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CV:

CURRENT POSITION:

- Since **Septembre 2011**: Maître de Conférences (research and teaching) at University Jean Monnet, (Saint Etienne) in the lab **Institut Camille Jordan**.

PAST RESEARCH EXPERIENCES:

- **September 2010 - august 2011**: ATER at University of Angers (Lab: **L**aboratoire **A**ngevin de **R**Echerche en **M**athématiques). Key words: symmetric Hilbert schemes, commuting varieties, Nakajima's quiver varieties.
- **September 2009 - august 2010** : ATER at University of Brest (Lab: **L**aboratoire de **M**athématiques de **B**rest).
Key words: singular locus of algebraic schemes, commuting shemes, nilpotent pairs.
- **September 2006 - november 2009** : PhD thesis under the supervision of Thierry Lévasseur at University of Brest (Laboratoire: **L**MB).
Key words: semisimple symmetric Lie algebras, algebraic varieties, commuting varieties, nilpotent elements, sheets, Slodowy slices.

PUBLICATIONS AND PREPRINTS:

Publications in peer-reviewed journals:

- _____ , On the normality of the null-fiber of the moment map for θ - and tori representations, *Journal of Algebra*, **507** (2018), 502-524.
- _____ , C. Lehn, M. Lehn and R. Terpereau, Towards a symplectic version of the Chevalley restriction theorem, *Compositio Mathematica*, **153** (2017), 647-666.
- _____ and P. Hivert, sheets of symmetric Lie algebras and slice induction, *Transformation Groups*, **21** (2016), 355-375.
- _____ and L. Evain, Nested punctual Hilbert schemes and commuting varieties of parabolic subalgebras, *Journal of Lie Theory*, **26** (2016), 497-533
- _____ , The closure of a sheet is not always a union of sheets, some counterexamples, Appendix of G. Carnovale, Lusztig's partition and sheets, *Mathematical Research Letters*, **22** (2014), 645-664.
- _____ , Irregular locus of the commuting variety of reductive symmetric Lie algebras and rigid pairs, *Transformation Groups*, **16** (2011), 1027-1061.
- _____ , Very nilpotent basis and n -tuples in Borel subalgebras, *C. R. Acad. Sci. Paris Sér. I Math.* **349** (2011), 149-152.

Last update: February 12, 2019

- _____, Sheets of symmetric Lie algebras and Slodowy slices, *Journal of Lie theory*, **51** (2011), 1-54.
- _____, Composantes irréductibles de la variété commutante nilpotente des algèbres de Lie symétriques semi-simples, [In french] (Irreducible components of the nilpotent commuting variety of symmetric Lie algebras), *Annales de l'institut Fourier*, **59** (2009), 37-80.

Preprints:

- M. Boos and _____, Parabolic conjugation and commuting varieties, arXiv:1604.08840, (accepted in *Transformation Groups*)

Workshop acts:

- _____, Sheets of semisimple symmetric Lie algebras, In: Algebraic Groups, *Oberwolfach Reports* **7** (2010), 1101-1163.

RESEARCH TALKS:

During international meetings:

- *Slice induction and sheets* at “Geometric Methods in Representation Theory”, Lancaster, 2014
- *The commuting variety of semisimple symmetric Lie algebras* at “Symmetric Spaces and Generalizations II”, Levico Terme, Italy, 2012.
- *Sheets of semisimple symmetric Lie algebras* at “Algebraic groups”, Oberwolfach, Germany, 2010.

During national meetings:

- *Sheets and Induction* at “meeting of the network Théorie de Lie Algébrique et Géométrie” Poitiers, 2015
- *Commuting varieties and Hilbert schemes* at “Journées d’Algèbre, Dualité et algèbre non-commutative” (GTIA), Clermont Ferrand, 2013
- *Sheets of symmetric Lie algebras* at “meeting of the network Géométrie, Dynamique et Représentations des Groupes 3066”, Lyon, 2010

Other talks: (Lab seminars and others)

- *From nested Hilbert schemes to quivers*, Dijon 2016.
- *Categorical quotients and Chevalley’s theorems*, Saint-Etienne 2016 (team day).
- *Geometric bestiary on the (co-)adjoint action*, Saint-Etienne 2016 (ANR meeting).
- *Slice induction for sheets in symmetric Lie algebras*, seminary of algebra at IHP, Paris 2015 | Brest 2015 | Roma I 2014 | Reims 2014 | Saint-Etienne 2014 (team day) | Lyon 2014 (ANR meeting).
- *Nested Hilbert schemes and commuting varieties*, Clermont-Ferrand 2013 | Saint-Etienne, 2012 (team day) | Saint-Etienne 2013 (working group) | Lyon 2013.

