

CHRISTOS EFTHYMIPOULOS

Curriculum Vitae

Date of Birth: 24/01/1971
Place of Birth: Athens, Greece
Residence: via Tommaso Antonio Catullo 1, p.3, ap.8 35 126 Padova
tel: +39 320 6486215
Work Address: Dipartimento di Matematica "Tullio Levi-Civita"
Università degli Studi di Padova
Via Trieste 63, 35121 Padova
tel: +39 0498271466, e-mail: cefthym@math.unipd.it

Present position

2019- **Associate Professor**, Department of Mathematics "Tullio Levi-Civita",
University of Padua

Past Academic Positions

2011 - 2019 **Research Director**, Research Center for Astronomy and Applied Mathematics,
RCAAM), Academy of Athens.
2003 - 2011 **Associate Researcher**, RCAAM, Academy of Athens.
2001 - 2003 **Assistant Professor (fixed term)**: Department of Statistics, University of the
Aegean.

Scientific Visits

2017-2018 **Invited Researcher**, Laboratoire d'Astrophysique de Marseille (June - July 2017,
September 2018))
2015-2016 **Visiting Researcher**, group on Mathematical Physics, Department of
Mathematics, University of Padua (November 2015, October 2016).
2014-2015 **Visiting Researcher**, Group on Astrodynamics and Celestial Mechanics,
Department of Mathematics, University of Rome "Tor Vergata" (April 2014,
February and June 2015).
2013 **Visiting Researcher**, group on Astrodynamics, Astronomical Institute, University
of Vienna (May 2013)
2012 **Invited Professor**, Faculty of Astronomy and Geophysical Sciences, National
University of La Plata, Argentina (September - October 2012).

Education

1993 - 1999 **Ph.D in Physics**, Department of Physics, University of Athens
Thesis title: "The Distribution Function of Gravitating Systems"
1988 - 1992 **1st degree in Physics**, Department of Physics, University of Athens

RESEARCH ACTIVITY

Main research subjects:

Hamiltonian perturbation theory
Non-linear dynamical systems
Application of nonlinear dynamical systems in Astrodynamics (Celestial Mechanics, Orbital Mechanics, Dynamics of gravitational systems, plasma physics)
Quantum Dynamical Systems
Systems with many degrees of freedom

Scientific publications (Appendix I):

Papers in "peer-review" scientific journals:	81
Reviews - Chapters and Short Communications:	10
Papers in refereed conference proceedings:	33
University Class Notes	05

Scitations: Google scholar: 1500, Scopus: ~850, Scopus h-index: 23, Scopus h-index self-scitations excluded: 21

Editorial tasks

Associate editor του περιοδικού Celestial Mechanics and Dynamical Astronomy (Springer, από το 2008 έως σήμερα)

Associate editor του περιοδικού Serbian Astronomical Journal (από το 2012 έως το 2017)

Reviewer in the scientific journals:

1. Annals of Physics. 2. Astronomical Journal. 3. Astronomy and Astrophysics. 4. Astrophysical Journal. 5. Astrophysics and Space Science. 6. Celestial Mechanics and Dynamical Astronomy. 7. Chaos. 8. Chaos, Solitons and Fractals. 9. Classical and Quantum Gravity. 10. Discrete and Continuous Dynamical Systems. 11. Entropy. 12. Foundations of Physics. 13. Galaxies (open access journal). 14. Icarus. 15. International Journal of Bifurcations and Chaos. 16. Journal of Physics A: Mathematical and Theoretical. 17. Journal of Mathematical Modelling and Algorithms. 18. Journal of Mathematical Physics. 19. Journal of Statistical Physics. 20. Lecture Notes in Physics. 21. Monthly Notices of the Royal Astronomical Society. 22. Nature (Astronomy). 23. Nonlinearity. 24. Physica D. 25. Physics Letters A.

Participation in Doctoral Schools - Thesis' supervision

Participation in the doctorate school of the Department of Mathematics of the University of Padua (since 2019)

Co-Supervisor (with G. Voyatzis) of the Ph.D Thesis of E. Legnaro (title attributed in August 2023, currently postdoctoral researcher at the University of Genova)

Orbital Dynamics and Diffusion at the resonances in the near-Earth space environment
Department of Physics, Aristotle University of Thessaloniki.

Supervisor of the Ph.D thesis of Rita Mastroianni (title attributed in April 2023, currently post-doctoral researcher at the Advanced Concepts Team, ESA-ESTEC)

KAM stability estimates in exoplanetary systems with planets with a high mutual inclination

Department of Mathematics, University of Padua

Supervisor of the Ph.D thesis of Mattia Rossi (title attributed in April 2023, currently post-doctoral researcher at the University of Genova)

Secular stability in the N-Body planetary problem
Department of Mathematics, University of Padua

Co-Supervisor (with G. Gravvanis) of the Ph.D Thesis of P. Kyziropoulos (title attributed in April 2018, currently post-doctoral researcher at the University of Cork)

Numerical Algorithms of the gravitational N-Body problem

Dept. of Electrical Engineering, Polytechnic school of the Democritus University of Thrace

Supervisor of the Ph.D thesis of Nikos Delis (title attributed in March 2014, currently teacher in middle education)

Study of Stochasticity in nonlinear dynamical systems with recurrent scatterings

Dept. of Physics, University of Athens.

Supervisor of the Ph.D thesis of P. Tsoutsis (title attributed in March 2010, currently teacher in middle education)

Wave dynamical structures in gravitational systems

Dept. of Physics, University of Athens

Co-supervisor (with R. Dvorak) of the Ph.D thesis of C. Lhotka (title attributed in February 2009, currently RTDB professor (Ricercatore a tempo determinato) at the University of Rome Tor Vergata

Nekhoroshev stability at the 1:1 resonance of the restricted three body problem

Astronomical Institute, University of Vienna

Supervisor of Msc theses: 4

Supervisor of diploma theses: 9

Funding/Grants

a. As scientific responsible/project coordinator

- α3. Project BIRD 232319 of the University of Padova: "*Development of Computer-Algebraic Library for High Order Normal Form Computations in Celestial Mechanics*". Funding from 01/04/2024 έως 31/03/2025, **total amount 24,000 euro.**
- α2. Centre National d'Etudes Spatiales (CNES) (October 2021- June 2023): Contract: "Development of a semi-analytic propagator for satellite orbits around the Moon", Project Co-ordinator, **total funding 72,000 euro.**
- α1. Marie Curie Innovative Training Network "Stardust-R" (Jan 2019 - June 2023), Research on the dynamics of satellites and space debris. Scientific responsible of the RCAAM node, and of the UNIPD node as Associate Partner. **Total funding of the node: 235.000 euro.**

b. Participation as senior researcher

- β4. Marie Curie Innovative Training Network "Stardust" (June 2015-Dec 2017), responsible of the RCAAM node as Associate Partner.
- β3. COST MPNS MP1006: Fundamental Problems in Quantum Physics (Jan 2011- Dec 2015), National representative for Greece in the Management Committee
- β2. Archemides - EPEAEK - Research Project for the support of the Technological Educational Institutes in Greece. Development of parallel computational techniques of the N-Body Problem. (2004-2006).
- β1. Empirikion Foundation - RCAAM project of Laboratory of High Performance Computations (2004-2006).

Scholarships

National scholarship for post-doctoral research, Greek Foundation of State Scholarships (2001)

National scholarship for doctoral research, Greek Foundation of State Scholarships (1994-1998)

Participation in conferences and Schools (Appendix II)

Participation in conference scientific organizing committees:	7
Invited Speaker in conferences and schools:	27
Invited seminars:	17
Speaker in conferences and schools outside Greece:	22
Speaker in conferences and schools in Greece	15
Research Seminars:	20
Teaching Seminars	8
Public outreach Activities:	31

Prizes - Awards - Participation in Scientific societies

Asteroid "2002 PV34" renamed "Efthymiopoulos" (IAU Minor Planet Center, January 12, 2017 meeting).

Member of the International Astronomical Union, President of the IAU A4 Inter-Division A-F Commission "Celestial Mechanics and Dynamical Astronomy" 2021-2024.

Member of the Hellenic Astronomical Society, Elected Board member (2010-2012), Elected Vice-president (2012-2014)

Member of the Association of Greek Physicists, Elected Board member (2010-2012 term).
"G.Th Foteinos" Prize of the Academy of Athens (1999)

COURSES AND TEACHING ASSIGNMENTS

Doctoral and Master's degree courses

2023	Doctoral course (24 hours): <i>Perturbative Methods in Nonlinear Dynamical Systems</i> Department of Mathematics Tullio Levi-Civita, Università degli Studi di Padova
2019	Doctoral course (8 hours): <i>Hamiltonian Perturbation Theory - Applications in Celestial Mechanics</i> Department of Mathematics, Università degli Studi di Roma Tor Vergata
2015 -2019	Master's degree course (56 hours): <i>Dynamical Astronomy</i> Graduate program in Astronomy/Astrophysics, Department of Physics, University of Athens
2015	Doctoral course (12 hours): <i>Applications of Canonical Perturbation Theory in Astrodynamics</i> Dipartimento di Matematica Tullio Levi-Civita, Università degli studi di Padova.
2012	Master's degree course (24 hours): <i>Theory of Orbits</i> Graduate program of the Faculty of Astronomy and Geophysical Sciences, National University of La Plata, Argentina
2008-2010	Master's degree course (52 hours): <i>Applications of Dynamical Systems in Physics</i> Department of Physics, University of Patras

Undergraduate courses

2020-	Rational Mechanics (72 hours) Dipartimento d'Ingegneria Meccanica - Università degli studi di Padova
2020-	Analytical Mechanics (56 hours) Dipartimento di Astronomia - Università degli studi di Padova
2002-2010	<i>Mathematical Analysis I</i> Department of Informatics, Educational Institute of Mesologgi
2002-2003	<i>Physics (electromagnetism)</i> Department of Informatics Engineering, University of the Aegean
2001-2003	<i>Numerical Methods</i> Department of Statistics, University of the Aegean

Appendix I: LIST OF SCIENTIFIC PUBLICATIONS

A. PhD Thesis

Efthymiopoulos, C.: 1999, "*The Distribution Function of Stellar Gravitating Systems*", Department of Physics, University of Athens (in Greek).

