

Resumé

1. PERSONAL DETAILS

Full Name: **Vladimir Martinusi**

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WEB OF SCIENCE: <https://www.webofscience.com/wos/woscc/summary/b518827d-58fa-4189-ab38-0b22998a30eb-0171300563/relevance/1>

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2. ACADEMIC DEGREES

- (2006–2010) Ph.D. in Industrial Engineering, Technical University “Gheorghe Asachi”, Iasi, Romania. Thesis: “Lagrangian and Hamiltonian Formulations in Relative Orbital Dynamics. Applications to Spacecraft Formation-Flying and Satellite Constellations.” Advisor: Prof. Alfred Braier
- (2005–2006) M.Sc. in Industrial Engineering, Technical University “Gheorghe Asachi”, Iasi, Romania. Thesis: “Relative Orbital Motion in Keplerian Force Fields. Applications in Space Rendezvous Missions.” Advisor: Prof. Daniel Condurache
- (1995–1999) B.Sc. in Mathematics, “Alexandru Ioan Cuza” University, Iasi, Romania. Thesis: “Viability of Differential Inclusions.” Advisor: Prof. Ovidiu Carja

3. ACADEMIC APPOINTMENTS

- (Apr. 2026 – Feb 2029) Associate Research Fellow, Technion – Israel Institute of Technology, Department of Aerospace Engineering, Haifa, Israel
- (Oct. 2023 – March 2026) Senior Visiting Lecturer, Technion – Israel Institute of Technology, Department of Aerospace Engineering, Haifa, Israel
- (Oct. 2020 – Sep. 2023) Visiting Lecturer, Technion – Israel Institute of Technology, Department of Aerospace Engineering, Haifa, Israel
- (Oct. 2016 – May 2018) Research Scientist (Ingénieur de recherche), University of Liège, Department of Aerospace and Mechanical Engineering, Liège, Belgium
- (Oct. 2013 – Sept. 2016) Marie Curie Postdoctoral Fellow, University of Liège, Department of Aerospace and Mechanical Engineering, Liège, Belgium
- (Feb. 2010 – Aug. 2013) Postdoctoral Fellow, Technion – Israel Institute of Technology, Department of Aerospace Engineering, Haifa, Israel
- (Feb. 2004 – Jan. 2010) Lecturer (with tenure), Technical University “Gheorghe Asachi”, Iasi, Romania
- (Sep. 1999 – Feb. 2004) Mathematics Teacher, “Emil Racovita” National College, Iasi, Romania

4. PROFESSIONAL EXPERIENCE (outside academia)

- (June 2018 – July 2020) Web Developer, Freelancer, Liège, Belgium Building, securing, and maintaining various web applications.
- (June 1997 – September 1997) Technical Editor (student job), POLIROM Publishing House, Iasi, Romania Technical editing.

5. RESEARCH INTERESTS

Algebraic Differential Geometry on rank-2 tensor fields; operator-based curvature and connection. Canonical perturbation theory; resonant orbital elements and regularization of Keplerian motion.

Relative motion and bounded dynamics for large satellite constellations under perturbations. Relativistic trajectory optimization near massive bodies. Variational methods for dynamical systems; generalizations of Gauss' and Lagrange's equations. Hamiltonian chaos, symmetry-breaking, and integrability in orbital mechanics.

6. TEACHING EXPERIENCE – last 5 years only

- Astrodynamics — main teacher, elective undergraduate course, Technion (since 2021)
- Space Mechanics — main teacher, undergraduate course, Technion (since 2022)
- Space Seminar — main teacher, undergraduate course, Technion (since 2023)

7. TECHNION ACTIVITIES

- 2024–present: Academic representative of the Technion in the national SPACE CAMPUS IL program; mentor for student-led aerospace innovation projects.

8. DEPARTMENTAL ACTIVITIES

- 2024: Faculty representative responsible for the Summer Research Program in Science and Engineering; coordinated activities across the department.
- 2024: Authored the full documentation for the Guidance, Navigation, and Control (GNC) module of the Space Systems Laboratory at the Technion.

