

Benoît GUERVILLE-BALLÉ

PH.D. HAB. IN MATHEMATICS
TOPOLOGY & GEOMETRY

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Current Qualification

- **Habilitation to Supervise Research**, defended on December 2023.
- **Ph.D.** in Mathematics (Summa Cum Laude, First Class Honors), defended on December 2013.
- **Graduate of Advanced Teaching** in Mathematics (2010).

Keywords: geometric topology, algebraic geometry, low-dimensional topology, hyperplane arrangements, algebraic plane curves, Zariski pairs, moduli space, algebraic computation (**Sagemath**).

Education & Qualification

- 2023/2024 **Habilitation to Supervise Research & Independent Researcher**,
Sorbonne University (Paris, France).
Title: *A stroll through the topology of line arrangements and their moduli space.*
- 2022/2023 **Temporary Assistant Professor** (research),
Research Institute for Mathematical Sciences, Kyoto University (Japan).
- 2021/2022 **Postdoctoral researcher**, funded by the JSPS
Kyushu University (Fukuoka, Japan).
- 2020/2021 **Independent researcher**, (due to COVID travel ban)
- 2019/2020 **Temporary Assistant Professor** (research),
Institute of Mathematics of the Polish Academy of Sciences (Warsaw, Poland).
- 2017/2019 **Postdoctoral researcher**, funded by the FAPESP,
São Paulo University, ICMC (São Carlos, Brazil).
- 2015/2017 **Postdoctoral researcher**, funded by the JSPS,
Tokyo Gakugei University (Japan).
- 2014/2015 **Temporary Assistant Professor** (research and teaching),
Fourier Institute (Grenoble, France).
- 2013/2014 **Temporary Assistant Professor** (research and teaching),
University of Pau (France).
- 2010/2013 **Ph.D. in mathematics and monitoring**,
University of Pau (France) & University of Zaragoza (Spain),
Title: *Topological invariants of line arrangements.*
Advisors: E. ARTAL BARTOLO, V. FLORENS and J. VALLÈS.
- 2009/2010 **Advanced Teaching in Mathematics** (agrégation externe),
University of Rouen (France).

15. *Combinatorial study of the moduli space of line arrangements*, with J. Viu-Sos, pp. 19, 2023 (preprint).
14. *On the non-connectivity of moduli spaces of arrangements: the splitting-polygon structure*, to appear in **Kyoto Journal of Mathematics**, 2021, (arXiv:2111.00399).
13. • *The loop-linking number of line arrangements*, **Mathematische Zeitschrift** Vol. 301, No. 2, pp. 1821-1850, 2022.
12. • *Topology and homotopy of lattice isomorphic arrangements*, **Proceedings of the A.M.S.**, Vol. 148, n. 5, May 2020, pp. 2193-2200.
11. *Fundamental groups of real arrangements and torsion in the lower central series quotients*, with E. Artal and J. Viu-Sos, **Experimental Mathematics**, Vol. 29, n. 1, 2020, pp. 28-35.
10. • *Configurations of points and topology of real line arrangements*, with J. Viu-Sos, **Mathematische Annalen**, Vol. 374, n. 1-2, 2019, pp. 1-35.
9. *On the topology of arrangements of a cubic and its inflectional tangents*, with S. Bannai, T. Shirane and H. Tokunaga, **Proceedings of the Japan Academy, Series A, Mathematical Sciences**, Vol. 93, n. 6, 2017, pp. 50-53.
8. *Non-homotopicity of the linking set of algebraic plane curves*, with T. Shirane, **Journal of Knot Theory and Its Ramifications**, Vol. 26, n. 13, 2017, pp. 13.
7. *A linking invariant for algebraic curves*, with J.B. Meilhan, **L'Enseignement Mathématique**, Vol. 66, n. 1/2, 2020, pp. 63-81.
6. *An arithmetic Zariski pair of line arrangements with non-isomorphic fundamental group*, with E. Artal, J.I. Cogolludo and M.A. Marco, **Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas**, Vol. 111, 2017, pp. 377-402.
5. *Multiplicativity of the \mathcal{L} -invariant and topology of glued arrangements*, **Journal of the Mathematical Society of Japan**, Vol. 70, n. 1, 2018, pp. 215-227.
4. *On the minimal degree of logarithmic vector fields of line arrangements*, with J. Viu-Sos, **Monografías Matemáticas García de Galdeano** Vol. 40, 2015, pp. 61-66.
3. *Zariski pairs of line arrangements with twelve lines*, **Geometry and Topology**, Vol. 20, 2016, pp. 537-553.
2. *A topological invariant of line arrangements*, with E. Artal and V. Florens, **Annali della Scuola Normale Superiore di Pisa - Classe di Scienze**, Vol. XVII, 2017, pp. 949-968.
1. *On complex line arrangements and their boundary manifolds*, with V. Florens and M.A. Marco, **Mathematical Proceedings of the Cambridge Philosophical Society**, Vol. 159, n. 2, September 2015, pp. 189-205.

