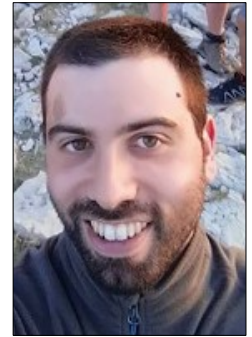


# COHEN Cyril, PhD

## Research themes:

Proof assistants, formalization of mathematics, logic, constructive mathematics, formal methods, type theory, homotopy type theory, cubical type theory.

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Born: 1985 December 13  
Sallanches, France  
Situation: Civil Union  
Others: French driving license



## Professional Situation

**Since 2014 October 1:** Researcher - Inria Sophia Antipolis – Méditerranée  
**2012 October 1 to 2014 September 30:** Postdoctorant - Chalmers (Göteborg, Suède)  
**2009 September 1 to 2012 September 30:** Doctorant contractuel – Inria / École Polytechnique  
**2005 September 1 to 2009 August 31:** Élève fonctionnaire stagiaire – ENS Cachan

## Studies

**From 2009 to 2012:** PhD thesis, *Mention Très Honorable (Summa cum laude)*  
**Thesis award from École polytechnique 2013**

### *Algebraic numbers: formalization and first-order theory*

Team Typical - INRIA Saclay, France

LIX - École Polytechnique, France

Inria - Microsoft Research joint center, Orsay, France

Defended on 2012 November 20 Tuesday, with the following jury:

- Gilles Barthe (president),
- Assia Mahboubi and Benjamin Werner (directors),
- Jeremy Avigad, Jean-Christophe Filliâtre and Marie-Françoise Roy (reviewers),
- Georges Gonthier and Bas Spitters (examiners).

### **2005 – 2009: Student (Élève normalien) at ENS Cachan.**

Track: mathematics and computer sciences

**2008 – 2009:** Computer Science M2, Master Parisien de Recherche en Informatique,  
Coauthorized with ENS Cachan, *Mention Très Bien (Summa cum laude)*

### **2007 – 2008:**

- French agrégation de mathématiques, *reçu 133ème.*
- Mathematics M1, Université Paris 7.

**2006 – 2007:** Computer science M1 at MPRI.

**2005 – 2006:** Computer science and mathematics L3, at Paris 7 University  
*Mention Très Bien. (Summa cum laude)*

### **Internship during studies at ENS Cachan:**

**2009 May – July:** internship for M2 : Quotient types in Coq,  
Inria - Microsoft Research joint center, Orsay, France.

**2007 June – August:** internship in quantum cryptography  
Mc Gill University, Montréal, Canada.

**2006 July – August:** internship in computational linguistics  
LaBRI - INRIA Futurs, France.

**2003 – 2005: prep school at lycée du Parc, Lyon.**

**2003: Baccalauréat S (A Level), France, *Mention Très Bien (Summa cum laude)*.**

# Research

## Publications in journals with reviews

- Guillaume Cano, Cyril Cohen, Maxime Dénès, Anders Mörtberg and Vincent Silès. Formalized linear algebra over elementary divisor rings in Coq. *Accepted for publication in LMCS, 2015*.
- Cyril Cohen and Thierry Coquand. A constructive version of Laplace's proof on the existence of complex roots. *Journal of Algebra*, may 2013
- Cyril Cohen and Assia Mahboubi. Formal proofs in real algebraic geometry: from ordered fields to quantifier elimination. *Logical Methods in Computer Science*, 2012.

