

# Eric Finster

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1 rue Victor Hugo  
Montrouge, 92120  
+33 07 82 45 57 72

## PERSONAL INFORMATION

Eric Finster  
Born 3 Octobre 1980, La Cañada, California, USA  
Nationality: American  
Email: ericfinster@gmail.com  
<https://github.com/ericfinster>  
Fluent in French

## EDUCATION

*Bachelor of Arts*, Mathematics  
University of Virginia, 2004

*Doctor of Philosophy*, Mathematics  
University of Virginia, 2010  
Thesis Advisor: Gregory Arone  
Thesis Title: *Stabilization of Homotopy Limits*

## AREAS OF INTEREST

Type Systems, Programming Language Semantics,  
Topology, Homotopy Theory, Higher Category Theory,  
Formal Proof Theory

## PROGRAMMING LANGUAGES

C/C++, x86 asm, Java, Scala, Javascript,  
Haskell, Ocaml, Python, Agda, Coq

## MOTIVATION

My reasearch has focused mainly on the suprising connection which has emerged between programming language theory, specifically dependent type systems, and the mathematical discipline of *homotopy theory*, a branch of topology in which I did my thesis work. First proposed by the Field's Medal winning mathematician Dr. Vladimir Voevodsky around 2006, this circle of ideas has revolutionized our understanding of the theory of equality in type theory, resulting in a major influx of new ideas from modern mathematics.

## RESEARCH EXPERIENCE

*École Polytechnique Fédérale de Lausanne*  
Sep 2010 - Aug 2012  
Department of Mathematics  
Supervisor: Dr. Kathryn Hess

*Institute for Advanced Study*  
Sep 2012 - Jul 2013  
Univalent Foundations Program  
Supervisor: Dr. Vladimir Voevodsky

*Inria Paris-Roquencourt*  
Dec 2013 - Dec 2014  
Team:  $\pi r^2$   
Supervisor: Dr. Pierre-Louis Curien

*École Polytechnique*  
Mar 2014 - Jan 2017  
Laboratoire d'Informatique (LIX)  
Projet: Tandem  
Supervisor: Dr. Eric Goubault

*Inria - Nantes*  
Feb 2017- Feb 2019  
Team: Gallinette  
Projet: ERC - CoqHott  
Supervisor: Dr. Nicolas Tabareau

*University of Birmingham*  
Feb 2019 - Mar 2020  
Department of Computer Science  
Working Group of Dr. Jamie Vicary

*University of Cambridge*  
Apr 2020 - Present  
Department of Computer Science  
Working Group of Dr. Jamie Vicary

## PUBLICATIONS

*Homotopy Type Theory: Univalent Foundations of Mathematics*  
Collective Book Project, 2013  
<https://homotopytypetheory.org/book/>

*Eilenberg-MacLane Spaces in Homotopy Type Theory*  
Logic in Computer Science (LICS) 2014  
with Dan Licata

*A Mechanization of the Blakers-Massey Theorem in Homotopy Type Theory*  
Logic in Computer Science (LICS) 2016  
with Dan Licata, Peter Lumsdaine, et Kuen-Bang Hou

*A Type Theoretic Definition of Weak  $\omega$ -categories*  
Logic in Computer Science (LICS) 2017  
with Samuel Mimram

**PUBLICATIONS  
(cont'd)**

*Goodwillie's Calculus of Functors and Higher Topos Theory*  
Journal of Topology, Volume 11, Issue 4, 2018  
with Mathieu Anel, Georg Biedermann, André Joyal

*A Generalized Blakers-Massey Theorem*  
Journal of Topology, Volume 13, Issue 4, 2020  
with Mathieu Anel, Georg Biedermann, André Joyal

*Types are Internal  $\infty$ -groupoids*  
Logic in Computer Science (LICS) 2021  
with Mathieu Sozeau and Antoine Allieux

**STUDENT  
SUPERVISION**

Independent Study of Dimitrios Economou, 2016  
University of Colorado, Boulder  
with Matthew Hammer

Thesis project of Thibaut Benjamin, 2017  
Ecole Polytechnique  
with Samuel Mimram