- *Diagonal actions and commuting varieties of symmetric Lie algebras*: Angers 2010 (2 seminars)| Metz 2010| Paris 2011 (seminar “enveloping algebras”) | Versailles 2011| Poitiers 2011 | Lyon 2011.
- *Phd results*: Brest 2009 (defense)| Paris VII 2010 (enveloping algebras).
- *Sheets of symmetric Lie algebras*: Brest 2009 | Poitiers 2009.
- *Nilpotent commuting varieties of symmetric Lie algebras*: Poitiers 2008 | Brest 2008 | Lyon 2009 | Grenoble 2009.

SUPERVISION:

PhD advisor:

- **2017-2020**: Kenny Phommady, *Polynomiality of the algebra of invariants of a parabolic contraction*, , codirection with Florence Fauquant-Millet.

Master level:

- **2017**: Kenny Phommady, *Polynomiality of $S(\mathfrak{g})^{\mathfrak{g}}$ with \mathfrak{g} a semisimple Lie algebra and introduction to the polynomiality problem of $S(\mathfrak{p})^{\mathfrak{p}}$ with \mathfrak{p} a parabolic subalgebra*, Master 2 of Ecole Normale Supérieure de Lyon), 4 months, codirection with Florence Fauquant-Millet.
- **2013**: Bruno Laurent, *(B,N)-pairs and finite groups of Lie types*[In French], Master 1 of Ecole Normale Supérieure de Lyon), 6 weeks

Undergraduate:

- **2017-2018**: Romain Tabard, *Crossing in graphs of polynomials and permutations*, Licence 3, one year, during courses
- **2016-2017**: Salma Grati and Nolwen Jouanin, *Zariski’s topology*, Licence 3, one year, during courses.
- **2016**: Geoffrey Just and Tristan Canale, *Propositional calculus, completeness and 1st order logic*, Licence 3, one semester, during courses.
- **2014**: Ibtissem Zaafrani, *Cryptography via groups, El Gamal case*, Licence 3, one semester during courses.

REVIEW:

- Referee reports for *Advances in Mathematics* (1), *Mathematische Zeitschrift* (1), *Progress in Mathematics* (1), *Transformation Groups* (1) and *Journal of Lie Theory* (1).
- Reviewer for MathSciNet since 2016.

INVOLVEMENT IN FUNDED PROJECTS:

- Member of the french Grant ANR *Geolie* (Geometric methods in Lie theory)

WORKING GROUPS / LECTURE GROUPS:

Involvement including talks:

- *Crystal Basis and diagrammatic algebras*, Lyon, 2018-2019.
- *Algebraic stacks* (and organisation), Saint-Etienne, 2018.
- *Parabolic contractions: degenerate flag varieties and polynomiality of the algebra of invariants* (and organisation), Saint-Etienne, 2017.
- *Kazhdan-Lusztig polynomials and Schubert varieties*, Lyon, 2017.
- *Working group in algebra in Saint-Etienne*, (and co-organisation) 2016-2017
- *Grothendieck topologies* (and co-organisation), Saint-Etienne, 2016.
- *Slices in Lie theory* (and co-organisation), Working groupe emanating from ANR (french grant) GeoLie, 2016-?.
- *A_∞ -Structures* (and co-organisation), Saint-Etienne, 2015-16
- *Triangulated categories*, Saint-Etienne, 2014-15
- *Nakajima's quiver varieties*, Lyon, 2012-13
- *Non-commutative deformation of nilpotent orbits*, Saint-Etienne, 2011-12

Active participation only:

- *Vector bundles, Buildings and stability*, Lyon 2016.
- *Plactic algebras*, Saint-Etienne, 2013-14
- *Cluster algebras and applications*, Lyon, 2013-14
- *Manin's conjecture*, Saint-Etienne, 2011-13

TEACHING:

- From **September 2011** - : Maitre de conférence, 192 h per year on average, all levels (from L1 to M2 Education), all science study paths (maths, biologie, core curriculum science and technology, transversal options ...).
- **Fall 2013**: 36h of Master degree course in the Master 2 Recherche of Lyon (**Master Mathématiques et Applications**) on *Lie algebras*.
- **September 2010 - june 2011**: ATER, 192h in L1-L2 core curriculum (maths, physics, chemistry, computer science, economics).
- **September 2009 - june 2010**: Half-ATER, 96h in L1-L2 Maths/Applied Maths and Social Science.
- **September 2006 - june 2009**: Instructorship, 192h in L1-L2 Maths.

