ICFP 2018
Conference Schedule

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Welcome to ICFP 2018, the 23rd ACM SIGPLAN International Conference on Functional Programming, in St. Louis, Missouri!

ICFP is a forum for sharing work on the principles and practice of functional programming. This year’s conference is colocated with Strange Loop, a software-developer conference that covers a programming languages, databases, security, and distributed systems. The two conferences are being held concurrently, with the main 3-day ICFP program followed by the main 2-day Strange Loop program, and with a joint party at the City Museum in between.

This year ICFP received 120 submissions, including 18 functional pearl submissions and 8 experience report submissions. From these, the program committee selected 40 papers for presentation at the conference, including 6 functional pearls and 3 experience reports. The technical program also includes invited keynotes by Ron Garcia, Pat Hanrahan, and Eugenia Cheng.

As usual, the main ICFP conference is complemented by many affiliated events, including 12 co-hosted symposia and workshops, the ICFP Programming Contest, and the Student Research Competition. Continued from previous years is the SIGPLAN Programming Languages Mentoring Workshop (PLMW) at ICFP to help senior undergraduate and beginning graduate students pursue careers in programming-language research.
Papers presented at main ICFP conference have been accepted for publication in the Proceedings of the ACM on Programming Languages (PACMPL), a Gold Open Access journal publishing research on all aspects of programming languages. PACMPL employs a two-stage reviewing process, which allows the Review Committee to conditionally accept a paper pending specific, mandatory revisions to the paper that the reviewers check before accepting the paper.

This year’s review process employed a Review Committee (RC, a.k.a. Program Committee) with 18 members plus an External Review Committee (ERC) with 43 members. Every paper was reviewed by at least two RC members and at least one ERC member, except papers with an author on the RC, which were reviewed by three ERC members that held it to a higher standard than other submissions. The RC met in person (with one remote participant) on May 10-11 in Salt Lake City. Among the 40 accepted papers, 24 were conditionally accepted, and all conditionally accepted papers were ultimately accepted. The 120 submitted papers included 12 papers with an author on the RC, and 4 of those were accepted.

For each paper that is accepted to the journal, authors are invited to submit an artifact that supports the paper’s claims. Artifacts were reviewed by an Artifact Evaluation Committee (AEC) with 35 members. Papers with accepted artifacts received an “Artifact evaluated: functional” badge in the paper’s published form. Each submitted artifact was reviewed by at least 2 (and in most cases 3) AEC members and discussed in a virtual meeting. For the 40 accepted papers, 27 artifacts were submitted, and 26 were accepted.
Finally, and new to ICFP in 2019, some accepted papers have been designated as Distinguished Papers. The ICFP Steering Committee (SC) introduced the Distinguished Paper designation as a way of promoting the work that appears at ICFP and as an opportunity to promote the careers of community members. The Distinguished Paper designation can be given to no more than 10% of accepted papers. While the RC and ERC obviously cannot predict which papers presented at this year’s conference will turn out to be the most influential and important, the RC and ERC have taken this opportunity to call out a few papers that are particularly worth your attention. Members of the RC and ERC nominated 7 of the accepted papers for a Distinguished Paper designation, and a separate Distinguished Papers Committee (DPC) with 7 members drawn from the RC and ERC made the final decision. Each DPC member read at least 3 of the papers (in camera-ready form) and wrote a brief review, focusing on how strongly the paper should be recommended to ICFP readers. The DPC then decided on the Distinguished Paper designation for 4 papers through a virtual meeting.
We have many people to thank for this year’s program. The success of ICFP relies first and foremost on the authors who submit their work for review and who present their work at the conference. The conference also relies on the work of dozens of committee members, who unfailingly devote more time and energy into organization, reviews, and publicity than is justified by any scrupulous accounting of the rewards. We would like to thank Alex Miller for working with us over several years to make the ICFP and Strange Loop colocation successful; Alex has been very generous in his support of ICFP. Last but certainly not least, we would like to thank Annabel Satin for her efforts—also over several years and on more fronts than anyone can track—to make ICFP successful.

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Sunday, Sept. 23, 2018

**HIW: Invited Talk**

9:00 - 9:05am: *Welcome to HIW*  Joachim Breitner

9:05 - 10:00am: *Invited Talk: Let’s Go Mainstream with Eta!*  Rahul Muttineni

**HIW: GHC**

10:20 - 10:45am: *GHC Update*  Simon Peyton Jones

10:45 - 11:10am: *Source Plugins*  Matthew Pickering

11:10 - 11:35am: *Generalized Abstract GHC.Generic*  Ryan Scott


11:51am - 12:00pm: *Lightning talk: The trick which makes exceptions-0.10.0 possible*  Samuel Gélineau

**HIW: Types**

1:30 - 1:55pm: *Coercion Quantification*  Ningning Xie and Richard A. Eisenberg

1:55 - 2:20pm: *Type-level visible type application*  My Nguyen

2:20 - 2:45pm: *Implementing Linear Haskell*  Matthew Pickering and Arnaud Spiwack
2:45 - 2:53pm: Lightning talk: Implementing a VMware Haskell Client with Extensible Records  Matthew Russell

