

# CURRICULUM VITAE

Ivo Terek

Ph.D., Mathematics

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## Research interests

- Differential Geometry (pseudo-Riemannian, Lorentzian, symplectic).
- Dynamical Systems (smooth dynamics, magnetic flows, hyperbolic systems).

## Employment & Education

- **University of California, Riverside — UCR** Riverside, CA, USA  
*Visiting Assistant Professor* (upcoming)
- **Williams College** Williamstown, MA, USA  
*Visiting Assistant Professor of Mathematics* 2024—present
- **The Ohio State University — OSU** Columbus, OH, USA  
*Ph.D., Mathematics* 2018—2024
  - Dissertation: *The geometry and structure of compact rank-one ECS manifolds.*
  - Advisor: Andrzej Derdzinski.
- **University of São Paulo — USP** São Paulo, SP, Brazil  
*M.Sc., Mathematics* 2016—2018  
*B.Sc., Mathematics* 2013—2016
  - Dissertation<sup>1</sup>: *Characterizations of Marginally Trapped Submanifolds in Space-Forms.*
  - Undergraduate research project: Lorentzian Differential Geometry.
  - Advisor: Alexandre Lymberopoulos.

## Awards, Grants & Honours

2024 Joint Mathematics Meeting AMS Travel Grant . . . . .	2024
Special Graduate Assignment – Department Fellowship (OSU) . . . . .	2024
Graduate Associate Teaching Award <sup>2</sup> (OSU) . . . . .	2023
Special Graduate Assignment – Department Fellowship (OSU) . . . . .	2023
Phil Huneke Excellence in Teaching Award (OSU) . . . . .	2022
Distinguished First-Year Graduate Teaching Associate Award (OSU) . . . . .	2019
National Council for Scientific and Technological Development (CNPq - grant 134593/2016-2)	2016-2018
Honorable mention for outstanding performance in the Mathematics B.Sc. program (USP) . . .	2016
São Paulo Research Foundation (FAPESP - grant 2014/09781-8) . . . . .	2014-2016

<sup>1</sup>Original title in Portuguese: *Caracterizações de Subvariedades Marginalmente Aprisionadas em Formas Espaciais.*

<sup>2</sup>This is the **highest university-level graduate teaching award** offered by The Ohio State University.

## Publications & preprints

The items are listed in reverse order of completion. Some DOI codes might still be inactive.

13. **Parallel differential forms of codegree two, and three-forms in dimension six** (with A. Derdzinski and P. Piccione).  
e-print arXiv 2503.15061, 22 pages // Submitted for publication.  
DOI: <https://doi.org/10.48550/arXiv.2502.15061>
12. **Marked length spectrum rigidity for Anosov magnetic surfaces** (with V. Assenza, J. de Simoi, and J. Marshall Reber).  
e-print arXiv 2409.20545, 21 pages // Submitted for publication.  
DOI: <https://doi.org/10.48550/arXiv.2409.20545>
11. **Nijenhuis geometry of parallel tensors** (with A. Derdzinski and P. Piccione).  
Annali di Matematica Pura ed Applicata, published online 08 December 2024.  
DOI: <https://doi.org/10.1007/s10231-024-01531-2>
10. **Compact plane waves with parallel Weyl curvature.**  
e-print arXiv 2407.07261, 22 pages. // To appear in Proceedings of the XI International Meeting in Lorentzian Geometry.  
DOI: <https://doi.org/10.48550/arXiv.2407.07261>
9. **Magnetic flatness and E. Hopf's theorem for magnetic systems** (with V. Assenza and J. Marshall Reber).  
Communications in Mathematical Physics. vol. **406** (2025), no. 2, article 24.  
DOI: <https://doi.org/10.1007/s00220-024-05166-5>.
8. **Killing fields on compact pseudo-Kähler manifolds** (with A. Derdzinski).  
Journal of Geometric Analysis, vol. **34** (2024), no. 5, article 144.  
DOI: <https://doi.org/10.1007/s12220-024-01591-z>
7. **Codazzi tensor fields in reductive homogeneous spaces** (with J. Marshall Reber).  
Results in Mathematics - Resultate der Mathematik, vol. **79** (2024), no. 4, article 137.  
DOI: <https://doi.org/10.1007/s00025-024-02151-1>
6. **Compact locally homogeneous manifolds with parallel Weyl tensor** (with A. Derdzinski).  
Advances in Geometry, vol. **24** (2024), no. 4, pp. 493–503.  
DOI: <https://doi.org/10.1515/advgeom-2024-0019>
5. **The metric structure of compact rank-one ECS manifolds** (with A. Derdzinski).  
Annals of Global Analysis and Geometry, vol. **64** (2023), no. 4, article 24.  
DOI: <https://doi.org/10.1007/s10455-023-09929-6>
4. **Rank-one ECS manifolds of dilational type** (with A. Derdzinski).  
Portugaliae Mathematica, vol. **81** (2024), no. 1–2, pp. 69–96.  
DOI: <https://doi.org/10.4171/PM/2110>
3. **Conformal flatness of compact three-dimensional Cotton-parallel manifolds.**  
Proceedings of the American Mathematical Society, vol. **152** (2024), no. 2, pp. 797–800.  
DOI: <https://doi.org/10.1090/proc/16446>
2. **The topology of compact rank-one ECS manifolds** (with A. Derdzinski).  
Proceedings of the Edinburgh Mathematical Society, vol. **66** (2023), no. 3, pp. 789–809.  
DOI: <https://doi.org/10.1017/S0013091523000408>
1. **New examples of compact Weyl-parallel manifolds** (with A. Derdzinski).  
Monatshefte für Mathematik, vol. **203** (2024), no. 4, pp. 859–871.  
DOI: <https://doi.org/10.1007/s00605-023-01908-0>

