

Juan VIU-Sos

DOUTOR EM MATEMÁTICA

– SINGULARIDADES, GEOMETRIA E TOPOLOGIA –

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Introdução

Posto atual: Professor Permanente na *Universidad Politécnica de Madrid* (UPM), Espanha.

Linhas de pesquisa: singularidades, topologia de pequena dimensão, arranjos de hiperplanos, integração motivica, funções zeta, campos de vetores logarítmicos, períodos efetivos, álgebra computacional ([Sagemath](#) [↗](#)).

Artigos e preprints

Publicações

- **Introduction to p -adic and motivic integration, zeta functions and invariants of singularities** [↗](#), In *p -adic analysis, arithmetic and singularities, Contemporary Mathematics* (778), p.103–176. Amer. Math. Soc.
- **On the equality of periods of Kontsevich-Zagier** [↗](#), com J. Cresson, *Journal de théorie des nombres de Bordeaux, Volume 34* (2022) no. 2, pp. 323–343 .
- **Motivic zeta functions on \mathbb{Q} -Gorenstein varieties** [↗](#), com E. León-Cardenal, J. Martín-Morales e W. Veys, *Advances in Mathematics* 370 (2020).
- **Configurations of points and topology of real line arrangements** [↗](#), com B. Guerville-Ballé, *Mathematische Annalen* 374 (2019), no. 1–2, 1–35.
- **Fundamental groups of real arrangements and torsion in the lower central series quotients** [↗](#), com E. Artal-Bartolo e B. Guerville-Ballé, *Experimental Mathematics* 29 (2020), no. 1, 28–35. .
- **A semi-canonical reduction for periods of Kontsevich-Zagier** [↗](#), *International Journal of Number Theory* 17 (2021), no. 01, 147–174.
- **On the minimal degree of logarithmic vector fields of line arrangements** [↗](#), com B. Guerville-Ballé, *Proceedings of the XIII International Conference Zaragoza-Pau on Mathematics and its Applications*, Monografías Matemáticas García de Galdeano, 40, 61–66, 2015.

Preprints

- preprint ◦ **Connectivity and combinatorial interplay in the moduli space of line arrangements** [↗](#), arXiv:2309.00322, com B. Guerville-Ballé.
- preprint ◦ **Combinatorics of line arrangements and dynamics of polynomial vector fields** [↗](#), arXiv:1412.0137, com B. Guerville-Ballé.

Paquetes desenvolvidos em Sagemath

- 2012 ◦ **Computing the Igusa and Topological zeta functions of a Newton non-degenerated polynomial** [↗](#).

Tese de doutorado

- 2012/2015 ◦ **"Periods and line arrangements: contributions to the Kontsevich-Zagier periods conjecture and to the Terao conjecture."** [🔗](#), *Université de Pau et des Pays de l'Adour/Universidad de Zaragoza*, Pau/Zaragoza, França/Espanha.

Tese em Matemáticas (*teoría de números, geometría algebraica e campos de vetores*) no LMAP (Équipe Algèbre et Géométrie). Orientadores: Enrique Artal, Jacky Cresson y Vincent Florens. **Qualificação** "Très honorable"/"Cum laude".

Banca e corretores

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| ◦ Pierre CARTIER (IHES, Corr.–Presidente) | ◦ Michel WALDSCHMIDT (Univ. Paris VI) |
| ◦ David MOND (Univ. of Warwick) | ◦ Jacques-Arthur WEIL (Univ. de Limoges) |
| ◦ Jean VALLÈS (Univ. de Pau) | ◦ Michel GRANGER (Univ. d'Angers, Corr.) |
| ◦ Masahiko YOSHINAGA (Hokkaido Univ., Corr.) | |

Postos e formação acadêmica

Postos precedentes

- 2020/2024 ◦ **Professor Associado na *Universidad Politécnica de Madrid***, Espanha.
- 2019/2020 ◦ **Pós-doutorando no IMPA - Instituto de Matemática Pura e Aplicada com uma bolsa CAPES/PNPD**, Rio de Janeiro, Brasil.
- 2017/2019 ◦ **Pós-doutorando no ICMC/Universidade de São Paulo com uma bolsa FAPESP**, São Carlos, Brasil.
- 2016/2017 ◦ **ATER (professor temporário de ensino e pesquisa) no Institut Fourier /Université Grenoble Alpes**, França.
- 2015/2016 ◦ **ATER na Université de Pau et des Pays de l'Adour**, França.
- 2012/2015 ◦ **Bolsa de doutorado conjunto, Université de Pau/Universidad de Zaragoza**, França/Espanha.