B. Papers in peer-reviewed journals (81)

- B81. Zouloumi, K., Harsoula, M., Efthymiopoulos, C.: 2024, "Multiple pattern speeds and the manifold spirals in a simulation of a barred spiral galaxy", *Mon. Not. R. Astr. Soc.*, 529, pp. 1941-1957.
- B80. Kerachian, M., Polcar, L., Skoupý, V., Efthymiopoulos, C., Lukes-Gerakopoulos, G.: 2023, "Action-angle formalism for extreme mass ratio inspirals in Kerr spacetime", *Physical Review D*, 108, 044004, pp. 1-22.
- B79. Legnaro, E., Efthymiopoulos, C., and Harsoula, M.: 2023, "Semi-analytical estimates for the chaotic diffusion in the Second Fundamental Model of Resonance. Application to Earth's navigation satellites", *Physica D*, 456, 133946, pp. 1-12.
- B78. Legnaro, E., and Efthymiopoulos, C.: 2023, "A detailed dynamical model for inclination-only dependent lunisolar resonances. Effect on the eccentricity growth mechanism", *Adv. Space Research*, 72, pp. 2460-2480.
- B77. Rossi, M., Efthymiopoulos, C.: 2023, "Relegation-free closed form perturbation theory and the domain of secular motions in the Restricted Three-Body Problem", *Cel. Mech. Dyn. Astron.* 135, 42, pp. 1-39.
- B76. Mastroianni, R., Efthymiopoulos, C.: 2023, "The phase-space architecture in extrasolar systems with two planets in orbits of high mutual inclination", *Cel. Mech. Dyn. Astron.* 135, 22, pp. 1-59.
- B75. San Sebastián, I.L., Parisi, M.G., Guilera, O.M., and Efthymiopoulos, C.: 2023, "Dispersion velocity revisited", *Cel. Mech. Dyn. Astron.*, 135, 11, pp. 1-28.
- B74. Celletti, A., De Blasi, I., Efthymiopoulos, C.: 2023, "Nekhoroshev estimates for the orbital stability of Earth's satellites", *Cel. Mech. Dyn. Astron.*, 135, 10, pp. 1-30.
- B73. Harsoula, M., Efthymiopoulos, C., Contopoulos, G., and Tzemos, A.: 2022, "Perturbed precessing ellipses as the building blocks of spiral arms in a barred galaxy with two pattern speeds", *Astron. Astrophys.* 667, A33, pp. 1-9.
- B72. Mastroianni, R., Efthymiopoulos, C.: 2022, "Kolmogorov algorithm for isochronous Hamiltonian systems", *Mathematics in Engineering*, 5(2), pp. 1-35.
- B71. Cavallari, I., Efthymiopoulos, C.: 2022, "Closed-form perturbation theory in the restricted three-body problem without relegation", *Cel. Mech. Dyn. Astron.* 134, 16, pp. 1-36.
- B70. Daquin, J., Legnaro, E., Gkolias, I., and Efthymiopoulos, C.: 2022, "A deep dive into the $2g + h$ resonance: separatrices, manifolds and phase space structure of navigation satellites", *Cel. Mech. Dyn. Astron.* 134, 6, pp. 1-31.
- B69. De Blasi, I., Celletti, A., Efthymiopoulos, C.: 2021, "Semi-Analytical Estimates for the Orbital Stability of Earth's Satellites", *J. Nonlin. Sci.*, 31, 93, pp. 1-37.
- B68. Harsoula, M.; Zouloumi, K.; Efthymiopoulos, C., and Contopoulos, G: 2021, "Precessing ellipses as the building blocks of spiral arms", *Astron. Astrophys.* 655, A55, pp. 1-16.
- B67. Efthymiopoulos, C., Harsoula, M., Contopoulos, G.: 2020, "Manifold spirals in barred galaxies with multiple pattern speeds", *Astron. Astrophys.* 636, A44, pp.1-12.
- B66. Guzzo, M., Efthymiopoulos, C., Paez, R.I.: 2020, "Semi-analytic Computations of the Speed of Arnold Diffusion Along Single Resonances in A Priori Stable Hamiltonian Systems", *J. Nonlinear Science*, 30, pp. 851-901
- B65. Tzemos, A. C., Contopoulos, G., Efthymiopoulos, C.: 2019, "Bohmian trajectories in an entangled two-qubit system", *Physica Scripta*, 94, id. 105218, pp.1-14

- B64. Gkolias, I., [Efthymiopoulos, C.](#), Celletti, A., and Pucacco, G.: 2019, “Accurate modelling of the low-order secondary resonances in the spin-orbit problem”, *Comm. Nonlinear Sys. Num. Sim.*, 77, pp.181-202.
- B63. Gkolias, I., Daquin, J., Skoulidou, D.K., Tsiganis, K., and [Efthymiopoulos, C.](#) 2019. “Chaotic transport of navigation satellites”. *Chaos*, id 101106, pp. 1-7.
- B62. [Efthymiopoulos, C.](#), Kyziropoulos, P. E.; Páez, R. I., Zouloumi, K., and Gravvanis, G.: 2019. “Manifold spirals, disc-halo interactions, and the secular evolution in N-body models of barred galaxies” *Mon. Not. Royal Astr. Soc.*, 484, pp. 1487-1505.
- B61. Christodoulidi, H., [Efthymiopoulos, C.](#): 2019. “Stages of dynamics in the Fermi-Pasta-Ulam system as probed by the first Toda integral”, *Mathematics in Engineering*, 1(2): 359–377
- B60. Paez, R., and [Efthymiopoulos, C.](#): 2018. “Secondary resonances and the boundary of effective stability of Trojan motions”. *Cel. Mech. Dyn. Astron.*, 130, 20, pp.1-23.
- B59. Tzemos, A., [Efthymiopoulos, C.](#), and Contopoulos, G.: 2018. “Origin of chaos near 3D quantum vortices: a general Bohmian theory”. *Phys. Rev. E*, 97, id 042201, pp.1-13.
- B58. Kyziropoulos, P., Filelis-Papadopoulos, C.K., Gravvanis, G., and [Efthymiopoulos, C.](#): 2018. “Toward the design of a novel hybrid parallel N-body method in scope of modern cloud architectures”. *J. Supercomputing*, 74, pp. 569-591.
- B57. Celletti, A., [Efthymiopoulos, C.](#), Gachet, F., Galeş, C. and Pucacco, G.: 2017, "Dynamical models and the onset of chaos in space debris", *Int. J. Nonlin. Mechanics*, 90, pp. 147-163.
- B56. Gkolias, I.; [Efthymiopoulos, C.](#); Pucacco, G.; Celletti, A.: 2017. “Hamiltonian formulation of the spin-orbit model with time-varying non-conservative forces”. *Comm. Nonlin. Sci. and Num. Sim.*, 51, pp. 23-38.
- B55. Kyziropoulos, P., Filelis-Papadopoulos, C.K., Gravvanis, G., and [Efthymiopoulos, C.](#): 2017. “A parallel Self Mesh-Adaptive N-body method based on approximate inverses”. *J. Supercomputing*, 73, pp. 5197-5220.
- B54. Contopoulos, G., Tzemos, A., and [Efthymiopoulos, C.](#): 2017. “Partial Integrability of 3D Bohmian trajectories”. *J. Phys. A*, 50, 19, id 195101.
- B53. Gachet, F., Celletti, A., Pucacco, G., and [Efthymiopoulos, C.](#): 2017. “Geostationary secular dynamics revisited: application to high area-to-mass ratio objects”. *Cel. Mech. Dyn. Astron.*, 128, pp.149-181.
- B52. Tzemos, A., Contopoulos, G., and [Efthymiopoulos, C.](#): 2016. “Origin of chaos in 3D Bohmian trajectories”. *Phys. Lett. A*, 380, pp. 3796-3802.
- B51. Kyziropoulos, P., [Efthymiopoulos, C.](#), Gravvanis, G., and Patsis, P.: 2016. “Structures induced by companions in galactic discs”. *Mon. Not. Royal Astr. Soc.*, 463, 2210-2228.
- B50. Paez, R., Locatelli, U., and [Efthymiopoulos, C.](#): 2016. “New Hamiltonian expansions adapted to the Trojan problem”. *Cel. Mech. Dyn. Astron.*, 126, pp. 519-541.
- B49. Gkolias, I., Celletti, A., [Efthymiopoulos, C.](#), and Pucacco, G.: 2016. “The theory of secondary resonances in the spin-orbit problem”. *Mon. Not. Royal Astr. Soc.*, 459, pp.1327-1339.
- B48. Harsoula, M., [Efthymiopoulos, C.](#), and Contopoulos, G.: 2016. “Analytical forms of chaotic spiral arms”, *Mon. Not. Royal Astr. Soc.*, 459, p.3419-3431.
- B47. Harsoula, M., Contopoulos, G., and [Efthymiopoulos, C.](#): 2015. “Analytic description of the structure of chaos”. *J. Phys. A. Math. Theor.* 48, p.135102.
- B46. [Efthymiopoulos, C.](#), Harsoula, M., and Contopoulos, G.: 2015. “Resonant normal form and asymptotic normal form behavior in magnetic bottle Hamiltonians”. *Nonlinearity*, 28, pp. 851-870.
- B45. Delis, N., [Efthymiopoulos, C.](#), and Kalapotharakos, C.: 2015. “Effective power-law dependence of Lyapunov exponents on the central mass in galaxies”. *Mon. Not. Royal Astr. Soc.*, 448, pp.2448-2468.
- B44. Paez, R., and [Efthymiopoulos, C.](#): 2015. “Trojan resonant dynamics, stability, and chaotic diffusion, for parameters relevant to exoplanetary systems”. *Cel. Mech. Dyn. Astron.*, 121, pp.139-170.
- B43. [Efthymiopoulos, C.](#), Contopoulos, G., and Katsanikas, M.: 2014. “Analytical Invariant Manifolds near Unstable Points and the Structure of Chaos”. *Cel. Mech. Dyn. Astron.*, 119, pp.331-356.
- B42. Cincotta, P., [Efthymiopoulos, C.](#), Giordano, C.M., and Mestre, M.: 2014. “Chirikov and Nekhoroshev diffusion estimates: bridging the two sides of the river”. *Physica D*, 266, pp.49-64.