9. PUBLIC PROFESSIONAL ACTIVITIES

- 2023: Invited Guest Editor for the special issue “Advances in Astrodynamics and Applied Mathematics,” journal **Mathematics** (MDPI).
- 2011–: Reviewer for **Journal of Guidance, Control and Dynamics**.
- 2012–2016: Reviewer for **Celestial Mechanics and Dynamical Astronomy**.
- 2012–2013: Reviewer for **Advances in Space Research**.

10. FELLOWSHIPS, AWARDS AND HONORS

- 2013: Marie Curie BEIPD-Cofund Postdoctoral Fellowship, University of Liège, Belgium.
- 2012, 2015: Excellent Reviewer Award, Journal of Guidance, Control and Dynamics.
- 2010: Sam & Cecilia Neaman Postdoctoral Fellowship, Technion – Israel Institute of Technology.

11. GRADUATE STUDENTS

Completed MSc Theses

- 2022: Nir Vegh — Analytical Modeling of the Solar Radiation Pressure by Canonical Methods

PhD Theses in Progress

- 2024–: Tomer Fine — Trajectory Optimization in the Presence of General Relativistic Effects.

MSc Theses in Progress

- Iris Kanter — A Matrix Reformulation of Pseudo-Riemannian Geometry.
- Ilay Lazarovich — Long-Term Formation-Keeping Strategies for Large Aperture Satellite Formations.
- Alexander Garber — Thesis topic under development.
- Amit Shores — Research direction: robust design of orbital manoeuvres using nonsingular orbital elements.
- Boris Karlinski — Research direction: geometric and structure-preserving methods for uncertainty propagation in nonlinear dynamical systems.
- Amit Kfir — Research direction: canonical transformations and Hamiltonian methods for spacecraft dynamics, including dual-quaternion formulations of attitude dynamics.
- Noya Yona — Research direction: general relativistic effects in high-precision aerospace applications.

Prospective MSc Supervision

- Yuval Cherniavsky — Admission pending. Proposed thesis: A Perturbed Lambert Solver via Nonsingular Resonant Canonical Variable Propagation.

12. RESEARCH GRANTS

- 2013–2015: Advanced Analytic Models in the Dynamics of Satellite Clusters. Granting agency: European Union (BEIPD-COFUND program). Role: Principal Investigator

13. JOURNAL PAPERS

1. Condurache D., Martinusi, V., Vectorial Regularization and Temporal Means in Keplerian Motion, *Journal of Nonlinear Mathematical Physics*, Vol.13, No.3, 2006, pp. 420-440.
2. Condurache D., Martinusi, V., Kepler's Problem in Rotating Reference Frames. Part I : Prime Integrals, Vectorial Regularization, *Journal of Guidance, Control and Dynamics*, Vol. 30, no.1, 2007, pp. 192-200.
3. Condurache D., Martinusi, V., Kepler's Problem in Rotating Reference Frames. Part II: Relative Orbital Motion, *Journal of Guidance, Control and Dynamics*, Vol. 30, no.1, 2007, pp. 201-213.
4. Condurache D., Martinusi, V., A Complete Closed Form Solution to the Kepler Problem, *Meccanica*, Vol. 42, no.5, 2007, pp. 465-476.
5. Condurache D., Martinusi, V., Foucault Pendulum-like Problems: A Tensorial Approach, *International Journal of Non-linear Mechanics*, vol. 43, issue 8, 2008, pp. 743-760.
6. Condurache, D.; Martinusi, V., A Quaternionic Exact Solution to the Relative Orbital Motion, *Journal of Guidance, Control, and Dynamics*, vol. 33, no.4, 2010, pp. 1035-1047.
7. Martinusi, V., Gurfil, P., Analytical Derivation of Single-Impulse Maneuvers Guaranteeing Bounded Relative Motion Under J_2 , *Journal of Guidance, Control, and Dynamics*, vol. 37, No. 1, 2014, pp. 233-242.
8. Martinusi, V., Gurfil, P., Analytical Solutions for J_2 -Perturbed Unbounded Equatorial Orbits, *Celestial Mechanics and Dynamical Astronomy*, Vol 115, No. 1, 2013, pp. 35-57.
9. Martinusi, V., Gurfil, P., Solutions and Periodicity of Satellite Relative Motion Under Even Zonal Harmonics Perturbations, *Celestial Mechanics and Dynamical Astronomy*, Vol. 111, No. 4, 2011, pp. 387-414.
10. Martinusi, V., Dell'Elce, L. and Kerschen, G., Analytic Propagation of Near-Circular Satellite Orbits in The Atmosphere of An Oblate Planet, *Celestial Mechanics and Dynamical Astronomy*, Vol. 123, No. 1, 2015, pp. 85-103.
11. Martinusi, V., Dell'Elce, L. and Kerschen, G., First-Order Analytic Propagation of Satellites in The Exponential Atmosphere of an Oblate Planet, *Celestial Mechanics and Dynamical Astronomy*, vol. 127, No. 4, 2017, pp. 451–476.
12. Martinusi, V., Hamiltonian Reduction Through Explicit Canonical Transformations and Resonant Canonical Variables, *Celestial Mechanics and Dynamical Astronomy*, vol. 135 (40), 2023.