VARIOUS DUTIES:

- **2018**: co-organiser of the days of the national research network TLAG, Saint-Etienne, 2 days.
- **2017**: Member of a hiring committee in Angers (Geometry)
- **2016 - ?** : Member of the laboratory board and scientific council
- **2016**: Main co-organiser of GeoLie days (Kick-off meeting of the french grant GeoLie), Saint-Etienne, 3 days.
- **2012 - ?**: Organisation of a local general seminar: Séminaire Stéphanois de Mathématiques Accessibles
- **2012 - 2016**: Member of the local council (mini lab council for the Saint Etienne part of the ICJ)
- **2011 - 2015** Person in charge of the management of teaching duties in the department
- **2009 - 2010**: Representative of ATERs at Brest's mathematical teaching department
- **2009 - 2010**: Representative of PhD students at the Brest's lab's council
- **2009 - 2010**: Co-organiser of Brest's PhD student seminar
- **2010**: Complier of the workshop act "Algebraic Group" in *Oberwolfach Report 7* (2010), 1101-1163.
- and some other small tasks of interest for the community (in charge of web page of the team, of some mailing lists. . .)

GENERAL TALKS AND POPULARIZATION:

Talks:

- Talk intended to high school students *Infinity in mathematics* (Saint-Etienne, 2018)
- Talk at "University for all" intended to the general public : *Infinity in mathematics* (Saint-Etienne, 2017)
- Talk intended to 200 Junior high school students : *From radix to JPEG, writing numbers and images* (Cordées de la réussite, Saint-Etienne, 2014)
- Talk at Séminaire Stéphanois de Mathématiques Accessibles on *Gödel's theorems and model theory* (Saint-Etienne, 2012)
- **6** PhD students seminar talks on: 1) *The irreducibility notion in algebraic geometry* (Brest, 2007), 2) *Representations of \mathfrak{sl}_2* (Brest, 2008), 3) *Notions of resolubility and semi-simplicity for Lie algebras* (Brest, 2009), 4) *Categories* (Brest, 2009). 5) *Gödel's theorems and model theory* (Brest, 2010). 6) *Quiver representations* (Angers, 2010).
- Presentation of the PhD subject at a high-school level (Rennes, 2008), 6 minutes talk and poster

Facilitator:

- Participation in popularization events of the lab: 2-3 days per years ("Mathalyon", Fête de la science, . . .) since 2012.

- Facilitator of a *research training course* intended to middle school students (project “MATH.en.JEANS”), Montbrison 2016-2017 (Queue of dice)
- Facilitator of three *research training courses* intended to high school students (project “Hippocampe”, 3 days), Saint-Etienne 2016 (Error Correcting Codes) and 2015 (Cryptography), Brest 2009 (radix).
- Participation as an “expert” in a café philosophique on the subject of *Infinity*, Saint-Etienne 2015.
- Creation of an activity on conics, Brest 2007.

COMPUTER SCIENCE:

- **Teaching:** *Cryptography* (2nd year transversal option at Saint-Etienne), *Implementation in linear algebra* (2nd year, Saint-Etienne), *Programming for Secondary education* (Master 2 EF, intended to future teachers in secondary education, Saint-Etienne)
- **Taken Courses:** *Error correcting codes*, *Goppa and Reed Salomon* (level M2), *Cryptography via Drinfeld modules* (M2), *Complexity and model theory* (M1), *Decidability and calculability* (L3).
- **Examples of recent implementations:** *Geometric computation in Lie algebras* at a research level (defining ideals of some varieties, smooth points, ring of invariants ...) (SAGE, GAP), Elementary programs linked with *cryptology* (Vignère cryptanalysis, RSA...) (Maple, SAGE)
- **Languages:** *Programming:* SAGE, Python, GAP, Scratch, Caml, MAPLE, Matlab, QBasic, *Web pages:* HTML, PHP

LANGUAGE:

- **French:** Native
- **English:** Fluent.
- **German:** Basic.