

# **A Virtual Tribute to Quark Confinement and the Hadron Spectrum 2021**

**Monday, August 2, 2021 - Friday, August 6, 2021**

**online**

## **Scientific Program**

## Invited plenary speakers

- 1) Chris Kelly (confirmed)
- 2) Julius Kuti (confirmed)
- 3) Krzysztof Cichy (confirmed)
- 4) Jan Zaanen (confirmed)
- 5) Andreas Bauswein (confirmed)
- 6) Jonivar Skullerud (confirmed)
- 7) Panos Christakoglou (confirmed)
- 8) Zurab Berezhiani (confirmed)
- 9) Guido Martinelli (confirmed)
- 10) Elke Aschenauer (confirmed)
- 11) Uwe-Jens Wiese (confirmed)
- 12) Gerald Dunne (confirmed)
- 13) Ivan Vitev (confirmed)
- 14) Yukinao Akamatsu (confirmed)
- 15) Eric Braaten (confirmed)
- 16) Andreas Kronfeld (confirmed)
- 17) Felix Ringer (confirmed)
- 18) Antonio Vairo (confirmed)

## Roundtable discussions

## round table on EIC:

JianWei Qiu (chair, confirmed)  
Zhongbo Kang (confirmed)  
Peter Petreczky (confirmed)  
Ignazio Scimeni (confirmed)

## round table on open quantum systems:

Cliff Burgess (confirmed)  
Miguel Escobedo (confirmed)  
Hans-Werner Hammer (chair, confirmed)  
Alexander Rothkopf (confirmed)

## round table on machine learning:

Kyle Cranmer (chair, confirmed)  
Andreas Ipp (confirmed)  
Nobuo Sato (confirmed)  
Phiala Shanahan (confirmed)

## A: Vacuum structure and confinement

Mechanisms of quark confinement (vortices, monopoles, calorons...) and the structure of the vacuum in non-Abelian gauge theories. Chiral symmetry breaking, and the Dirac spectrum in the low-momentum region. Studies of ghost and gluon propagators. Confining strings and flux tubes, their effective actions. Renormalons and power corrections. Interface between perturbative and nonperturbative physics.

**Conveners:** D. Antonov (ITP, U. Heidelberg), M. Faber (TU Vienna), J. Greensite (San Francisco State U)

## Focus Subsection: Emergent Gauge Fields and Chiral Fermions

Chiral fermions and anomalous hydrodynamic effects in condensed matter systems, quantum simulators of QCD, topological phenomena in condensed matter systems.

**Conveners:** F. Assaad (Würzburg U.), K. Jansen (DESY Zeuthen), T. Schaefer (NC State U), V. Shevchenko (NRC Kurchatov I.)

## B: Light quarks

Chiral and soft collinear effective theories; sum rules; lattice calculations; Schwinger-Dyson equations; masses of light quarks; light-quark loops; phenomenology of light-hadron form factors, spectra and decays; structure functions and generalized parton distributions; exotics and glueballs; experiments.

**Conveners:** J. Goity (Hampton U.), B. Ketzer (Bonn U.), M. Constantinou (Temple U.) H. Sazdjian (IPN Orsay), N. G. Stefanis (Ruhr U. Bochum)

## C: Heavy quarks

Heavy-light mesons, heavy quarkonia, heavy baryons, heavy exotics and related topics: phenomenology of spectra, decays, and production; effective theories for heavy quarks (HQET, NRQCD, pNRQCD, vNRQCD, SCET); sum rules for heavy hadrons; lattice calculations of heavy hadrons; heavy-quark mass determinations; experiments.

**Conveners:** G. Bodwin (Argonne NL), P. Pakhlov (ITEP, Moscow), J. Soto (U. Barcelona), A. Vairo (TU Munich)

## D: Deconfinement

QCD at finite temperature; quark-gluon plasma detection and characteristics; jet quenching; transport coefficients; lattice QCD and phases of quark matter; QCD vacuum and strong fields; heavy-ion experiments. experiments.

**Conveners:** P. Foka (GSI), J. Ghiglieri (SUBATECH, Nantes), E. Iancu (CEA/DSM/Saclay), P. Petreczky (BNL), A. Vuorinen (U. Helsinki)

## **E: QCD and New Physics**

Physics beyond the Standard Model from hadronic physics, including precision experimental data and precision calculations.

**Conveners:** W. Detmold (MIT), S. Gardner (U. Kentucky), M. Gersabeck (U. Manchester), E. Mereghetti (LANL), J. Portoles (IFIC, Valencia)

## **F: Nuclear and Astroparticle Physics**

Nuclear matter; nuclear forces; quark matter; neutron and compact stars.

**Conveners:** M. Alford (Washington U. St.Louis), D. Blaschke (U. Wroclaw), T. Cohen (U. Maryland), J. Marton (SMI Vienna), A. Schmitt (U Southampton)

## **G: Strongly Coupled Theories**

Hints on the confinement/deconfinement mechanisms from supersymmetric and string theories; strongly coupled theories beyond the Standard Model; applications of nonperturbative methods of QCD to other fields.

**Conveners:** D. Espriu (U. Barcelona), Z. Fodor (U. Wuppertal), S. Khalil (Zewail City U.), A. Martin (U. Notre Dame), E. Neil (U. Colorado)

## **H. Statistical Methods for Physics Analysis in the XXI Century**

Machine learning techniques; data fitting and extraction of signals; new developments in unfolding methods; averaging and combination of results.

**Conveners:** T. Dorigo (U. Padova), S.V. Gleyzer (CERN), P. Shanahan (MIT), L. Tagliacozzo (U. Barcelona)