2:53 - 3:01pm: Lightning talk: Asterius: Bringing Haskell to WebAssembly  Shao Cheng

3:01 - 3:10pm: Lightning talk: Performance impact of control flow optimization  Andreas Klebinger

**HIW: Tools and Hardware**  Illinois Central

3:30 - 3:55pm: Pier: yet another Haskell build tool  Judah Jacobson

3:55 - 4:20pm: Clash: a practical Haskell to circuit compiler  Christiaan Baaij

4:20 - 4:28pm: Lightning talk: More Explicit Foralls in GHC  Matthew Yacavone

4:28 - 4:45pm: GHC Community Discussion  Simon Peyton Jones

**HOPE: morning-1**  Frisco+Burlington Route

9:00 - 10:00am: A preview of a tutorial on L (polarized μμ̃)  Kenji Maillard, Étienne Miquey, Xavier Montillet, Guillaume Munch-Maccagnoni, and Gabriel Scherer

**HOPE: morning-2**  Frisco+Burlington Route

10:20 - 11:00am: Finding fixed points faster  Michael Arntzenius
### HOPE: morning-3
**Frisco+Burlington Route**

11:20am - 12:00pm: *A Metalanguage for Guarded Iteration*  
Sergey Goncharov, Christoph Rauch, and Lutz Schöder

### HOPE: afternoon-1
**Frisco+Burlington Route**

1:30 - 2:10pm: *Functional programming with MLTS*  
Ulysse Gérard, Dale Miler, and Gabriel Scherer

### HOPE: afternoon-2
**Frisco+Burlington Route**

2:30 - 3:10pm: *Taming Control Flow through Linear Effect Handlers*  
Daan Leijen and Jonathan Immanuel Brachthäuser

### HOPE: afternoon-3
**Frisco+Burlington Route**

3:30 - 4:10pm: *A domain theory for statistical probabilistic programming*  
Ohad Kammar, Matthijs Vákár, and Sam Staton

### PLMW @ ICFP: Session 1
**New York Central**

- 9:00 - 9:30am: *What an SMT solver can do for you*  
  Nadia Polikarpova

- 9:30 - 10:00am: *Gradual Types*  
  Ronald Garcia

### PLMW @ ICFP: Session 2
**New York Central**

- 10:20 - 10:50am: *I'm a Young Assistant Professor: AMA. + Heather's Unsolicited Advice About Grad School*  
  Heather Miller
10:50am - 12:00pm: Interactive Game  Joachim Breitner and Niki Vazou

**PLMW @ ICFP: Session 3**

New York Central

1:30 - 2:03pm: *How to write a Great Research Paper*  Simon Peyton Jones

2:03 - 2:36pm: *Dependent Types*  Stephanie Weirich

2:36 - 3:10pm: *An opinionated talk on how to give talks*  Ranjit Jhala

**PLMW @ ICFP: Session 4**

New York Central

3:30 - 4:30pm: *Panel Discussion: Research in Functional Programming*

David Darais, Leonidas Lampropoulos, Katie Ots, Ivan Perez, and Alejandro Russo
ICFP Keynotes and Reports: Monday Keynote
Stifel Theatre

9:00 - 10:00am: *Gradual Typing*  Ronald Garcia

ICFP Research Papers: Environments and Tools
Stifel Theatre

★ 10:30 - 10:52am: *Build Systems à la Carte*  Andrey Mokhov, Neil Mitchell, and Simon Peyton Jones

10:52 - 11:15am: *Keep Your Laziness in Check*  Kenneth Foner, Hengchu Zhang, and Leonidas Lampropoulos


11:37am - 12:00pm: *Functional Programming for Compiling and Decompiling Computer-Aided Design*  Chandrakana Nandi, James R. Wilcox, Taylor Blau, Dan Grossman, and Zachary Tatlock

ICFP Research Papers: Program Construction
Stifel Theatre

1:00 - 1:22pm: *Prototyping a Functional Language using Higher-Order Logic Programming: A Functional Pearl on Learning the Ways of λProlog/Makam*  Antonis Stampoulis and Adam Chlipala

1:22 - 1:45pm: *A Type and Scope Safe Universe of Syntaxes with Binding: Their Semantics and Proofs*  Guillaume Allais, Robert Atkey, James Chapman, Conor McBride, and James McKinna
1:45 - 2:07pm: *Reasonably Programmable Literal Notation*  
Cyrus Omar and Jonathan Aldrich

2:07 - 2:30pm: *Refunctionalization of Abstract Abstract Machines: Bridging the Gap between Abstract Abstract Machines and Abstract Definitional Interpreters (Functional Pearl)*  
Guannan Wei, James Decker, and Tiark Rompf