- B41. Christodoulidi, H., and Efthymiopoulos, C.: 2013. “Low-dimensional q-tori in FPU lattices: dynamics and localization properties”. *Physica D*, 261, pp.92-113.
- B40. Efthymiopoulos, C.: 2013. “High order normal form stability estimates for co-orbital motion”. *Cel. Mech. Dyn. Astron.*, 117, pp. 101-112.
- B39. Gontikakis, C., Patsourakos, S., Efthymiopoulos, C., Anastasiadis, A., and Georgoulis, M.K.: 2013. “Combining particle acceleration and coronal heating via data-constrained calculations of nanoflares in coronal loops”. *Astrophys. J.*, 771, pp. 126.1 - 126.15.
- B38. Efthymiopoulos, C. and Harsoula, M: 2013. “The speed of Arnold Diffusion”. *Physica D* 251, pp. 19-38.
- B37. Contopoulos, G., Delis, N., and Efthymiopoulos, C.: 2012. “Order in de Broglie - Bohm Quantum Mechanics”. *J. Phys. A: Math. Theor.* 45, 5301.
- B36. Efthymiopoulos, C., Delis, N., and Contopoulos, G: 2012. “Wavepacket approach to particle diffraction through thin targets: quantum trajectories and arrival times”. *Annals of Physics* 327 pp 438 - 460.
- B35. Delis, N., Efthymiopoulos, C., and Contopoulos, G: 2012. “Quantum vortices and trajectories in charged particle diffraction”. *Int. J. Bifurcations and Chaos* 22, 1250214, pp.1-12.
- B34. Christodoulidi, H., Efthymiopoulos, C., and Bountis, T: 2010. “Energy localization on q-tori, long term stability and the interpretation of FPU recurrences”. *Physical Review E* 81, 016210, pp.1-16.
- B33. Efthymiopoulos C., Kalapotharakos, C., and Contopoulos, G: 2009. “Origin of chaos near critical points of quantum flow”, *Physical Review E* 79, .036203, pp.1-18.
- B32. Tsoutsis, P., Kalapotharakos, C., Efthymiopoulos C., and Contopoulos, G: 2009. “Invariant manifolds and the response of spiral arms in barred galaxies”, *Astron. Astrophys.* 495 pp.743-758.
- B31. Anastasiadis, A., Gontikakis, C., and Efthymiopoulos C: 2008. “Particle interactions in single or multiple 3D solar reconnecting current sheets”, *Solar Physics* 253, pp.199-214.
- B30. Efthymiopoulos C: 2008. “On the Connection between the Nekhoroshev theorem and Arnold diffusion”, *Cel. Mech. Dyn. Astron.* 102, pp.49-68.
- B29. Contopoulos, G, and Efthymiopoulos C.: 2008. “Ordered and chaotic Bohmian trajectories”, *Cel. Mech. Dyn. Astron* 102, pp.219-239.
- B28. Tsoutsis, P. Efthymiopoulos C., and Voglis, N: 2008. “The coalescence of invariant manifolds and the spiral structure of barred galaxies”, *Mon. Not. Royal Astr. Soc.* 387, pp.1264-1280.
- B27. Lhotka, C., Efthymiopoulos C., and Dvorak, R.: 2008. “Nekhoroshev Stability at L4 or L5 in the elliptic restricted three-body problem”, *Mon. Not. R. Astr. Soc.* 384, pp. 1165-1177.
- B26. Kalapotharakos C., Efthymiopoulos C, and: Voglis, N: 2008. “ Appropriate SCF basis sets for orbital studies of galaxies and a “quantum-mechanical” method to compute them”, *Mon. Not. R. Astr. Soc.*, 383, pp. 971-988.
- B25. Lukes-Gerakopoulos, G., Voglis, N., and Efthymiopoulos C. 2008. “Tsallis Entropy in the limit of weak chaos and a new indicator of chaoticity”, *Physica A* 387, pp.1907-1925.
- B24. Efthymiopoulos C, Kalapotharakos, C., and Contopoulos, G: 2007. “Nodal points and the transition from ordered to chaotic Bohmian trajectories”, *J. Phys. A: Math. Theor.* 40,pp.12945-12972.
- B23. Gontikakis, C., Anastasiadis, A., and Efthymiopoulos C: 2007. “ Particle acceleration and X-Ray spectra in single and multiple solar current sheets”, *Mon. Not. R. Astr. Soc* 378, pp.1019-1030.
- B22. Voglis, N., Tsoutsis, P., and Efthymiopoulos C: 2006. “Invariant Manifolds, Phase Correlations of Chaotic Orbits and the Spiral Structure of Galaxies”, *Mon. Not. R. Astr. Soc* 373, pp.280-294.
- B21. Gontikakis, C, Efthymiopoulos C, and Anastasiadis, A: 2006. “Regular and Chaotic Dynamics in 3-D Reconnecting Current Sheets”, *Mon. Not. R. Astr. Soc.*, 368, pp.293-304.
- B20. Efthymiopoulos C, and Contopoulos, G: 2006. “Chaos in Bohmian Quantum Mechanics”, *J. Phys. A: Math. Gen.* 39, pp.1819-1852.
- B19. Efthymiopoulos C, and Sandor, Zs: 2005. “Optimized Nekhoroshev Estimates for the Trojan Asteroids with a Symplectic Mapping Model of Co-orbital Motion”, *Mon. Not. R. Astr. Soc* 364, pp.253-271.
- B18. Efthymiopoulos C, Gontikakis, C, and Anastasiadis, A: 2005. “Particle Dynamics in 3-D Current Sheets in the Solar Atmosphere”, *Astron. Astrophys* 443, pp.663,678.

- B17. Efthymiopoulos C.: 2005. “Formal Integrals and Nekhoroshev Stability in a Mapping Model for the Trojan Asteroids”, *Cel. Mech. Dyn. Astron.* 92, pp.29-52.
- B16. Efthymiopoulos C., Bountis, T., and Manos, T.: 2004. “Explicit Construction of Formal Integrals with Quasi-monomial Terms from the Painlevé Series”, *Reg. & Chaotic Dynamics* 9, pp.385-398.
- B15. Efthymiopoulos C., Giorgilli, A., and Contopoulos G.: 2004. “Nonconvergence of Formal Integrals II: Improved Estimates for the Optimal Order of Truncation”, *J. Phys. A: Math. Gen.* 37, pp.10831-10858.
- B14. Contopoulos G., Efthymiopoulos C., and Giorgilli, A.: 2003. “Nonconvergence of Formal Integrals”, *J. Phys. A: Math. Gen.* 36, pp.8639-8660.
- B13. Efthymiopoulos C., and Voglis N.: 2001. “A ‘spherical shell number density’ model for violently relaxed N-Body systems”, *Astron. Astrophys.* 378, pp.679-699.
- B12. Voglis N., Harsoula M., and Efthymiopoulos C.: 2000. “Counterrotating galaxies and memory of cosmological initial conditions”. *Cel. Mech. Dyn. Astron.* 78, pp.265-278.
- B11. Sandor Zs., Erdi B., and Efthymiopoulos C.: 2000. “The phase space structure around L₄ in the restricted three-body problem”, *Celest. Mech. & Dyn. Astron.*, 78, pp.113-123.
- B10. Contopoulos G., Efthymiopoulos C., and Voglis N.: 2000. “The Third Integral in a Self-Consistent Galactic System”. *Cel. Mech. Dyn. Astron.* 78, pp.243-263.
- B09. Voglis N., Contopoulos G., and Efthymiopoulos C.: 1999. “Detection of ordered and chaotic motion using the dynamical spectra”. *Cel. Mech. Dyn. Astron.* 73, pp.211-220.
- B08. Efthymiopoulos C., Contopoulos G., and Voglis N.: 1999. “Cantori, islands and asymptotic curves in the stickiness region”. *Cel. Mech. Dyn. Astron.* 73, pp.221-230.
- B07. Contopoulos G., Voglis N., and Efthymiopoulos C.: 1999. “Chaos in Relativity and Cosmology”. *Cel. Mech. Dyn. Astron.* 73, pp.1-16.
- B06. Voglis N., Contopoulos G., and Efthymiopoulos C.: 1998. “Method for distinguishing between ordered and chaotic orbits in four-dimensional maps”. *Phys. Rev. E* 57, pp.372-377.
- B05. Dvorak R., Contopoulos G., Efthymiopoulos C., and Voglis, N.: 1998. “Stickiness in Mappings and Dynamical Systems”, *Planetary and Space Science* 46, pp.1567-1578.
- B04. Voglis N., and Efthymiopoulos C.: 1998. “Angular dynamical spectra. A new method for determining frequencies, weak chaos and cantori”. *J. Phys. A* 31, pp.2913-2928.
- B03. Patsis P.A., Efthymiopoulos C., Contopoulos G. and Voglis N.: 1997. “Dynamical spectra of barred galaxies”, *Astron. Astrophys.* 32, pp.493-500.
- B02. Efthymiopoulos C., Contopoulos G., Voglis N., and Dvorak R: 1997. “Stickiness and Cantori”. *J. Phys. A* 30, pp.8167-8186.
- B01. Contopoulos G., Voglis N., Efthymiopoulos C., Froeschlé C., Gonczi R., Lega E., and Lohinger E.: 1997. “Transition spectra of dynamical systems”. *Cel. Mech. Dyn. Astron.* 67, pp.293-317.