Reviewer for: Groups Geometry and Dynamics, Journal of Combinatorial Theory - Series A, Canadian Mathematical Bulletin, Manuscripta Mathematica, Collectanea Mathematica.

Academic references

E. ARTAL, University of Zaragoza

L. PARIS, University of Burgundy

H. TOKUNAGA, Tokyo Metropolitan University

A. LIBGOBER, University of Illinois at Chicago

K. SAITO, RIMS

M. YOSHINAGA, Osaka University

Research invitations

- Jul. 2023 Research Institute for Mathematical Sciences (Japan), with K. Saito during 2 days.
- Dec. 2021 Okayama University (Japan), with S. Bannai, T. Shirane and H. Tokunaga during 2 days.
- Mar. 2022 Research Institute for Mathematical Sciences (Japan), with K. Saito during 2 days.
- Mar. 2019 Mathematical Research Institute of Oberwolfach (Germany) for a research in pair, with P. Baille, A. Libgober and S. Settepanella during 2 weeks.
- Apr. 2018 University of Zaragoza (Spain), with E. Artal during 1 week.
- Jul. 2017 Hokkaido University (Japan), with S. Settepanella during 1 week.
- Mar. 2017 Hokkaido University (Japan), with S. Settepanella during 1 week.
- Mar. 2014 University of Zaragoza (Spain), with E. Artal during 1 week.

Teaching Experiences

- **Temporary Assistant Professor at University J. Fourier**

2014/15 *Differential equation* (24hrs), B.Sc 2nd year of Physics, exercises

Mathematics (72hrs), B.Sc 1st year of Mathematics and I.T., courses and exercises

- **Temporary Assistant Professor at University of Pau**

2013/2014 *Group theory* (48.75hrs), B.Sc 2nd year of Mathematics, courses and exercises

Initiation to Statistic Modelization (24hs), B.Sc 2nd year of Mathematics Applied to Social Sciences, courses and exercises

Linear Algebra for I.T. (19.5hrs), B.Sc 1st year of I.T., exercises

Elementary algebra (48.75hrs), B.Sc 1st year of Natural Sciences, courses and exercises

- **Monitor at University of Pau**

2012/2013 *Algebraic Topology* (10.5hs), M.A 1st year of Mathematics, exercises

2011/2013 *Group theory* (2 x 48.75hs), B.Sc 2nd year of Mathematics, courses and exercises

2010/2011 *Geometry* (48.75hrs), refresher training for the 1st year of B.Sc.

Responsabilities

- 2022 Organizer of the conference *Singularity theory and geometric topology*, Oct. 24-27, RIMS (Japan).
2010/11 Organizer of the Ph.D. Seminar at the University of Pau (France).

Selection of Communications in International Meetings

- June 2023 **Algebraic and topological interplay of algebraic varieties**, Jaca (Spain)
Nov. 2019 **IMPANGA**, Warsaw (Poland)
July 2018 **ICM 2018**, Rio de Janeiro (Brazil)
June 2018 **International school on singularities and Lipschitz geometry**, Cuernavaca (Mexico)
July 2016 **63rd Topology Symposium**, Kobe (Japan)
Mar. 2016 **Workshop on Hyperplane Arrangements and Singularity Theory**, Sapporo (Japan)
Mar. 2016 **AMS Sectional Meeting**, Stony Brook (New York, USA)
Aug. 2015 **Workshop hyperplane arrangements and reflection groups**, Hanover (Germany)
Sept. 2014 **Geometry and Combinatorics of Hyperplane Arrangements and Related Problems**, Sapporo (Japan)
Aug. 2014 **Symposium on Singularities**, Sapporo (Japan)

Professional skills

- I.T. skills: Sage Maple GAP GeoGebra
 Python L^AT_EX Beamer HTML & CSS3
- Linguistic: **French:** native language **English:** working knowledge
 German: intermediate **Japanese:** beginner

Interviews, Grants and Awards

- 2021 Excellent Poster Award during the Pre-Math-for-Innovation Workshop in Kyushu Univeristy (Japan).
2019 Interviewed for a tenure track position in Okinawa Institute of Science and Technology (Japan).
2018 Interviewed for a temporary assistant position (4 years) in Innsbruck University (Austria).
 Ranked 6th for a tenure position in Caen University (France).
 Interviewed for a tenure position in Aix-Marseille University (France).
 Awarded the European Label *Marie Skłodowska-Curie Actions Seal of Excellence*.
2017 Post-doctoral grant from the Foundation for Research Support of the State of São Paulo (Brazil).
 Ranked 2nd for the Brunella Post-doctoral grant in University of Burgundy (France).
2016 Interviewed for a tenure position in Bourgogne University (France).
2014 Post-doctoral grant from the Japanese Society for the Promotion of Science, JSPS (Japan).