

# Philipp Haller

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Interests	Programming languages, type systems, concurrent and distributed programming	
Professional Experience	<b>KTH Royal Institute of Technology, Sweden</b> <i>School of Computer Science and Communication</i> Assistant professor (tenure track)	2014 – present
	<b>Typesafe, Switzerland</b> Consultant and software engineer	2012 – 2014
	<b>Stanford University, USA</b> <i>Department of Electrical Engineering</i> Post-doctoral fellow	2011 – 2012
	<b>EPFL, Switzerland</b> <i>School of Computer and Communication Sciences</i> Post-doctoral researcher	2011 – 2012
	Research assistant	2006 – 2010
Education	<b>EPFL, Switzerland</b> Doctor of Science in Computer Science Advisor: Martin Odersky Thesis title: “Isolated Actors for Race-free Concurrent Programming”	2006 – 2010
	<b>Karlsruhe Institute of Technology, Germany</b> Dipl.-Inform. in Computer Science, awarded highest distinction	2001 – 2006
Awards & Nominations	<ul style="list-style-type: none"><li>• Nomination for EPFL Doctorate Award <i>School of Computer and Communication Sciences, EPFL</i></li><li>• Prize of Excellence (exceptional teaching contribution) <i>School of Computer and Communication Sciences, EPFL</i></li><li>• Best Student Paper Award <i>9th International Conference Coordination Models and Languages</i></li><li>• e-fellows Scholarship <i>Deutsche Telekom AG and McKinsey &amp; Company</i></li><li>• Full Scholarship <i>German National Academic Foundation</i></li><li>• Karls-Preis (exceptional social contribution) <i>Karls-Gymnasium Stuttgart, Germany</i></li></ul>	2010 2008 2007 2004 – 2010 2001 – 2006 2000

## Keynotes and Invited Talks

Invited talks &  
lectures

- Invited Talk: Swedish Multicore Day, December 2016, Sweden
- Invited Talk: Northeastern University, September 2016, USA
- Invited Talk: Scala World, September 2016, UK
- Invited Talk: ECOOP Doctoral Symposium, July 2016, Italy
- Invited Lecture: TU Darmstadt, May 2016, Germany
- **Keynote:** parallel conference, April 2016, Germany
- Invited Talk: ACM SPLASH Doctoral Symposium, October 2015, USA
- **Keynote:** ACM SPLASH ETX Workshop, October 2015, USA
- Invited Talk: Vrije Universiteit Brussel, December 2014, Belgium
- Invited Talk: ECOOP Summer School, July 2014, Sweden
- Invited Talk: ACM SPLASH-I Series, October 2013, USA
- Invited Talk: Skills Matter, December 2012, UK
- Invited Talk: Scala eXchange, November 2012, UK
- **Keynote:** ACM SIGPLAN AGERE Workshop, October 2012, USA
- Invited Talk: Scalathon, July 2011, USA
- Invited Talk: Saarland University, May 2009, Germany
- Invited Talk: Universität Freiburg, November 2008, Germany
- Invited Talk: IT University of Copenhagen, June 2008, Denmark
- Dagstuhl Seminars (including seminars 16402, 17051)

## Funding Awarded

**Swiss CTI** 2014 – 2016  
co-PI M. Odersky, 388,522 EUR

**Marianne och Marcus Wallenbergs Stiftelse** 2016 – 2018  
co-PI M. Wiggberg, 206,155 EUR

## Teaching Activities

Teaching  
Experience

**KTH Royal Institute of Technology, Sweden** 2015 – 2017  
*Lecturer, examiner*  
Compiler construction, 9.0 ECTS credits, Spring 2015, 2016, 2017  
In addition to a full lecture series, students develop a complete compiler including an individual compiler extension as a course project.

**UPMARC Multicore Computing Summer School** 2011  
*Invited lecturer*  
Designed and taught a series of lectures for graduate students on multicore programming in Scala. A majority of the lectures were based on libraries and frameworks that I developed as part of my graduate work.