C. Review Articles - Chapters - Reports and Short Communications (10)

- C10. Efthymiopoulos, C., Tsiganis, K, Gkolias, I, Gaitanas, M, Yanez, C.: 2023, SELENA: “Semi-analytical Integrator for Lunar Artificial Satellites”, Final Report for the CNES R&T R-S20/BS-0005-062 Research Activity, *ArXiv*:2309.11904
- C09. Efthymiopoulos, C., and Paez, R.I.: 2023, Arnold diffusion and Nekhoroshev theory, in: Baù, G., Di Ruzza, S., Páez, R.I., Penati, T., Sansottera, M. (eds) *New Frontiers of Celestial Mechanics: Theory and Applications. I-CELMech 2020. Springer Proceedings in Mathematics & Statistics*, vol 399. Springer, pp. 1-44.
- C08. Efthymiopoulos, C.: 2017, “Mind the Galactic Bar”, *Nature Astronomy*, 1, 9, pp. 571-572.
- C07. Efthymiopoulos, C., Contopoulos, G., and Tzemos A: 2017, Chaos in de Broglie - Bohm quantum mechanics and the dynamics of quantum relaxation, in *Ann. Fondation Louis de Broglie*, 42, pp. 133-159.
- C06. Efthymiopoulos, C.: 2015, “Perturbative methods in Celestial Mechanics and the roots of Quantum Mechanics: A historical perspective”, *Rivista dell'Unione Matematica Italiana*, Ser. I, 8, pp.1 – 35.
- C05. Efthymiopoulos, C.: 2012, “Canonical perturbation theory, stability and diffusion in Hamiltonian systems. Applications in dynamical astronomy”, in P. Cincotta, C. Giordano and C. Efthymiopoulos

(eds), Proceedings of the 3rd La Plata School on Astronomy and Geophysics, *Association of Astronomy of Argentina*, pp. 3-146.

- C04. Efthymiopoulos, C.: 2012, “Hyperbolic normal forms and invariant manifolds: astronomical applications”, invited review, *Serbian Astronomical Journal*, 184, pp.1-12.
- C03. Contopoulos, G., and Efthymiopoulos, C.: 2011, “Galactic dynamics”, *Scholarpedia*, 6(5):10670
- C02. Efthymiopoulos, C.: 2010, “Special Features of Galactic Dynamics II: disc dynamics”, in C. Froeschlé and D. Benest (eds), *European Phys. J. Special Topics*, 186, pp.91-122.
- C01. Efthymiopoulos, C., Voglis N., and Kalapotharakos, C: 2008, “Special Features of Galactic Dynamics”, in C. Froeschlé and D. Benest (eds), *Lecture Notes in Physics*, 729, pp.297-389 (Springer).

D. Papers in refereed conference proceedings (33)

- D33. Rossi, M., and Efthymiopoulos, C.: 2022, “Characterization of the stability for trajectories exterior to Jupiter in the restricted three-body problem via closed-form perturbation theory”, in A. Celletti, C. Gales, C. Beaugé, A. Lemaître (eds.), Multi-scale (time and mass) dynamics of space objects *Proceedings IAU Symposium No. 364*, 2022, pp. 232-238.
- D32. Mastroianni, R., and Efthymiopoulos, C.: 2022, “Secular dynamics in extrasolar systems with two planets in mutually inclined orbits”, in A. Celletti, C. Gales, C. Beaugé, A. Lemaître (eds.), Multi-scale (time and mass) dynamics of space objects *Proceedings IAU Symposium No. 364*, pp. 191-196.
- D31. De Blasi, I., Celletti, A., and Efthymiopoulos, C.: 2022, “Satellites’ orbital stability through normal forms”, in A. Celletti, C. Gale, C. Beaugé, A. Lemaître (eds.), Multi-scale (time and mass) dynamics of space objects *Proceedings IAU Symposium No. 364*, pp. 146-151.
- D30. Cavallari, I., and Efthymiopoulos, C.: 2022, “Closed-form perturbation theory in the Sun-Jupiter restricted three body problem without relegation”, in A. Celletti, C. Gale, C. Beaugé, A. Lemaître (eds.), Multi-scale (time and mass) dynamics of space objects *Proceedings IAU Symposium No. 364*, pp. 113-119.
- D29. Daquin, J., Gkolias, I., Efthymiopoulos, C.: 2021, "A manifold structure near Galileo like satellites", in Proceedings of the 43rd COSPAR Scientific Assembly. Held 28 January - 4 February, 2021. Abstract E1.20-0020-21 (poster), id.1512.
- D28. Gachet, F., Efthymiopoulos, C., Celletti, A., and Pucacco, G: 2016, The true nature of the equilibrium for geostationary objects, applications to the high area-to-mass ratio debris, Proceedings of the 6th ICATT, 14-17 March 2016, Darmstadt, Germany
- D27. Paez, R., Locatelli, U., and Efthymiopoulos, C.: 2016, The Trojan problem from a Hamiltonian perturbative perspective, Proceedings of the Astrodynamical Network Astronet II final conference, *Astrophys. Sp. Sci. Proc.* 44, pp.193-211.
- D26. Contopoulos, G., Harsoula, M., and Efthymiopoulos, C.: 2016, “Analytical study of chaos and applications”, in T. Bountis (Ed.), Proceedings of the 11th Conference/Summer school on Chaos and Complexity, *European Phys. J. Special Topics*, 225, pp.1053-1070.
- D25. Contopoulos, G., Delis, N., and Efthymiopoulos, C.: 2015, “Bohmian Trajectories in the Scattering Problem”, in Chaos, Information Processing and Paradoxical Games: the legacy of John S Nicolis, World Scientific, pp.3 – 25.
- D24. Efthymiopoulos, C., and Paez, R.: 2014: “Modelling resonant trojan motions in planetary systems”, in Z. Knezevic and A. Lemaître (eds), "Complex Planetary Systems", *proceedings of the IAU Symposium 310*, Springer, pp.70-74.
- D23. Paez, R., and Efthymiopoulos, C.: 2014: “Modelling Trojan dynamics: diffusion mechanisms through resonances”, in Z. Knezevic and A. Lemaître (eds), "Complex Planetary Systems", *proceedings of the IAU Symposium 310*, Springer, pp.97-98.
- D22. Contopoulos, G., Efthymiopoulos, C., and Katsanikas, M: 2014: “Analytical study of the structure of chaos near unstable points”, proceedings of the 11th Hellenic Astronomical Conference, *ArXiv1410.2761*, pp.1-13.
- D21. Efthymiopoulos, C.: 2009, “Scaling of the Diffusion Coefficient on the Normal Form Remainder in Doubly Resonant Domains”, in ‘Dynamics of Celestial Bodies’ (Proceedings of the meeting in honour of Prof. J. Hadjidemetriou), *Proc. Astr. Inst. Belgrade*, pp.109-112.

