

Welcome to ISPDC 2022

21st IEEE International Symposium on Parallel and Distributed Computing

Basel, Switzerland
July 11-13, 2022
ispdc2022.dmi.unibas.ch



University
of Basel



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Technical Committee on Parallel Processing



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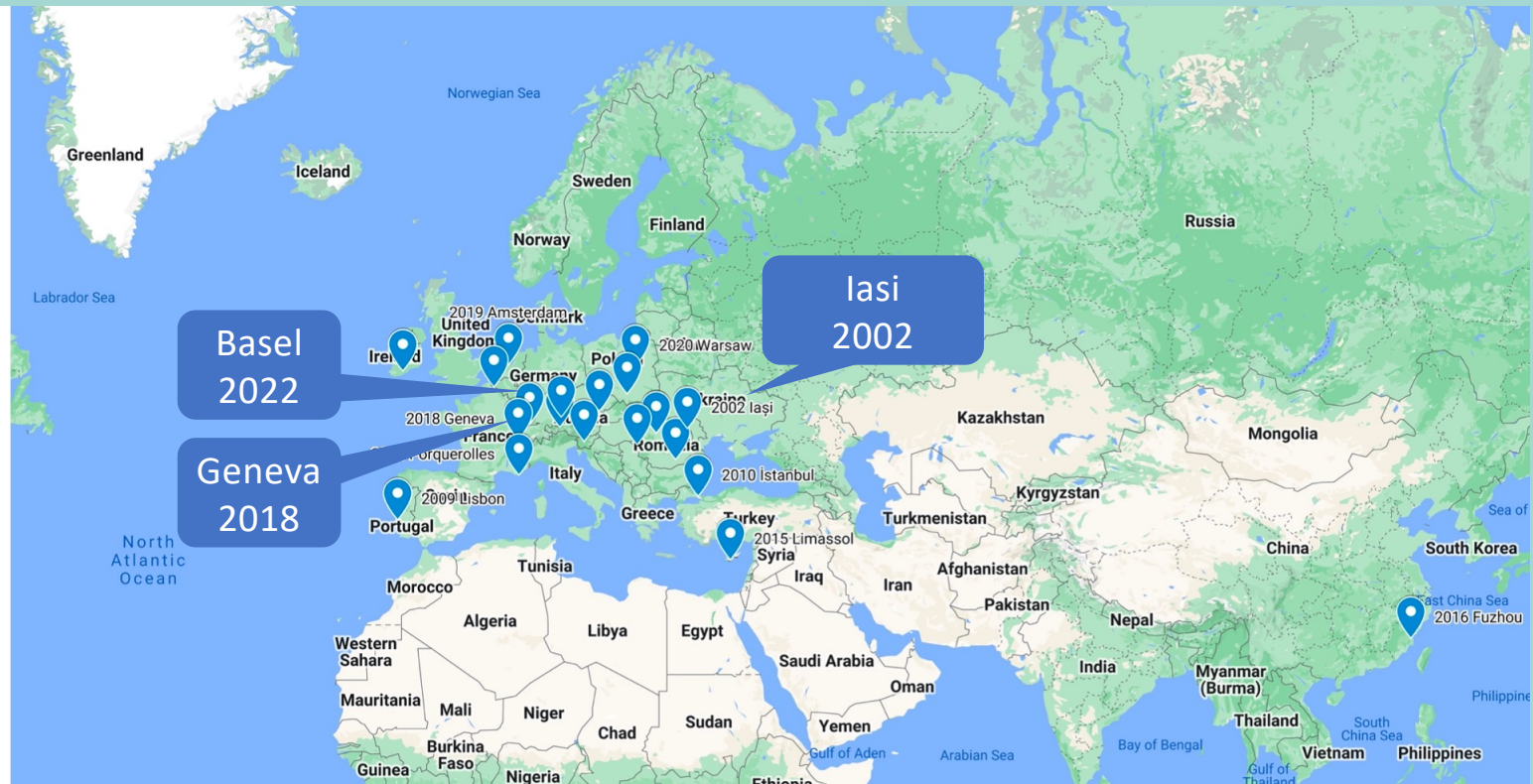
Welcome Remarks from the ISPDC 2022 General Chair