14. CONFERENCES

1. Condurache, D., Martinusi, V., Exact Solution to the Relative Orbital Motion in Eccentric Orbits, *International Conference "Analytical Methods of Celestial Mechanics"*, Sankt-Petersburg, Russia, 2007.
2. Condurache, D.; Martinusi, V., A Quaternionic Exact Solution to the Relative Orbital Motion, *AIAA/AAS Astrodynamics Specialist Conference*, Honolulu, Hawaii, 18-21 Aug. 2008, Paper AIAA 2008-6764.
3. Condurache, D.; Martinusi, V., Exact solution to The Relative Orbital Motion in A Central Force Field, *IEEE/AIAA 2nd International Symposium on Systems and Control in Aerospace and Astronautics*, Shenzhen, China, 10-12 Dec. 2008, DOI: 10.1109/ISSCAA.2008.4776296.
4. Condurache, D; Martinusi, V., Hypercomplex Eccentric Anomaly in the Unified Solution to the Relative Orbital Motion, *AAS/AIAA Astrodynamics Specialist Conference*, Pittsburgh, Pennsylvania, 9-13 Aug. 2009. Paper AAS 09-321. (also published in *Advances in the Astronautical Sciences*, Vol.135, 2010, pp. 281-300.)
5. Condurache, D; Martinusi, V., Analytic Solution to the Relative Orbital Motion Around an Oblate Planet, *AIAA Guidance, Navigation and Control Conference and Exhibit*, Chicago, Illinois, 10-13 Aug. 2009 . Paper AIAA-2009-6098.

