

# Nicolas Garrel

*Post-doctoral fellow in mathematics*

Konkordienstr 57  
01127 Dresden  
Germany  
☎ +33 7 60 58 97 07  
✉ math.g@rrel.fr  
📧 nicolas.garrel.me  
Born June 19, 1990

## Curriculum

- 2021–2022 **Postdoc**, *TU Dresden*, Dresde, with Arno Fehm.
- 2020–2021 **Postdoc**, *Universiteit Antwerpen*, Antwerp, with Karim Becher.
- 2018–2019 **Postdoc**, *University of Alberta*, Edmonton, with Nikita Karpenko.
- 2015–2018 **PhD Thesis**, *Université Paris-Nord*, Villetaneuse, with Anne Quéguiner.  
“Cohomological invariants of algebraic groups and algebras with involution”
- 2013 **Master**, *Université Paris-Sud*, Orsay.  
Number theory and Algebraic geometry
- 2011 **Licence**, *Université Paris-Sud*, Orsay.
- 2010–2015 **École Normale Supérieure**, *Mathematics department*, Paris, ranked 16th.
- 2008–2010 **Preparatory classes**, *Lycée Louis-le-Grand*, Paris.

## Research interests

- Main Algebras with involution, Galois cohomology, Witt rings, Hermitian forms, Hermitian Morita theory, K-theory
- Secondary Algebraic groups,  $\lambda$ -rings, Crossed-products, Higher categories, Ordered fields, Valuations

## Published articles

- 2020 **Cohomological and Witt invariants of Witt classes**, *Annals of K-Theory* 5-2, 213–248, DOI 10.2140/akt.2020.5.213.

## Accepted articles

- 2020 **Mixed Witt rings of algebras with involution**, *Canadian Journal of Mathematics*.

## Submitted articles

- 2022 **An Artin-Schreier-type theory for signatures of hermitian forms over involutions of the first kind.**
- 2022 **Lambda-operations for hermitian forms over algebras with involution of the first kind.**
- 2022 **Extending cohomological invariants from quadratic forms to quaternionic anti-hermitian forms.**

## Teaching

- 2021–2022 **Discrete structures**, *TU Dresden*, (exercise classes, freshman, in German).
- 2021 **Algebraic function fields**, *TU Dresden*, (exercise classes, Master, in English).
- 2020–2021 **Central simple algebras and involutions**, *Universiteit Antwerpen*, (Course, Master, in English).
- 2019 **Biocalculus**, *University of Alberta*, (freshman course, inverted classroom).

- 2017–2018 **Mathematical methods for engineers**, *Université Paris-Nord*, (TA only, third year course for engineers, 30 students).
- 2017–2018 **Analysis 1**, *Université Paris-Nord*, (first year course for science students, 30 students).
- 2015–2018 **Introduction to mathematical structures**, *Université Paris-Nord*, (first year course for science students, 30 students).
- 2011–2015 **Weekly oral interrogations**, *Lycée Louis-le-Grand*, (interrogations for preparatory classes).

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## International conferences

- 2018 **Affine Algebraic Groups, Motives and Cohomological Invariants**, *BIRS*, Banff, Speaker.  
“Mixed Witt rings and cohomological invariants of algebras with involution”
- 2018 **Quadratic Forms and Related Structures**, *MFO*, Oberwolfach, Speaker.  
“Cohomological invariants of Witt classes and algebras with involution”
- 2017 **Higher Obstructions to Rational Points**, *Emory University*, Atlanta, Attended.
- 2015 **Cohomological Methods in Algebraic Groups**, *CIRM*, Luminy, Attended.

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## Visits

- 2020 **Research programme participant**, *Isaac Newton Institute*, Cambridge.  
Programme “K-theory, algebraic cycles and motivic homotopy”
- 2019 **Research visit**, *Universiteit Antwerpen*, Anvers, with Karim Becher.  
On mixed Witt rings of algebras with involution
- 2018 **Research visit**, *Universiteit Antwerpen*, Antwerp, with Karim Becher.  
On cohomological invariants of quadratic forms
- 2014 **Exchange program**, *Chennai Mathematical Institute*, Chennai.  
Organization of a seminar on Galois cohomology
- 2013 **Master’s internship**, *University of Pennsylvania*, Philadelphia, with David Harbater.  
Around patching methods for torsors

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## Seminar talks, workshops, summer schools and workgroups

- 2020 **KAH Programme seminar**, *Isaac Newton Institute*, Cambridge.  
Mixed graded structures for the K-theory of Azumaya algebras
- 2020 **Séminaire “Variétés Rationnelles”**, *Jussieu*, Paris.  
Morita lifting of Brauer subgroups, and mixed K-theory rings
- 2019 **ALGAR: Algebras with involution**, *Universiteit Antwerpen*, Anvers.  
“Mixed Witt rings of algebras with involution”
- 2019 **Algebra team seminar**, *Universiteit Antwerpen*, Anvers.  
“Hermitian Brauer 2-groups and mixed Witt rings of algebras with involution”
- 2019 **Mini-course: Quadratic forms and axial algebras**, *Université d’Artois*, Lens.  
“Signatures of hermitian forms and the spectrum of mixed Witt rings”
- 2019 **Workshop: Forms, flags, graphs and beyond**, *University of Ottawa*, Ottawa.  
“Exterior powers of hermitian forms over algebras with involution”
- 2019 **Workgroup**, *University of Alberta*, Edmonton.  
Around motives
- 2018 **Algebra team seminar**, *Université d’Artois*, Lens.  
“Cohomological invariants and operations on Witt classes”
- 2018 **Topology team seminar**, *Université Paris-Nord*, Villetaneuse.  
“The hermitian Brauer 3-group and mixed Witt rings of algebras with involution”

- 2017 **Topology team seminar**, *Université Paris-Nord*, Villetaneuse.  
“Cohomological and Witt invariants of Witt classes”
- 2016 **Mini-course: Commutative Algebraic Groups, Hermitian K-Theory and Quadratic Forms**, *Université d’Artois*, Lens.
- 2016 **PhD students seminar**, *Université Paris-Nord*, Villetaneuse.  
“Numbers are ordinary functions”
- 2016 **Workgroup**, *IHP*, Paris.  
Around Merkurjev’s work on cohomological invariants
- 2015 **PhD students seminar**, *Université Paris-Nord*, Villetaneuse.  
“Non-abelian Galois cohomology and Galois descent”
- 2015 **Workgroup**, *Université Paris-Nord*, Villetaneuse.  
Around Suslin’s conjecture

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## Other skills

Languages	French (native), English (fluent), Spanish (intermediary), German (beginner)
Software	Linux, Windows, L <sup>A</sup> T <sub>E</sub> X, Sage, Emacs
Web	HMTL, CSS, Javascript, PHP, SQL (all moderately)
Programming	Rust, OCaml, Python, Haskell, Idris, Lisp, Bash, Pascal Objet (all moderately)