

# Tutorial Conclusion

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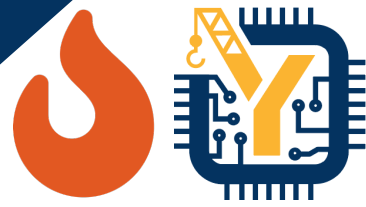
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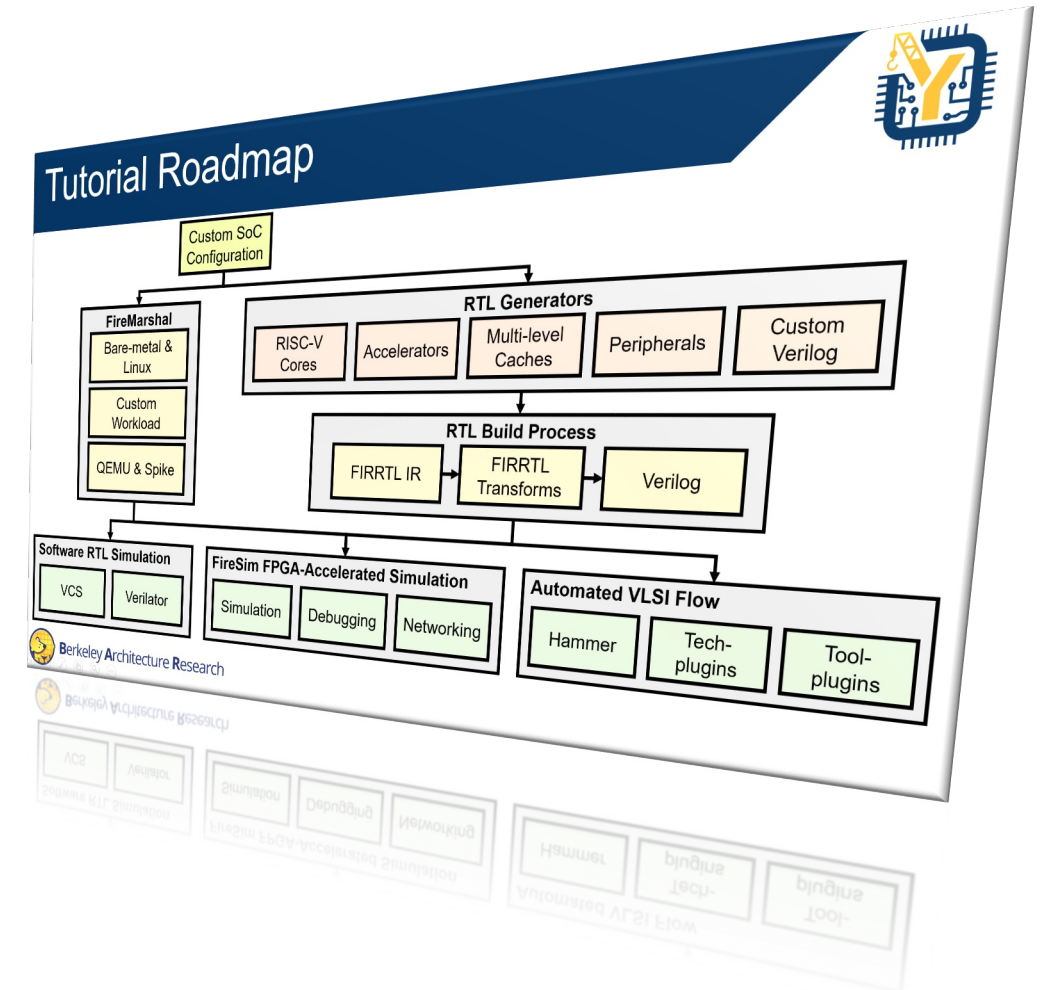
Berkeley  
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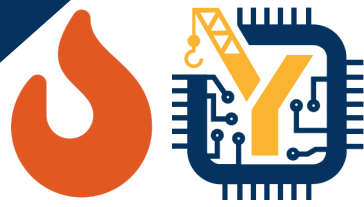
# Recap



- Chipyard Basics
  - Composing SoC using generators
    - **New!:** Constellation NoC generator
  - Adding custom accelerators
  - Simulation
  - VLSI flow:
    - **New!:** fully open-source RTL to GDS flow
- FireSim
  - Full-system FPGA-accelerated simulation
  - Linux-based software workloads
  - Debugging and instrumentation
  - Network simulation
  - **New!:** distributed metasim support!
  - **New!:** local (on-premises) FPGA support!



