

Zoé YVON

Curriculum Vitae

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EDUCATION

- From October 2020 **PhD**, Title: *Galois representations of Elliptic Curves and Entanglement of Division fields*, supervised by Samuele Anni and David Kohel, defense: December, 13th 2024
Institut de Mathématiques de Marseille, Marseille, France
- 2018–2020 **Master degree**, *Fundamental Mathematics*, Topic: *Algebraic geometry and Arithmetic*, valedictorian and honors, Thesis: *The inverse Galois problem for $GL_2(\mathbb{F}_p)$ with p prime*, supervised by Samuele Anni
Aix-Marseille Université, (Marseille, France)
- 2015–2018 **Bachelor degree**, *Mathematics*, second of the promotion
Aix-Marseille Université (Marseille, France) and Université de Nantes (Nantes, France)

EMPLOYMENT

- September 2024–August 2025 **Postdoc position (ATER)**, 192h of teaching at Mathematic Department
Institut de Mathématiques de Marseille, Aix-Marseille Université (Aix/Marseille, France)
- November 2023–August 2024 **Postdoc position (ATER)**, 160h of teaching at IUT (University and Technology Institute) of Computer Science, at Aix-en-provence
Institut de Mathématiques de Marseille, Aix-Marseille Université (Aix/Marseille, France)

PUBLICATIONS and CURRENT PROJECTS

- September 2023 **Article**, *Polynomials realizing images of Galois representations of an elliptic curve*, Zoé Yvon, *Fonctiones et Approximatio*, 69.1 (2023), 113–136, doi:10.7169/facm/2106
- July 2024 **Article**, *Coincidence of division fields of an elliptic curve defined over a number field*, Zoé Yvon, Preprint, Arxiv
- Expected after PhD **Article**, *Work on modular curves to study entanglement of elliptic curves*, Zoé Yvon, Samuele Anni and David Kohel

CONFERENCES TALKS

- April 2023 **Invited talk**, *Coincidence of division fields of an elliptic curve defined over a number field*, in Density problems in Arithmetic, CIRM
Marseille, France
- July 2024 **Invited talk**, *Coincidence of division fields of an elliptic curve defined over a number field*, in European Congress of Mathematics, Universidad de Sevilla
Sevilla, Spain

- January 2022 **Contributed talk**, *Valuation of coefficients of polynomials geometrically realizing $GL_2(\mathbb{Z}/n\mathbb{Z})$* , in Seminari de Teoria de Nombres de Barcelona, Universitat de Barcelona
Barcelona, Spain
- January 2023 **Contributed talk**, *Coincidence of division fields of an elliptic curve defined over a number field*, in Seminari de Teoria de Nombres de Barcelona, Universitat de Barcelona
Barcelona, Spain
- February 2024 **Contributed talk**, *Vertical coincidence of an elliptic curve defined over a number field*, in Seminari de Teoria de Nombres de Barcelona, Universitat de Barcelona
Barcelona, Spain

SEMINARS TALKS

- 2021-2023 **Seminar of PhD students of Institut de Mathématiques de Marseille**, 6 talks: *The inverse Galois problem / Torsion point on elliptic curves (x2) / Ramification in number fields (x2) / Modular curves*
Marseille, France
- April 2022 **Seminar of the team ATI (Arithmetic and Information Theory)**, *Valuation of coefficients of polynomials geometrically realizing $GL_2(\mathbb{Z}/n\mathbb{Z})$*
Marseille, France
- December 2023 **Day of the group AGLR (Arithmetic, Geometry, Logic and Representations)**, *Galois representations of elliptic curves*
Marseille, France

CONFERENCES and SEMINARS PARTICIPATION

- 2020-2023 **Weekly seminar of the team ATI (Arithmetic and Information theory)**, *Institut de Mathématiques de Marseille (Marseille, France)*
- March 2021-March 2023 **Weekly seminar of the PhD students of Luminy**, *PhD students of I2M, and joined in September 2023 by PhD students of CPT (Centre de physique théorique)*
- January 2022 **Conference**, *STNB (Seminari de Teoria de Nombres de Barcelona)*, Universitat de Barcelona, (Barcelona, Spain)
- January 2023 **Conference**, *STNB (Seminari de Teoria de Nombres de Barcelona)*, Universitat de Barcelona, (Barcelona, Spain)
- February 2023 **Conference**, *SAGA (Symposium of Algebraic Geometry and Applications)*, CIRM, (Marseille, France)
- February 2023 **Conference**, *COUNT (Computations and their uses in number theory)*, CIRM, (Marseille, France)
- April 2023 **Workshop**, *Density problem*, CIRM, (Marseille, France)
- May 2023 **Conference**, *Arithmetic Statistics*, CIRM, (Marseille, France)
- May 2023 **Workshop**, *An expedition into Arithmetic geometry*, Lorentz Center, (Leiden, The Netherlands)
- June 2023 **Conference**, *AGC²T (Arithmetic Geometry Cryptography and Code Theory)*, CIRM, (Marseille, France)