**International Summer School on Trends in Concurrency** 2008

Lecturer

Helped design and teach a series of lectures for graduate students on concurrent programming in Scala using actors and joins. All lectures were based on my graduate research projects.

**EPFL, Switzerland**

2006 – 2009

Teaching Assistant, Prof. Martin Odersky

Duties as head teaching assistant included shared administrative responsibilities with faculty instructor, fielding of all student inquiries, and oversight of student teaching assistants.

- Compiler Construction, Fall 2006, Fall 2007
- Advanced Programming, Spring 2007, Fall 2007 (head TA)
- Foundations of Software (M.Sc. level), Fall 2008 (head TA)
- Foundations of Software (M.Sc. level), Fall 2009 (sole TA)
  - Designed new student project using the Coq proof assistant

**Publication List**

Publications

**Statistics:** Google scholar reports 14 papers cited at least 14 times each.

See <http://scholar.google.com/citations?user=sDt5PL4AAAAJ>

**Refereed Journals and Conference Proceedings**

**OOPSLA 2016**

- Philipp Haller, Alex Loiko. “LaCasa: Lightweight Affinity and Object Capabilities in Scala.” *Proceedings of the 2016 ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications, 2016.*

**Onward! 2016**

- Heather Miller, Philipp Haller, Normen Müller, Jocelyn Boullier, Jorge Vicente Cantero. “Function Passing: A Model for Typed, Distributed Functional Programming.” *Proceedings of the 2016 ACM International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software, 2016.*

**SCALA 2016**

- Philipp Haller, Simon Geries, Michael Eichberg, and Guido Salvaneschi. “Reactive Async: Expressive Deterministic Concurrency.” *Proceedings of the 2016 ACM SIGPLAN Symposium on Scala, 2016.*

**ECOOP 2014**

- Heather Miller, Philipp Haller, and Martin Odersky. “Spores: A Type-Based Foundation for Closures in the Age of Concurrency and Distribution.” *Proceedings of the 28th European Conference on Object-Oriented Programming, 2014.* (Google Scholar: **10 citations**)

**ICSE 2014**

- Heather Miller, Philipp Haller, Lukas Rytz, and Martin Odersky. “Functional Programming For All! Scaling a MOOC for Students and Professionals Alike.” *Proceedings of the 36th International Conference on Software Engineering, Software Engineering Education and Training (SEET) Track, 2014.* (Google Scholar: **12 citations**)

- OOPSLA 2013** • Heather Miller, Philipp Haller, Eugene Burmako, and Martin Odersky. “Instant Pickles: Generating Object-Oriented Pickler Combinators for Fast and Extensible Serialization.” *Proceedings of the 27th ACM SIGPLAN International Conference on Object Oriented Programming Systems Languages & Applications*, 2013. (Google Scholar: **21 citations**)
- ECOOP 2012** • Lukas Rytz, Martin Odersky, and Philipp Haller. “Lightweight Polymorphic Effects.” *Proceedings of the 26th European Conference on Object-Oriented Programming*, 2012. (Google Scholar: **33 citations**)
- HOSC 2012** • Tiark Rompf, Adriaan Moors, Nada Amin, Philipp Haller, and Martin Odersky. “Scala-Virtualized: Linguistic Reuse for Deep Embeddings.” *Higher-Order and Symbolic Computation*, Vol. 25, No. 1, March 2012. (Google Scholar: **30 citations**)
- ECOOP 2010** • Philipp Haller and Martin Odersky. “Capabilities for Uniqueness and Borrowing.” *Proceedings of the 24th European Conference on Object-Oriented Programming*, 2010. (Google Scholar: **79 citations**)
- TCS 2009** • Philipp Haller and Martin Odersky. “Scala Actors: Unifying Thread-based and Event-based Programming.” *Theoretical Computer Science*, Vol. 410, No. 2, February 2009. (Google Scholar: **324 citations**)  
Significantly extended version of the COORDINATION’07 paper below.
- COORDINATION 2008** • Philipp Haller and Tom Van Cutsem. “Implementing Joins Using Extensible Pattern Matching.” *Proceedings of the 10th International Conference on Coordination Models and Languages*, 2008. (Google Scholar: **46 citations**)
- COORDINATION 2007** • Philipp Haller and Martin Odersky. “Actors that Unify Threads and Events.” *Proceedings of the 9th International Conference on Coordination Models and Languages*, 2007. (**Best Student Paper Award**)  
The above paper has also been featured on Lambda the Ultimate, and in articles on IBM developerWorks, and DZone (more than **70,000 hits!**)
- JMLC 2006** • Philipp Haller and Martin Odersky. “Event-based Programming Without Inversion of Control.” *Proceedings of the 7th Joint Modular Languages Conference*, 2006. (Google Scholar: **123 citations**)  
The above paper has also been featured on Lambda the Ultimate (more than **20,000 hits!**), and in an article on IBM developerWorks.