- D20. Contopoulos, G., Efthymiopoulos, C., and Harsoula, M.: 2008, "Order and Chaos in Quantum Mechanics", in T. Bountis (Ed.), Proceedings of the 20th Conference/Summer school on Chaos and Complexity, *Nonlin. Phenomena Com. Sys.* 11, pp.107 – 120.
- D19. Gontikakis, C., Efthymiopoulos, C., and Anastasiadis, A.: 2008, "Particle Acceleration in Single or Multiple Reconnecting Current Sheets", in Contopoulos, G. and Patsis P. (Eds): "Chaos in Astronomy", *Astrophysics and Space Science Proceedings*, Springer, pp. 449-453.
- D18. Efthymiopoulos, C., Tsoutsis, P., Kalapotharakos, C., and Contopoulos G: 2008, "Invariant Manifolds and Spiral Arms of Barred Galaxies", in Contopoulos, G. and Patsis P. (Eds): "Chaos in Astronomy", *Astrophysics and Space Science Proceedings*, Springer, pp. 173-182.
- D17. Lukes-Gerakopoulos, G., and Efthymiopoulos, C.: 2008: "The Average Power-Law Exponent and Tsallis Entropy", in Contopoulos, G. and Patsis P. (Eds): "Chaos in Astronomy", *Astrophysics and Space Science Proceedings*, Springer, pp. 363-366.
- D16. Tsoutsis, P., and Efthymiopoulos, C.: 2008: "The Coalescence of Invariant Manifolds in Barred Galaxies", in Contopoulos, G. and Patsis P. (Eds): "Chaos in Astronomy", *Astrophysics and Space Science Proceedings*, Springer, pp. 247-251.
- D15. Gontikakis, C., Anastasiadis, A., and Efthymiopoulos C.: 2008: "Particle Acceleration in Single or Multiple Current Sheets. The Final Spectra.", in proceedings of the ESA Solar Orbiter Workshop II pp.1-4.
- D14. Gontikakis, C., Efthymiopoulos C., and Anastasiadis, A.: 2006. "Electron Orbits in Solar-type Reconnecting Current Sheets". 6th Panhellenic ELASET meeting, Cefalonia, September (2005) *Am. Inst. Phys. Conf. Proc.* 848, pp.88-94.
- D13. Efthymiopoulos C.: 2005: "Nekhoroshev Stability Estimates for Different Models of the Trojan Asteroids", in Z. Knezevic and A. Milani (Eds) "Dynamics of Populations of Planetary Systems", proceedings of IAU Colloquium 197, pp.195-201.
- D12. Efthymiopoulos, C., Bountis T., and Manos, T: 2004: "Explicit Construction of First Integrals by Singularity Analysis of Nonlinear Dynamical Systems", in D. Tsahalis (ed.), Proceedings of the 1st International Conference "From Scientific Computing to Computational Engineering", Athens, September 8-10 2004 (electronic edition, 7 pages).
- D11. Voglis, N., Kalapotharakos, K., Stavropoulos, I., and Efthymiopoulos, C., 2003: "The Level of Chaos in Self-Consistent N-Body Systems", in G. Contopoulos and N. Voglis (Eds) "Order and Chaos in Galaxies", Lect. Notes in Physics, Springer, pp.117-125.
- D10. Efthymiopoulos, C. and Voglis N., 2002: "Computational Methods of the N-Body Problem" in D. Tsahalis (ed.) "Proceedings of the 2nd Conference on Computational Mechanics", GRACM, Patras 2002 (electronic edition, 10 pages).
- D09. Contopoulos G., Voglis N., and Efthymiopoulos C., 2002: "Orbits and Integrals in Self-Consistent Systems" in Fridman, A. (ed.), Proceedings of the Galactic Dynamics Meeting, Moscow, Space Science Reviews, 102, pp.37-50.
- D08. Voglis N., Efthymiopoulos C., and Contopoulos G: 1999, "Invariant spectra of orbits in multidimensional symplectic maps" in Simo, C. (ed.), "Hamiltonian Systems with Three or More Degrees of Freedom", Kluwer Academic Publishers, pp. 340-344.
- D07. Efthymiopoulos C., Voglis N., and Contopoulos G., 1999: "Angular dynamical spectra and their applications" in Steves, B.A., and Roy, A.E. (eds) "The Dynamics of Small Bodies in the Solar System", Kluwer Academic Publishers, pp.455-462.
- D06. Contopoulos G., Voglis N., and Efthymiopoulos C., 1999: "Order and chaos in 3-D systems" in Simo, C. (ed.), "Hamiltonian Systems with Three or More Degrees of Freedom", Kluwer Academic Publishers, pp. 26-38.
- D05. Contopoulos G., Efthymiopoulos C., and Voglis N., 1999: "The form and significance of dynamical spectra", in Dvorak, R., Haupt, H.F., and Wodnar, K. (eds) "Modern Astrometry and Astrodynamics", Austrian Academy of Sciences, Vienna, pp.171-187.
- D04. Efthymiopoulos C., Voglis N., and Contopoulos G., 1997: "Diffusion and transient spectra in a 4-dimensional symplectic mapping", in Benest, D., and Froeschlé, C. (eds) "Discrete Dynamical Systems", Gordon and Breach Science Publishers, pp.91-106.

- D03. Voglis N., and Efthymiopoulos C., 1996: “A model distribution function for violently relaxed N-Body systems” in Muzzio J.C. et al. (eds), “Chaos in Gravitational N-Body Systems”, Kluwer Academic Publishers, pp. 245-254.
- D02. Contopoulos G., Voglis N. and Efthymiopoulos C., 1996: “Orbits in barred galaxies”, in Sandqvist, Aa., and Lindblad, P.O., (eds) “Barred Galaxies and Circumnuclear Activity”, Springer, pp. 19-41.
- D01. Contopoulos G., Voglis N., Efthymiopoulos C., and Grousouzakou E., 1995: “Invariant spectra of dynamical systems”, in Hunter, J., and Wilson, R. (eds) “Waves in Astrophysics”, N. York Acad. Sci. 773, pp.145-167

E. University Class Notes (5)

- E05. Efthymiopoulos, C.: 2022, “Meccanica Razionale” (in Italian, 185 pages), notes for the undergraduate course delivered at the Dept. of Mechanical Engineering of the University of Padova.
- E04. Efthymiopoulos, C.: 2021, “Meccanica Analitica” (in Italian, 168 pages), notes for the undergraduate course delivered at the Dept. of Physics and Astronomy of the University of Padova.
- E03. Efthymiopoulos, C.: 2003, “Formal Integrals of Motion in Hamiltonian Dynamical Systems” (in greek, 32 pages) Seminar notes. www.math.upatras.gr/~crans.
- E02. Efthymiopoulos, C.: 2003, “Notes on Numerical Analysis” (96 pages), Electronic edition, University of the Aegean. www.samos.aegean.gr/actuar/cefthim
- E01. Efthymiopoulos, C.: 2003, “Introduction to programming in C++” (83 pages). Electronic edition. University of the Aegean. www.samos.aegean.gr/actuar/cefthim

Annex II: list of participations in international conferences - seminars - schools - public outreach activities

a. Participation to the scientific committee of international conferences and schools (7)

a7. New Frontiers in Celestial Mechanics - Theory and Applications

Final Conference of the PRIN Project CELMECH-I, Padova, February 2023 (SOC/LOC Member).

a6. Computational perturbative methods for Hamiltonian systems - Applications in Physics and Astronomy

Athens, July 2016. Joint organisation with the Dexterus project of the University of Rome Tor Vergata (Chairman of the SOC and LOC).

a5. 11th Conference of the Hellenic Astronomical Society

Athens, September 2013 (SOC Member, Chairman of LOC).

a4. Quantum Mechanics meets Relativity

2nd Workgroup meeting of the COST MP1006 Action: Fundamental problems of quantum physics, Athens, September 2012 (SOC/LOC Member).

a3. 10th Conference of the Hellenic Astronomical Society

Ioannina, September 2011 (SOC Member).

a2. Non-Integrability, diffusion and chaos: applications to dynamical astronomy

Third La Plata School on Astronomy and Geophysics, La Plata, Argentina, July 2011 (SOC Member).

a1. Chaos in Astronomy: (in honor of the memory of N. Voglis)

International Conference organised by the RCAAM, Academy of Athens, September 2007 (SOC and LOC Member).

b. Invited speaker in international conferences and schools (27)

b27. 1. The usefulness of action-angle variables in celestial mechanics - 2. Homoclinic Chaos - From Poincaré to modern computational tools

8-hour lectures in "From Stardust to Extrasolar Planets: Dynamics of Exoplanetary & Solar System Bodies", CELTA ASI Summer School 2022, 15 – 27 August 2022, Glasgow and Skye island, Scotland

b26. Closed-form perturbation theory for small bodies in the solar system

in "Multi-scale (time and mass) dynamics of space objects", IAU Symposium No. 364, Iasi (October 2021)

b25. Introduction to Nekhoroshev Theory and Arnold diffusion

in First CELMECH-I Training School, University of Milano (February 2020)

b24. Chaotic Diffusion and its application for satellite orbits

in "STARDUST-R Opening Training School", Glasgow (December 2019)

b23. Galactic Tidal Streams

in 14th Conference of the Hellenic Astronomical Society, Volos (Greece), (July 2019)

b22. Semi-analytical Approaches to Arnold Diffusion

in "Dynamical Systems: from Geometry to Mechanics", a workshop organized in the framework of the progetto di eccellenza University of Rome Tor Vergata, Rome (February 2019)

b21. Methods and Applications in Manifold Dynamics: from molecules to Space and galaxies
in "Perspectives in Hamiltonian Dynamics" an ERC Funded Conference, Università degli Studi di Padova, Venezia (June 2018)

b20. Metastability dynamics and FPU timescales: the perspective of perturbation theory
in "FPU-2018", Workshop, Università degli Studi di Padova, Padova (April 2018)

b19. Analytical study of the secular dynamics of the geosynchronous space debris
in CELMECVII, Viterbo, Italy, (September 2017).