6. Condurache, D., Martinusi, V., Super-integrability in The Unperturbed Relative Orbital Motion Problem, *AIAA/AAS Astrodynamics Specialist Conference*, Toronto, Canada, 2-5 August 2010. Paper AIAA-2010-7669.
7. Martinusi, V., Gurfil, P., Closed-Form Solutions for Satellite Relative Motion in an Axially-Symmetric Gravitational Field, *AAS/AIAA Spaceflight Mechanics Meeting*, New Orleans, LA, USA, February 2011, Paper AAS 11-209.
8. Condurache, D., Martinusi, V., State Space Analysis for the Relative Spacecraft Motion in Geopotential Fields, *AIAA Guidance, Navigation, and Control Conference*, 8 – 11 Aug 2011, Portland, Oregon, USA. Paper AIAA-2011-6656.
9. Martinusi, V., Gurfil, P., Optimal Satellite Formation Establishment about an Oblate Planet, *AIAA Guidance, Navigation, and Control Conference*, 8 – 11 Aug 2011, Portland, Oregon, USA. Paper AIAA-2011-6628.
10. Martinusi, V., Gurfil, P., Closed-Form Solutions for Open Orbits Around an Oblate Planet, *AAS/AIAA Space Flight Mechanics Meeting*, January 29 – February 2, 2012, Charleston, SC, USA. Paper AAS 12-163.
11. Condurache, D., Martinusi, V., A Closed-Form Solution to the Two-Body Problem in Non-Inertial Reference Frames, *AAS/AIAA Space Flight Mechanics Meeting*, January 29 – February 2, 2012, Charleston, SC, USA. Paper AAS 12-213.
12. Martinusi, V., Gurfil, P., Keplerization of Motion in Any Central Force Field, *1st IAA Conference on Dynamics & Control of Space Systems*, 2012, Porto, Portugal. Paper IAA-AAS-DyCoSS1-08-01.
13. Condurache, D., Martinusi, V., Universal Functions in the Study of the Relative Orbital Motion, *1st IAA Conference on Dynamics & Control of Space Systems*, March 19-21, Porto, Portugal. Paper IAA-AAS-DyCoSS1-08-07.
14. Condurache, D., Martinusi, V., Analytical Orbit Propagator Based on Vectorial Orbital Elements, *AIAA Guidance, Navigation and Control Conference*, 19-21 August 2013, Boston, MA, USA. Paper AIAA-2013-5188.
15. Martinusi, V., Dell’Elce, L. and Kerschen, G., Analytic Model for The Motion About an Oblate Planet in The Presence of Atmospheric Drag, *2nd IAA Conference on Dynamics & Control of Space Systems*, March 24-26, Rome, Italy. Paper IAA-AAS-DyCoSS2-14-11-05.
16. Martinusi, V., Dell’Elce, L. and Kerschen, G., Analytic Propagation for Satellites in Near-Circular Low-Earth Orbits, *AIAA/AAS Astrodynamics Specialist Conference*, August 4-7, San Diego, CA.
17. Dell’Elce, L., Martinusi, V. and Kerschen, G., Robust Optimal Rendezvous Using Differential Drag, *AIAA/AAS Astrodynamics Specialist Conference*, August 4-7, San Diego, CA.
18. Martinusi, V., Dell’Elce, L. and Kerschen, G., Analytic Solution for The Relative Motion of Satellites in Near-Circular Low-Earth Orbits, *AAS/AIAA Space Flight Mechanics Meeting*, January 11-15 2015, Williamsburg, VA, USA.
19. Martinusi, V., Condurache, D., Closed-Form Solution to The Attitude Kinematics Equation For An Arbitrary Angular Velocity, *AAS/AIAA Space Flight Mechanics Meeting*, January 11-15 2015, Williamsburg, VA, USA.
20. Condurache, D., Martinusi, V., Hypercomplex Universal Variables Approach For The State Transition Matrix In The General Keplerian Relative Orbital Motion, *AAS/AIAA Space Flight Mechanics Meeting*, February 1-3 2021 (virtual).
21. Vegh, N., Martinusi, V., Modeling of Interplanetary Orbits by Canonical Methods, *The 61st Israel Annual Conference on Aerospace Sciences*, 2022, Israel.
22. Vegh, N., Martinusi, V., Canonical Modeling of The Solar Radiation Pressure Perturbation, *5th Workshop on Key Topics in Orbit Propagation Applied to Space Situational Awareness*, 22-24 Jun 2022, Logrono, Spain.
23. Martinusi, V., Remarks on The Super-integrability of Dynamical Systems, *5th Workshop on Key Topics in Orbit Propagation Applied to Space Situational Awareness*, 22-24 Jun 2022, Logrono, Spain.
24. Martinusi, V., Efficient Numerical Integration for Perturbed Gravitational Fields, *The 62nd Israel Annual Conference on Aerospace Sciences*, 2023, Israel.

25. Lazarovich, I., Martinusi, V., Long-Term Mitigation of Earth Oblateness Effects on Large Aperture Satellite Constellations, *The 63rd Israel Annual Conference on Aerospace Sciences*, 2024, Israel.
26. Kanter, I., Martinusi, V., Analytical Dynamics Within Rotating Frames: Addressing the Keplerian Ballistic Problem, *The 63rd Israel Annual Conference on Aerospace Sciences*, 2024, Israel.
27. Martinusi, V., Poisson Brackets Processors for Astrodynamics: A Natural Geometry for The Perturbed Kepler Problem, *6th Workshop on Key Topics in Orbit Propagation Applied to Space Situational Awareness*, Jun 2024 Arras, France.
28. Martinusi, V., Uncertainty Propagation by using Riemannian Geometry, *The 64th Israel Annual Conference on Aerospace Sciences*, 2024, Israel.