

Alejandro Bravo Doddoli  
**Curriculum Vitæ**<sup>1</sup>  
Mathematics Department, UCSC  
1156 High St, Santa Cruz, CA 95064  
abravodo@ucsc.edu

---

### EDUCATION

- Ph.D UCSC, United States, Mathematics Science, June 2023. Thesis title: Metric lines on metabelian Carnot groups. Advisor Richard Montgomery.
  - M.S. UNAM, Mexico, Mathematics Science, September 2016. Thesis title: La Dinámica de un Vehículo Articulado de n-trailers, *The Dynamics of an Articulated n-trailer Vehicle*. Advisor: Luís García Naranjo.
  - B.S. UNAM, Mexico, Mathematics, 2014. Thesis title: Teoría de Hodge en Variedades Reales y Complejas, *Theory in real and complex Manifolds*. Advisor: Oscar Alfredo Palmas Velasco.
- 

### MAIN RESEARCH INTERESTS

- Nonholonomic Systems, Hamiltonian Systems, Dynamical Systems, Geometric Mechanics, sub-Riemannian Geometry, Differential Geometry, Optimal and Control Theory, Carnot groups, Integrable sub-Riemannian flow, No integrable sub-Riemannian flow.
- 

### AWARDS

- 2014. Honorific Mention, Medalla Sotero Prieto.
  - 2014-2016. Conacyt Scholarships.
  - 2015-2017. Honorable mention of academic excellence.
  - 2017-2021. Conacyt Scholarships.
- 

### PUBLICATIONS

1. Bravo-Doddoli A. and García-Naranjo L. C., The motion of an articulated n-trailer vehicle. *Reg. And Chaos. Dyn.* 20 (2015), 497–517.
  2. Bravo-Doddoli A., Higher elastica: geodesics in jet space. *European Journal of Mathematics*. (2022). Open access. <https://doi.org/10.1007/s40879-022-00574-0>
  3. Bravo-Doddoli A. and Montgomery R., Geodesics in jet Space, *Regular and Chaotic Dynamics*. 27:2 (2022), 151–182
  4. Bravo-Doddoli A., No periodic geodesics in the Jet space  $J^k(\mathbb{R},\mathbb{R})$ , accepted by *Pacific Journal of Mathematics*. <https://doi.org/10.48550/arXiv.2203.16178>
-

5. Bravo-Doddoli A., Chaotic sub-Riemannian geodesic flow on  $J^2(\mathbb{R}^2, \mathbb{R})$ , submitted. <https://arxiv.org/abs/2205.06156>
6. Bravo-Doddoli A., No periodic geodesics in the Jet space  $J^k(\mathbb{R}, \mathbb{R}^n)$ , not submitted. <https://arxiv.org/abs/2205.06156>
7. Bravo-Doddoli A., Symplectic reduction of the sub-Riemannian geodesic flow on meta-abelian Carnot groups. <https://doi.org/10.48550/arXiv.2211.05846>

---

### TEACHING EXPERIENCE

- Algebra, Physics major, Facultad de Ciencias, UNAM, Mexico, 08/05/2013-01/26/2014.
- Algebra, Physics major, Facultad de Ciencias, UNAM, Mexico, 08/04/2014-01/25/2015.
- Algebra, Physics major, Facultad de Ciencias, UNAM, Mexico, 01/26/2015-08/09/2015.
- Analitic Geometry II, Mathematics major, UNAM, Mexico, 08/10/2015-02/01/2016.
- Mathematics II, Biology major, UNAM, Mexico, 08/10/2015-02/01/2016.
- Mathematics I, Biology major, UNAM, Mexico, 01/25/2016-08/08/2016.
- Mathematics II, Biology major, UNAM, Mexico, 08/10/2016-02/01/2017.
- Mathematics I, Biology major, UNAM, Mexico, 01/25/2017-08/08/2017.

---

### T.A.

- Facultad de Ciencias, UNAM, 2012-2014.
- Mathematics Department, UCSC, 2017-2023.

---

### CONFERENCE TALKS

- 2016 XLIX Congreso Nacional de La Sociedad Matemática Mexicana – Aguascalientes, Mexico.
- 2016 Seminario de Becados de IM-UNAM, Mexico City, Mexico.
- 2016 Seminario IIMAS-UNAM, Mexico City, Mexico.
- 2016 XLIX Congreso Nacional de La Sociedad Matemática Mexicana – Hermosillo, Mexico.
- 2018 Geometry and Analysis Seminar Mathematics department UCSC, Santa Cruz, U.S.
- 2019 Workshop on Nash Blow-up and the simple tower, II-Sciencesconf.org, University Leuven. Belgium.
- 2019 Geometric Methods In Differential Equations in The Americas Conference on Differential

Equations and Nonlinear Analysis place at the Mathematics Research Center CIMAT, Guanajuato, Mexico.