## Books

2. **Introduction to Lorentz Geometry: Curves and Surfaces** (with A. Lymberopoulos). Chapman & Hall/CRC Press, Boca Raton, FL, 2021. ix+340 pp.  
(English translation of the Portuguese original.)  
DOI: <https://doi.org/10.1201/9781003031574>, ISBN: 9780367468644.
1. **Introdução à Geometria Lorentziana: Curvas e Superfícies** (with A. Lymberopoulos). Brazilian Mathematical Society - SBM, **Universitary Texts Collection**, vol. **21**, Rio de Janeiro, RJ, 2018. 546 pp. (In Portuguese. [Errata](#).)  
ISBN: 9788583371397.

## Scientific dissemination and other relevant texts

4. **Corrections of minor misstatements in several papers on ECS manifolds** (with A. Derdzinski). e-print arXiv 2404.09766, 4 pages (not intended for publication)  
DOI: <https://doi.org/10.48550/arXiv.2404.09766>
3. **Mergulhos Clássicos de Variedades Grassmannianas: uma visão geral**. Revista Matemática Universitária (Brazilian Mathematical Society), vol. **1** (2021), pp. 1-14.  
(English title: *Classical Embeddings of Grassmannian Manifolds: an overview*).  
DOI: <http://doi.org/10.21711/26755254/rmu20211>
2. **Topics in Lorentz Geometry**. e-print arXiv:1908.01710, 76 pages (lecture notes, not intended for publication).  
DOI: <https://doi.org/10.48550/arXiv.1908.01710>
1. **Usando Geometria Diferencial para classificar trajetórias de fótons na Relatividade Especial** *Acta Legalicus* (Institute of Mathematics and Computer Sciences – USP), n° **14** (2018), 14 pp.  
(English title: *Using Differential Geometry to classify trajectories of photons in Special Relativity*).

## In preparation

- **Notes on Causality Theory** (with P. Piccione). // Working title, 312 pages.
- **Wave-type spacetimes with parallel Cotton tensor** (with R. Sánchez Galán).
- **Lorentzian magnetic flows of Anosov type** (with D. Zhang).

## Peer reviewing service

Referee for:

- International Electronic Journal of Geometry, Glasnik Matematičk, Expositiones Mathematicae.

Reviewer for:

- MathSciNet (2 articles).

## Talks, mini-courses taught, and poster presentations

(22 items)

Links for talk slides or posters are provided when possible.

- 2025 • Contributed talk. *A magnetic version of E. Hopf's theorem*. SLMath (MSRI) Special Session on Metric Geometry and Topology II (2025 Joint Mathematics Meeting).

