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Proceedings of the
International Conference on Strangeness in Quark Matter 2017

Preface

The 17th edition of the *International Conference on Strangeness in Quark Matter* took place from 10-15 July 2017 in Utrecht in the Netherlands (http://sqm2017.nl). This conference series focuses on new experimental and theoretical developments on the role of strangeness and heavy-flavour production in heavy-ion collisions, and in astrophysical phenomena related to strangeness. This year's conference attracted more than 210 participants from 25 countries, with 20% of female researchers. A two-day long graduate school on the role of strangeness in heavy ion collisions with 40 young participants preceded the conference, which was supported by the Dutch Physical Society (NNV).

The scientific programme consisted of 53 invited plenary talks, 70 contributed parallel talks and a poster session. Three discussion sessions provided scope for the necessary debates on crucial observables to characterise strongly interacting matter at extreme conditions of high baryon density and high temperature and to define possible future directions. One of the discussions centred on hadronic resonance production and their vital interactions in the partonic and hadronic phase that provide evidence for an extended hadronic lifetime even in small collision systems and might affect other observables for the quark-gluon plasma. Moreover, future astrophysical consequences for SQM following the recent detection of gravitational waves were outlined: gravitational waves from relativistic neutron star collisions can serve as cosmic messengers for the phase structure and equation-of-state of dense and strange matter, quite similar to the environment created in relativistic heavy-ion collisions.

Representatives from all major collaborations at the Large Hadron Collider (LHC) and Super Proton Synchrotron at CERN, Brookhaven's Relativistic Heavy Ion Collider (RHIC), and the Heavy Ion Synchrotron SIS at the GSI Helmholtz Centre in Germany made special efforts to release new data at this conference. Thanks to the excellent performance of these accelerator facilities and detectors, a wealth of new data on the production of strangeness and heavy flavour in nuclear collisions has become available.

Among the highlights presented at the conference, the ALICE Collaboration reported new results on strange and multi-strange hyperon production in 5.02 TeV heavy-ion collisions and the first measurement of charm baryons (Λ_c and Ξ_c) in proton-proton and proton-lead collisions at the LHC. Furthermore, ALICE performed the most precise measurement of the (anti-)hypertriton lifetime, an exotic nucleus composed of a proton, a neutron and a lambda particle. The CMS Collaboration reported progress in understanding the energy loss of charm and beauty quarks in the hot QCD medium, while the STAR experiment at RHIC gave an update on global lambda polarisation, which reveals that the curl of the fluid created at RHIC is much higher than that in any fluid ever observed. Enhanced strangeness production in small systems, as reported by the

HADES, NA61/SHINE and ALICE Collaborations, has also reignited the discussion surrounding strangeness production as a signature of the quark-gluon plasma.

Experimentally, the field faces high prospects for future measurements at the Facility for Antiproton and Ion Research in Darmstadt, NICA at JINR Dubna, and at CERN (namely detector upgrades at the LHC during long shutdown 2 and the AFTER programme).
On the theory side, new developments and vigorous research efforts are taking place towards a full understanding of strangeness production and open heavy-flavour dynamics in heavy-ion collisions. Global polarisation in heavy-ion collisions is also a highly debated topic since it allows studying the vorticity of the medium and the initial magnetic field.

A dedicated session was held in memory of Helmut Oeschler who was an active member of the ALICE collaboration and passed away unexpectedly in 2017. Margit Oeschler, Helmut's wife, was present at the memorial session.

Four young scientist prizes, sponsored by the European Physical Journal A, were awarded to the best parallel talk and poster presenters: Heidi Schuldes (Goethe University Frankfurt, Germany), Christian Bierlich (Lund University, Sweden), Yingru Xu (Duke University, US) and Vojtech Pacik (Niels Bohr Institute, Denmark).

André Mischke and Paul Kuijer, Editors

More than 210 participants attended SQM2017 conference in Utrecht (courtesy: Pieter van Dorp van Vliet, Utrecht University).