**ICFP Research Papers: Continuations and Effects**  
Stifel Theatre

3:00 - 3:23pm: *Capturing the Future by Replaying the Past (Functional Pearl)*  
James Koppel, Gabriel Scherer, and Armando Solar-Lezama

3:23 - 3:46pm: *Handling Delimited Continuations with Dependent Types*  
Youyou Cong and Kenichi Asai

3:46 - 4:10pm: *Versatile Event Correlation with Algebraic Effects*  
Oliver Bračevac, Nada Amin, Guido Salvaneschi, Sebastian Erdweg, Patrick Eugster, and Mira Mezini
ICFP Research Papers: Probabilistic Programming and Learning

Stifel Theatre

★ 4:40 - 5:02pm: The Simple Essence of Automatic Differentiation  Conal Elliott

5:02 - 5:25pm: Functional Programming for Modular Bayesian Inference  Adam Ścibior, Ohad Kammar, and Zoubin Ghahramani

5:25 - 5:47pm: Contextual Equivalence for a Probabilistic Language with Continuous Random Variables and Recursion  Mitchell Wand, Ryan Culpepper, Theophilos Giannakopoulos, and Andrew Cobb

5:47 - 6:10pm: Teaching How to Program using Automated Assessment and Functional Glossy Games (Experience Report)  José Bacelar Almeira, Alcino Cunha, Nuno Macedo, Hugo Pacheco, and José Proença

ICFP Student Research Competition: Poster Reception

Grand Hall

6:30 - 8:30pm: SRC Poster Reception
ICFP Keynotes and Reports: Tuesday Keynote

Stifel Theatre

9:00 - 10:00am: The Role of Functional Programming and DSLs in Hardware  Pat Hanrahan

ICFP Research Papers: Compilation and Concurrency

Stifel Theatre

10:30 - 10:52am: Competitive Parallelism: Getting Your Priorities Right
Stefan K. Muller, Umut Acar, and Robert Harper

10:52 - 11:15am: Static Interpretation of Higher-Order Modules in Futhark: Functional GPU Programming in the Large
Martin Elsman, Troels Henriksen, Danil Annenkov, and Cosmin Oancea

11:15 - 11:37am: Finitary Polymorphism for Optimizing Type-Directed Compilation
Atsushi Ohori, Katsuhiro Ueno, and Hisayuki Mima

11:37am - 12:00pm: Fault Tolerant Functional Reactive Programming (Functional Pearl)
Ivan Perez

ICFP Keynotes and Reports: Report on ICFP and Climate Change

Stifel Theatre

12:15 - 12:50pm: Report on ICFP and Climate Change  Benjamin C. Pierce
ICFP Research Papers: Proof Techniques and Mechanization

Stifel Theatre

1:00 - 1:22pm: *MoSeL: A General, Extensible Modal Framework for Interactive Proofs in Separation Logic*  
Robbert Krebbers, Jacques-Henri Jourdan, Ralf Jung, Joseph Tassarotti, Jan-Oliver Kaiser, Amin Timany, Arthur Charguéraud, and Derek Dreyer

1:22 - 1:45pm: *Mtac2: Typed Tactics for Backward Reasoning in Coq*  
Jan-Oliver Kaiser, Beta Ziliani, Robbert Krebbers, Yann Régis-Gianas, and Derek Dreyer

1:45 - 2:07pm: *Compositional Soundness Proofs of Abstract Interpreters*  
Sven Keidel, Casper Bach Poulsen, and Sebastian Erdweg

★ 2:07 - 2:30pm: *Equivalences for Free: Univalent Parametricity for Effective Transport*  
Nicolas Tabareau, Éric Tanter, and Matthieu Sozeau

ICFP Research Papers: Bidirectional Programming

Stifel Theatre

3:00 - 3:22pm: *What You Needa Know about Yoneda: Profunctor Optics and the Yoneda Lemma (Functional Pearl)*  
Guillaume Boisséau and Jeremy Gibbons

3:22 - 3:45pm: *Incremental Relational Lenses*  
Rudi Horn, Roly Perera, and James Cheney
3:45 - 4:07pm: Synthesizing Quotient Lenses  Solomon Maina, Anders Miltner, Kathleen Fisher, Benjamin C. Pierce, Dave Walker, and Steve Zdancewic

4:07 - 4:30pm: Generic Deriving of Generic Traversals  Csongor Kiss, Matthew Pickering, and Nicolas Wu

ICFP Student Research Competition: Finalist Presentations

5:00 - 5:40pm: Finalist Presentations

ICFP Programming Contest: Contest Report and Results

5:40 - 6:10pm: Contest Report and Results  Matthew Fluet
### ICFP Keynotes and Reports: Wednesday Keynote

**Stifel Theatre**

- **9:00 - 10:00am:** *Conveying the Power of Abstraction*  
  Eugenia Cheng

### ICFP Research Papers: Semantics

**Stifel Theatre**

- **10:30 - 10:52am:** *Partially-Static Data as Free Extension of Algebras*  
  Jeremy Yallop, Tamara von Glehn, and Ohad Kammar

