

# Preface

The Thematic Einstein Semester AG+ – *Varieties, Polyhedra, Computation* within the Berlin Mathematics Research Center MATH+ during the winter term 2019/2020 was devoted to connections and collaborations of algebraic geometry with other mathematical fields.

The goal of the semester was to bring together researchers who have worked on a variety of applications with algebraic geometers, to find and exploit algebraic structures in order to extend the scope of traditional research in modeling, simulation and optimization, and, conversely, to progress theory by advancing fundamental mathematics and build new bridges within mathematics.

At the core of the program there were three interrelated streams:

- numerical algebraic geometry & complexity,
- curves, arithmetic & dynamics,
- varieties & convexity.

The semester was opened by a Fall School in October 2019 whose lecture notes can be found in the first part of the present volume. Among the various activities of the semester were the Opening Conference, a Research Retreat and the Milestone Conference at the end. Also part of the semester was the conference on *Brill–Noether theory* held at the end of November 2019. The variety of topics addressed by the workshops, seminars and collaborations during this semester is reflected in the surveys and contributed research articles in this volume's second part.

We would like to take the opportunity to thank the participants and the speakers who made the Thematic Einstein Semester a success. We also like to thank the Berlin Mathematics Research Center MATH+ and the Einstein Foundation for supporting these events.

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