b18. 3D Vortices, Bohmian Chaos and Quantum Relaxation
in 2nd FQXI Workshop on Quantum Rogue Waves as Emerging Quantum Events, Ecole de Marseille (July 2017).

b17. Analytical Framework for Exo-Trojan Dynamics
in 9th Humboldt Colloquium on Celestial Mechanics, Bad Hofgastein, Austria (March 2017).

b16. Mechanisms of Bohmian Chaos and the rate of quantum relaxation
in FQXI Workshop on Quantum Rogue Waves as Emerging Quantum Events, Université Aix-Marseille, (June 2016).

b15. Resonant Co-orbital dynamics
in workshop organized in memory of John Hadjidemetriou, University of Thessaloniki (December 2013).

b14. Hyperbolic normal form, analytic computation of invariant manifolds and applications in astrodynamics
in Planetary Motions, Satellite Dynamics and Spaceship Orbits, a Workshop held by the Center of Mathematical Research, University of Montreal (July 2013).

b13. Spiral Structure in Galaxies: open problems in stellar dynamics
in the 55th Reunion of the Astronomical Association of Argentina, Mar del Plata (September 2012, in Spanish).

b12. Chaos in de Broglie - Bohm Quantum Mechanics and its Physical Consequences
in Quantum Malta 2012, international conference on "Fundamental Problems in Quantum Physics", organized by the COST Action MP1006, European Science Council (April 2012).

b11. Canonical Perturbation theory - Chaos and diffusion in Hamiltonian systems
10 hours lectures, in 3rd La Plata School on Astronomy and Geophysics, La Plata, Argentina (July 2011).

b10. Aubry-Mather Sets: Numerical Computations
in "Classical and Weak KAM Theory", Workshop organised by the Dept. of Mathematics of the University of Padova (February 2010).

b9. Invariant manifolds and chaotic spiral arms in galaxies
in 6th Sub-Regional Astronomical Committee (SREAC), Meeting, Belgrade (September 2009).

b8. Chaotic dynamics in galaxies
in 9th conference of the Hellenic Astronomical Society, Athens (September 2009)

b7. Tractable calculations in Nekhoroshev Theory
in CELMEC V, Viterbo, Italy (September 2009).

b6. Galactic Dynamics
(3 hours lecture) in "Dynamics of Gravitational Systems", CNRS School, Aussois, France (July 2009).

b5. *Nekhoroshev Stability in multidimensional Hamiltonian systems with application to the Fermi-Pasta-Ulam problem*
in “Chaos and Complexity”, 21st International conference - Summer School, Athens (July 2008).

b4. *Invariant Manifolds and Spiral Arms in Barred Galaxies*
in “Chaos in Astronomy” (in memory of N. Voglis), International Workshop organised by the Center for Astronomy, Academy of Athens (September 2007).

b3. *On the Connection between the Nekhoroshev theorem and the coefficient of Arnold Diffusion*
in “Theory and Applications of Dynamical Systems”, meeting in honour of C. Froeschlé, Spoleto, Italy (June 2007).

b2. *Special Features of Galactic Dynamics*
Review talk, CNRS Workshop on Celestial Mechanics, Aussois, France (March 2006, in French).

b1. *Improved Nekhoroshev Estimates for Formal Series*
in “6th Alexander von Humboldt Colloquium on Celestial Mechanics”, Bad Hofgastein, Austria (March 2004).

c. Invited Seminars (17)

c17. *Manifolds from Lagrangian points. Applications in solar system and in galaxy dynamics*
School of Astronomy, and Space Science, Nanjing University (June 2024)

c16. *From Plato to Galileo: are the laws of nature mathematical in nature?*
School of Science, University of Duke Kunshan (June 2024)

c15. *Closed-form perturbation theory with Lie series*
I-CELMech Webinars, (May 2021)

c14. *The influence of close encounters to secular planetary dynamics*
in Seminar of Analysis, Department of Mathematics, University of Torino (February 2020)

c13. *Manifold Dynamics: from Molecules to Astrodynamics*
Department of Physics, University of Rome Tor Vergata (January 2019)

c12. *Manifold dynamics and orbit design for space missions*
Istituto Nazionale di Astrofisica (INAF), Rome (February 2019)

c11. *The invariant manifold modeling of spiral structure*
Laboratoire d'Astrophysique de Marseilles (June 2017).

c10. *Effects of in-falling companions on galactic discs*
Seminar of the Stellar Astrophysics Center, Department of Astronomy, University of Aarhus (December 2016).

c9. *Analytical Study of the secular dynamics of geosynchronous space debris*
Seminar of the Department of Pure and Applied Mathematics, University of Padova (October 2016).

c8. *Arnold diffusion estimates through optimal normal form computations in Hamiltonian systems*
Floris Takens Seminar, Johann Bernoulli Institute for Mathematics and Computer Science, University of Groningen (June 2015).

c7. *Resonant Adiabatic Normal Forms: asymptotic behavior and applications*
Astrodynamics Group, Department of Mathematics, University of Rome Tor Vergata (April 2014).

c6. Applications of Invariant Manifolds in Dynamical Astronomy
Astrodynamics Group, Institute of Astronomy, University of Vienna (May 2013).

c5. The speed of Arnold diffusion
Seminar of the Department of Pure and Applied Mathematics, University of Padova (May 2011)

c4. Arnold diffusion and Nekhoroshev theory in Resonance junctions
Seminar on Dynamical Systems Theory, Department of Mathematics, University of Roma II
Tor Vergata (May 2010)

c13. The dynamics of doubly resonant domains
in "The Dynamics of Celestial Bodies", International Workshop in honor of Prof. J. Hadjidemetriou,
Lithoro (June 2008).

c3. The importance of Chaos in Bohmian quantum mechanics
Workshop on the Foundations of Quantum Mechanics, Department of Physics,
University of Milano (March 2008)

y2. What can we Learn from Nekhoroshev Theory regarding the stability of orbits in nonlinear dynamical systems?
Seminar on Dynamical Systems, Institute for Astronomy, Univ. of Vienna, (April 2007)

c1. Applications of Formal Series in Nekhoroshev Estimates of the Practical Stability of Orbits
"Cassiopeia" Seminar, Observatoire de la Cote d'Azur, Nice (June 2004)

d. Speaker in International Conferences and Schools outside Greece (23)

d23. Manifolds and spirals under multiple pattern speeds
in "Spirals and bars in galaxies: One-day workshop", organised by the RCAAM, Academy of Athens
(October 14, 2022)

d22. 3D secular dynamics for extrasolar planetary systems: an overview
in "Theory, Models and Simulations in Celestial Mechanics", I-CELMECH International Conference, Pisa,
(14-16 June 2022)

d21. SELENA: A Semi-Analytical Propagator for Lunar Satellite Orbits
in "Missions to the Moon: advances in astrodynamics", CNES Workshop, DIAGORA Conference Center,
Toulouse, France (October 11, 2023)

d20. Perturbed Didymos system dynamics
in Hera WG3 online meeting, (May 3-5 2022).

d19. Accurate measurement of Arnold diffusion using computer-algebraic optimal normal forms
in Workshop on Computational Dynamics, Foundations of Computational Mathematics FOCM 2017,
Barcelona (July 2017).

d18. The Use of normal forms in problems of resonance: application to space debris
in Final Stardust Conference on Asteroids and Space Debris, ESTEC, Netherlands (November 2016).

d17. Computational Hamiltonian Perturbation theory: prospects and challenges
in Computational perturbative methods in Hamiltonian systems - applications in physics and astronomy,
Athens (July 2016).

d16. Modelling resonant co-orbital motions for extrasolar planets
in Complex Dynamical Systems, IAU Symposium held in Namur, Belgium (July 2014).

- d15. Invariant Manifolds and chaotic spiral structure*
in 11th Conference of the Hellenic Astronomical Society, Athens (September 2013).
- d14. Hyperbolic normal form and the analytic computation of invariant manifolds*
in CELMEC IV, 6th international conference organized by the Italian Society for Celestial Mechanics, Viterbo, Italy (September 2013).
- d13. Round table discussion: experimental tests of quantum theory*
in Quantum Theory Without Observers III: A Conference organised in the framework of the COST Action MP1006: Foundations of Quantum Physics, Bielefeld, Germany (April 2013).
- d12. Kolmogorov Normal form and low-dimensional tori in partly or fully isochronous systems*
in 8th Alexander von Humboldt Symposium on Celestial Mechanics, Bad Hofgastein, Austria (March 2011)
- d11. De Broglie – Bohm approach to electron diffraction and the interpretation of quantum-mechanical arrival time measurements*
in workshop on “CUPI 2011: New Frontiers of Quantum Foundations”, organized by the Perimeter Institute, Clemson University SC, USA (March 2011).
- d10. The role of chaos in the de Broglie – Bohm theory*
in workshop on “21st Century perspectives for the de Broglie – Bohm theory”, The Towler Institute, Vallico Sotto, Tuscany, Italy (September 2010).
- d9. Anisotropic Nekhoroshev Stability*
in 7th Alexander von Humboldt Symposium on Celestial Mechanics, Bad Hofgastein, Austria (April 2008).
- d8. Computer-Assisted Nekhoroshev Stability Estimates in Solar System Dynamics*
in CELMECIV, 4th Conference on Celestial Mechanics, Viterbo, Rome (September 2005).
- d7. Formal Integrals and Nekhoroshev Stability of the Trojan Asteroids*
in IAU Colloquium 197, “Asteroids, Comets, Meteors”, Belgrade (September 2004).
- d6. Improved Nekhoroshev Estimates for Formal Integrals*
in Singularity Analysis and Integrable Foliations of Hamiltonian Dynamical Systems, International Workshop, Athens, (October 2003).
- d5. Spherical Shell Number Density Models of the Distribution Function*
in Order and Chaos In Galaxies: Theory and Applications, International Workshop organised by the Research Center for Astronomy of the Academy of Athens (September 2002).
- d4. Cantori and Asymptotic Curves in the Stickiness Region*
in Chaos in Celestial Mechanics and Galactic Dynamics, Workshop of the International Astronomical Union, Namur, Belgium (1998)
- d3. Angular Dynamical Spectra and their Applications*
in The Dynamics of Small Bodies in the Solar System, NATO Advanced Study Institute held in Marratea, Italy (1997).
- d2. Diffusion and Transient Spectra in 4D Symplectic Mappings*
in Discrete Dynamical Systems, International Workshop organised by the Observatory of Nice, Aussois, France (1996).
- d1. The distribution function of cold-collapsed N-Body Systems*
in “Galactic Dynamics and N-Body Simulations”, 2nd School of the European Astrophysical Doctoral Network, Thessaloniki (1993).