  - **10:52 - 11:15am:** *Relational Algebra by Way of Adjunctions*  
    Jeremy Gibbons, Fritz Henglein, Ralf Hinze, and Nicolas Wu

- **11:15 - 11:37am:** *Strict and Lazy Semantics for Effects: Layering Monads and Comonads*  
  Andrew Hirsch and Ross Tate

- **11:37am - 12:00pm:** *What's the Difference? A Functional Pearl on Subtracting Bijections*  
  Brent Yorgey and Kenneth Foner

### ICFP Research Papers: Gradual Typing and Proving

**Stifel Theatre**

- **1:00 - 1:22pm:** *A Spectrum of Type Soundness and Performance*  
  Ben Greenman and Matthias Felleisen

- **1:22 - 1:45pm:** *Casts and Costs: Harmonizing Safety and Performance in Gradual Typing*  
  John Peter Campora, Sheng Chen, and Eric Walkingshaw

- **1:45 - 2:07pm:** *Graduality from Embedding-Projection Pairs*  
  Max S. New and Amal Ahmed

### ICFP Research Papers: Complexity and Bounds  
**Stifel Theatre**

3:00 - 3:23pm: *Parallel Complexity Analysis with Temporal Session Types* Ankush Das, Jan Hoffmann, and Frank Pfenning

3:23 - 3:46pm: *Parametric Polymorphism and Operational Improvement* Jennifer Hackett and Graham Hutton

3:46 - 4:10pm: *Tight Typings and Split Bounds* Beniamino Accattoli, Stéphane Graham-Lengrand, and Delia Kesner

### ICFP Research Papers: Dependent Types  
**Stifel Theatre**

4:30 - 4:52pm: *Elaborating Dependent (Co)pattern Matching* Jesper Cockx and Andreas Abel

4:52 - 5:15pm: *Generic Zero-Cost Reuse for Dependent Types* Larry Diehl, Denis Firsov, and Aaron Stump
ICFP Keynotes and Reports: Closing Events

Stifel Theatre

5:15 - 5:30pm: *SIGPLAN Awards*  Satnam Singh

5:30 - 5:40pm: *Student Research Competition Awards*  Ravi Chugh

5:40 - 5:55pm: *Program Chair's Report*  Matthew Flatt

5:55 - 6:00pm: *ICFP 2019 Announcement*  Derek Dreyer

Social Events: Strange Loop Party

City Museum

7:00 - 9:30pm: *Strange Loop Party, ride a bus from the venue to the City Museum*
### Haskell: Keynote

**9:00 - 9:05am:** *Welcome and Chair's Report*  
Nicolas Wu

**9:05 - 10:00am:** *Neither Web nor Assembly (Invited Talk)*  
Andreas Rossberg

### Haskell: Session 1

**10:30 - 11:00am:** *AutoBench: Comparing the Time Performance of Haskell Programs*  
Martin A. T. Handley and Graham Hutton

**11:00 - 11:30am:** *Autobahn 2.0: Minimizing Bangs while Maintaining Performance (System Demonstration)*  
Marilyn Sun and Kathleen Fisher

**11:30am - 12:00pm:** *Improving Typeclass Relations by Being Open*  
Guido Martínez, Mauro Jaskelioff, and Guido De Luca

### Haskell: Session 2

**1:30 - 2:00pm:** *Rhine: FRP with Type-Level Clocks*  
Manuel Bärenz and Ivan Perez

**2:00 - 2:30pm:** *A High-Performance Multicore IO Manager Based on libuv (Experience Report)*  
Dong Han and Tao He

**2:30 - 3:00pm:** *Embedding Invertible Languages with Binders: A Case of the FliPpr Language*  
Kazutaka Matsuda and Meng Wang
Thursday, Sept. 27, 2018

**Haskell: Session 3**  
Illinois Central

3:30 - 4:00pm: *Ghosts of Departed Proofs (Functional Pearl)*  
Matt Noonan

**NPFL: Keynote**  
Texas Special

9:00 - 10:00am: *Daisy - a framework for sound accuracy analysis and optimization of numerical programs*  
Eva Darulova

**NPFL: Talks I**  
Texas Special

10:20 - 10:50am: *Hasktorch: A Comprehensive Haskell Library for Differentiable Functional Programming*  
Sam Stites and Austin Huang

10:50 - 11:20am: *APLicative Programming with Naperian Functors*  
Jeremy Gibbons

**NPFL: Talks II**  
Texas Special

11:20am - 12:00pm: *Error analysis almost for free*  
Eva Richter and Matti Richter

**NPFL: Talks III**  
Texas Special

1:30 - 2:00pm: *A Haskell Interface to Sundials via inline-c*  
Dominic Steinitz

2:00 - 2:30pm: *On the Calculation of Functions in the Algebra of Physical Space*  
Nathan Waivio
### NPFL: Talks IV  
**Texas Special**