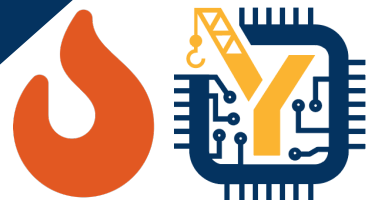
# Join The Community!



- Used in industry and academia
- Development is all open-source and on GitHub
  - “main” branch is active development, may be unstable
  - We recommend using tagged releases (e.g. Chipyard 1.9.0 / FireSim 1.16.0 released a few days ago)
- Sub-projects managed using submodules
- Hundreds of pages of documentation!
  - If something isn't clear, please let us know
- We appreciate feedback! We appreciate PRs even more!
- Thank you for attending!



# Join us at the First FireSim/Chipyard Workshop Tomorrow! [fires.im/workshop-2023](https://fires.im/workshop-2023)



## First FireSim and Chipyard User and Developer Workshop at ASPLOS 2023

March 26, 2023 - Vancouver, BC, Canada

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### Overview

The FireSim and Chipyard user and developer community has experienced rapid growth, with significant cross-institution user and developer collaborations. This full-day workshop at ASPLOS 2023 aims to bring together these communities to help drive the future direction of this ecosystem and spawn new collaborations.

This workshop will feature talks from academic and industrial users of FireSim and Chipyard, across areas like computer architecture, systems, programming languages, and VLSI research/development. We hope that the presentations in this workshop will inspire lively discussion of FireSim/Chipyard governance, feature roadmaps, outreach activities, host platform specifications, and more.

### Keynote

#### FireSim in High-Profile Action—FETT: DARPA's First Ever Bug Bounty Program

[Joe Kiniry](#), Principal Scientist, Galois



**Bio:** Dr. Kiniry is a Principal Scientist at Galois and the Research Lead of several programs: High-assurance Secure Hardware/Firmware Design and Verification, Rigorous Systems Engineering (High-assurance Model-Based Systems and Software Engineering with Digital Twins), Trustworthy and Verifiable Elections, High-assurance Cryptography, and Audits-for-Good. Dr. Kiniry is also the Principled CEO and Chief Scientist of Free & Fair, a Galois spin-out focusing on high-assurance elections technologies and services.

#### Abstract:

Joe will talk about FETT, DARPA's first ever bug bounty program, and how FireSim played a key role in FETT's success. More information about FETT is found here: <https://fett.darpa.mil/>. FETT was a part of the DARPA SSITH program: <https://www.darpa.mil/program/ssith>.

### Program/Schedule

Time (PDT)	Talk Title and Authors	Slides (coming soon)
9:00am - 9:30am	<b>Intro and Welcome</b> Workshop Organizers	PDF
9:30am - 10:20am	<b>Keynote: "FireSim in High-Profile Action—FETT: DARPA's First Ever Bug Bounty Program"</b> Joe Kiniry (Galois, Inc.)	PDF
10:20am - 10:40am	Coffee Break	
10:40am - 11:05am	<b>"TraceDoctor: Versatile High-Performance Tracing for FireSim"</b> Björn Gottschall (Norwegian University of Science and Technology), Magnus Jahre (Norwegian University of Science and Technology)	PDF
11:05am - 11:30am	<b>"Integrating a high performance instruction set simulator with FireSim to cosimulate operating system boots"</b> Jiahua Zhang (Tenstorrent Inc.), Varun Koyyalagunta (Tenstorrent Inc.), Joe Rahmeh (Tenstorrent Inc.), Divyang Agrawal (Tenstorrent Inc.)	PDF
11:30am - 12:00pm	<b>"Developing and Evaluating the nanoPU and nanoSort using Chipyard and Firesim"</b> Stephen Ibanez (Stanford University & Intel), Theo Jepsen (Stanford University & Intel)	PDF
12:00pm - 1:40pm	Lunch	
1:40pm - 2:05pm	<b>"MIRAGE: Mitigating Cache Attacks with a Randomized Fully-Associative Cache"</b> Gururaj Saileshwar (NVIDIA Research & University of Toronto), Moinuddin Qureshi (Georgia Tech)	PDF
2:05pm - 2:30pm	<b>"ChipShop: A Cloud-Based GUI for Accelerating SoC Design"</b> Shahzaib Kashif (Usman Institute of Technology), Talha Ahmed (Usman Institute of Technology), Farhan Ahmed Karim (Universiti Kebangsaan Malaysia)	PDF
2:30pm - 2:55pm	<b>"Profiling an Architectural Simulator"</b> Johnson Umeike (University of Kansas), Alex Manley (University of Kansas), Neel Patel (University of Kansas), Mohammad Alian (University of Kansas)	PDF
2:55pm - 3:20pm	<b>"Berkeley eXtensible Environment: A Cloud-Based Open-Source Computer Architecture Simulation Environment"</b> Farzad Fatollahi-Fard (Lawrence Berkeley National Laboratory), Nirmalendu Patra (Lawrence Berkeley National Laboratory), Angelos Ioannou (Lawrence Berkeley National Laboratory), John Shalf (Lawrence Berkeley National Laboratory)	PDF
3:20pm - 3:40pm	Coffee Break	
3:40pm - 4:05pm	<b>"FireSim on Xilinx U250 and Other Custom Host Platforms"</b> David Christoph Metz (Norwegian University of Science and Technology), Magnus Själander (Norwegian University of Science and Technology)	PDF
4:05pm - 4:30pm	<b>"Ocelot Vector Unit and Integrating SV-based Modules in BOOM"</b> Dongjie (DJ) Xie (Tenstorrent Inc.), Srikanth Arekapudi (Tenstorrent Inc.)	PDF
4:30pm - 5:00pm	<b>Wrap-up and Discussion</b> Workshop Organizers/Attendees	PDF