Formação precedente

- 2011/2012 ◦ **Mestrado "Iniciación a la Investigación en Matemáticas"**, *Universidad de Zaragoza*, Bilbao-Zaragoza-Logroño, Espanha.
- Dissertação de mestrado: "Funciones zeta y poliedro de Newton: aspectos teóricos y computacionales". Orientador: Enrique Artal.
- 2010/2011 ◦ **Mestrado "Mathématiques, Modélisation et Simulation"**, *Université de Pau et des Pays de l'Adour*, França.
- Dissertação de mestrado: "Nœuds, entrelacs et coloriage". Orientador: Vincent Florens.
- 2005/2011 ◦ **Licenciado em Matemáticas (graduação)**, *Universidad de Zaragoza*, Zaragoza, Espanha.

Atividades de pesquisa

Seminários e minicursos proferidos

- 2020 ◦ **Minicurso (4,5h) "An introduction to geometric motivic integration"**, *Thematic Program on Singularity Theory*, IMPA, Rio de Janeiro, Brasil.
- 2018 ◦ **Minicurso (20h) "An introduction to p -adic and motivic integration, zeta functions and new stringy invariants of singularities"**, *Mini-cours pour doctorants*, ICMC-USP, São Carlos, Brasil.
- 2017 ◦ **Minicurso (7h) "Line arrangements: combinatorics, geometry and topology"**, *Mini-cours pour doctorants*, ICMC-USP, São Carlos, Brasil.

Palestras em congressos nacionais e internacionais

- 2023 ◦ **The geometric Kontsevich-Zagier conjecture**, *Workshop on "Periods"*, Universidade de Lisboa, Portugal.