2:30 - 3:10pm: *Manifolds as Haskell types*  
Justus Sagemüller

### NPFL: Talks V  
**Texas Special**

3:30 - 4:10pm: *Exact Real Arithmetic for Geometric Operations*  
Pavel Panchekha

### OCaml: Session 1  
**Frisco**

9:00 - 9:05am: *Introduction*  
Andrew Kennedy

9:05 - 9:35am: *The OCaml Platform 1.0*  
Anil Madhavapeddy and Gemma Gordon

9:35 - 9:45am: *The OCaml Software Foundation*  
Michel Mauny and Yann Régis-Gianas

9:45 - 9:50am: *This PDF is an OCaml bytecode*  
Gabriel Radanne

### OCaml: Session 2  
**Frisco**

10:20 - 10:40am: *Abusing Format for fun and profits*  
Gabriel Radanne and Frédéric Bour

10:40 - 11:00am: *RFCs, all the way down!*  
Romain Calascibetta
### OCaml: Session 3
**Frisco**

11:20 - 11:40am: *The Vecosek Ecosystem*  
Sebastien Mondet

11:40am - 12:00pm: *OCaml on the ESP32 chip: Well Typed Lightbulbs Await*  
Lucas Pluvinage, Sadiq Jaffer, and Anil Madhavapeddy

### OCaml: Session 4
**Frisco**

1:30 - 1:50pm: *Wall: rendering vector graphics with OCaml and OpenGL*  
Frédéric Bour

1:50 - 2:10pm: *Winning on Windows: porting the OCaml platform*  
David Allsopp

### OCaml: Session 5
**Frisco**

2:30 - 2:50pm: *R&B: Towards bringing functional programming to everyday's web programmer*  
Hongbo Zhang, Cristiano Calcagno, Jordan Walke, Cheng Lou, and Ricky Vetter

2:50 - 3:10pm: *MLExplain*  
Kévin Le Bon and Alan Schmitt

### OCaml: Session 6
**Frisco**

3:30 - 3:50pm: *Relit: Implementing Typed Literal Macros in Reason*  
Charles Chamberlain and Cyrus Omar

### TyDe: Applications and Monoids
**New York Central**

8:45 - 8:55am: *Welcome!*  
Richard A. Eisenberg and Niki Vazou
8:55 - 9:15am: Extended Abstract: F# OpenCL Type Provider  Kirill Smirenko and Semyon Grigorev

9:15 - 9:35am: Extended Abstract: Comprehending Monoids with Class  Lionel Parreaux and Christoph E. Koch

9:35 - 10:00am: Authenticated Modular Maps in Haskell  Victor Cacciari Miraldo, Harold Carr, Alex Kogan, Mark Moir, and Maurice Herlihy

TyDe: Types  New York Central

10:20 - 10:45am: Typing, Representing, and Abstracting Control: Functional Pearl  Philipp Schuster and Jonathan Immanuel Brachthäuser

10:45 - 11:10am: Extensible Type-Directed Editing  Joomy Korkut and David Thrane Christiansen

11:10 - 11:35am: Sums of Products for Mutually Recursive Datatypes: The Appropriationist’s View on Generic Programming  Victor Cacciari Miraldo and Alejandro Serrano

11:35am - 12:00pm: Implementing Resource-Aware Safe Assembly for Kernel Probes as a Dependently-Typed DSL  Ilya Yanok and Nate Nystrom

TyDe: Keynote  New York Central

1:30 - 2:20pm: Extrinsic vs Intrinsic Specifications, and Subset Types  K. Rustan M. Leino
TyDe: Effect Handlers & Abstract Machine
New York Central

2:20 - 2:45pm: *First Class Dynamic Effect Handlers: or, Polymorphic Heaps with Dynamic Effect Handlers*  Daan Leijen

2:45 - 3:10pm: *From Algebra to Abstract Machine: A Verified Generic Construction*  Carlos Tomé Cortiñas and Wouter Swierstra

TyDe: Error Messages & Contexts
New York Central

3:30 - 3:50pm: *Extended Abstract: Context Constrained Computing*  Robert Atkey and James Wood

3:50 - 4:10pm: *Extended Abstract: Improving Error Messages for Dependent Types*  Joseph Eremondi, Wouter Swierstra, and Jurriaan Hage

ICFP Tutorials: T01: Introduction to Programming and Proving in Cedille
Burlington Route

9:00am - 12:00pm: *T01: Introduction to Programming and Proving in Cedille*  Aaron Stump, Chris Jenkins, and Colin McDonald
ICFP Tutorials: T02: Direct Manipulation Programming in Sketch-n-Sketch

Burlington Route

1:00 - 4:00pm: T02: Direct Manipulation Programming in Sketch-n-Sketch
Ravi Chugh, Nick Collins, Brian Hempel, Justin Lubin, and Mikaël Mayer

