

# Benoît GUERVILLE-BALLÉ

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PHD IN MATHEMATICS  
TOPOLOGY & GEOMETRY

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## Current Qualification

- **Guest researcher** in Tokyo Metropolitan University.
- **PhD** 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, homotopy Theory, hyperplane arrangements, algebraic plane curves, Zariski pairs, Galois coverings, algebraic computation (*Sagemath*).

## Education & Qualification

- 2020/2021 **Guest researcher**,  
Tokyo Metropolitan University (Japan).
- 2019/2020 **Temporary Assistant Professor** (research),  
Institute of Mathematics of the Polish Academy of Sciences (IM PAN, Poland).
- 2017/2019 **Postdoctoral researcher**, funded by the Foundation for Research Support of the State of São Paulo (FAPESP),  
Institute of Mathematical Sciences and Computations (USP-ICMC, São Carlos, Brazil).
- 2015/2017 **Postdoctoral researcher**, funded by the Japanese Society for the Promotion of Science (JSPS),  
Tokyo Gakugei University (Japan), Department of Mathematics.
- 2014/2015 **Temporary Assistant Professor** (research and teaching),  
Fourier Institute (Grenoble, France), Topology team.
- 2013/2014 **Temporary Assistant Professor** (research and teaching),  
University of Pau (France), Algebra and Geometry team.
- 2010/2013 **PhD in mathematics and monitoring**,  
University of Pau (France) & University of Zaragoza (Spain),  
Defended on December, 6th 2013.  
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).
- 2007/2009 **Masters in Fundamental Mathematics**,  
University Pierre and Marie Curie, Paris VI (France).  
Title: *Complex reflections groups, braids groups and Hecke algebra*.  
*Advisor:* J. MICHEL.

## Academic references

E. ARTAL, University of Zaragoza  
M. OKA, Tokyo University of Science  
A. YASUHARA, Waseda University  
A. LIBGOBER, University of Illinois at Chicago  
H. TOKUNAGA, Tokyo Metropolitan University  
M. YOSHINAGA, Hokkaido University

## Publications & Preprints

• Main publications

13. *The loop-linking number of line arrangements*, pre-print, 2020, (arXiv:2004.03550).
12. • *Topology and homotopy of lattice isomorphic arrangements*, **Proceedings of the American Mathematical Society**, 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:** Journal of Combinatorial Theory - Series A, Canadian Mathematical Bulletin, Manuscripta Mathematica, Collectanea Mathematica.

## Research invitations

- 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 2<sup>nd</sup> year of Physics, exercises  
*Mathematics* (72hrs), B.Sc 1<sup>st</sup> year of Mathematics and I.T., courses and exercises

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

- 2013/2014 *Dissertation*, B.Sc 3<sup>rd</sup> year of Mathematics, examiner and reviewer  
*Group theory* (48.75hrs), B.Sc 2<sup>nd</sup> year of Mathematics, courses and exercises  
*Initiation to Statistic Modelization* (24hs), B.Sc 2<sup>nd</sup> year of Mathematics Applied to Social Sciences, courses and exercises  
*Linear Algebra for I.T.* (19.5hrs), B.Sc 1<sup>st</sup> year of I.T., exercises  
*Elementary algebra* (48.75hrs), B.Sc 1<sup>st</sup> year of Natural Sciences, courses and exercises

- **Monitorat at University of Pau**

- 2012/2013 *Algebraic Topology* (10.5hs), M.A 1<sup>st</sup> year of Mathematics, exercises
- 2011/2013 *Group theory* (2 x 48.75hs), B.Sc 2<sup>nd</sup> year of Mathematics, courses and exercises
- 2010/2011 *Geometry* (48.75hrs), refresher training for the 1<sup>st</sup> year of B.Sc.

## Selection of Communications in International Meetings

- Nov. 2019 **Days of the federation**, ENS Lyon (France)
- 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 **63<sup>rd</sup> Topology Symposium**, Kobe (Japan)
- July 2016 **13<sup>th</sup> Workshop on algebraic surfaces**, Kochi (Japan)

- Mar. 2016 **Workshop on Hyperplane Arrangements and Singularity Theory**, Sapporo (Japan)
- Mar. 2016 **AMS Sectional Meeting**, Stony Brook (New York, USA)
- Jan. 2016 **3<sup>rd</sup> Workshop on Algebraic Geometry**, Ube (Japan)
- Aug. 2015 **Workshop hyperplane arrangements and reflection groups**, Hanover (Germany)
- Dec. 2014 **Day on Hyperplane Arrangements**, Nancy (France)
- Sept. 2014 First workshop of JSPS-MAE Sakura Program **Geometry and Combinatorics of Hyperplane Arrangements and Related Problems**, Sapporo (Japan)
- Aug. 2014 Second Franco-Japanese-Vietnamese **Symposium on Singularities**, Sapporo (Japan)
- Feb. 2014 **Winter Braids IV**, Dijon (France)
- Sept. 2012 **XII International Conference Zaragoza-Pau on Applied Mathematics and Statistics**, Jaca (Spain)

## Professional skills

- I.T. skills: Sage            Maple            GAP            GeoGebra  
                  Scilab            Javascript      Pascal          Asymptote  
                  L<sup>A</sup>T<sub>E</sub>X          Beamer          TiKz            HTML & CSS3
- Linguistic: **French:** native language      **English:** working knowledge  
                  **German:** intermediate                    **Japanese:** beginner

## Interviews, Grants and Awards

- 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 6<sup>th</sup> 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, FAPESP (Brazil).  
       Ranked 2<sup>nd</sup> for the Brunella Post-doctoral grant in Bourgogne University (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).