Thesis project of Antoine Allieux, 2018  
Inria Paris-Roquencourt  
with Mathieu Sozeau et Yves Guiraud

**INTERNATIONAL  
INVITATIONS AND  
COLLABORATIONS**

Stockholm University  
Oct-Nov 2015  
collaboration with Dr. Peter Lumsdaine

Wesleyan University  
Mar-May 2017  
collaboration with Dr. Dan Licata

Carnegie Mellon University  
February 2018  
collaboration with Dr. Steve Awodey

University of Regensburg  
March 2018  
collaboration with Dr. Denis-Charles Cisinski

**MISCELLANEOUS**

Organiser, *Young Topologist's Meeting*, Lausanne 2011  
Scientific Committee, *UF/HOTT* Warsaw, 2015  
Scientific Committee, *UF/HOTT* Porto, 2016  
Scientific Committee, *GETCO* Paris, 2020

SEMINARS AND  
CONFERENCES

*Revisiting the Opetopes*  
Scottish Category Theory Seminar  
Glasgow, May 2012

*Type Theory and the Opetopes*  
Higher Dimensional Algebra, Categories, Types  
Ljubljana, 2012

*The Calculus of Opetopes*  
Institute for Advanced Study  
Princeton, January 2013  
<https://video.ias.edu/1213/univalent/0131-EricFinster>

*Cohomology in Homotopy Type Theory*  
Institute for Advanced Study  
Princeton, March 2013  
<https://video.ias.edu/univalent/1213/0306-EricFinster>

*The Language of Opetopic Categories*  
Workshop on Opetopes, Opetopic Sets and Opetopic Categories  
Warsaw, March 2013

*Opetopic Diagrams as a Language for Higher Categorical Proofs*  
Mathematical Structures of Computation  
Lyon, January 2014

*Opetopic Diagrams as a Language for Higher Categorical Proofs*  
Journées de la Fédération de Recherche en Mathématiques  
Institute Henri Poincaré, Paris, May 2014

*A Survey of Univalent Foundations*  
Université Paris-Diderot  
Paris, November 2014  
<https://www.youtube.com/watch?v=z3IBvmrc0bg>

*Opetopic Diagrams and Higher Categorical Proof Theory*  
Higher-Dimensional Rewriting and Applications  
Warsaw, May 2015

*Towards an Opetopic Type Theory*  
Invited Researcher Seminars  
Stockholm, October 2015 (2 lectures)

*Higher Categories with Families*  
Homotopy Type Theory Workshop  
Max Planck Institute, Bonn, Feb 2016

*The Identity of Proofs*  
Workshop, Mathématiques et Philosophie des Mathématiques  
Toulouse, April 2016

*Opetopic Higher Categories, a Diagrammatic Approach*  
GDR Topologie Algebrique  
Paris, December 2016

*Left Exact Modalities in Type Theory*  
Journées Nationales Géocal  
Nantes, November 2017

*Left Exact Modalities in Type Theory*  
Carnegie Mellon Logic Seminar  
Pittsburgh, February 2018

*Left Exact Modalities in Type Theory*  
Cambridge Logic and Semantics Seminar  
Cambridge, March 2018

*The Catt Proof Assistant*  
Journées PPS  
Fontainebleau, June 2018

*The Cotopological Tower*  
GDR Topologie Algebrique  
Montpellier, October 2018

*Egalité et identité dans les fondements des mathématiques*  
Le Même et l'autre: identité, orthogonalité, types  
Lyon, November 2018

*Towards Higher Universal Algebra in Type Theory*  
Journées PPS  
IRIF, Paris, Nov 2018

*Towards Higher Universal Algebra in Type Theory*  
Homotopy Type Theory Electronic Seminar  
Online, December 2018  
<https://www.youtube.com/watch?v=h1CVHVtAlqQ>

*A Type Theoretic View of Goodwillie Calculus*  
Workshop on Geometry in Modal Homotopy Type Theory  
Carnegie-Mellon, Pittsburgh, March 2019  
<https://www.youtube.com/watch?v=bcUk416B8jI>  
<https://www.youtube.com/watch?v=xIHq6XcVEBE>