Guillaume Brunerie

Curriculum Vitae

(last updated in December 2017)

▬▬▬ Education/Employment

2016–current	**Postdoctoral member**, *Institute for Advanced Study*, Princeton, New Jersey.
2013–2016	**PhD student**, *Université de Nice Sophia Antipolis*, Nice, France.
2012–2013	**Visiting student**, *Institute for Advanced Study*, Princeton, New Jersey.
2009–2013	**Élève normalien**, *École Normale Supérieure*, Paris, France.
2007–2009	**Classes préparatoires MPSI/MP***, *Lycée Louis-le-Grand*, Paris, France.

▬▬▬ Degrees

2016	PhD in mathematics at the university of Nice (mention très honorable)
2012	Master 2 in mathematics at the ENS and Paris 7 (grade 18.7/20)
2011	Master 1 in mathematics at the ENS (grade 17/20)
2010	Licence 3 in mathematics at the ENS (grade 18/20)

▬▬▬ PhD Thesis

Title	*On the homotopy groups of spheres in homotopy type theory*
Institution	Université de Nice Sophia Antipolis, Laboratoire J.A. Dieudonné (mathematics)
Advisor	Carlos Simpson
Defense date	June 15th 2016

▬▬▬ Teaching experience

May 2015	Mini-course on homotopy type theory for PhD students in the PhD colloquium *Inter'Actions 2015*, Grenoble, France (7 hours)
2013–2016	Oral interrogations in linear algebra and exercise sessions in linear algebra, discrete mathematics and calculus, for students in first year of university, Nice, France (total 192 hours)

▬▬▬ Other awards

2007	Member of the French delegation for the *International Mathematics Olympiads* in Hanoi, Vietnam (obtained a bronze medal)
2007	First prize in mathematics and regional award in physics at the *Concours général des lycées*

Publications

2017 **The James construction and $\pi_4(\mathbb{S}^3)$ in homotopy type theory**, Guillaume Brunerie, *Journal of Automated Reasoning, Special Issue on Homotopy Type Theory and Univalent Foundations*, accepted for publication

2015 **A Cubical Approach to Synthetic Homotopy Theory**, Dan Licata and Guillaume Brunerie, *Logic in Computer Science (LICS 2015), pages 92–103, IEEE, doi:10.1109/LICS.2015.19*

2013 **$\pi_n(\mathbf{S}^n)$ in Homotopy Type Theory**, Dan Licata and Guillaume Brunerie, *Certified Programs and Proofs (CPP 2013), volume 8307 of Lecture Notes in Computer Science (LNCS), pages 1–16, Springer, doi:10.1007/978-3-319-03545-1*

Preprints and non-refereed publications

2017 **Cartesian Cubical Type Theory**, Carlo Angiuli, Guillaume Brunerie, Thierry Coquand, Kuen-Bang Hou (Favonia), Robert Harper, Daniel R. Licata, preprint

2013 **Homotopy Type Theory: Univalent Foundations of Mathematics**, The Univalent Foundations Program (collective book), Institute for Advanced Study, 2013, `http://homotopytypetheory.org/book/`

Talks

Nov. 2017 **The Steenrod squares in homotopy type theory**, *Topology Seminar*, Western University of Ontario, London, Ontario, Canada.

Sep. 2017 **Homotopy type theory: working invariantly in homotopy theory**, *Short talks by postdoctoral members*, School of Mathematics, IAS, Princeton, New Jersey.

Jun. 2017 **The Steenrod squares in homotopy type theory**, *TYPES 2017*, Budapest, Hungary.

Mar. 2017 **The Steenrod squares in homotopy type theory**, *MURI Team Meeting*, Carnegie Mellon University, Pittsburgh, Pennsylvania.

Mar. 2017 **Invariant homotopy theory in homotopy type theory**, *Topology seminar*, University of Illinois Urbana-Champaign, Urbana, Illinois.

Sep. 2016 **Invariant homotopy theory in the univalent foundations**, *Short talks by postdoctoral members*, School of Mathematics, IAS, Princeton, New Jersey.

Jul. 2016 **Custom definitional equalities in Agda**, *ICMS 2016*, Berlin, Germany.

Jun. 2016 **Examples of closed natural numbers in homotopy type theory**, *Séminaire Chocola*, Lyon, France.

May 2016 **The fourth homotopy group of the three-dimensional sphere**, *Workshop on Homotopy Type Theory and Univalent Foundations of Mathematics*, Fields Institute, Toronto, Ontario, Canada.

