symmetries (QTS12) and XXVII. International Conference on Integrable Systems and Quan tum Symmetries (ISQS27), Czech Technical University in Prague, Czech Republic, July 24-28, 2023.
 - *Tulczyjew symplectic spaces for displacement and canonical mappings, Department of Mathematics, Yeditepe University, May 12, 2023, Istanbul.
 - *Displacement versus canonical mappings in Vlasov dynamics, Invited keynote talk in III. Workshop on Nonlinear Systems, Department of Math ematics, Gebze Technical University, Jan 3-9, 2023.
 - 7. (online) *Geometric mechanics and finite element methods, Department of Mathematics, Gebze Technical university, Mar 14, 2021, Kocaeli.
 - 8. (Online) Workshop on Nonlinear systems, (organizer) Department of Mathematics, Gebze Technical University, Sep 29, 2020, Kocaeli.
 - *Hamiltonian formulations of second order degenerate Lagrangians, Department of Physics, Mimar Sinan University of Fine Arts, Apr. 11, 2019, Istanbul.
 - *Geometry and physics on diffeomorphism groups, Seminar, Department of Mathematics, Istanbul University, Feb. 20, 2019, Istanbul.

- *Poisson bivectors in four dimensions, Workshop on Nonlinear Systems, Department of Mathematics, Gebze Technical University, Nov. 26, 2018, Kocaeli.
- *On geometric problems of plasma dynamics, Seminar, Department of Mathematics, Gebze Technical University, Nov. 20, 2018, Kocaeli.
- *Nonlinearities in NMR and Debye-Hückel theory, Research seminar in School of Engineering, Australian College of Kuwait, Nov. 2016.
- 14. *Marx and the problem of infinitesimals, Joint Symposia on Philosophy and Mathematics, Yeditepe University, Feb. 27-28, 2014, Istanbul.
- *Configuration spaces of Poisson-Vlasov equations, "Workshop on Geometry of Mechanics and Control" National Mathematics Initiative, Indian Institute of Science (January 2-10, 2014) Bangalore, India.
- *Poisson structures in 3D and Darboux-Halphen system, colloquium talk at "Workshop on Geometry of Mechanics and Control" National Mathematics Initiative, Indian Institute of Science (January 2-10, 2014) Bangalore, India.
- *Eulerian equations and geometry of Lagrangian flows, International Workshop on Differential Equations and Applications, Atılım University (August 12-15, 2013) Ankara.
- *Local vs global integrability, seminar at Department of Mathematics, Yeditepe University, May 14, 2013, Istanbul.
- 19. *Hamiltonyen Parçacıkların Kinetik Denklemleri I, XVI. Ulusal Mekanik Kongresi, Erciyes Üniversitesi, 22-26 Haziran 2009, Kayseri.
- 20. *Üç Boyutta iki-Hamiltonlu Yapının Varlığı, 9. Dinamik Sistemler Çalıştayı, İzmir Üniversitesi, 18-19 Haziran 2009, İzmir.
- *Geometry of Vlasov-Poisson Equations, Seminars at Department of Physics and Institute For Fusion Studies, Sep. 21, 2001, University of Texas at Austin, USA.
- 22. *Symplectic Geometry of Incompressible Flows, talk at NEEDS 2000, June 29-July 7, Gökova, Turkey.
- *Geometric Mechanics, seminar at Physics Department of Boğaziçi University, Dec. 15, 1999, Istanbul.
- 24. International Conference on New Applications of Multisymplectic Geometry, Sep. 20-24, 1999, Universidad de Salamanca, Spain.
- 25. *Neo-Klasik Mekanik, Geometrik Mekanik başlıklı iki çağrılı konuşma. 12. Ulusal Matematik Kongresi, 6-10 Eylül, 1999, İnönü Üniversitesi, Malatya.

