

Foreword

The *International Workshop on the Physics of Excited Nucleons, NSTAR2019*, the 18th workshop in the esteemed cycle of NSTAR conferences, was held at the University of Bonn, Germany, from June 10-14, 2019. It was the latest of a series of successful conferences at the Rensselaer Polytechnic Institute (1988), Florida State University (1994 and 2005), Jefferson Lab (1995, 2000 and 2011), INT Seattle (1996), George Washington University (1997), ECT* Trento (1998), Mainz (2001), Pittsburgh (2002), the LPSC Grenoble (2004), University of Bonn (2007), Institute of High Energy Physics Beijing (2009), Valencia University (2013), Osaka University (2015) and the University of South Carolina (2017).

The goal of *NSTAR2019* was to bring together experts in all areas of physics relevant to baryon spectroscopy, in experiment, phenomenology and theory. Latest results were presented in 20 plenary talks and 59 parallel contributions. All the proceedings, which we received before the deadline are collected in this volume. The workshop was attended by 114 scientists from 41 universities and laboratories from 16 countries around the world.

Exciting new high-precision data were shown from facilities in Asia, Europe and the US, e.g. BESIII, ELSA, GSI, JLab, MAMI and Spring-8. Large-acceptance detectors provide complete angular distributions in many reaction channels. Over the last years, a special focus has been placed on the measurement of single- and double polarization observables. Many new polarization measurements, as well as their impact on the determination of the nucleon excitation spectrum, have been shown and discussed during the meeting.

On the theory side, new results were presented on *ab initio* calculations of the nucleon resonance spectrum on the basis of Quantum Chromodynamics, either directly in terms of quarks and gluons through lattice gauge theory or via Dyson-Schwinger approaches. Chiral effective-field theories were discussed as well, where resonances are described in terms of nucleons and mesons as effective degrees of freedom. Contributions on quark potential models, capable of shedding light on the nucleon resonance spectrum in more phenomenological terms, were also presented. Methods for the solution of inverse scattering problems, i.e. amplitude analysis and partial-wave analysis, which are very important for hadron physics, were discussed in some detail. Through them, an interface between such models and experiment is established which enables a well-defined comparison between calculations and measurements.

We thank all participants for their valuable contributions and the lively discussions which made the workshop the success that it was. The conference was made possible through the existing financial support of our institutional partners.

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After the fruitful workshop at Bonn University we are looking forward to the next meeting which is planned to be held at Venice (Italy) in 2021.



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