- 2020 Geometry and Analisis Seminar Mathematics Department UCSC, Santa Cruz, U.S.
- 2020 Geometry and Analisis Seminar Mathematics Department SS, Sacramento, U.S.
- 2020 TV Ciencias Facultad de Ciencias, Mexico City, Mexico.
- 2022 Seminar of the Department of Mathematics at University of Fribourg, Fribourg, Switzerland.
- 2022 Geometry and Analisis Seminar Mathematics Department UCSC, Santa Cruz, U.S.
- 2023 Seminar in Mathematical Physics Dipartimento di Matematica "Tullio Levi-Civita", University of Padua, Padova, Italy.
- 2023 Spring Western Sectional Meeting American Mathematical Society, Fresno California, U.S.
- 2023 Dialogos Virtuales de Analisis and Geometria, Departamento de Matematicas de la Facultad de Ciencias UNAM, Online.

---

#### CONGRESS ASSISTANCE

- 2013-XLVI Congreso Nacional Sociedad Matemática Mexicana, Merida , México.
- 2014-XLVII Congreso Nacional Sociedad Matemática Mexicana, Durango , México.
- 2014-School on Singularity Theorey in Topology, Geometry and Foliations, IM-UNAM, cuernavaca, Mexico.
- 2014-Taller de Geometría y Mecánica, Oxaca, Mexico.
- 2015- IX International Summer School on Symplectic geometry, Classical Mechanics and Intereactions with Spectral Theory
- 2015-XLVII Congreso Nacional Sociedad Matemática Mexicana, Durango , México.
- 2016- X International Summer School on Symplectic geometry, Classical Mechanics and Intereactions with Spectral Theory.
- 2016-XLVII Congreso Nacional Sociedad Matemática Mexicana, Durango , México.
- 2018- From Symplectic Geometry to Chaos Mathematical Sciences Research Institute (MSRI) Berkley, U.S.
- 2018 Iberoamerican Meeting on Geometry, Mechanics and Control, Guanaguato, Mexico.
- 2019 Sub-Riemanoan Geometry and Beyond II, University of Jyväskylä, Finland.
- 2019 Workshop on Nash Blow-up and the semple tower, II-Sciencesconf.org, University

Leuven. Belgium

- 2019 Geometric methods in differential equations, Americas Conference on Differential Equations and Nonlinear Analysis CIMAT, Guanaguato, Mexico.
- 2021 A Topological Theory of Tangent Distributions, Lorentz Center, Netherland.
- 2023 Geometry and Control, Cartona, Italy.
- 2023 Spring Western Sectional Meeting American Mathematical Society, Fresno California, U.S.

---

### POSTERS

- 2015 – IX International Summer School on Symplectic geometry, Classical Mechanics and Intereactions with Spectral Theory, La Crsitalera, Miraflores de la Sierra Spain.
- 2016 – X International Summer School on Symplectic geometry, Classical Mechanics and Intereactions with Spectral Theory, La Crsitalera, Miraflores de la Sierra Spain.
- 2018 Iberoamerican Meeting on Geometry, Mechanics and Control, Guanaguato, Mexico.
- 2019 Sub-Riemanoan Geometry and Beyond II, University of Jyväskylä, Finland.
- 2023 Geometry and Control, Cartona, Italy.

---

### TRAINING

- "Preparing for Inclusive Teaching" at UCSC's C.I.T.L. (Center for Innovations in Teaching and Learning) (2017-2021).

---

### LANGUAGES

- English, Spanish (mother tongue).
- Mathematical reading exam in French and Portugues, Bacherlor Level, UNAM 2014.
- Mathematical reading exam in French and Portugues, Master Level, UNAM 2016.
- Mathematical reading exam in French, Ph.D Level, UCSC, 2020.

---

### COMPUTERS SKILLS

- Experience with Matlab, Maple, Latex, Linux, Exel.

---

### VOLUNTARY JOB

- Direct Reading program, (2018-200, 2021-2023).
- Graduate colloquim organazier.
- Reviwer articles for American Society of Mathematics.

---

### **CURRENT PROFESSIONAL MEMBERSHIPS**

- Sociedad Matemática Mexicana.
- American Society of Mathematics.

---

### **REFERENCES**

- Dr. Richard Montgomery Mathematics Department-UCSC. Email: [rmont@ucsc.edu](mailto:rmont@ucsc.edu)
- Dr. Luis Garcia Naranjo. University of Padua Dipartimento di Matematica "Tullio Levi-Civita", Italy. Email: [luis.garcianaranjo@math.unipd.it](mailto:luis.garcianaranjo@math.unipd.it)
- Dr. Felipe Monroy-Pérez. Departamento de Ciencias Básicas UAM-Azcapotzalco, Mexico. Email: [fmp@azc.uam.mx](mailto:fmp@azc.uam.mx)
- Dr. Frank Bauerle. Mathematics Department-UCSC. Email: [bauerle@ucsc.edu](mailto:bauerle@ucsc.edu)
- Dr. Enrico Le Donne. Department of Mathematics at University of Fribourg, Switzerland. Email: [enrico.ledonne@gmail.com](mailto:enrico.ledonne@gmail.com)