#### **Refereed Workshops (Excluding Short Versions of Papers Above)**

- PLACES 2017** • Philipp Haller and Fredrik Sommar. “An Empirical Study of Affine Types for Isolated Actors in Scala.” *10th Workshop on Programming Language Approaches to Concurrency- and Communication-centric Software (PLACES '17)*, 2017.
- PLACES 2017** • Philipp Haller and Ludvig Axelsson. “Quantifying and Explaining Immutability in Scala.” *10th Workshop on Programming Language Approaches to Concurrency- and Communication-centric Software (PLACES '17)*, 2017.

- ProWeb 2017** • Lucas Wiener, Tomas Ekholm, and Philipp Haller. “Modular Responsive Web Design: An Experience Report.” *International Workshop on Programming Technology for the Future Web (ProWeb '17)*, 2017.
- NWPT 2015** • Philipp Haller and Heather Miller. “A Formal Model for Direct-style Asynchronous Observables.” *27th Nordic Workshop on Programming Theory (NWPT '15)*, 2015.
- AGERE! 2015** • Gianluca Stivan, Andrea Peruffo, and Philipp Haller. “Akka.js: Towards a portable actor runtime environment.” *5th ACM SIGPLAN International Workshop on Programming based on Actors, Agents and Decentralized Control (AGERE! '15)*, 2015.
- REM 2013** • Philipp Haller and Heather Miller. “RAY: Integrating Rx and Async for Direct-style Reactive Streams.” *ACM SPLASH Workshop on Reactivity, Events and Modularity*, 2013.
- LCPC 2012** • Aleksandar Prokopec, Heather Miller, Tobias Schlatter, Philipp Haller, and Martin Odersky. “FlowPools: A Lock-free Deterministic Concurrent Dataflow Abstraction.” *25th International Workshop on Languages and Compilers for Parallel Computing*, 2012. (Google Scholar: **21 citations**)  
Invited to *Revised Selected Papers of the 25th International Workshop on Languages and Compilers for Parallel Computing, Lecture Notes in Computer Science, Vol. 7760*, 2013.
- Big Learning 2011** • Heather Miller, Philipp Haller, and Martin Odersky. “Tools and Frameworks for Big Learning in Scala: Leveraging the Language for High Productivity and Performance.” *NIPS Workshop on Parallel and Large-scale Machine Learning*, 2011.
- SCALA 2011** • Philipp Haller and Heather Miller. “Parallelizing Machine Learning – Functionally: A Framework and Abstractions for Parallel Graph Processing.” *2nd Scala Workshop*, 2011.
- CAP 2010** • Philipp Haller. “Static Debugging of Programs Using High-level Concurrency Libraries.” *ACM SPLASH Workshop on Concurrency for the Application Programmer*, 2010. Position Paper.
- SCALA 2010** • Philipp Haller. “Lightweight Language Support for Type-based, Concurrent Event Processing.” *1st Scala Workshop*, 2010.