e. Speaker in conferences and schools in Greece (15)

e15. Chaos in Hamiltonian Dynamical Systems

in 26th school on "Dynamical Systems and Complexity", National Polytechnic School of Athens, July 2019

e14. Invariant Manifolds and their Applications in Physics

in 25th school on "Dynamical Systems and Complexity", National Center of Nuclear Research Demokritos, July 2018

e13. The book-keeping method of canonical perturbation theory and its applications

in 11th HSTAM Conference on Methods of Analytical Mechanics, Athens (May 2016).

e12. Analytical study of classical and quantum complexity

in 5th PhD School - Conference on "Mathematical Modeling of Complex Systems", Patras (July 2015).

e11. The Role of Chaos in de Broglie - Bohm quantum mechanics

in "Fundamental problems in quantum physics", a workshop organised in the framework of the COST action MP1006, Athens (March 2012).

e10. Stability in Hamiltonian systems and the Fermi-Pasta-Ulam problem

in "Chaos, Complexity and Nonlinear Dynamics", 22nd Summer School, Patras (July 2009).

e9. The transition to chaos in the pilot-wave approach to quantum mechanics

in 20th summer school on "Chaos, Complexity and Nonlinear Dynamics", Patras (July 2007).

e8. Charged Particle Orbits in Solar Reconnecting Current Sheets

in 6th Hellenic Astronomical Conference, Kefalonia (September 2005).

e7. Nekhoroshev Theory in Nonlinear Hamiltonian Dynamical Systems

in 18th summer school on "Complexity and Chaos", Volos (July 2005).

e6. Introduction to KAM and Nekhoroshev Theory

in Complexity in Science and Society - International Conference and Summer School, Parallel Session on Hamiltonian Dynamical Systems, Patras (July 2004)

e5. Singularity Analysis in Ordinary Differential Equations

in 12th summer school on "Complexity and Chaos", Chalkida (July 2003).

e4. Formal Integrals in Area Symplectic Maps

in 15th summer school on "Complexity and Chaos", Patras (July 2002).

e3. Computational Methods in the Gravitational N-Body Problem

4th International Congress on Computational Mechanics, organised by the Greek Research Association on Computational Mechanics, Polytechnical School of Patras (July 2002)

e2. The third Integral in Self-Consistent N-Body Systems

in 12th summer school on "Complexity and Chaos", organized by the Center of Research and Applications of Nonlinear Systems (Univ. of Patras), Patras (1999).

e1. Fitting Models for the distribution function of cold-collapsed N-Body Systems

Joint European and National Astronomical Meeting organised by the Hellenic Astronomical Society, Halkidiki (1997).

f. Research Seminars (17)

f17. Theory and Applications of Spin-Orbit secondary resonances
Observatoire de la Cote d'Azur, Nice (July 2017)

f16. Asymptotic properties of quantum normal forms and effects on quantum dynamics
Evaluation seminar of the Mechamol Consortium, Amsterdam (May 2017)

f15. Impact of companions on galactic discs: simulations by the new N-body code MAIN
Seminar of the Department of Electrical and Electronic Engineering, Demokritus University of Thrace (January 2016)

f14. Estimates on the speed of Arnold diffusion through optimal normal form computations in Hamiltonian systems
COSA Seminar, National Center for Nuclear Research Democritos(2015)

f13. Analytical study of chaos with convergent series for the invariant manifolds
Internal seminar of the section of Applied Analysis, Dept. of Mathematics, University of Patras (2015)

f12. Analytical calculation of invariant manifolds and the structure of chaos (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2013)

f11. The speed of Arnold Diffusion (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2011)

f10. The theory of de Broglie - Bohm and the role of Chaos (in Greek)
National Center for Nuclear Research Democritos (2011)

f9. A review of the Standard Model of particle physics and the role of nonlinear Science (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2009)

f8. Anisotropic Nekhoroshev stability and its relation to the Fermi-Pasta-Ulam problem (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2008)

f7. Sub-quantum H-theorem and the role of chaotic Bohmian trajectories in the emergence of Born's rule (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2007)

f6. Nonlinear effects in the Bohm picture of Quantum Mechanics and Quantum Field Theory (in Greek)
Internal Seminar of the Section of Mechanics, Dept. of Physics, Aristotle University of Thessaloniki (2007)

f5. Theoretical Interpretation of Natural Packets in the Fermi-Pasta-Ulam Problem (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2006)

f4. Bose - Einstein Condensates and Applications to Quantum Technology (in Greek)
Internal seminar of the Dept. of Information Systems Engineering, University of the Aegean, Samos (May 2003).

f3. A Review of Normal Forms and Formal Integrals of Motion (in Greek)
Internal seminar of CRANS, Dept. of Mathematics, University of Patras (2002)

f2. Fitting Models for the distribution function of cold-collapsed N-Body Systems
Internal seminar of the Theory Group of the Max Planck Institute for Astronomy, Heidelberg (1996).

f1. Stickiness and Cantori''
Internal seminar of the Astronomical Institute of the University of Vienna (1996).

g. Teaching Seminars (8)

g8. Tidal Evolution in the Solar System

Graduate Program of the Dept. of Mathematics, University of Padova (October 2016).

g7. Planetary Dynamics

Four seminar series, Faculty of Astronomy and Geophysical Sciences, National University of La Plata, Argentina (November 2014).

g6. Applications of canonical perturbation theory in astrodynamics

Three seminar series, Dept. of Mathematics, University of Rome Tor Vergata (March 2014).

g5. Open problems in advanced physics and their relation to astronomy

Series of three two-hour lectures at the Institute of Radio-Astronomy (IAR), La Plata: i) Standard model of particle physics, ii) dark matter, iii) alternative theories of gravity (October 2012).

g4. Perturbation theory and the Kolmogorov – Arnold - Moser theorem (in greek)

three-hour lecture in the framework of the graduate course “Special topics in Chaos and Complexity”, graduate program on Mathematical Modeling, National Center for Nuclear Research Demokritos (October 2010).

g3. General introduction to dynamical systems (in Greek)

three-hour lecture in the framework of the graduate course “Special topics in Chaos and Complexity”, graduate program on Mathematical Modeling, National Center for Nuclear Research Demokritos (October 2010 and October 2011).

g2. Kolmogorov-Arnold-Moser theorem: an instructive approach (in Greek)

Series of four two-hour lectures in the framework of the graduate course on nonlinear dynamical systems, Dept. of Mathematics, University of Patras (May - June 2008)

g1. The Nekhoroshev theorem and the stability of nonlinear Hamiltonian dynamical systems (in Greek)

Series of six two-hour lectures in the framework of the graduate course on nonlinear dynamical systems, Dept. of Mathematics, University of Patras (February – March 2005)

h. Εσωτερικό σεμινάριο ΚΕΑΕΜ (37)

h37. The information approach to the interpretation of quantum mechanics (July 2022)

h36. Secular dynamics for exoplanetary systems with two planets in mutually inclined orbits (June 2021)

h35. Universal Quantum Equilibrium and the interpretation of quantum probabilities (October 2019)

h34. Chaos at the crossroad: the dynamics of navigation satellites (June 2019)

h33. Semi-analytical approaches to Arnold diffusion (February 2019)

h32. Quantum Decoherence and its role in quantum foundations (October 2018).

h31. Tidal streams around galaxies (October 2017).

h30. Dynamics of tidal interactions (March 2017).

h29. Emergent non-linearities from Quantum Mechanics (January 2017).

h28. Realistic analytical modelling of the long-term orbital dynamics in the GEO domain (June 2016).

h27. Impact of companions on galactic discs: simulations with the new N-body code MAIN(February 2016).