Jul. 2015 **A Cubical Approach to Synthetic Homotopy Theory**, *LICS 2015*, Kyoto, Japan.

May 2015 **Théorie des types dépendants et axiome d'univalence**, *Inter'Actions 2015*, Grenoble, France.
(minicourse of 7h)

Dec. 2014	**Théorie des types cubiques**, *Séminaire Logique et Interactions*, Université d'Aix-Marseille, Marseille, France.
Nov. 2014	**The fourth homotopy group of the three-sphere**, *Homotopy Type Theory Workshop*, University of Oxford, United Kingdom.
Oct. 2014	**Cubical homotopy type theory**, *Agda Implementors' Meeting XX*, Tallinn, Estonia.
Sep. 2014	**Homotopy type theory**, *Conférence HOGT*, Université de Nice Sophia Antipolis, Nice, France.
May 2014	**Cubical homotopy type theory**, *Formalization of mathematics in proof assistant*, Institut Henri Poincaré, Paris, France.
Jan. 2014	**Cubical homotopy type theory**, *Recent developements in Type Theory*, Lyon, France.
Jan. 2014	**Homotopy Type Theory**, *Journées francophones des languages applicatifs*, Fréjus, France.
Dec. 2013	**Introduction à la théorie des types homotopiques**, *Groupe de travail Algèbre supérieure*, Université de Nice Sophia Antipolis, Nice, France. (series of 3 talks)
Oct. 2013	**A type-theoretic definition of weak infinity-groupoids**, *Stockholm Logic Seminar*, Stockholm, Sweden.
Oct. 2013	**Homotopy type theory and homotopy groups of spheres**, *Séminaire Chocola*, Lyon, France.
Sep. 2013	**The Hopf Fibration**, *Conference on Type Theory, Homotopy Theory and Univalent Foundations*, Barcelona, Spain.
Sep. 2013	**What is missing for Agda to be suitable for Univalent Foundations?**, *Agda Implementors' Meeting XVIII*, Gothenburg, Sweden.
Jun. 2013	**An elementary definition of weak ∞-groupoids**, *CMS Summer Meeting*, Halifax, Nova-Scotia, Canada.
May 2013	**A type-theoretic definition of weak ∞-groupoids**, *ASL North American Annual Meeting*, Waterloo, Ontario, Canada.
Apr. 2013	**Homotopy Theory in Type Theory**, *Seminar of the Institute for Advanced Study*, Princeton, New Jersey. (together with Dan Licata and Peter Lumsdaine)
Mar. 2013	**The James construction and $\pi_4(\mathbb{S}^3)$**, *Seminar of the IAS special year*, Princeton, New Jersey.
Feb. 2013	**$\pi_2(\mathbb{S}^2)$ in HoTT**, *Seminar of the IAS special year*, Princeton, New Jersey.
Jan. 2013	**Weak infinity-groupoids**, *Seminar of the IAS special year*, Princeton, New Jersey. (series of 2 talks)
Nov. 2012	**$\pi_k(\mathbb{S}^n)$ for $k < n$**, *Seminar of the IAS special year*, Princeton, New Jersey.
Oct. 2012	**Higher inductive types**, *Tutorial of the IAS special year*, Princeton, New Jersey.

May 2012	**Théorie des types homotopiques, fondations univalentes et types inductifs supérieurs**, *Mini-cours de l'équipe Analyse Algébrique de l'Institut de Mathématiques de Jussieu*, Paris, France. (series of 2 talks)
Apr. 2012	**Introduction à la théorie des types homotopiques, fondations univalentes des mathématiques**, *Groupe de travail « Algèbre et topologie homotopiques »*, Université Paris 7, France. (series of 2 talks)
Jan. 2012	**Théorie des types homotopiques**, *Groupe de travail d'élèves de logique de l'ENS*, Paris, France. (series of 2 talks)
Oct. 2011	**Introduction à la théorie des types homotopiques**, *Groupe de travail « Catégories supérieures, polygraphes et homotopie »*, Laboratoire PPS, Paris, France. (series of 3 talks)
Feb. 2009	**Le théorème de complétude de Gödel**, *Séminaire de mathématiques des élèves du lycée Louis le Grand*, Paris, France.

Languages spoken

Native	**French**
Fluent	**English**
Intermediate	**Portuguese, Polish, Russian**