## Publications in international conferences with reviews

- Cyril Cohen, Anders Mörtberg. A Coq Formalization of Finitely Presented Modules. *ITP*, 2014.
- Cyril Cohen, Maxime Dénès, Anders Mörtberg. Refinements for free!. *CPP*, 2013.
- Cyril Cohen. Pragmatic Quotient Types in Coq. *ITP*, 2013.
- Georges Gonthier, Andrea Asperti, Jeremy Avigad, Yves Bertot, Cyril Cohen, François Garillot, Stéphane Le Roux, Assia Mahboubi, Russell O'Connor, Sidi Ould Biha, Ioana Pasca, Laurence Rideau, Alexey Solovyev, Enrico Tassi and Laurent Théry. A Machine-Checked Proof of the Odd Order Theorem. *ITP*, 2013.
- Cyril Cohen. Construction of real algebraic numbers in Coq. *ITP*, 2012.
- Cyril Cohen, Assia Mahboubi. A formal quantifier elimination for algebraically closed fields. *CICM*, 2010.

## Workshops, seminars and tutorials

- *Typeclasses and Setoids*, **Coq tutorial @ ITP 2015**, Nanjing, China, August 2015
- *Refinements for free!*, **68nqrt seminar**, Inria Rennes & Université Rennes 1, June 2015
- *A Coq formalization of a sign determination algorithm*, **TYPES 2015**, Tallinn, Estonia, May 2015
- *A cubical evaluation model for Type Theory*, **Cosynus seminar**, École polytechnique, April 2015
- *Mathematical Components and algebraic numbers*, **TPP 2014**, Fukuoka, Japan, December 2014
- *A Coq formalization of finitely presented modules*, **Marelle seminar**, Sophia Antipolis, November 2013
- *Reasoning about big enough numbers in Coq*, **4th Coq Workshop**, August 2012
- *A construction of real algebraic numbers in Coq*, **Brower Seminar**, Nijmegen University, Netherlands 2012
- *Formalisation de l'élimination des quantificateurs pour les corps réels clos en Coq*, **Univ. Rennes 1**, 2012
- *Construction of real algebraic numbers in Coq*, **MAP 2011**, Leyden, Netherlands
- *Quantifier elimination in real closed fields*, **TYPES 2011**, Bergen, Norway.
- *Formalized foundations of polynomial real analysis*, **TYPES 2010**, Warsaw, Poland

## Miscellaneous

- Attended **Coq Coding Sprint 2015**, Inria Sophia Antipolis
- Member of the program committee **MAP 2014**, IHP, Paris
- Organiser of **Proglog team seminars 2013-2014**, Chalmers, Göteborg
- Visit to **Institute for Advanced Study** in December 2012 and April 2013.
- Teaching Assistant for **MAP Spring School 2012** (Mathematics Algorithms and Proofs).
- Presented a LEGO robot at **Fête de la Science in 2010**, stand *Inria*.

# Teachings

**2015: Coadvising M2 interns : Boris Djalal (Inria Marelle) and Gabriel Lewertoski (Inria  $\pi r^2$ )**

**2015: TP paradigms of programming languages, University of Nice Sophia Antipolis**

**2013 – 2014: Coadvising PhD Student Anders Mörtberg, Chalmers, Göteborg.**

**2009 – 2012: Teaching in École polytechnique.**

Initiation to programming. Algorithmics and programming in Java.

Web programming (HTML, Javascript, PHP, MySQL). Proofs Assistants (Coq).

**August 2008: Passed the competitive examination to become a High School Math teacher.**

**2006 – 2009: Teaching in prep school**

Mathematics interrogations, lycées Saint-Louis and Louis-le-Grand

Lab sessions in Caml Light, lycée Stanislas.

# Languages

**French:** mother language.    **English:** fluent.    **German:** basics.

## Miscellaneous

- President of AIA (Improvisation Theater Association), 2015 – ..., Antibes
- Secretary for « Comité des Projets » at Inria Sophia Antipolis - Méditerranée, 2014 – ...
- Representative for PhD student at « conseil de laboratoire » in LIX, 2010 – 2012.
- Coorganising an improvisation theater convention, 2011 September 17.
- Former technical staff in association Cr@ns (<http://www.crans.org>).
- Salsa dancer, theatre improvisation and magician.