- 2024 • Contributed talk. *Codazzi tensors in homogeneous spaces*. Graduate Student Topology and Geometry Conference (Michigan State University).
- Poster presentation. *Killing vector fields on compact pseudo-Kähler  $\partial\bar{\partial}$ -manifolds are holomorphic*. Special Holonomy and Geometric Structures on Complex Manifolds (IMPA).
- Contributed talk. *Compact locally homogeneous manifolds with parallel Weyl curvature*. Symmetry and Geometry in South Florida (Florida International University).
- Contributed talk. *The topology of compact Lorentzian manifolds with parallel Weyl curvature*. XI International Meeting on Lorentzian Geometry (Universidad Autónoma de Yucatán).
- Invited talk. *On compact Cotton-parallel three-manifolds*. AMS Special Session on Metric Geometry and Topology, II (2024 Joint Mathematics Meeting).
- 2023 • Invited Talk. *An overview of completeness in Lorentzian geometry*. Oklahoma State University MGSS Graduate Student Seminar. // Online.
- Seminar talk. *The bundle structure of compact rank-one ECS manifolds*. University of São Paulo Differential Geometry Seminar.
- Contributed talk. *Compactifying rank-one Weyl-parallel manifolds*. Graduate Student Conference in Algebra, Geometry, and Topology (Temple University).
- Seminar talk. *Conformal flatness and compactness in dimension three*. OSU Geometry, Topology, and Dynamics Student Seminar (The Ohio State University).
- Contributed talk. *On compact rank-one ECS manifolds*. 2023 Midwest Geometry Conference (Kansas State University).
- 2022 • Mini-course. *Causality and Spacetimes*. 2<sup>nd</sup> edition of the OSU Graduate Math Summer Mini-Courses (The Ohio State University).
- Contributed talk. *Magnetic Cotangent Bundles*. Midwest Dynamical Systems Early Career Conference (University of Notre Dame).
- 2021 • Mini-course. *Symplectic Geometry Crash Course*. 1<sup>st</sup> edition of the OSU Graduate Math Summer Mini-Courses (The Ohio State University).
- Poster presentation. *On rigidity of 0-isotropic submanifolds of Lorentzian space forms*. X International Meeting on Lorentzian Geometry (University of Córdoba). // Online.
- Seminar talk. *Guillemin-Kazhdan path marked length spectrum rigidity I*. Ohio State Smooth Dynamics Seminar.
- 2020 • Invited talk. *Contrasts between Riemannian and Lorentzian Geometry*. First year anniversary of the undergraduate Mathematics Program at *Federal Institute of Ceará* - IFCE. // In Portuguese. Recording available at <https://youtu.be/ywnX95Pqx5Q>.
- 2019 • Mini-course. *MAT6702 - Topics in Lorentz Geometry* taught at the *University of São Paulo* - USP. Partly supported by the OSU and USP departments of Mathematics, and by a FAPESP-OSU 2015 Regular Research Award (grant 2015/50265-6).
- Seminar talk. *Characterization of non-admissible curves in Lorentz-Minkowski space via a single invariant*. Ohio State MGSA Graduate Student Seminar.
- 2016 • Poster presentation. *A version of Weierstrass' Representation in Lorentz-Minkowski Space*. 24<sup>th</sup> USP International Symposium of Undergraduate Research (University of São Paulo).
- Poster presentation. *Curves and Surfaces in Lorentz-Minkowski Space*. 68<sup>th</sup> Reunion of the Brazilian Society for the Progress of Science (Federal University of South of Bahia).
- 2015 • Poster presentation. *Curves and Surfaces in Lorentz-Minkowski Space*<sup>3</sup>. 23<sup>th</sup> USP International Symposium of Undergraduate Research (University of São Paulo).

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<sup>3</sup>This work received an honorable mention.

## Participation at conferences, courses, seminars and other events

(28 items)

- 2025 • *2025 Joint Mathematics Meeting* (Seattle Convention Center, Seattle, WA).
- 2024 • *Graduate Student Topology and Geometry Conference* (Michigan State University).
- *Special Holonomy and Geometric Structures on Complex Manifolds* (IMPA).
  - *Symmetry and Geometry in South Florida* (Florida International University).
  - *XI International Meeting on Lorentzian Geometry* (Universidad Autónoma de Yucatán).
  - *2024 Joint Mathematics Meeting* (Moscone Convention Center, San Francisco, CA).
- 2023 • *SLMath Summer School: Topics in Geometric Flows and Minimal Surfaces* (St. Mary's College).
- *Graduate Student Conference in Algebra, Geometry, and Topology* (Temple University).
  - *2023 Midwest Geometry Conference* (Kansas State University).
- 2022 • *2022 Midwest Dynamical Systems Conference* (Indiana University–Purdue University).
- *Pacific Northwest Geometry Seminar* (Seattle University).
  - *Lehigh Conference on Differential Geometry* (Lehigh University).
  - *Geometric Structures (re)United* (University of Illinois at Chicago).
  - *Midwest Dynamical Systems Early Career Conference* (University of Notre Dame).
  - *36<sup>th</sup> Annual Geometry Festival* (New York University – Courant Institute). // Online.
- 2021 • *Workshop Modern Techniques in Riemannian Geometry* (Durham University & UNAM). // Online.
- *X International Meeting on Lorentzian Geometry* (University of Córdoba). // Online.
- 2020 • *5<sup>th</sup> Geometry-Topology Summer School* (Istanbul Center for Mathematical Sciences). // Online.
- *Pacific Northwest Geometry Seminar* (Lewis and Clark College).
  - *Symmetry and Geometry on the Southern Great Plains* (University of Oklahoma).
- 2019 • *Graduate Student Topology and Geometry Conference* (University of Illinois at Urbana-Champaign).
- 2018 • *University of São Paulo's Institute of Physics' 2018 summer courses*.
- 2017 • *EMALCA: School of Mathematics for Latin America and Caribbean* (University of Antioquia).
- 2016 • *24<sup>th</sup> USP International Symposium of Undergraduate Research* (University of São Paulo).
- *68<sup>th</sup> Reunion of the Brazilian Society for the Progress of Science* (Federal University of South of Bahia).
- 2015 • *23<sup>th</sup> USP International Symposium of Undergraduate Research* (University of São Paulo).
- *XLV ed. of the University of São Paulo's Institute of Mathematics and Statistics' summer courses*.
- 2014 • *XLIV ed. of the University of São Paulo's Institute of Mathematics and Statistics' summer courses*.