- June 2023 **Conference, FoCM (Foundations of Computational Mathematics, Workshop: Computation Number Theory, Sorbonne Université (Paris, France)**
- February 2024 **Conference, STNB (Seminari de Teoria de Nombres de Barcelona), Universitat de Barcelona (Barcelona, Spain)**
- July 2024 **ECM (European Congress of Mathematics), Universidad de Sevilla (Sevilla, Spain)**

WORKING GROUPS

- 2020-2021 **Local Fields**, <https://sites.google.com/view/samuele-anni/home/groupe-de-travail?authuser=0>, Reference: Local Fields by Serre and Algebraic Number Theory by Neukirch, Given talks: Ramification in Local Fields/Discriminant and Different/The proof of Kronecker-Weber theorem by class field theory
- 2021-2022 **Entanglement of elliptic curves**, Reference: Towards a classification of entanglements of Galois representations attached to elliptic curves, by Daniels, Lozano-Robledo and Morrow, Given talks: Fake CM entanglements/Entanglements of Weil type
- 2021-2022 **Schemes theory**, Given talks: Projective Schemes/Immersion theorem
- 2022-2023 **Rational Points on curves over finite fields**, <https://sites.google.com/view/samuele-anni/home/groupe-de-travail?authuser=0>, Reference: Rational points on curves over finite fields by Serre, Given talks: Jacobians/Genus 1

RESEARCH SCHOOLS

- January 2021 **Arizona Winter School**, Courses: *A friendly introduction to the theory of modular forms and An introduction to modular groups*, Online
- January 2023 **Introduction to SAGA (Symposium on Algebraic Geometry and Applications)**, Courses: *Galois representations and modular forms, Modularity and diophantine applications, Local-global principles and Jacobians and models of curves*, CIRM Marseille, France
- January 2023 **Spring School in Arithmetic Statistics**, Courses: *Galois representations and statistics, Complex Multiplication, Class field theory and Frobenius distributions*, CIRM Marseille, France

RESPONSABILITIES

- March 2021–March 2023 **Responsible (among three) of the PhD students seminar of Institut de Mathématiques de Marseille (and Centre de Physique Théorique) at Luminy**
- From september 2022 **Representative of PhD students in laboratory council**, *Institut de Mathématiques de Marseille*
- 14th march 2023 **π -evening**, Organization (with two other people) of an evening for the international π -day, (with four 10 minutes talks) and a pie competition

TEACHINGS

- 2020-2023 **64h per year during the three first year of PhD, Mathematic Department**
129h of assistant position, Faculty of Sciences
- Bachelor Mathematic and Computer Science applied to Human and Social Sciences, 1st year, Algebra and Geometry, 27h
 - Bachelor Mathematic, 1st year, Linear Algebra, 18h+36h+36h
 - Bachelor Mathematic, 1st year, Mathematic tools, 12h
- Stages hippocampe, 3 days during which middleschool and highschool students come to University to do "Mathematic Research" and have to present what they found on a poster at the end of these three days. Each tutor supervises 3 groups of 3 or 4 students, 5 traineeships:**
Topics: The sequence/following at the next number/performance (La suite au prochain numéro) / Boxes, squares and paths / Register machines / Numbers and Sums (Des nombres et des sommes) / Models: economy, population, epidemics
- 2023-2024 **160h of assistant position, IUT (University and Technology Institut) of Computer Science, Aix-en-Provence**
- Mathematic Tools (Linear algebra), 1st year, 24h
 - Discrete Mathematics (Sets, Logic, Arithmetic), 1st year, 26h
 - Probabilities, 2nd year, 32h
 - Cryptography and security, 2nd year, 20h
 - Cryptography complements, 2nd, 8h
 - Advanced cryptography, 3rd year, 4h
 - Graphs, 1st year, 28h
 - Statistics, 1st year, 18h
- 2024-2025 **192h of assistant position, Department of Mathematics, Marseille, France**
- General mathematics, Bachelor Mathematic 1st year in 2 years, 67h
 - Study of functions and complex numbers, Bachelor Mathematic 1st year in 2 years, 47h
 - Power series and Fourier series, Bachelor Mathematic 3rd year, 54h
- Stages hippocampe, 2 traineeships**

POPULAR SCIENCE

- March 2022 **Participation to the competition, Ma thèse en 180 secondes (My PhD in 180 seconds)**
- March 2023 **Talk for π -evening, One of the three great problem of Antiquity: squaring the circle**

ACADEMIC TRAINING

- December 2021 **Mooc, Ethique de la Recherche (Research ethics)**
- December 2021 **Mooc, Intégrité Scientifique (Scientific Integrity)**

2021-2022 **Courses taken in Bachelor Science and Humanity**, *History and Philosophy of Mathematics*, Study of Euclid Elements, solving equation using geometry, formalism introduced by Descartes, philosophic points of view, universal language of Leibniz

COMPETENCES

Langage French (Native Tongue), English
Computer LateX, Sagemath
skills

HOBBIES

Music Piano (20 years), accordion (basic level), chorus
Diorama Fanciful Miniatures set design