- *Hydrodynamical Invariants and Jacobi Structures, talk at IX. Regional Conference on Mathematical Physics, Aug. 9-14, 1999, Feza Gürsey Institute, Istanbul.
- 27. *Fen fakültesi ögrencilerine Feza Gürsey Enstitüsünü tanıtıcı konuşma, 4 Haz. 1999, İstanbul Üniversitesi, Vezneciler.
- *Lectures on Symplectic Geometry, in: Research semester on Geometry and Integrability, Feb. 15-June 15, 1999, Feza Gürsey Institute, Istanbul, Turkey.
- *Colloqium on Geometry and Integrability, at Physics Departments of Middle East Technical University (Feb 11, 1999), Bilkent University (Feb 11, 1999) and Boğaziçi University (Feb 18, 1999).
- 30. *Poisson Geometry and Time-dependent Motions, seminars at Mathematics Department of Boğaziçi University (Nov 3, 1998) and, Physics Department of Istanbul Technical University (Nov. 12, 1998), Istanbul.
- Research semester on Seiberg-Witten monopoles and M-theory, summer, 1998, Feza Gürsey Institute, Istanbul, Turkey.
- 6th Gökova Conference on Geometry and Topology, May 25-30, 1998, Akyaka-Gökova, Turkey.
- *Geometrik Mekaniğin Yapısı, Sicimler, Zarlar ve Dualite Simetrileri Kış Okulunda yapılan konuşma, 19-23 Ocak 1998, İzzet Baysal Üniversitesi, Bolu, Türkiye.
- 34. *A time-extended Hamiltonian formalism, talk at VIII. Regional Conference on Mathematical Physics, June 27-July 4, 1997, Yerevan, Armenia.
- 35. *General Helicity conservation, talk at Anatolian Lectures on Dynamical Systems, June 15-19, 1997, Department of Mathematics, Middle East Technical University, Ankara, Turkey.
- Workshop on Turbulence Modelling and Vortex dynamics, Sep. 2-6, 1996, Istanbul Technical University, Maçka, Istanbul, Turkey.
- 37. *Poisson geometrisi, Fizikte Geometri ve Topoloji Kış Okulunda yapılan konuşma, 29 Ocak-2 Şubat 1996, İzzet Baysal Üniversitesi, Bolu, Türkiye.
- Variational and local methods in the study of Hamiltonian systems, 24-28 October, 1994 (with certificate) ICTP, Trieste, Italy.
- Research workshops on Mathematical Ecology (May 26-29, 1993) and, Pattern Formation and Lattice Gas Automata (Jun 7-12, 1993) at Fields Institute, Waterloo, Canada.

- *N-bileşenli Kodama denklemlerinin iki-Hamiltonlu yapısı, VI. Diferansiyel Denklemler Sempozyumu'nda yapılan konuşma, 28-29 Eylül, 1992, Ankara Üniversitesi, Fen Fakültesi, Ankara, Türkiye.
- 41. International Workshop on Geometry and Arithmetic, July 19-Aug 1, 1992, Akdeniz University, Antalya, Turkey.
- *Poisson structures and 2-monopole problem, talk at Dynamics Days, June 19-20, 1992, Department of Mathematics, Middle East Technical University, Ankara, Turkey.
- 1st Gökova Conference on Geometry and Topology: Low Dimensional Topologies, May 25-29, 1992, Akyaka-Gökova, Turkey.
- 44. *2-monopole problem, talk at V. Regional Conference on Mathematical Physics, Dec 15-22, 1991 Trakya University, Edirne, Turkey.
- *3-boyutta korunum yasaları için bir yöntem, V. Diferansiyel Denklemler Sempozyumu'nda yapılan konuşma, 25-27 Eylül, 1991, Anadolu Üniversitesi, Eskişehir, Türkiye.
- I. International Colloquium on Recent Developments in Theoretical Physics, May 27-31, 1991, Trakya University, Edirne, Turkey.
- *Multi-Hamiltonian structure of hydrodynamic type equations, talk at NATO-Advanced Research Workshop: Singular Limits of Dispersive Waves, July 7-12, 1991, ENS-Lyon, France.
- *Poisson structure of 3-dimensional dynamical systems, seminar at Physics Department, March 28, 1991, Middle East Technical University, Ankara.
- Summer School on High Energy Physics and Cosmology, June 18-July 28, 1990 Trieste, ICTP, Italy.
- 50. Trieste Conference on Topological Methods in Quantum Field Theory, June 11-15, 1990, ICTP, Trieste, Italy.
- Recent Developments in Quantum Electrodynamics and Quantum Optics, NATO-ASI, Augost 14-26, 1989, Boğaziçi Univ. Istanbul, Turkey.
- 52. Partially Integrable Nonlinear Evolution Equations and Their Physical Applications, NATO-ASI, March 21-30, 1989 Centre de Physique, Les Houches, Haute-Savoie, France

6 Educational works

6.1 Teaching statement

My aims in teaching mathematics are, to communicate important concepts common to various fields of mathematics and science, to convey the joy and satisfaction of discovering new relations and ideas during the learning process, as well as the beauty, excitement and effectiveness of mathematics.

Based on the fact that an intellectual activity is personal and can be learned by actually doing it, I try to have students actively participate into the lectures. Sometimes I ask their suggestions on how to perform a computation and do it (if does not take much time) even if their suggestion is not useful or wrong, explain why their suggestion did not work and present the correct results. For the same purpose, I require students, coming to my office with questions, to present their question on the board and show me their difficulties. Then I start asking simple questions or give suggestions to orient them to the solution of their problem.