Florina M. Ciorba (University of Basel, Switzerland)

ISPDC: 21 editions

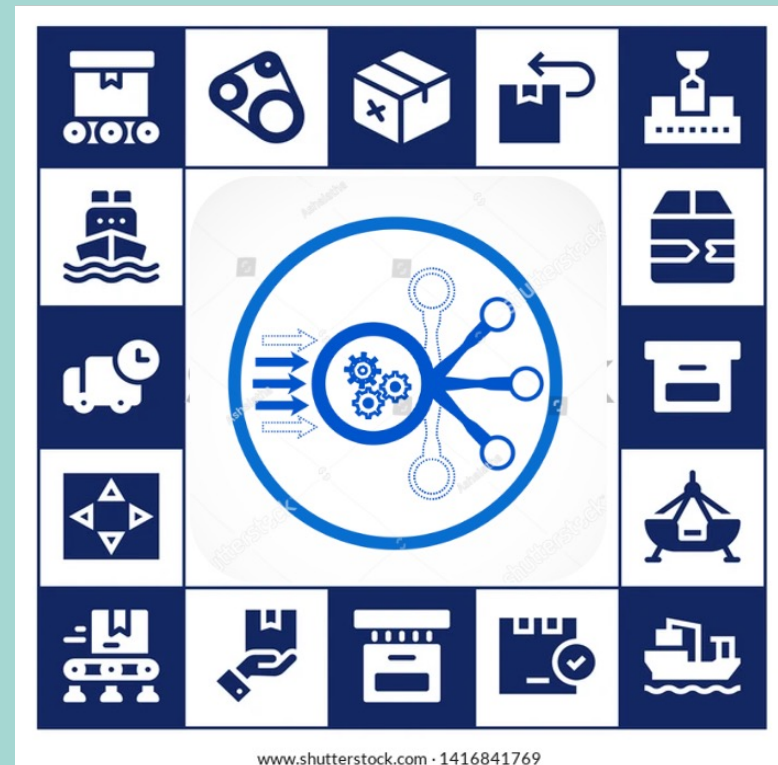
ISPDC 2002-2022

- 2002 Iași
- 2003 Ljubljana
- 2004 Cork
- 2005 Lille
- 2006 Timișoara
- 2007 Hagenberg
- 2008 Kraków
- 2009 Lisbon
- 2010 İstanbul
- 2011 Cluj-Napoca
- 2012 Munich
- 2013 Bucharest
- 2014 Porquerolles
- 2015 Limassol
- 2016 Fuzhou
- 2017 Innsbruck
- 2018 Geneva
- 2019 Amsterdam
- 2020 Warsaw
- 2021 Cluj-Napoca
- 2022 Basel