ICFP Keynotes and Reports: Strange Loop Keynote

Stifel Theatre

4:30 - 5:20pm: Strange Loop Keynote  Erica Joy Baker

Social Events: Industrial Reception

Regency C

5:30 - 7:30pm: Industrial Reception

Social Events: Strange Loop Unsessions

Unsessions Room

7:00 - 10:00pm: Strange Loop Unsessions at Union Station; see Strange Loop website for details
Friday, Sept. 28, 2018

**Haskell: Session 4**

9:00 - 9:30am: *Deriving Via: or, How to Turn Hand-Written Instances into an Anti-pattern*  
Baldur Blöndal, Andres Löh, and Ryan Scott

9:30 - 10:00am: *Generic Programming of All Kinds*  
Alejandro Serrano and Victor Cacciari Miraldo

**Haskell: Session 5**

10:30 - 11:00am: *Type Variables in Patterns*  
Richard A. Eisenberg, Joachim Breitner, and Simon Peyton Jones

11:00 - 11:30am: *The Thoralf Plugin: For Your Fancy Type Needs*  
Divesh Otwani and Richard A. Eisenberg

11:30am - 12:00pm: *Suggesting Valid Hole Fits for Typed-Holes (Experience Report)*  
Matthías Páll Gissurarson

**Haskell: Session 6**

1:30 - 2:00pm: *A Promise Checked Is a Promise Kept: Inspection Testing*  
Joachim Breitner

2:00 - 2:30pm: *Branching Processes for QuickCheck Generators*  
Agustín Mista, Alejandro Russo, and John Hughes

2:30 - 3:00pm: *Coherent Explicit Dictionary Application for Haskell*  
Thomas Winant and Dominique Devriese
Haskell: Session 7

3:30 - 3:59pm: *Theorem Proving for All: Equational Reasoning in Liquid Haskell (Functional Pearl)*  Niki Vazou, Joachim Breitner, Rose Kunkel, David Van Horn, and Graham Hutton

3:59 - 4:00pm: *Closing Statement*  Nicolas Wu

ML: Invited talk

9:00 - 10:00am: *ELPI: an extension language with binders and unification variables (Invited talk)*  Enrico Tassi

ML: Session 1

10:20 - 10:45am: *Safely Mixing OCaml and Rust*  Stephen Dolan

10:45 - 11:10am: *Rust Distilled: An Expressive Tower of Languages*  Aaron Weiss, Daniel Patterson, and Amal Ahmed

11:10 - 11:35am: *Generating Mutually Recursive Definitions*  Jeremy Yallop and Oleg Kiselyov

11:35am - 12:00pm: *Experience Report: Type-Safe Multi-Tier Programming with Standard ML Modules*  Martin Elsman, Philip Munksgaard, and Ken Friis Larsen
Friday, Sept. 28, 2018

**ML: Session 2**

1:30 - 1:55pm: *ML as a Tactic Language, Again*  Guido Martínez, Danel Ahman, Victor Dumitrescu, Nick Giannarakis, Chris Hawblitzel, Cătălin Hrițcu, Monal Narasimhamurthy, Zoe Paraskevopoulou, Clément Pit-Claudel, Jonathan Protzenko, Tahina Ramananandro, Aseem Rastogi, and Nikhil Swamy

1:55 - 2:20pm: *Design and verification of functional proof checkers*  Roberto Blanco

2:20 - 2:45pm: *Disornamentation*  Lucas Baudin and Didier Rémy

2:45 - 3:10pm: *Generic Programming with Combinators and Objects*  Dmitrii Kosarev and Dmitri Boulytchev

**ML: Session 3**

3:30 - 4:10pm: *Programming with Abstract Algebraic Effects*  Dariusz Biernacki, Maciej Piróg, Piotr Polesiuk, and Filip Sieczkowski

**Scala: Keynote**

9:00 - 10:00am: *Cross-Platform Language Design in Scala.js*  Sébastien Doeraene

**Scala: Session 1: Scala Foundations**

10:42 - 11:05am: Initialization Patterns in Dotty  Fengyun Liu, Aggelos Biboudis, and Martin Odersky

11:05 - 11:27am: Path Dependent Types with Path-Equality  Jaemin Hong, Jihyeok Park, and Sukyoung Ryu

11:27 - 11:50am: $\kappa$DOT: Scaling DOT with Mutation and Constructors  Ifaz Kabir and Ondřej Lhoták

**Scala: Student Talks 1**

11:50am - 12:00pm: Julia Subtyping Lessons Scala Could Learn (Student Talk)  Artem Pelenitsyn

12:00 - 12:10pm: Scala with explicit nulls (student talk)  Abel Nieto and Ondřej Lhoták

**Scala: Session 2: Scala Extensions & Parsing**

1:10 - 1:32pm: Garnishing Parsec with Parsley  Jamie Willis and Nicolas Wu

1:32 - 1:55pm: Interflow: Interprocedural Flow-Sensitive Type Inference and Method Duplication  Denys Shabalin and Martin Odersky