On the other hand, mathematics is more about ideas and relations than complicated formulas and long computations. To help students digest the ideas beyond technicalities, I frequently stop and explain with diagrams, pictures etc, why we are doing all those computations, proofs etc. For each subject I try to answer in brief words questions like: what is the problem? What is the idea to solve it? What will be our benefits after solving it? At this stage some history and application areas (this may be mathematics itself) may come in and my background in physics may be useful. After showing all mathematical technicalities in detail, I again briefly summarize the problem and the ideas to solve it. In a calculus course, for example, I refer, during a semester, to the Fundamental Theorem. For differential equations, I advocate the idea that a difficult problem in mathematics can be reduced to a problem either in calculus or in linear algebra which are more basic parts of mathematics.

For difficult and long subjects, I usually present a detailed example first, and then go into general theory (for instance, the geometry of sphere before the general theory of surfaces). This way students can see how a general theory works for a specific example.

6.2 Remote teaching

For online education, there are several factors I have to make sure: First is, students must get the right material to study and keep away from uncontrolled trash of internet. I send them explicit notes beforehand and show examples of what they have to avoid. Second is the increasing role of active participation in learning and evaluation. I require them to send in, on weekly basis, not only the homework assigned but any material they produce in the course of learning. Their efforts and endeavours throughout the semester contribute more than fifty percent to their final grade. Third is, to create an online environment where students can discuss and learn freely in their own way. Apart from extended online lectures, I invite students to join whatsapp and or facebook groups where they can exchange ideas, solutions, raw materials, even mistakes under my observation.

With suitable technological support beyond standard remote teaching ingredients; like google classroom, moodle, zoom, etc, it is also possible to perform a hybrid classroom teaching with some students connecting online.

6.3 Program and unit design

As chairman of department of mathematics at Yeditepe University, I learned, on one hand, through long discussions with other faculties, about subjects of mathematics necessary for students of other departments such as engineering, art, architecture, economics, psychology, health sciences, dentistry etc and their proper presentations. On the other hand, I had the opportunity to start new graduate programs and to desing courses in modern differential and symplectic geometry such as applications of Lie groups to differential equations, geometry of plasma dynamics, geometry of manifolds of maps and more recently, an introductory course on geometric mechanics. After going through preliminaries that can be found in classic books, materials for these courses are usually chosen from the current literature so that students can easily extend their knowledge to research problems.

6.4 Courses

- Undergraduate level: Calculus for Engineers I,II, Calculus for Math Students I,II, Calculus for Health Sciences, Calculus III, Analytic Geometry, Differential Equations, Ordinary Differential Equations, Advanced Ordinary Differential Equations, Partial Differential Equations, Linear Algebra, Linear spaces, Matrix algebra, Elementary Differential Geometry, Calculus on Manifolds, Geometries, Mathematical Foundations of Thermodynamics, Calculus of Variations, Basic Algebraic Structures, Mathematics for architects, Mathematical Modelling (Yeditepe University), Quantitative Decision Techniques (Özyeğin University), Calculus for Mathematics Students III (Bogazici University), Precalculus and calculus for engineering students, business mathematics (Australian College of Kuwait)
- Graduate level: Introduction to Geometric Mechanics, Geometry of Diffeomorphism Groups, Geometry of Manifolds of Maps, Lie Groups and Lie Algebras, Topics in Geometry, Complex Analysis (Yeditepe University), Lectures on Symplectic Geometry, in: Research Semester on Geometry and Integrability, Feza Gursey Institute, Spring 1999, Lectures on Plasma Physics Geometry, in Research Semester on Qualitative Theory of Nonlinear Partial Differential Equations, FGI, Spring 2001.
- Teaching assistant to the second year course: Linear Algebra (Bilkent University).
- Teaching assistant to mechanics, electric, optics laboratories (Istanbul Technical University).
- Science (physics, astronomy, chemistry, biology) courses to first encounters (Tarsus Private Lyceè).
- Teaching assistant to mechanics, electric, optics laboratories and the second year course: Mathematical Methods of Physics (METU).

6.5 Organizational

- Summer School of Young Mathematicians (for High School Students), Yeditepe University, August 11-26, 2011.
- National Mathematics Graduate Students Workshop, June 14-21, 2010, Yeditepe University.
- Member of the organizing committee of Special Program on Geometry and Topology, Feza Gürsey Institute, Spring 2000.
- Organizer of the regular seminars in 1999-2000 academic year (Feza Gürsey Institute).