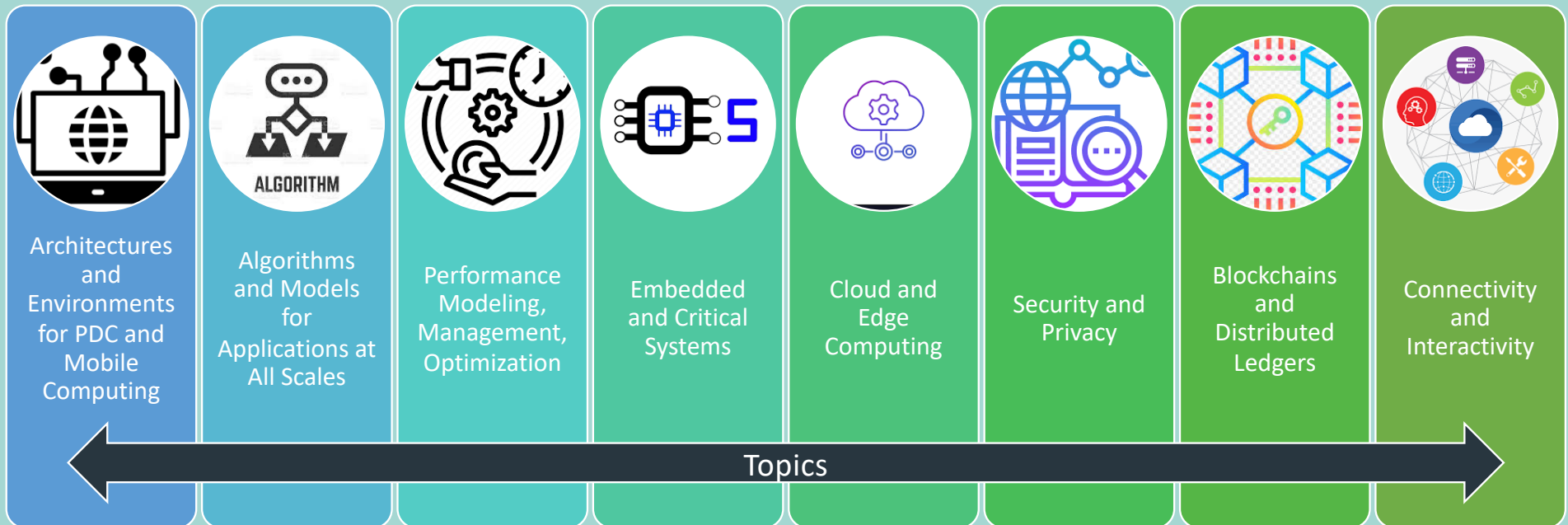


ISPDC Profile

Parallelism and distribution in computing and systems for the advancement & benefit of science, engineering, and society.



ISPDC 2022



ISPDC 2022: ispdc2022.dmi.unibas.ch

20 Original Research Paper Presentations (18 full, 2 short)
On password protected website

6 Oral Research Communications
On password protected website

1 Opening Word
5 Keynote Presentations

4 Coffee breaks
3 Lunch breaks
1 Conference Dinner

1 Day-long Social Event
(optional)

1st ISPDC edition
sponsored by



Opening Word and Keynote Presentations



Torsten Schwede
University of Basel, Switzerland
Opening Word
9:00 Monday



Rosa M. Badia
BSC, Spain
Easy Development and Execution of Workflows with eFlows4HPC
9:15 Monday



Joachim Stadel
University of Zurich, Switzerland
Simulating Our Universe: Leveraging Present and Future Supercomputing Systems
13:30 Monday



Rachid Guerraoui
EPFL, Switzerland
The Road to a Universal Internet Machine
9:00 Tuesday



Utz-Uwe Haus
HPE HPC/AI EMEA Research Lab
The Green vs. Exascale HPC: Carbon-neutral site operations, energy efficiency, and overall sustainability
13:30 Tuesday



Joseph Sifakis
Verimag Laboratory Grenoble, France
Why is it so Hard to Make Self-driving Cars?
9:00 Wednesday



Program

Up on the
terrace

Monday, July 11, 2022 (Day 1)

- 08:00 Registration
- 08:45 **ISPDC 2022 Welcome Remarks** – Florina Ciorba, University of Basel, Switzerland
- 09:00 **Opening word** – Prof. Dr. Torsten Schwede
Vice-President of Research, University of Basel, Switzerland
- 09:15 **[Keynote talk] Easy Development and Execution of Workflows with eFlows4HPC**
Rosa M. Badia, Barcelona Supercomputing Center, Spain
- 10:15 [Break] Coffee (provided)
- Session 1: Large-scale distributed systems – Chair Ahmed Eleliemy**
- 10:40 [Full paper] Deep Heuristic for Broadcasting in Arbitrary Networks
Hovhannes Harutyunyan, Narek Hovhannisyan, and Rakshit Magithiya
- 11:10 [Full paper] FlexiShard: a Flexible Sharding Scheme for Blockchain based on a Hybrid Fault Model,
Tirathraj Ramburn, and Dhruvajyoti Goswami
- 11:40 [Oral communication] Maestro: A Middleware for Data Orchestration in Scientific Workflows
Ali Mohammed, Christopher Haine, and Utz-Uwe Haus
- 12:00 [Oral communication] Real-time scheduling mechanisms for cost-efficient power consumption
strategies, Bogdan-Costel Mocanu and Florin Pop
- 12:20 [Break] Lunch (provided)
- 13:30 **[Keynote talk] Simulating Our Universe: Leveraging Present and Future Supercomputing Systems**
Joachim Stadel, University of Zurich, Switzerland
- Session 2: Acceleration – Chair Hovhannes Harutyunyan**
- 14:30 [Full paper] Online Event Selection for Mu3e using GPUs
Valentin Henkys, Bertil Schmidt, and Niklaus Berger
- 15:00 [Full paper] Cuckoo Node Hashing on GPUs
Muhammad Javed, Hao Zhou, David Troendle, and Byunghyun Jang
- 15:30 [Full paper] Coarse-Grained Floorplanning for Accelerating Quantized Neural Networks on Multi-Die
FPGAs, Danielle Tchuinkou Kwadjo, Erman Nghonda, and Christophe Bobda