2:17 - 2:40pm: Truly Abstract Interfaces for Algebraic Data Types: The Extractor Typing Problem  Nicolas Stucki, Paolo G. Giarrusso, and Martin Odersky
Scala: Student Talks 2

2:40 - 2:50pm: Adding polymorphic functions to Scala (Student Talk)  
Guillaume Martres

2:50 - 3:00pm: Validating Changes in Typechecking on Codebases with SemanticDB (Student talk)  
Max Ovsiankin and Eugene Burmako

Scala: Session 3: DSLs & Sponsor Talk

3:20 - 3:42pm: A Domain-specific Language for Microservices  
Jacob Donham

3:42 - 4:10pm: SemanticDB: a common data model for Scala developer tools  
Eugene Burmako

Scheme: Invited Talk 1

9:00 - 10:00am: From Scripting to Proving: Gradual Verification with a Scheme  
David Van Horn

Scheme: Session 1

10:20 - 10:40am: Growing Schemes: Twenty Years of Scheme Requests for Implementation  
Arthur Gleckler

10:40 - 11:00am: Loop Patterns: Extension of Kleene Star Operator for More Powerful Pattern Matching against Arbitrary Data Structures  
Satoshi Egi
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<td>11:20 - 11:40am: Temporal Logic, μKanren, and a Time-Traveling RDF Database</td>
<td>Nathaniel Rudavsky-Brody</td>
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<tr>
<td>11:40am - 12:00pm: A Surprisingly Competitive Conditional Operator: miniKanrenizing the Inference Rules of Pie</td>
<td>Benjamin Boskin, Weixi Ma, David Thrane Christiansen, and Daniel Friedman</td>
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<td>1:30 - 1:50pm: Racets: Faceted Execution in Racket</td>
<td>Kristopher Micinski, Zhanpeng Wang, and Thomas Gilray</td>
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<td>1:50 - 2:10pm: An Efficient Compiler for the Gradually Typed Lambda Calculus</td>
<td>Andre Kuhlenschmidt, Deyaaeldeen Almahallawi, and Jeremy G. Siek</td>
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<td>2:30 - 2:50pm: Schism: A Self-Hosting Scheme to WebAssembly Compiler</td>
<td>Eric Holk</td>
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<td>2:50 - 3:10pm: Tail Calling Between Code Generated by C and Native Backends</td>
<td>Laurent Huberdeau and Marc Feeley</td>
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<td>3:30 - 4:10pm: Rebuilding Racket on Chez Scheme: An Experience Report</td>
<td>Matthew Flatt</td>
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ICFP Tutorials: T03: Abstracting Gradual Typing: A Systematic Approach to Designing Gradually Typed Languages

Texas Special

9:00am - 12:00pm: T03: Abstracting Gradual Typing: A Systematic Approach to Designing Gradually Typed Languages  Ronald Garcia and Éric Tanter

ICFP Tutorials: T04: Beluga: Programming Proofs About Formal Systems

Texas Special

1:00 - 4:00pm: T04: Beluga: Programming Proofs About Formal Systems Brigitte Pientka, Jacob Thomas Errington, and Aliya Hameer

ICFP Keynotes and Reports: Strange Loop Keynote

Stifel Theatre

4:30 - 5:20pm: Strange Loop Keynote: Machine learning failures - for art! Janelle Shane
Erlang: Opening & Keynote talk
Burlington Route

9:00 - 9:10am: Day Opening  Adrian Francalanza and Natalia Chechina

9:10 - 10:00am: Invited Keynote -- Distributed Erlang: From Datacenter Applications to Planetary Scale Applications  Christopher Meiklejohn

Erlang: Latest News
Burlington Route

10:20 - 11:00am: Latest News from the OTP Team  Kenneth Lundin

Erlang: Session 1
Burlington Route

11:20 - 11:45am: Understanding Formal Specifications through Good Examples  Alex Gerdes, John Hughes, Nicholas Smallbone, Stefan Hanenberg, Sebastian Ivarsson, and Meng Wang

11:45am - 12:00pm: Towards Secure Erlang Systems  Alexandre Jorge Barbosa Rodrigues and Viktória Fördős

Erlang: Session 2
Burlington Route

1:30 - 1:55pm: iDeA: An Immersive Debugger for Actors  Aman Shankar Mathur, Burcu Kulahcioglu Ozkan, and Rupak Majumdar

1:55 - 2:20pm: Automatic Detection of Core Erlang Message Passing Errors  Joseph Harrison

2:20 - 2:30pm: 10 min Coffee break
Saturday, Sept. 29, 2018

**Erlang: Session 3**  
Burlington Route

2:30 - 2:55pm: *Modelling Distributed Erlang within a Single Node*  
Stavros Aronis, Viktória Fördős, and Dániel Szoboszlay

2:55 - 3:10pm: *Modeling Erlang Processes as Petri Nets*  
Jörgen Brandt and Wolfgang Reisig