6.6 Thesis Supervised

- Oğul Esen, Tulczyjew Construction of Legendre Transformations, MS Thesis, Graduate School of Science and Engineering, Yeditepe University (2006).
- Oğul Esen, Fiber Bundles, Diffeomorphism Groups and Plasma Dynamics, PhD Thesis, Graduate School of Science and Engineering, Yeditepe University (2010). (Received Best Work Award in XVIth National Congress on Mechanics (2010) and National Serhat Özyar Prize 2011)
- First advisor to Yasemin Yılmaz, Lie algebra extensions with applications to fluids and kinetic theories (completed with the advisor: Ender Abadoğlu, Yeditepe University, 2017)
- First advisor to Filiz Çağatay Uçgun, Higher order Lagrangian theories with constraints (completed with the advisor: Oğul Esen, Yeditepe University, 2017)
- First advisor to Derya Çoksak, On the Low Lagrangian formulation of Vlasov-Poisson equations (Completed with Ender Abadoğlu, Yeditepe University, 2020)
- Mehmet Işık, Exorcising Ghost in Chiral Oscillator, Graduation Thesis, Yeditepe University, Mathematics Department, 2022.
- Alihan Korkmaz, Lie Algebraic Structure of NMR Spectroscopy, Graduation Thesis, Yeditepe University, Mathematics Department, 2022.

7 Administrative works

• Acting Head of Department of Mathematics (Sep 2014-July 2015) Australian College of Kuwait: Integrated the Department of Mathematics as a department in School of Engineering. Performed first performance appraisal of faculty staff. Participated regular review of auspice partners

(Central Institute of Technology, Australia). Implemented new curriculum units in transforming CIT units to ACK ones. Interviewed candidates and identify three PhD holder for manpower of department. Introduced new standards for the department in teaching mathematics and physics to different departments with large number of students.

- Chairman (May 2003-Oct 2011) Department of Mathematics, Yeditepe University: Substantial revision on undergraduate program was made. Internal report for the department was prepared and presented to referees from Europian Universities Association. Graduate programs (master with and without thesis, PhD) were opened. Program for minor in mathematics, double major program for students of many other departments and, certificate program in actuarial sciences were started. The department has enlarged to seventeen full-time and fourty part-time faculty serving more that hundred courses to threethousand students, from four full-time and thirteen part-time faculty serving approximately fourty courses to sevenhundred students. Research output of the department has reached the peak of eighteen articles in the year 2009. A nationwide graduate students meeting was organized in June 14-21, 2010. Every year one week has been spent to visit teachers and students of high schools at various cities around the country.
- Member of Administrative Committee of Faculty of Art and Science (June 2003-June 2009) Yeditepe University.
- Member of Science Advisory Committee for high schools of ISTEK Foundation (2003-2011).

8 Refereeing and Reviewing

For Mathematical Reviews, Physics Letters A, Computer Physics Communications, Turkish Journal of Mathematics, European Physics Journal B, Journal of Nonlinear Mathematical Physics,

One Ph.D. Thesis for Department of Mathematics, Boğaziçi University.

As Higher Education Council's jury for Assoc. Professorships of sixteen candidate.

Panelist in evaluation of four research projects presented to TÜBİTAK.

9 Scholarships, awards and memberships

9.1 Scholarship

- NATO-B2 Postdoctoral Research grant 2001
- NATO-B Postdoctoral scholarship 1993-1994
- TÜBİTAK-Graduate scholarship 1991-1992

9.2 Award

• Junior science prize, TÜBİTAK (Scientific and Technological Research Council of Turkey) 1998

9.3 Memberships

• Founding and executive committee member of 'association for rights of talented children and their families' Istanbul, 2020

10 References

- Dr. Muhittin Mungan, Professor of Physics at Department of Physics, Boğaziçi University, Bebek 34342, Istanbul. mmungan@boun.edu.tr, +90-536-8307680 (colleague).
- Dr. Partha Guha, Professor of Mathematics, Department of Mathematics, Khalifa University, Zone-1 Abu Dhabi, UAE. partha.guha@ku.ac.ae, +91-9051407709 (colleague, for scientific works)
- Dr. Evgeny V. Ferapontov, Professor of Mathematic at Department of Mathematical Sciences, Loughborough University, Leicestershire, LE11 3TU, United Kingdom. E.V.Ferapontov@lboro.ac.uk, +44 (0)1509 22 3309 (colleague, for scientific works)
- 4. Dr. Tudor Ratiu, Professor of Mathematics and Chair of Geometric Analysis, Section de Mathematiques, Faculté des Sciences de Base, EPFL (Ecole Polytechnique Federale de Lausanne), Station 8 CH-1015 Lausanne Switzerland, Fax: +41 (0) 21 693 7920, http://cag.epfl.ch/page-39504-en.html, tudor.ratiu@epfl.ch, +41 (0) 21 693 7922) (colleague, for scientific works)