h26. The concept of Laplace plane and the 3D dynamic sin the geo-stationary ring (September 2015)

h25. Space debris and the resonant dynamics in the geo-stationary ring (March 2015)

h24. Resonant dynamics of trojan exoplanets (January 2014)

h23. Trojan Captures and Escapes(September 2013)

h22. Invariant manifolds and applications in astrodynamics (June 2013)

h21. Power-Law dependence of the Lyapunov exponents of chaotic orbits on the central mass in galaxies (April 2013)

h20. Quantitative estimates on Arnold diffusion: bridging the theories of Chirikov and Nekhoroshev (January 2013)

h19. Dynamics of low-dimensional tori in the Fermi - Pasta - Ulam problem (February 2012)

h18. Normal forms and the representation of Arnold diffusion(October 2011)

h17. Dark Matter in Galaxies(jointly with P. Patsis, in the framework of the “Dark Matter Week”, December 2010)

h16. Wavepacket approach to electron diffraction, de Broglie - Bohm theory and the problem of arrival times(October 2010)

h15. Density matrix and the arrival time distribution according to Bohmian mechanics (October 2010)

h14. Arnold diffusion and the application of Nekhoroshev theory in simply-resonant domains(June 2010)

h13. Electron diffraction and arrival time measurements in Bohmian quantum mechanics(November 2009)

h12. A review of the Standard Model of particles and interactions in Nature(May 2009)

h11. Low-dimensional tori and energy localization in FPU lattices(November 2008)

h10. Arnold diffusion and Nekhoroshev theory(October 2007)

h9. The transition from order to chaos in the pilot-wave approach to quantum mechanics(March 2007)

h8. The problem of self-consistency and the spiral structure in galaxies(October 2006)

h7. Chaos in Bohmian quantum mechanics(in common with Acad. Prof. G. Contopoulos, September 2006)

h6. Quantum Decoherence and the theory of quantum measurement (2 seminars, May 2006)

h5. Theoretical interpretation of the “natural packets” in the Fermi - Pasta - Ulam problem(May 2005)

h4. Classical “wave mechanics” and the quantum theory of Bohm(December 2004)

h3. Nekhoroshev stability of the Trojan asteroids(October 2004)

h2. Lie symmetries and the theorem of E. Noether(March 2004)

h1. Analytic determination of polynomial integrals by the Painlevé series (October 2003)

i. Posters

i12. The mechanism of chaos in 3-D Bohmian quantum trajectories

(with A. Tzemos and G. Contopoulos)

in International School "Enrico Fermi" on the foundations of quantum mechanics. Lake Como, July 2016.

i11. Particle Acceleration in Single or Multiple Current Sheets. The Final Spectra

(with C. Gontikakis and A. Anastasiadis)

ESA Solar Orbiter Workshop II, Athens, June 2006

i10. Statistics of families of orbits in self-consistent N-Body systems

(with N. Voglis, C. Kalapotharakos and I. Stavropoulos)

5th Hellenic Astronomical Conference, Athens, September 2003.

i9. Invariant manifolds and the spiral structure of barred galaxies

(with P. Tsoutsis and C. Kalapotharakos)

in "Pattern speeds along the Hubble sequence", International Workshop organized by the Department of Astronomy, University of Padova, August 2008.

i8. The production of Tsallis entropy in the limit of weak chaos and a new indicator of chaoticity

(with G. Lukes-Gerakopoulos)

in "Complexity, Metastability and Non-extensivity", International Conference organized by the Dept. of Physics and Astronomy, University of Catania, July 2007.

i7. Modified Lynden-Bell Statistics for Collisionless N-Body Systems

(with N. Voglis)

in Galactic Dynamics, International Symposium in honor of D. Lynden-Bell, Cambridge, UK (1995).

i6. Invariant Spectra of Multidimensional Symplectic Mappings

(with N. Voglis)

in Hamiltonian Systems of Three or More Degrees of Freedom, NATO Advanced Study Institute, Barcelona, Spain (1995)

i5. Precise resonance location in the Trojan problem with a new asymmetric expansion

with R. Paez and U. Locatelli

in "Dynamics of Complex Systems: a meeting in honour of the 60th birthday of R. MacKay", University of Warwick, May 2016

i4. Modeling Trojan dynamics: diffusion mechanisms through resonances

with R. Paez

in "Complex Planetary Systems", IAU Symposium 310, Namur, Belgium, July 2014

i3. Quantum vortices and nonlinear effects of quantum trajectories in particle diffraction

(with N. Delis and G. Contopoulos)

in "Nonlinear Dynamics and Complexity: Theory, Methods and Applications", International Conference in honor of Prof. T. Bountis, Department of Physics, Aristotle University of Thessaloniki, July 2010.

i2. Q-tori in the Fermi-Pasta-Ulam Model

(with H. Christodoulidi and T. Bountis)

in “Nonlinear Dynamics and Complexity: Theory, Methods and Applications”, International Conference in honor of Prof. T. Bountis, Department of Physics, Aristotle University of Thessaloniki, July 2010.

i1. The Coalescence of Invariant Manifolds and the Spiral Structure in Barred Galaxies”

(with P. Tsoutsis)

in “Chaos in Astronomy” (in memory of N. Voglis), International Workshop organised by the Center for Astronomy, Academy of Athens, September 2007.

k. Public outreach activities (31)

k31. La matematica dell'osservazione astronomica (in italian)

Public activity organized in the framework of the "Science 4All" third mission activity of the University of Padova, Padova, September 2022 and September 2023

k30. "Lo sviluppo storico della Meccanica Celeste ed il suo ruolo nelle scienze fisiche” (in italian)

A Webinar organized in the framework of the public activities of the PRIN I-CELMECH: “New frontiers of Celestial Mechanics: Theory and Applications”, University of Padova, May 2022

k29. Le maree nel sistema solare e il loro ruolo nel fenomeno della vita (in italian)

Public webinar organized in the framework of the "VenetoNight" third mission activity of the University of Padova, Padova, October 2021

k28. Modern Advances in Celestial Mechanics: Exoplanets - Galaxies and General Relativity (in Greek)

Public talk organized in the framework of the 50th anniversary of the International Astronomical Union - Academy of Athens East Aula of Central Building (October 2019)

k27. Night Observation of Deep Sky Objects (in Greek)

Amateur Astronomy activity with the Anavryta School of Athens (June 2019)

k26. Estimation of Open and Globular Cluster distances and ages with HR diagrams (in Greek)

Lecture and Experiment - Anavryta School of Athens (May 2019)

k25. Improved Method for a Precise School Eratosthenes Experiment (in Greek)

Lecture and Experiment - Anavryta School of Athens (March 2018)

k24. Watching the sky: Astronomical Observation (in Greek)

Morning lessons and night observation with amateur telescopes, Primary School of Kastritsi (June 2017).

k23. The phenomenon of tides in the Solar system (in Greek)

A daily workshop on tides, co-organized by the RCAAM and the sports and cultural club "Mad Waters", Halkida (September 2016).

k22. The distinguished "Lady Gravity", the Earth's seasons, Ice ages and the Moon's phases (in Greek)

Primary school lesson, 7th Primary School of Kamatero (May 2016).

k21. Watching the sky: Astronomical Observation (in Greek)

A night observation with amateur telescope, 7th Primary School of Kamatero (June 2016).

k20. Past and future Manned space missions - From the Moon to Mars (in Greek)

Secondary school of the Prison of Avlona (April 2016).

k19. Gravitational planetary dynamics and its effect on the Earth's climate (in Greek)

Advanced Physics Winter School, Association of Greek Physicists, Athens (December 2015).

k18. The discovery of the nature of Light (in Greek)

Public talk in the framework of the International Year of Light 2015, Academy of Athens (June 2015)

- k17. The scientific legacy and recognition of N. Voglis (in Greek)*
Cultural Association of the Municipality of Avlona (May 2015).
- k16. The distance ladder in Astronomy*
Cultural center of the Municipality of Athens (March 2014)
- k15. Modern alternative interpretations of quantum mechanics II: the role of human conscience in the interpretation of the physical world (in Greek)*
Christian Union of Scientists (January 2014).
- k14. Modern alternative interpretations of quantum mechanics (in Greek)*
Christian Union of Scientists (October 2013).
- k13. The Harmony of the Heavens (in Greek)*
Popular talk, B.E. Theocharakis Foundation (December 2011).
- k12. Introduction to the concepts of the theory of Relativity (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Zakynthos (June 2011).
- k11. Dark Matter and Dark Energy in the Universe (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Nea Philadelphia (December 2010)
- k10. A simple example of astrodynamical simulation (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Kyparissia (June 2010).
- k9. The question of Dark Matter in Galaxies (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Eretria (June 2010).
- k8. Introduction to the physics of radiation (in Greek)*
Graduate program of the Attiko Hospital (January 2010)
- k7. Quantum Mechanics and the new physical view of the world (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Nea Philadelphia (December 2009)
- k6. Physics and applications of ultrasounds (in Greek)*
Graduate program of the Attiko Hospital (November 2009)
- k5. Evolution of ideas, milestones of progress and challenges in Astronomy (in Greek)*
Ilija M. Kolarac Foundation, Belgrade (September 2009).
- k4. Distance Measurements in Astronomy (in Greek)*
Advanced Astronomy Summer School, , Association of Greek Physicists, Agioi Theodoroi (August 2009).
- k3. The view of modern physics regarding the fundamental interactions in Nature (in Greek)*
Advanced Physics Summer School, Association of Greek Physicists, Eretria (June 2009).
- k2. Galilée: Revolution de l'Astronomie et de la Physique (in French)*
Lycée Franco-Hellénique d'Athènes (January 2009)
- k1. The grand experiment at CERN and its contribution to Astronomy (in Greek)*
A talk in the framework of the International Year of Astronomy - 2009, Eastern Hall, Academy of Athens (December 2008)