

XVth Quark Confinement and the Hadron Spectrum



Monday 1 August 2022 - Saturday 6 August 2022

University of Stavanger

Scientific Programme

Confirmed Plenary Speakers

Nora Brambilla (TU-Munich) - "Summary"**Vladimir Braun** (Regensburg U.) - "Higher Twists"**Hee Sok Chung** (Korea U.) - "Quarkonium production and polarization: where do we stand?"**Giacomo Cacciapaglia** (Lyon U.) - "Strong Dark Matter"**Zohreh Davoudi** (U. Maryland) - "Quantum simulations for QCD: where we are now and what is in reach"**Susan Gardner** (U. Kentucky) - "QCD and BSM"**Nobuo Sato Gonzales** (Jefferson Lab) - "Getting ready for the EIC"**Lukas Heinrich** (TU-Munich) - "New end-to-end optimisation of instruments for particle and nuclear physics applications"**Martin Hoferichter** (U. Bern) - "Interplay of nuclear physics, effective field theories, phenomenology, and lattice QCD in neutrino physics"**Kenta Itahashi** (RIKEN) - "What can pionic atoms tell us about the QCD vacuum"**Nicolo Jacazio** (U. Bologna) - "Heavy ion collisions as a tool: which physics can be explored"**Derek Leinweber** (Adelaide U.) - "Dynamical fermions, center vortices, and emergent phenomena"**Grant Mathews** (Notre Dame U.) - "Neutron star mergers and the quark-matter equation of state"**Swagato Mukherjee** (Brookhaven Lab) - "Lattice QCD for heavy-ion collisions: Status update"**Antonio Pineda** (U. Autònoma Barcelona) - "Renormalons, the plaquette, the gluon condensate and all that"**Saša Prelovšek** (U. Ljubljana) - "QCD confronts heavy flavor and exotic hadrons"**Alexander Rothkopf** (U. Stavanger) - "Real-time dynamics, inverse problems and lattice simulations"**José Peláez Sagredo** (U. Complutense Madrid) - "Light meson scattering: spectroscopy and exotics. Where do we stand?"**Daniel Salvat** (Indiana U.) - "The neutron lifetime problem: where do we stand?"**Gerrit Schierholz** (DESY) - "Towards a dynamical solution of the strong CP problem"**Andrea Shindler** (Michigan State U.) - "Gradient flow, perturbative and nonperturbative renormalisation"**Dam Thanh Son** (U. Chicago) - "Universal properties of neutron rich nuclei near the neutron drip line"**Michael Strickland** (Kent State U.) - "Non equilibrium evolution of quarkonium in medium in the open quantum system approach"**Nazario Tantaló** (INFN Rome) - "Non-perturbative calculation of radiative corrections in weak decays"**Changzheng Yuan** (Institute of HEP) - "Exotic states in the quarkonium sector: status and perspectives"

(and more exciting speakers to be confirmed. Stay tuned!)

Roundtable discussions

Standard Model Anomalies

Joaquim Matias (U. A. Barcelona) - moderator**Ashutosh Kotwal** (Duke U.)**Andrea Mauri** (U. Zurich)**Lukas Varnhorst** (U. Wuppertal)**Tom Tong** (U. Siegen)

Neutron Stars and QCD

David Blaschke (U. Wrocław) - moderator**Kenji Fukushima** (U. Tokyo)**Aleksi Kurkela** (U. Stavanger)**Will Newton** (TAMU)**Michael Coughlin** (U. Minnesota)

QCD Topology and Axions

Guido Martinelli (INFN Rome) - moderator

Claudio Bonati (U. Pisa)

Francesco D'Eramo (U. Padova)

Daniel Nogradi (ELTE)

High Precision QCD Frontier

Ignazio Scimemi (UC Madrid) - moderator

Krzysztof Cichy (Adam Mickiewicz U)

YuMing Wang (Nankai U.)

Gorazd Cvetič (UT Santa Maria)

Timothy Hobbs (Fermilab)

Alexander Manashov (U. Hamburg)

Poster session

The poster session takes place on **Tuesday August 2nd 2022** between **18:00-20:00h** in the **Tjodhallen hall in the KE building**.

Please note that the **poster boards are oriented vertically (portrait)** and we kindly ask you to print your poster accordingly.

Campus maps and room information can be found [here](#).

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), F. Assaad (U. Würzburg), M. Faber (TU Vienna), J. Greensite (San Francisco State U), T. Schäfer (North Carolina State U)

Parallel sessions for track A mainly take place in the EOJ auditorium but some take place in the AR building room G-202. Make sure to check the indico timetable.

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

(IJCLab Orsay), I. Scimemi (U. Complutense de Madrid), N. G. Stefanis (Ruhr U. Bochum)

Parallel sessions for track B take place in the AR building room G-001

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: H.S. Chung (Korea U.), R. Mussa (INFN Torino), J. Soto (U. Barcelona), A. Vairo (TU Munich)

Parallel sessions for track C take place in the AR building room Ø-110

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), P. Petreczky (BNL), A. Vuorinen (U. Helsinki)

Parallel sessions for track D mainly take place in the AR building room Ø-120 but some take place in the AR building room G-202. Make sure to check the indico timetable.

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), M. Mikhasenko (TU-Munich), J. Portoles (IFIC, Valencia)

Parallel sessions for track E take place in the AR building room G-101

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), J. Marton (SMI Vienna), A. Schmitt (U Southampton), L. Tolos (ICE Barcelona)

Parallel sessions for track F take place in the AR building room Ø-130

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.), R. Pasechnik (Lund U.), E. Rinaldi (RIKEN iTHEMS), V. Vento (U. de Valencia)

Parallel sessions for track G take place in the AR building room V-101

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)

Parallel sessions for track B take place in the AR building room G-201