Program

Dock near and under
the central bridge

Tuesday, July 12, 2022 (Day 2)

- 09:00 [Keynote talk] The Road to a Universal Internet Machine**
Rachid Guerraoui, École Polytechnique Fédérale de Lausanne, Switzerland
- 10:00 [Break] Coffee (provided)
- Session 3: Parallel, distributed computing, machine learning, and security – Chair Sheikh Ghafoor**
- 10:20 [Full paper] A type system to avoid runtime errors for Multi-ML
Frédéric Gava, Victor Allombert, and Julien Tesson
- 10:50 [Full paper] Estimating the Impact of Communication Schemes for Distributed Graph Processing
Tian Ye, Sanmukh R. Kuppannagari, Cesar A. F. De Rose, Sasindu Wijeratne, Rajgopal Kannan, and Viktor Prasanna
- 11:20 [Full paper] A scalable algorithm for homomorphic computing on multi-core clusters
Frédéric Gava and Léa Bayati
- 11:50 [Oral communication] DAPHNE: An Open and Extensible System Infrastructure for Integrated Data Analysis Pipelines, Patrick Damme
- 12:10 [Short paper] TrustS: Probability based trust management system in smart cities
Bogdan-Costel Mocanu, Gabriel Cosmin Apostol, Dragoş Rădulescu, and Cristina Şerbănescu
- 12:30 [Break] Lunch (provided)
- 13:30 [Keynote talk] Green vs. Exascale HPC : Carbon-neutral site operations, energy efficiency and overall sustainability** (sponsored by HPE), Utz-Uwe Haus, Head of the HPE HPC/AI EMEA Research Lab
- Session 4: High performance computing – Chair Bogdan-Costel Mocanu**
- 14:30 [Full paper] APPFIS: An Advanced Parallel Programming Framework for Iterative Stencil Based Scientific Applications in HPC Environments, Md Bulbul Sharif and Sheikh Ghafoor
- 15:00 [Oral communication] A nonblocking approach for the computation of the Laplacian
Julio Sanchez-Curto and Pedro Chamorro-Posada
- 15:20 [Short paper] A hybrid clustering algorithm for high-performance edge computing devices
Giuliano Laccetti, Marco Lapegna, and Diego Romano
- 18:00 **[Conference dinner] Boat trip on the Rhine** (included in the registration)

Program

Best paper award &
Next year's location

Wednesday, July 13, 2022 (Day 3)

09:00 [Distinguished keynote talk]: **Why is it so Hard to Make Self-driving Cars?**
Joseph Sifakis, Verimag Laboratory, Grenoble, France, 2007 Turing Award Winner

10:00 [Break] Coffee (provided)

Session 5: Program and performance analysis – Chair Josef Spillner

10:30 [Full paper] Performance Comparison of Speculative Taskloop and OpenMP-for-loop Thread Level Speculation on Hardware Transactional Memory, Juan Salamanca

11:00 [Full paper] Analysis and Mitigation of Soft-Errors on High Performance Embedded GPUs
Luca Sterpone, Sarah Azimi, Corrado De Sio, and Filippo Parisi

11:30 [Full paper] Performance Modeling of Scalable Resource Allocations with the Imperial PEPA Compiler, William Sanders, Srishti Srivastava, and Ioana Banicescu

12:15 [Break] Lunch (provided)

Session 6: Networking, distributed computing, and scalability– Chair Frédéric Gava

13:30 [Full paper] Investigating TCP/MPTCP Support for Drop Computing in User Space Network Stacks, Cosmin Stoica, Radu-Ioan Ciobanu, and Ciprian Dobre

14:00 [Full paper] ZPAXOS: An asynchronous BFT PAXOS with a leaderless synchronous group
Dinesh Amarasekera and Nalin Ranasinghe