**Erlang: Final talk and Closing**  
Burlington Route

3:30 - 3:55pm: *Typing the Wild in Erlang*  
Nachiappan Valliappan and John Hughes

3:55 - 4:10pm: *Farewell & Closing*  
Adrian Francalanza and Natalia Chechina

**FARM: Live Coding**  
Jeffersonian+Knickerbocker

9:00 - 9:10am: *Welcome*  
Brent Yorgey, Donya Quick, and Tom Murphy

Miguel Negrão

9:35 - 10:00am: *La Habra — Livecoding with Clojurescript*  
Sarah Groff Hennigh-Palermo

**FARM: Generative Systems**  
Jeffersonian+Knickerbocker

10:20 - 10:45am: *Compositional Computational Constructive Critique: Or, How My Computer Learned to Appreciate Poetry*  
Jennifer Hackett
10:45 - 11:10am: *Chord Progressions in Haskell*  Brittni Watkins

11:10 - 11:35am: *Pattern-Based Algorithmic Music with Euterpea*  Donya Quick

11:35am - 12:00pm: *GAYER: A Graphical Audio player in ReasonML*  Cora Johnson-Roberson

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**FARM: Audio**

Jeffersonian+Knickerbocker

1:30 - 1:55pm: *Programming-by-Example for Audio: Synthesizing Digital Signal Processing Programs*  Mark Santolucito, Kate Rogers, Aedan Lombardo, and Ruzica Piskac

1:55 - 2:20pm: *Call For Collaboration: The Vecosek Ecosystem*  Sebastien Mondet


2:45 - 3:10pm: *(Ab)using a monadic screen-presentation EDSL as a just-intonation synth pad controller*  Justus Sagemüller

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**FARM: Art**

Jeffersonian+Knickerbocker

3:30 - 3:55pm: *Abstract Nonsense*  Ju Gonçalves

3:55 - 4:10pm: *Closing*  Donya Quick, Brent Yorgey, and Tom Murphy
Saturday, Sept. 29, 2018

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<th>FHPC: Morning Session 1</th>
<th>New York Central</th>
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| 8:45 - 9:00am: *Welcome and Introductions*  
Kei Davis and Mike Rainey |
| 9:00 - 10:00am: *HELIX: A Case Study of a Formal Verification of High Performance Program Generation*  
Vadim Zaliva and Franz Franchetti |

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<th>FHPC: Morning Session 2</th>
<th>New York Central</th>
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| 10:20 - 11:20am: *Modular Acceleration: Tricky Cases of Functional High-Performance Computing*  
Troels Henriksen, Martin Elsman, and Cosmin Oancea |
| 11:20am - 12:05pm: *Preventing Data Races with Refinement Types*  
George Stelle |

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<th>FHPC: Afternoon Session 1</th>
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| 1:30 - 2:15pm: *An Efficient Compiler for Recursive Functions on Mostly-Serialized Data*  
Michael Vollmer, Chaitanya Koparkar, Laith Sakka, Milind Kulkarni, and Ryan R. Newton |
| 2:15 - 3:00pm: *Comparing strategies for lightweight threading based on continuations*  
Kavon Farvardin and John Reppy |

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<th>FHPC: Afternoon Session 2</th>
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| 3:30 - 4:15pm: *Optimizing Data Parallelism with Linear Programming in Nessie*  
Joseph Wingerter and John Reppy |
| 4:15 - 5:00pm: *Optional Discussion*  
Kei Davis and Mike Rainey |
ICFP Tutorials: T05: Purely functional UIs with React
Wabash Cannonball

9:00am - 12:00pm: T05: Purely functional UIs with React  Michael Sperber

ICFP Tutorials: T06: Getting Satisfaction out of Games:
Learning to use SAT solvers through puzzles and games
Frisco

9:00am - 12:00pm: T06: Getting Satisfaction out of Games: Learning to use SAT solvers through puzzles and games  Eric Mertens and Jose Calderon

ICFP Tutorials: T07: Writing a chat system in Pony
Texas Special

9:00am - 12:00pm: T07: Writing a chat system in Pony  Andrew Turley

ICFP Tutorials: T08: Implement your own reactive language: the ReactiveML experiment
Wabash Cannonball

1:00 - 4:00pm: T08: Implement your own reactive language: the ReactiveML experiment  Guillaume Baudart, Louis Mandel, Cédric Pasteur, and Marc Pouzet
ICFP Tutorials: T09: Pijul, a purely functional version control system  
Frisco  
1:00 - 4:00pm: T09: Pijul, a purely functional version control system.  
Pierre-Étienne Meunier

ICFP Tutorials: T10: Hop.js: JavaScript multitier programming  
Texas Special  
1:00 - 4:00pm: T10: Hop.js: JavaScript multitier programming  
Manuel Serrano

Social Events: FARM Evening of Algorithmic Arts  
The Luminary  
7:30 - 9:30pm: FARM Evening of Algorithmic Arts
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