

Session Program

Aug 8 - 13, 2022



The 39th International Symposium on Lattice Field Theory (Lattice 2022)

Algorithms

Hörsaalzentrum Poppelsdorf, Alle Räume
Endenicher Allee 19 C, 52115 Bonn, Germany

Mon, August 8

2:00 PM

Algorithms: Algorithms I

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Urs Wenger

2:00 - 2:20 PM

Flow-based density of states for complex actions

Speaker
Julian Urban

2:20 - 2:40 PM

Stochastic normalizing flows for lattice field theory

Speaker
Elia Cellini

2:40 - 3:00 PM

Kernel controlled real-time Complex Langevin simulation

Speaker
Daniel Alvestad

3:00 - 3:20 PM

Gauge-equivariant flow models for sampling in lattice field theories with pseudofermions

Speaker
Fernando Romero-Lopez

3:20 - 3:40 PM

Automatic differentiation for stochastic processes

Speaker
Guilherme Telo

3:40 - 4:00 PM

Applying the worldvolume tempered Lefschetz thimble method to lattice field theories

Speaker
Prof. Masafumi Fukuma

4:00 PM

4:30 PM

Algorithms: Algorithms II

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Simone Bacchio

4:30 - 4:50 PM

Status update on flow models for gauge field generation

Speaker
Phiala Shanahan

4:50 - 5:10 PM

Exploration of Efficient Neural Network for Path Optimization Method

Speaker
Yusuke Namekawa

5:10 - 5:30 PM

Reducing the Sign Problem using Line Integrals

Speaker
Rasmus Larsen

5:30 - 5:50 PM

Topology changing update algorithms for SU(3) gauge theory

Speaker

Timo Eichhorn

5:50 - 6:10 PM

Machine Learning Trivializing Maps

Speaker

Joe Marsh Rossney

6:10 - 6:30 PM

Learning trivializing flows

Speaker

David Albandea

6:30 PM

Tue, August 9

2:00 PM

Algorithms: Algorithms III

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Michael Fromm

2:00 – 2:20 PM

Overcoming exponential volume scaling in quantum simulations of lattice gauge theories

Speaker

Christopher Kane

2:20 – 2:40 PM

Exploring the phase structure of the multi-flavor Schwinger model with quantum computing

Speaker

Stefan Kühn

2:40 – 3:00 PM

Digitizing $\mathrm{SU}(2)$ gauge fields and what to look out for when doing so

Speaker

Timo Jakobs

3:00 – 3:20 PM

Defining Canonical Momenta for Discretised $\mathrm{SU}(2)$ Gauge Fields

Speaker

Carsten Urbach

3:20 – 3:40 PM

Toward Quantum Computing Phase Diagrams of Gauge Theories with Thermal Pure Quantum States

Speaker

Connor Powers

3:40 – 4:00 PM

Quantum state preparation algorithms for the Schwinger model with a theta term

Speaker

Alexei Bazavov

4:00 PM

4:30 PM

Algorithms: Algorithms IV

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Alexei Bazavov

4:30 – 4:50 PM

Real time evolution and a traveling excitation in $\mathrm{SU}(2)$ pure gauge theory on a quantum computer.

Speaker

Emanuele Mendicelli

4:50 – 5:10 PM

Determining the Mass Renormalization of the Schwinger Model with Wilson Fermions using Tensor Networks

Speaker

Mr Takis Angelides

5:10 - 5:30 PM

Improving Quantum Simulations towards lattice SU(3)

Speaker

Henry Lamm

5:30 - 5:50 PM

Quantum Computing for Open Systems

Speaker

Bharath Sambasivam

6:30 PM

Wed, August 10

2:00 PM

Algorithms: Algorithms V

Session | Location: CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | Convener: Lena Funcke

2:00 - 2:20 PM **D_n Lattice Gauge Theory on the Quantum Annealer**

Speaker

Michael Fromm

2:20 - 2:40 PM **Quantum computing for lattice supersymmetry**

Speaker

Christopher Culver

2:40 - 3:00 PM **Grassmann tensor-network method for strong-coupling QCD**

Speaker

Jacques Bloch

3:00 - 3:20 PM

Toward tensor renormalization group study of three-dimensional non-Abelian gauge theory

Speaker

Takaaki Kuwahara

3:20 - 3:40 PM

Entanglement filtering and improved coarse-graining on two dimensional tensor networks including fermions

Speaker

Ryo Sakai

3:40 - 4:00 PM **Symmetry breaking in an extended-O(2) model**

Speaker

Leon Hostetler

4:00 PM

4:30 PM

Algorithms: Algorithms VI

Session | Location: CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | Convener: Akio Tomiya

4:30 - 4:50 PM **Density of states techniques for fermion worldlines**

Speaker

Christof Gattringer

4:50 - 5:10 PM

Improved lattice method for determining entanglement measures in SU(N) gauge theories

Speaker

Tobias Rindlisbacher

5:10 - 5:30 PM **Error Reduction using Machine Learning on Ising Worm Simulation**

Speaker
Jangho Kim

5:30 - 5:50 PM

An ML approach to the classification of phase transitions in many flavor QCD

Speaker
Marius Neumann

5:50 - 6:10 PM

Generative models for scalar field theories: how to deal with poor scaling?

Speaker
Javad Komijani

6:10 - 6:30 PM

Mitigating the Hubbard Sign Problem. A Novel Application of Machine Learning

Speaker
Marcel Rodekamp

6:30 PM

Thu, August 11

9:00 AM

Algorithms: Algorithms VII

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Fernando Romero-Lopez

9:00 - 9:20 AM **Infinite Variance in Fermionic Systems**

Speaker

Cagin Yunus

9:20 - 9:40 AM **Oscillating Autocorrelation and the HMC Algorithm**

Speaker

Falk Zimmermann

9:40 - 10:00 AM

Transfer matrices and temporal factorization of the Wilson fermion determinant

Speaker

Urs Wenger

10:00 - 10:20 AM **MLMC++ as a variance reduction method**

Speaker

Mr Mostafa Khalil

10:20 - 10:40 AM **Deflation in multigrid multilevel Monte Carlo**

Speaker

Gustavo Ramirez-Hidalgo

10:40 - 11:00 AM

Towards the Application of Skewed Detailed Balance in Lattice Gauge Theories

Speaker

Joao C. Pinto Barros

11:00 AM

11:30 AM

Algorithms: Algorithms VIII

Session | **Location:** CP1-HSZ, CP1-HSZ/1.004 (CP1-HSZ) - HS7 | **Convener:** Jacques Bloch

11:30 - 11:50 AM **Efficiently unquenching electromagnetism in QCD+QED**

Speaker

Tim Harris

11:50 AM - 12:10 PM

Circuitizing product formulas for (1+1)D SU(2) lattice gauge theories: Lessons from alternative formulations

Speaker

Jesse Stryker

12:10 - 12:30 PM

On the determination of the strong QCD coupling at the Z-pole with new gradient-flow based beta-function

Speaker

Chik Him (Ricky) Wong

12:30 - 12:50 PM

T-mu phase diagram using classical-quantum hybrid algorithm

Speaker

Akio Tomiya

12:50 PM