### Invited Papers

- AGERE! 2012** • Philipp Haller. “On the Integration of the Actor Model in Mainstream Technologies: The Scala Perspective.” *Proceedings of the 2nd International Workshop on Programming based on Actors, Agents, and Decentralized Control*, 2012. (Google Scholar: **26 citations**)

### Books

- Philipp Haller and Frank Sommers. “Actors in Scala.” *Artima*, 2011 (Google Scholar: **39 citations**)

## Other Work (Unrefereed)

- Michel Schinz and Philipp Haller. “A Scala Tutorial for Java Programmers.” *Scala Website* ([scala-lang.org](http://scala-lang.org)). This popular tutorial has been translated to Spanish, Japanese, and German.

## Research Students Supervised

- Ph.D. student, since 09/2016, Xin Zhao, KTH
- M.Sc. thesis, since 09/2016, Ludvig Axelsson “Quantifying and Explaining Immutability in Scala,” KTH
- M.Sc. thesis, since 09/2016, Fredrik Sommar, “An Empirical Study of Affine Types for Isolated Actors in Scala,” KTH
- M.Sc. thesis, 09/2015 to 06/2016, Alexandre Loiko, “Type Systems for Uniqueness and Borrowing,” KTH
- M.Sc. thesis, 01/2016 to 06/2016, Simon Geries, “Safety and efficiency of new abstractions for reactive, asynchronous programming,” KTH
- M.Sc. thesis, 01/2016 to 06/2016, Johan Stenberg, “Snapple: A distributed, fault-tolerant, in-memory key-value store using Conflict-Free Replicated Data Types,” KTH
- M.Sc. thesis, 01/2015 to 06/2015, Lucas Wiener, “Modular responsive web components,” KTH
- M.Sc. thesis, 02/2014 to 01/2015, Alon Dolev (external student of Erik Meijer), “Scalable Join-Pattern Matching for Observables,” TU Delft
- M.Sc. level, 09/2013 to 01/2014, Louis Bliss, “Incremental Picklers for Scala Pickling,” co-supervision with Heather Miller, EPFL
- M.Sc. level, 09/2012 to 01/2013, Tobias Schlatter, “FlowSeqs: Barrier-Free ParSeqs,” co-supervision with Heather Miller and Aleksandar Prokopec, EPFL
- M.Sc. level, 02/2012 to 06/2012, Tobias Schlatter, “Multi-Lane FlowPools,” co-supervision with Heather Miller and Aleksandar Prokopec, EPFL
- M.Sc. level, 02/2012 to 06/2012, Pierre Grydbeck, “Parallel Machine Learning: An Expectation Maximization Algorithm for Gaussian Mixture Models,” co-supervision with Heather Miller, EPFL
- B.Sc. level, 02/2012 to 06/2012, Bruno Studer, “Parallel Machine Learning: Collaborative Filtering via Alternating Least Squares,” co-supervision with Heather Miller, EPFL
- M.Sc. level, 09/2011 to 01/2012, Eric Zbinden, “Natural Language Programming Analysis in Scala,” co-supervision with Philippe Suter, IBM Research
- M.Sc. level, 09/2011 to 01/2012, Stanislav Peshterliev, “Parallel Natural Language Processing Algorithms in Scala,” co-supervision with Heather Miller, EPFL
- M.Sc. level, 09/2011 to 01/2012, Florian Gysin, “Improving Parallel Graph Processing through the Introduction of Parallel Collections,” co-supervision with Heather Miller, EPFL

- M.Sc. thesis, 09/2011 to 03/2012, Christophe Pache, “Distribution of Workflows using an Actor Model Framework,” EPFL
- M.Sc. level, 02/2011 to 06/2011, Georges Discry, “Extending the Menthor Framework for Parallel Graph Processing to Distributed Computing,” co-supervision with Heather Miller, EPFL
- M.Sc. level, 02/2009 to 06/2009, Rémi Bonnet, “Alias Tracking through Capabilities,” EPFL
- B.Sc. level, 09/2007 to 01/2008, Antoine Yersin, “Scala AIO: New Facilities on top of Java NIO Programming,” EPFL
- M.Sc. level, 09/2007 to 01/2008, Federico Marmorì, “Remote Actors for Distributed Programming,” EPFL
- M.Sc. level, 09/2007 to 01/2008, Thibaud Hottelier, “A Flexible Regular Expression Library for Scala,” EPFL
- M.Sc. level, 09/2007 to 01/2008, Thomas Hofer, “Comet-style Web Applications in Scala,” EPFL