- **Zeta functions, abelian orbifold resolutions of singularities and the geometry of curves in weighted projective planes**, *VI Congreso de Jóvenes Investigadores de la RSME (Sesión de singularidades)*, Universidad de León, Espanha.
- 2022 ◦ **Zeta functions, orbifold motivic measures and \mathbb{Q} -resolutions of singularities**, *Summer School on Motivic Integration*, Henrich Heine University, Düsseldorf, Alemania.
- **On the geometry of curves in weighted projective planes and the Monodromy Conjecture for some surface singularities**, *17th International Workshop on Real and Complex Singularities*, Univ. São Paulo, São Carlos, Brasil.
- 2021 ◦ **On zeta functions, weighted blow-ups and the Monodromy Conjecture for some surface singularities**, *Singularities in the Midwest (online edition)*, Univ. Wisconsin-Madison, USA.
- 2020 ◦ **Generación de variantes aleatorias de exámenes**, *Workshop ENSEMAT 2020 "Usos y Avances en la Docencia de las Matemáticas en las Enseñanzas Universitarias"*, Universidad Politécnica de Madrid, Espanha.
- **Sobre la conjetura de la monodromia para singularidades cuasihomogéneas de superficie**, *Seminario de Álgebra, Geometría y Topología*, Universidad Complutense de Madrid, Espanha.
- **Embedded topology and combinatorics of line arrangements: some counter-examples using GeoGebra**, *14th Workshop of Young Researchers in Mathematics*, UCM-UAM-UC3M-IMI, Espanha.
- 2019 ◦ **Configurations of points and new Zariski pairs of line arrangements**, *Workshop on Topological and Analytical Methods in Singularity Theory*, CIMAT - Guanajuato, México.
- **Classification of trihedral singularities $\mathbb{C}^3/G_{d,q}$ via arithmetic properties and motivic zeta functions**, *Workshop "Zeta functions, singularities and applications"*, CIMAT - Zacatecas, México.
- **A new formula for the motivic and topological zeta functions from \mathbb{Q} -resolution of singularities**, *12th Mini Workshop on Singularities, Geometry and Differential Equations and 1st Meeting on Foliations and Singularities*, UFES, Vitoria, Brasil.
- 2018 ◦ **Motivic zeta functions on \mathbb{Q} -Gorenstein varieties and \mathbb{Q} -resolution of singularities**, *Lipschitz Geometry of Singularities*, Oaxaca, México.
- **Motivic zeta functions, orbifold motivic measures and \mathbb{Q} -resolutions of singularities (Short Communication)**, *International Congress of Mathematicians 2018*, Rio de Janeiro, Brasil.
- **Motivic zeta functions, orbifold motivic measures and \mathbb{Q} -resolutions of singularities**, *15th International Workshop on Real and Complex Singularities*, ICMC-USP, Brasil.
- 2017 ◦ **Combinatorics and topology of line arrangements via configurations of points**, *XI Encontro Regional de Topologia*, USP-UNESP-UFSCar, Brasil.
- **A geometrical construction of Zariski pairs of real line arrangements**, *VIII Rencontre Pau-Zaragoza d'Algèbre et Géométrie*, Université de Pau, França.
- **A geometrical construction of Zariski pairs of real line arrangements**, *IV Congreso de Jóvenes Investigadores de la RSME (Sesión de singularidades)*, Universidad de Valencia, Espanha.
- **Configurations of points and topology of real line arrangements**, *Congreso bienal de la Real Sociedad Matemática Española 2017*, Universidad de Zaragoza, Espanha.
- 2016 ◦ **A semi-canonical reduction for periods of Kontsevich-Zagier**, *Singularities and Topology*, Laboratoire J. A. Diudonné, Université de Nice, França.
- **A semi-canonical reduction for periods of Kontsevich-Zagier**, *Autour des Équations Différentielles*, Institut Fourier, Université de Grenoble Alpes, França.
- 2015 ◦ **On the geometry of line arrangements and dynamics of polynomial vector fields**, *Geometry, topology and combinatorics of hyperplane arrangements and related problems*, Universidad de Zaragoza, Espanha.
- **Una reducción semi-canónica para periodos de Kontsevich-Zagier**, *III Congreso de Jóvenes Investigadores de la RSME*, Universidad de Murcia, Espanha.
- **On the geometry of line arrangements and polynomial vector fields**, *Functional Equations in LIMoges 2015*, XLIM, Université de Limoges, França.

- 2014 ○ **On periods of Kontsevich-Zagier**, *The 1st Workshop of JSPS-MAE Sakura Program "Geometry and Combinatorics of Hyperplane Arrangements and Related Problems"*, Hokkaido University, Japão.

Estágios de pesquisa

- 2015 ○ **Hokkaido University and Tokyo Gakugei University (3 semaines)** convidado por M. Yoshinaga and A. Yasuhara, Japão.
- 2014 ○ **Hokkaido University (3 semaines)** convidado por M. Yoshinaga, Japão.
- 2011 ○ **Laboratoire de Mathématiques et de leurs Applications (1 month)** convidado por V. Florens, *Université de Pau et des Pays de l'Adour*, França.

Prêmios

- 2014 ○ **1er premio poster "Periods of Kontsevich-Zagier: conjectures and reduction"**, *Journées de l'École Doctorale*, Université de Pau et des Pays de l'Adour.
- 2013 ○ **2º premio poster "Periods as volumes and the Kontsevich-Zagier conjecture"**, *II Congreso de Jóvenes Investigadores de la RSME*, Universidad de Sevilla, Espanha.

Postos de responsabilidade e outros

- 2023 ○ **Organizador do IberoSing International Workshop 2023: Mirror symmetry & Hodge ideals**, URL: <https://iberosing.github.io/IW23/>, Univ. de Granada, Granada, Espanha.
- 2022 ○ **Organizador do IberoSing International Workshop 2022**, URL: <https://eventos.ucm.es/86046/detail/iberosing-international-workshop-2022.html>, Univ. Complutense de Madrid, Espanha.
- 2020/... ○ **Organizador do seminário virtual "Iberoamerican Webinar of Young Researchers in Singularity Theory and related topics"**, URL: iberosing.github.io, Instituto de Matemática Interdisciplinar (IMI).
- 2013/2014 ○ **Organizador do Seminário de doutorandos do LMAP**, Université de Pau et des Pays de l'Adour.

