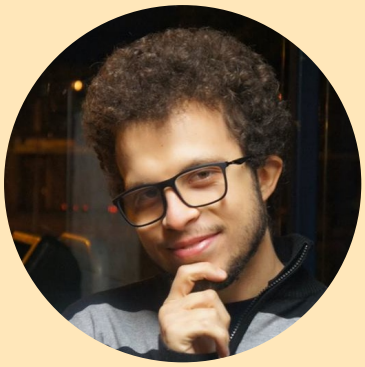

Riccardo Pengo

Born in Milan, Italy on December 21st, 1993

Smaragdlaan 148, 2332JX
Leiden, The Netherlands

+31 617674650

riccardopengo@gmail.com

Languages

Spanish ~ CEFR level B1

English ~ CEFR level C1

Italian ~ Native speaker

Computer skills

LaTeX

Linux

SAGE

PARI-GP

C

Python

Matlab®

Education

2015- **M.Sc. in Mathematics** — EQF level 7
ALGANT Master | University of Milan & Leiden University

2012-2015 **B.Sc. *summa cum laude* in Mathematics** — EQF level 6
University of Milan | GPA: 29.47/30

2007-2012 **Upper secondary education diploma** — EQF level 4
Liceo Scientifico "A. Einstein", Milan | Final Grade: 100/100

Teaching

Fall 2016 **Teaching assistantship** — University
"Mathematics for Statisticians" | Leiden University

2012-2016 **Private tutoring for high school students** — High school
Liceo Scientifico "A. Einstein" and others | Milan

Scholarships

2016-2017 **ERASMUS Scholarship** — 10 months, €2400
University of Milan

2012-2015 **INdAM Scholarship for Undergraduate Students** — 3 years, €12000
University of Milan

Project works

July 2016 **Algebraic Surfaces seminar** — Geometry
"Surfaces with zero Kodaira dimension" | University of Milan

July 2016 **Homological Algebra seminar** — Algebra
"Group cohomology and the Mordell-Weil theorem" | University of Milan

June 2016 **Number Theory seminar** — Number theory
"Ramification and the different ideal" | University of Milan

Dec. 2015 **Commutative Algebra seminar** — Algebra
"Axiomatic definition of the Krull dimension" | University of Milan

July 2015 **Final Bachelor Degree seminar** — Number theory
"Algebraic integers: euclidean domains and rings of integers" | University of Milan

Aug. 2014 **INdAM Bachelor Summer School** — Summer school
Perugia, Italy

Aug. 2013 **INdAM Bachelor Summer School** — Summer school
Perugia, Italy

Additional information

2017- **Experience as an amateur actor** — Theatre
"Leiden English Freshers", Leiden

2013-2016 **Experience as an amateur improvisational theatre actor** — Theatre
"Teatro del Vigentino", Milan

2014-2016 **Student reprensentative** — Politics
University of Milan, Department of Mathematics

Mathematical interests

My main mathematical interests are in the field of arithmetic. I am interested in the unique relationships that appear in Number Theory between Algebra, Algebraic Geometry and Analysis. Galois representations, modular and automorphic forms, modular curves, elliptic curves, Shimura varieties and p-adic geometry are among the topics that fascinate and interest me.

Master courses attended - University of Milan

Fall 2015 — **Commutative Algebra, prof. L. Barbieri-Viale & F. Andreatta** — Algebra
Syllabus: substitution principle; spectrum of a ring; Hilbert's Nullstellensatz; primary decomposition; regular rings; integral ring extensions; valuations; Noether's normalization; dimension theory; derivations; Zariski tangent space; primary decomposition of modules; support of a module; associated primes; filtered/graded modules; Artin-Rees lemma; Hilbert-Samuel polynomial; equivalence of different notions of dimensions.

Fall 2015 — **Category theory, prof. S. Mantovani** — Algebra
Syllabus: categories, functors, natural transformations; universal properties, limits and colimits; adjunctions, equivalencences; representable functors and Yoneda's lemma; monads and algebras for a monad, monadic functors; monoidal categories and closed monoidal categories; monoids in a monoidal category; regular and Barr-exact categories; additive categories; abelian categories; toposes.

Fall 2015 — **Geometry of Schemes, prof. P. Stellari** — Algebraic geometry
Syllabus: sheafs of rings; ringed spaces; affine schemes; schemes and morphisms of schemes; rational points; projective, noetherian, reduced, irreducible, integral schemes; dimension theory for schemes; fiber products and base change; morphisms of finite type; separated, proper, projective, smooth and étale morphisms; Zariski's main theorem; quasi-coherent and coherent sheafs.

Fall 2015 — **Complex manifolds, prof. L. van Geemen** — Geometry
Syllabus: complex differentiable manifolds; holomorphic tangent bundle; holomorphic maps and their differential; differential forms of type (p,q); elliptic curves over $\mathbb{C}$; the meromorphic Weierstrass $\wp$ function; plane cubic curves, addition law, j-invariant; vector bundles; the tangent bundle, the canonical bundle, the normal bundle; divisors and line bundles; the adjunction formula; sheaves and presheaves of abelian groups; homomorphisms of sheaves; exact sequences of sheaves; cohomology with coefficients in a sheaf of abelian groups; acyclic resolutions; the De Rham theorem.

