

Preface



The present special volume of “Pure and Applied Mathematics Quarterly” arose from the “International Conference on Singularity Theory 2019”, which was held at the Tsinghua Sanya International Mathematics Forum (TSIMF) from December 9, 2019 till December 13, 2019 and was dedicated to the 75th birthday of Gert-Martin Greuel. This conference was attended by roughly 40 participants from China, Germany, Japan, France, Poland, Russia, Spain and the United Kingdom. Among them, one could find colleagues and friends of Gert-Martin, former members of

his group at the University of Kaiserslautern, his PhD and diploma students as well as other mathematicians influenced by his mathematical work and his engagement as director of the Mathematical Research Institute in Oberwolfach.

Greuel’s interests in mathematics can be described as singularity theory viewed in a broad sense. This includes many theoretical contributions and also the development of the computer algebra system Singular. His engagement in singularity theory is reflected in the content of this special volume. The largest group of contributions is devoted to the study of various aspects of the topology of singularities (papers of Ebeling and Gussein-Zade, Hamm, Nagy and Nemethi, K. Saito, M. Saito). Other contributions are dealing with singularities of algebraic varieties (works of Budur and Wang, Kulikov), classification of singularities (papers of Nguyen, Pham and Marques), Cohen-Macaulay modules over curve singularities (work of Faber) as well as applications of the singularity theory to mathematical physics (papers of Varchenko and Woodruff). This special volume also contains papers on the toric algebraic geometry (by Altmann et al.), tropical algebraic geometry (by Shustin), modular forms (by Aoki and K. Saito), differential geometry (by Qui and Li) as well as on convex geometry (by Han), digesting broad mathematical interests of Gert-Martin. We would like to mention the engagement of Gert-Martin Greuel for mathematics beyond his research interests. He was several years editor-in-chief of *zbMATH*. He initiated the mathematical exhibition *IMAGINARY*. We would like to thank all the people who have contributed to the success of the conference and to this special volume.