

Preface

Radosław Smolec¹

1. Nicolaus Copernicus Astronomical Center
Bartycka 18, 00–716 Warszawa, Poland

Cepheids and RR Lyrae stars are not just one of the many groups of variable stars we know. They are *classical* pulsators – extraordinary stars, excellent standard candles, invaluable tools of modern astrophysics. They are used for distance measurements and form an irreplaceable rung of the cosmic distance ladder. They allow us to study the structure and evolution of our Galaxy and nearby stellar systems. They are interesting on their own right, as complex dynamical systems showing additional modes, period doublings, modulations or even deterministic chaos. We may use these phenomena to get a glimpse into their internal structure.

Finally, they are our every-day passion.

No doubt, we are witnessing the revival of the classical pulsators. With the advent of ultra-precise space photometry and astrometry, and with data stemming from big ground-based surveys, our knowledge of classical pulsators is now growing at an increasingly fast rate. The photometric measurements, together with spectroscopy and interferometry build up a framework for the development of the theories of stellar evolution and pulsation. It is not easy to keep up with this comprehensive view and embrace all the aspects of these fascinating stars. For this we need to meet.

In October 2015, we have met in Hungary, in the Royal city of Visegrád, famous for the Congress of Visegrád (1335) where the meeting of the Hungarian, Bohemian, and Polish kings took place. Instead of negotiating economic and diplomatic issues among the kingdoms, modern day, international astronomers met to discuss RR Lyrae stars. Saying that their close classical siblings, Cepheids, played just a supporting role would be an understatement. These two groups of stars share related phenomena, problems, and challenges, and they are inseparable. The days in Visegrád were enjoyable, full of excellent talks and interesting discussions. It was clear that such meetings are needed by the community, and continuation is vital.

Two years later we met in Poland, in the Royal city of Niepołomice. The conference venue was Niepołomice Royal Castle, which was built in the mid-14th century and rebuilt in the late Renaissance style. This elegant and historical setting was an admirable scene for our conference, reminding us that we are in a new Renaissance of studying classical pulsators. What has changed during the last two years? What are the new discoveries? Which puzzles have been solved and which are still with us? What are the new challenges? These proceedings carry some answers and I hope their reading will be as enjoyable as our conference was.

The conference will be memorable not only thanks to exquisite science, but also thanks to outstanding social events. On Monday evening, the conference continued during the open-air BBQ. With engaging discussions, fire pit, some Polish specialties: grilled juicy meats and mountain cheese, local sausages, pickles and shots of the famous bison-grass vodka, *Żubrówka*, the outside cold went unnoticed. The



Comparison of the V -band and radial velocity curves of a modulated RRab star in the globular cluster M3 at the courtyard of the Niepołomice castle, the conference venue. Data and analysis courtesy of Johanna Jurcsik, drawing by Katrien Kolenberg.

conference dinner took place on Wednesday, in the medieval Wieliczka salt mine, a UNESCO World Heritage Site. A sixty meter deep spiral of wooden steps took us to the labyrinth of magnificent corridors, glittering chambers, and finally to the breathtaking Chapel of Saint Kinga full of majestic carvings; the setting of the deepest conference photo ever. After sightseeing, we celebrated the success of the conference in a magnificent scenery of the Jan Haluszka chamber, 135 m below the ground, to the calm tunes of harp music, delicious food and with toasts of bitter-sweet *Gorzka Żółdkowa*. The ride to the surface in a dark, claustrophobic and trembling miners' lift was an unforgettable experience as well.

I'm grateful to the Scientific Organizing Committee, co-chaired by Katrien Kolenberg and Paweł Moskalik, for putting together an exciting program, and to all the participants for filling these days with illuminating talks and vital interactions. Paweł's advice and continuous support were priceless for the preparation of the conference. I'm grateful to the Local Organizing Committee for making the organisation smooth. Henryka Netzel and Paulina Karczmarek did an excellent job at the registration desk and spent hours at the tedious preparation of the conference kits. Niepołomice is the home of the Youth Astronomical Observatory (MOA). I'm grateful to our colleagues for presenting their Observatory and their exceptional popularization work among school children. You may not miss their beautiful contribution in this book! High participation of the students in the conference was also possible thanks to the hospitality of MOA who made their guest houses available for us. Many of us were welcomed at the airport and taken to Niepołomice by Waldek and Wioletta Ogłóza and Justyna Put. Their help was critical at every moment before and during the conference. Although they were not in the LOC, smooth progression was also guaranteed by Dorota Skowron and Natalia Żywucka-Hejzner. Marzena Majewska (The Foundation of the Royal Castle in Niepołomice) and Jadwiga Kapusta (Wieliczka salt mine) assured flawless social events at the Castle and in the Wieliczka salt mine. Katrien Kolenberg not only co-chaired the SOC, but also made beautiful graphics that decorated conference materials, including the marvelous magic cups.

Our conference received strong support from the Polish Ministry of Science and Higher Education through the dissemination of science grant (704/P-DUN/2017), from the Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences, and from the Polish Astronomical Society. Piotr Życki, Agata Różańska,

Urszula Wiczorek and Anna Zuchora are among those whose contributions were essential to our success.

Finally, I'm grateful to the fellow editors of this book, Karen Kinemuchi and Richard I. Anderson. Karen's enlightening comments on the language surpass those given by the classical Strunk and White, and made the editorial process instructive and enjoyable experience. Karen will also welcome us in Cloudcroft, New Mexico, for the *Frontiers of Classical Pulsators* conference in October 2019; the third meeting in this vital and indispensable series. 'Royal' is the last word one can use to describe Cloudcroft; 'wild and untamed' seem much better, recalling to the American Old West era. In two years time, we will see where our science is taking us, and perhaps onto new wild landscapes. New Mexico is such an amazingly beautiful place! With its clear, expansive sky and the refreshing alpine air, we can hope to see some of our actors, Cepheids and RR Lyraes, live. Instead of bejeweled royal crowns, we'll see them with cowboy hats!

Thank you for coming to Poland and see you in New Mexico soon!



Wojtek Dziembowski could not attend our conference. Just after, the SOC co-chairs Katrien Kolenberg and Paweł Moskalik visited him in his home and reported about the meeting. From left to right: Paweł, Wojtek's wife Anna, Wojtek, Katrien, Gerald Handler and Alosha Pamyatnykh. Wojtek's grandparents are proudly looking down from the walls.