Fall 2015 — **Projective algebraic geometry, prof. M. Bertolini** — Algebraic geometry
Syllabus: affine and projective varieties; the Zariski topology; morphisms between varieties; regular, rational and birational maps; tangent space; dimension; Hilbert polynomial; Grassmann varieties; vector bundles; enumerative geometry and Schubert calculus.

Spring 2016 — **Algebraic number theory, prof. F. Andreatta & M. A. Seveso** — Number theory
Syllabus: number fields; number rings and rings of integers; finiteness of the ideal class group and Dirichlet unit theorem; p-adic numbers and fields; valuations, local and complete fields; quadratic and cubic reciprocity; adéle ring and idéle group; Fourier analysis on groups; Tate's thesis, L-functions and the functional equation.

Spring 2016 — **Analytic number theory, prof. G. Molteni** — Number theory
Syllabus: Prime Number Theorem; primes in arithmetic progressions; sieves and Selberg Λ^2 method; Brun-Titchmarsh theorem; Van der Waerden's Theorem, Erdős-Turàn conjecture; introduction to the Green-Tao theorem; Waring's problem.

Spring 2016 — **Algebraic surfaces, prof. A. Lanteri** — Geometry
Syllabus: compact complex surfaces; numerical characters; curves on a surface; intersection theory; the Néron-Severi group and numerical equivalence; Riemann-Roch theorem; Noether's and genus formula; the Hodge index theorem; the Nakai-Moishezon criterion; the ample cone; nef divisors; the nef and Mori cone; Kleiman's criterion; Kawamata rationality theorem; rational and birational maps; linear systems; blowing-ups; Castelnuovo's contraction theorem; minimal models; the Noether-Enriques theorem; Enriques' theorem on minimal models; ruled and rational surfaces; Castelnuovo's rationality criterion; Enriques' ruledness criterion; Kodaira dimension.

Spring 2016 — **Homological algebra, prof. L. Barbieri-Viale** — Algebra
Syllabus: homotopy and homology; abelian categories, chain complexes and chain homotopies; projective and injective resolutions; derived functors; Tor and Ext; sheaf and group cohomology; spectral sequences and applications.

Master courses attended - Leiden University

Fall 2016 — **Galois Representations and Automorphic Forms, prof. P. Bruin & A. Kret** — Number theory

Syllabus: profinite groups; infinite Galois theory; local fields; Hensel's lemma; Eisenstein polynomials; ramification groups; Frobenius elements; Chebotarev's density theorem; adéle and idéle; main theorems of class field theory; weak and strong approximation; representation theory; Artin representations; Artin conductor; l-adic Galois representations; elliptic curves; the Tate module; complex multiplication; étale cohomology; Weil-Deligne representations; Haar measure; Hecke algebras; smooth and admissible representations; unramified representations; the Cartan decomposition and the Satake isomorphism; Steinberg and cuspidal representations; $(\mathfrak{g}, K)$-modules; the local Langlands correspondence; automorphic forms and automorphic representations; adélic modular forms; strong multiplicity one theorem; the global Langlands conjecture.

Fall 2016 — **Characteristic classes, prof. S. Shadrin** — Geometry

Syllabus: Stiefel-Whitney classes: axiomatic definitions, properties and geometric interpretation; Euclidean vector bundles; Stiefel-Whitney classes for the projective space; applications: immersions in the Euclidean space, Stiefel-Whitney numbers and cobordisms; characteristic classes for principal G-bundles; classifying G-bundle; the Grassmannian as a universal space; Stiefel-Whitney classes of the tautological bundle $\gamma_n \to G_n(\mathbb{R}^\infty)$; the cohomology ring of the real Grassmannian; Thom isomorphism theorem; the Euler class; explicit description of the cup product; Mayer-Vietoris and relative Mayer-Vietoris; Leray-Hirsch theorem; splitting principle for vector bundles; Chern classes: definitions and Whitney formula; Todd class and Chern character; cohomology of $G_n(\mathbb{C}^m)$; enumerative problems; Pontrjagin classes; the ring of oriented cobordisms.

Fall 2016 — **Differential geometry, prof. M. Crainic** — Geometry

Syllabus: operations on vector bundles; differential forms with coefficients in a vector bundle; connections on vector bundles; parallel transport; the curvature of a connection; the first Chern class; connections compatible with a metric; the torsion of a connection; Riemannian manifolds and the Levi-Civita connection; geodesics; the tubular neighborhood theorem; Lie groups and Lie algebras; free and proper actions; principal bundles; connections on principal bundles; G-structures.

Spring 2017 — **Topics in Number Theory, prof. P. Stevenhagen** — Number Theory

Syllabus: local fields and valuations; Kronecker-Weber theorem; local and global class field theory.