Experiencia em ensino

Professor associado: Universidad Politécnica de Madrid (Espanha)

- 2021/2022 ○ **Informática**, *Teoria e práticas de laboratório*, S1 Ingeniería Civil.
- **Cálculo I**, *Teoria e exercícios*, S1 Ingeniería Naval.
- 2020/2021 ○ **Estadística y Optimización**, *Teoria e exercícios*, S2 Ingeniería Civil.
- **Cálculo I**, *Teoria e exercícios*, S1 Ingeniería Naval.

ATER: Université Grenoble Alpes (76,5h, França)

- 2016/2017 ○ **MATH101-Langage mathématique, algèbre et géométrie**, *Teoria e exercícios*, L1 Math/Info.

ATER: Université de Pau (192h, França)

- 2015/2016 ○ **Initiation à la modélisation statistique**, *Teoria e exercícios*, L1 MIASHS.
- **Statistiques Descriptives**, *Teoria, exercícios e práticas de laboratório*, L1 MIASHS-Math-SDT.
- **Fonctions et intégrales**, *Exercícios*, L1 Mathématiques.
- **Équations différentielles I**, *Exercícios*, L2 Mathématiques.

Monitor associado: Université de Pau (128h, França)

- 2014/2015 ○ **Arithmétique**, *Exercícios*, L1 Mathématiques.
- **Algèbre Linéaire II**, *Exercícios*, L1 MIASHS.
- **Équations différentielles I**, *Exercícios*, L2 Mathématiques.
- 2013/2014 ○ **Arithmétique**, *Exercícios*, L1 Mathématiques.

- **Algèbre Linéaire II**, *Exercícios*, L1 MASS.
- **Topologie et Calcul Différentiel**, *Exercícios*, L2 Mathématiques.

Participação em escolas científicas

- 2019 ○ **School “XX School of Mathematics Lluís Santaló 2019: p-Adic Analysis, Arithmetic and Singularities”**, *Universidad Internacional Menendez Pelayo*, Santander, Espanha.
- 2018 ○ **Course “Post-quantum Cryptography”**, *BCAM&UPV/EHU*, Bilbao, Espanha.
- **International school “Singularity Theory”**, *ICMC-USP*, São Carlos, Brasil.
- **International school “Singularities and Lipschitz Geometry”**, *Universidad Nacional Autónoma de México*, Cuernavaca, México.
- 2017 ○ **Graduate school “Introduction To Geometric Analysis: The Atiyah-Singer Index Theorem”**, *BCAM-UPV/EHU*, Bilbao, Espanha.
- 2016 ○ **School “III EACA International School on Computer Algebra and its Applications”**, *Universidad de Sevilla*, Sevilla, Espanha.
- 2014 ○ **Clay Mathematics Institute Summer School 2014 “Periods and Motives: Feynman amplitudes in the 21st century”**, *Instituto de Ciencias Matemáticas*, Madrid, Espanha.
- 2013 ○ **School “Multiple Zeta Values, Multiple Polylogarithms and Quantum Field Theory”**, *Instituto de Ciencias Matemáticas*, Madrid, Espanha.
- **Graduate School “New aspects on Singularity Theory”**, *Instituto de Ciencias Matemáticas*, Madrid, Espanha.
- 2012 ○ **Doc-Course “Singularities and Applications”**, *Universidad de Sevilla*, Sevilla, Espanha.
- **Doc-Course “Cohomología de haces, dualidad de Verdier y cohomología de intersección”**, *Universidad Complutense de Madrid*, Madrid, Espanha.

Competências

Línguas

- **Espanhol** – Língua materna
- **Francês** – Fluente Nível C2 (*Dalf C1*, 2014)
- **Inglês** – Fluente Nível C1 (*FCE*, 2013)
- **Português** – Fluente Nível B2

Informática

- Sage, Maple, Mathematica.
- Fortran, Matlab, R.
- Python, C/C++, Java.
- \LaTeX , TikZ/Pgf, Beamer.