14:30 [Oral communication] FARGO: Federated leARNinG for human mobility
Radu-Ioan Ciobanu and Ciprian Dobre

14:50 [Break] Coffee (provided)

Session 7: Middleware – Chair Ciprian Dobre

15:30 [Full paper] Workload Deployment and Configuration Reconciliation at Scale in Kubernetes-Based Edge-Cloud Continuums, Hass Daniel and Josef Spillner

16:00 [Full paper] Optimizing the RJMS of an Academic HPC & Research Computing Facility
Sebastien Varrette, Emmanuel Kieffer, and Frederic Pinel

16:30 [Full paper] Communication-Efficient Cluster Scalable Genomics Data Processing Using Arrow Flight, Tanveer Ahmad, Chengxin Ma, and Zaid Al Ars

17:00 **ISPC 2022 Best Paper Award and Closing Remarks** – Florina Ciorba, University of Basel, Switzerland
Invitation to ISPC 2023 in Bucharest, Romania – Ciprian Dobre, University Politehnica Bucharest, Romania

Program

Thursday, July 14, 2022 (Day 4 – optional)

08:30

20:30

[Social event] Hiking in Swiss mountains
(optional – requires separate ticket)

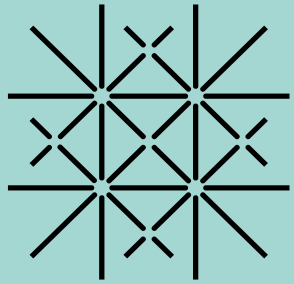
- Oeschinen Lake is a UNESCO World Heritage Site
- Perhaps the most beautiful mountain lake in the Swiss Alps



ISPDC 2022 People

- ispdc2022.dmi.unibas.ch/people/
- Program Committee Co-Chairs
- Proceedings Chair
- Publicity Chairs
- Local Organizing Committee
- Program Committee
- Advisory Committee
- Steering Committee





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University of Basel

- 1460: Pope Pius II founded Switzerland's **first university**
- 1527: **Paracelsus** (Medicine)
- 1532: Reformation, University in Augustinian monastery
- 1588: Botanical garden on Rhine terrace
- 1590: University Library (2'700 books from monasteries)
- 1687: Jakob **Bernoulli** (Mathematics)
- 1733: Leonhard **Euler** (Mathematics)
- 1822: Course catalog in German (vs. Latin)
- 1869: Friedrich **Nietzsche** (Classical Philology)
- 1890: Emilie **Frey** (1st female student, Medicine)
- 1938: Elsa **Mahler** (1st female Professor, Russian & Lit.)
- 1939: Headquarters Kollegienhaus (previously here)
- 1948: Karl **Jaspers** (Philosophy, Psychology, Sociology)
- 1950: Tadeusz **Reichstein** (Nobel Prize for Medicine)
- 1978: Werner **Arber** (Nobel Prize for Medicine)
- 2022: UniBas among the 100 best universities worldwide
13'039 students, 2'900 PhD students, 380 professors
7 faculties



584 Basel. Kollegienhaus der Universität

Basel 
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Grüzi!

Basel – Where the world comes together.

Cultural capital of Switzerland, 40 museums

Well-preserved historic old town

Corner of three different countries:
Switzerland, France, Germany

Free public transportation for all hotel guests

Free surfing via Basel's own WLAN network

Basel Rhine Swim



Opening Word President's Office



Torsten Schwede (Vice President of Research, University of Basel, Switzerland)

9:00 July 11, 2022

Keynote Presentation

Easy Development and Execution of Workflows with eFlows4HPC



Rosa M. Badia (Barcelona Supercomputing Center, Spain)

9:15 July 11, 2022

Keynote Presentation

*Simulating Our Universe: Leveraging
Present and Future Supercomputing Systems*



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Rachid Guerraoui (EPF Lausanne, Switzerland)

9:00 July 12, 2022

Keynote Presentation

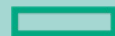
The Green vs. Exascale HPC: Carbon-neutral site operations, energy efficiency, and overall sustainability



Utz-Uwe Haus (HPE HPC/AI EMEA Research Lab)

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Keynote Presentation

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