## Languages

Portuguese (native), English (fluent), Spanish (intermediate), French (reading).

## Teaching experience

2024–2025: Visiting Assistant Professor at *Williams College*:

- Spring 2025 - MATH250 - Linear Algebra (Instructor). ×2
- Fall 2024 - MATH426 - Differential Topology (Instructor).
- Fall 2024 - MATH326 - Differential Geometry (Instructor).

2018–2023: Graduate Associate in *The Ohio State University's* College of Arts and Sciences. Courses taught (in any capacity):

- Spring 2022, Autumn 2022, Autumn 2023 - MATH2177 - Mathematical Topics for Engineers (TA).
- Spring 2021 - MATH3345 - Foundations of Higher Mathematics (Grader).
- Autumn 2020 - MATH1150 - Precalculus (TA).
- Spring 2020 - MATH1149 - Trigonometry (TA).

- Autumn 2019 - MATH2173 - Engineering Mathematics B (TA).
- Spring 2019 - MATH1152 - Calculus II (TA).
- Autumn 2018 - MATH1151 - Calculus I (TA).

2018: Teaching Assistant at *University of São Paulo - USP*, for:

- 1<sup>st</sup>sem/2018 - MAT3120 - Differential and Integral Calculus III (Oceanographic Institute).
- XLVII Ed. of the Institute of Mathematics and Statistics' summer courses - MAT5719 - Geometric Differential Calculus in  $\mathbb{R}^n$ .

2017: Higher Education Improvement Program (PAE) internship at *University of São Paulo - USP*, for:

- 2<sup>nd</sup>sem/2017 - MAT2454 - Differential and Integral Calculus II (Polytechnic School).
- 1<sup>st</sup>sem/2017 - MAT2453 - Differential and Integral Calculus I (Polytechnic School).

2013–2016: Teaching Assistant at *University of São Paulo - USP*, for:

- XLVI Edition of the Institute of Mathematics and Statistics' summer courses - Linear Algebra.
- 2<sup>nd</sup>sem/2016 - MAT0336 - Differential Geometry II (Institute of Mathematics and Statistics).
- 2<sup>nd</sup>sem/2016 - MAT0326 - Differential Geometry I (Institute of Mathematics and Statistics).
- 1<sup>st</sup>sem/2014 - MAT0111 - Differential and Integral Calculus I (Oceanographic Institute).
- 2<sup>nd</sup>sem/2013 - MAE0116 - Elements of Statistics (Institute of Mathematics and Statistics).

2013: Mathematics teacher for middle school at *Youhua Languages Institute*.

### Department service and other relevant work experience

2021–2022: Writing, editing and proofreading the *Precalculus with Review* online Ximera book for the OSU courses MATH1120 and MATH1121. // Summer 2021, Spring 2022.

2021–2024: Member of the OSU Math. Dept. Directed Reading Program committee (chair 2022–2023).

2020–2021: Conversion of distance learning Geodetic Science and Mathematics courses to  $\text{\LaTeX}$  beamers, as part of an interdisciplinary project between OSU's Department of Mathematics and the School of Earth Sciences – funded by the National Geospatial-Intelligence Agency (NGA). // Summer 2020, Fall 2021.

### Students supervised

At Williams College:

6. Brennan Halcomb, Forrest Hu, Gary Hu, Rauan Kaldybayev, Theodore Mollano (2025).  
MATH493 Independent Study: Geometry and Quantum Theory.
5. David Baron (2024).  
MATH493 Independent Study: Algebraic Topology.
4. Theodore Mollano (2024–2025).  
Honors thesis: *Delzant's correspondence for Hamiltonian  $SO(3)$ -spaces*.

At Ohio State University, Math. Dept. Directed Reading Program:

4. Pallav Pant (2022–2023).  
Reading projects: *Smooth manifolds and the Frobenius theorem*;  
*The Schwarzschild metric and Birkhoff's theorem*.
3. Kabir Belgikar (2021).  
Reading project: *A construction of the hyperreals and an introduction to non-standard analysis*.
2. Will Scites (2020–2021).  
Reading projects: *Frames adapted to surfaces*;  
*Riemannian Geometry & Lagrangian Mechanics*.

1. Maverick Huang (2019–2021).

Reading projects: *Some metric aspects in Riemannian geometry*;

*The Einstein-Hilbert functional and the Einstein field equations.*