### External Service

Editorial Board, Computer Languages, Systems and Structures, International Journal, Elsevier (since 08/2015)

### Program Committees

- <Programming> 2018: Int’l Conference on the Art, Science, and Engineering of Programming
- ESOP 2018: 27th European Symposium on Programming
- Scala 2017: 8th ACM SIGPLAN Scala Symposium, **Program Co-Chair**
- GPCE 2017: 16th International Conference on Generative Programming: Concepts & Experience
- IWACO 2017: 8th Int’l Workshop on Aliasing, Capabilities & Ownership
- ECOOP 2017: European Conference on Object-Oriented Programming, **Artifact Evaluation Committee Co-Chair**, PC member
- CC 2017: 26th International Conference on Compiler Construction
- FSEN 2017: 7th Int’l Conf. on Fundamentals of Software Engineering
- PLACES 2017: Programming Language Approaches to Concurrency- and Communication-centric Software (ETAPS), **Co-Chair**
- SCALA 2016: 7th ACM SIGPLAN Symposium on Scala
- AGERE! 2016: 6th ACM SIGPLAN International Workshop on Programming based on Actors, Agents, and Decentralized Control (SPLASH), **Co-Chair**
- REBLS 2016: ACM SPLASH Workshop on Reactive and Event-based Languages & Systems
- PMLDC 2016: 1st Workshop on Programming Models and Languages for Distributed Computing (ECOOP)
- ECOOP 2016: European Conference on Object-Oriented Programming
- REBLS 2015: ACM SPLASH Workshop on Reactive and Event-based Languages & Systems
- SPLASH 2015: ACM SPLASH Doctoral Symposium

- AGERE! 2015: 5th ACM SIGPLAN International Workshop on Programming based on Actors, Agents, and Decentralized Control (SPLASH), **Co-Chair**
- SCALA 2015: 6th ACM SIGPLAN Symposium on Scala, **Co-Chair**
- AGERE! 2014: 4th ACM SIGPLAN International Workshop on Programming based on Actors, Agents, and Decentralized Control (SPLASH), **Co-Chair**
- REBLS 2014: Workshop on Reactive and Event-based Languages & Systems (SPLASH)
- SCALA 2014: 5th Workshop on Scala (ECOOP), **Co-Chair**
- PLPV 2014: ACM SIGPLAN Workshop on Programming Languages meets Program Verification (POPL)
- AGERE! 2013: 3rd International Workshop on Programming based on Actors, Agents, and Decentralized Control (SPLASH)
- REM 2013: Workshop on Reactivity, Events and Modularity (SPLASH)
- ECOOP 2013: European Conference on Object-Oriented Programming
- SCALA 2013: 4th Workshop on Scala (ECOOP), **Co-Chair**
- ACME 2013: Workshop on ACadeMics Tooling with Eclipse (ECOOP)
- AGERE! 2012: 2nd International Workshop on Programming based on Actors, Agents, and Decentralized Control (SPLASH)
- LaME 2012: International Workshop on Languages for the Multi-core Era (ECOOP)

### **External Visibility**

- Industry Presentations
- *Scala Days 2016*, June 2016, Berlin, Germany
  - *Scala Days 2015*, June 2015, Amsterdam, Netherlands
  - *Scala Days 2014*, June 2014, Berlin, Germany
  - *Strange Loop 2013*, September 2013, St. Louis, USA
  - *Scala Days 2013*, June 2013, New York City, USA
  - *Emerging Technologies for the Enterprise*, April 2013, Philadelphia, USA
  - *Boston Area Scala Enthusiasts*, August 2012, MIT, Boston, USA
  - *JavaOne 2009*, June 2009, San Francisco, USA
  - *IBM Development Lab Böblingen*, May 2007, Böblingen, Germany
- Memberships
- Professional Member, ACM
  - Member, ACM SIGPLAN
  - Member, German Informatics Society (GI)
  - Member, EPFL Alumni