### Registration

**March 26, 2023 - Vancouver, BC, Canada**

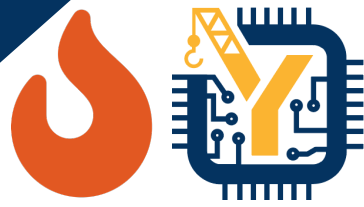
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10:20am – 10:40am	Coffee Break	
10:40am – 11:05am	<b>“FireSim: A High-Performance, Open-Source, Full-System Emulator”</b> <i>Joe Kiniry (Galois, Inc.), Michael J. Hill (University of Wisconsin), and</i>	PDF
11:05am – 11:30am	<b>“Integrating a high performance instruction set simulator with FireSim to cosimulate operating system boots”</b> <i>Jiahua Zhang (Tenstorrent Inc.), Varun Koyyalagunta (Tenstorrent Inc.), Joe Rahme (Tenstorrent Inc.), Divyang Agrawal (Tenstorrent Inc.)</i>	PDF
11:30am – 12:05pm	<b>“Accelerating and Extending the x86-64 CPU and OS Portability of Chipyard and FireSim”</b> <i>David Christoph Metz (Norwegian University of Science and Technology), Thomas Sjaeland (University of Intel)</i>	PDF
12:05pm – 12:40pm	Coffee Break	
1:40pm – 2:05pm	<b>“MIRAGE: Mitigating Cache Attacks with a Randomized Fully-Associative Cache”</b> <i>Gururaj Saileshwar (NVIDIA Research &amp; University of Toronto), Moinuddin Qureshi (Georgia Tech)</i>	PDF
2:05pm – 2:30pm	<b>“ChipSim: A Cloud-Based GUI for Accelerating SoC Design”</b> <i>Abhishek Kashif (University of Illinois), Suman Arora (Intel), and Ahsan Ahmed Karim (Universiti</i>	PDF
2:30pm – 2:55pm	<b>“An Architecture for Simulating a Large Number of Processors”</b> <i>Johnson Linke (University of Kansas), Raj Mahajan (University of Kansas), Neel Patel (University of Kansas), Mohammad Alian (University of Kansas)</i>	PDF
2:55pm – 3:40pm	<b>“Berkeley eXTensible Environment: A Cloud-Based Open-Source Computer Architecture Simulation Environment”</b> <i>Farzad Fatollahi (Lawrence Berkeley National Laboratory), Nishu Patra (Lawrence Berkeley National Laboratory), and</i>	PDF
3:40pm – 4:05pm	<b>“FireSim on Xilinx U250 and Other Custom Host Platforms”</b> <i>David Christoph Metz (Norwegian University of Science and Technology), Magnus Sjaeland (Norwegian University of Science and Technology)</i>	PDF
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# Talks from 10 speakers who use or contribute to FireSim/Chipyard from 12 different institutions!

## Registration



# Learn More



- Chipyard

- Github: <https://github.com/ucb-bar/chipyard/>
- Docs: <https://chipyard.readthedocs.io/en/latest/index.html>
- Mailing List: <https://groups.google.com/forum/#!forum/chipyard>



- FireSim

- Website: <https://fires.im/>
- Github: <https://github.com/firesim/firesim/>
- Docs: <https://docs.fires.im/en/latest/>
- Mailing List: <https://groups.google.com/forum/#!forum/firesim>



**Tutorial Feedback:**

<https://fires.im/tutorial-feedback/>

