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30 Years with Vladimir Gerdt

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My first meeting with Vladimir was in March 1990. I had started two months before as a Ph.D. student of Jacques Calmet in the computer science department of Karlsruhe University and Vladimir was visiting our computer algebra group for a seminar talk on his research. For him, it was one of his first travels into the west, as under Soviet rule he was not considered as sufficiently politically reliable for travels outside of the eastern block. It turned out that after his visit we were both riding on the same train to France. Although we were travelling to different locations, we spent several hours together on the train discussing many things. Probably none of us expected that this was the beginning of a lifelong collaboration and friendship!

Our careers show many similarities and our research interests have always been closely related. We both started as theoretical physicists. He came to computer algebra through phenomenological computations in high energy physics and for the same purpose got interested in the symmetry theory of differential equations. I developed for my diploma thesis a computer algebra package for anomaly computations in string theoretical models and began my thesis work with learning symmetry theory (partially through papers of Vladimir). Both of us always remained interested in constrained dynamics and field theory, a topic which we frequently discussed and on which we e. g. co-organised a session at the ACA conference in Sofia 2012 (the photo shows us at the conference dinner of the ACA conference 2018 in Santiago de Compostela). Although we were both dominantly working on differential equations, the development of symbolic methods for them required algebraic tools and thus we both got early on interested e. g. in Gröbner bases. Vladimir combined them with the Janet-Riquier theory to introduce

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involutive bases, Gröbner bases with additional combinatorial properties. Their theory was another topic which we frequently discussed until his death. He was mainly concerned with efficient algorithms and I have studied more theoretical applications, but there was a lot of common ground in the middle. We also shared an interest in applying geometric and algebraic ideas for the numerical integration of differential equations.

Vladimir was half Russian and half German. The proper Latin spelling of his family name is actually Herdt and not Gerdt; the wrong spelling was introduced when some of his early scientific works were translated from Russian to English by a translation office at JINR, as in the Cyrillic alphabet g and h are represented by the same letter. He still had a number of relatives in various places in Germany and this was one reason why he was such a frequent visitor to Germany. If sufficient funding was available, he would visit Germany basically every year at least once. So he was a frequent speaker in our computer algebra seminar in Kassel. He had closer contacts to several German universities where he also stayed longer times as a guest lecturer. He spent e. g. two winter terms in Kassel teaching courses on constrained dynamics, differential algebra and quantum computing and co-supervising some of my students. While he was a bit shy in speaking German, he could read it quite well and thus had no problems assessing German theses.

Another area where Vladimir and I had a lot of contact was the CASC conference series which he founded jointly with Ernst Mayr in 1998. In the beginning, these meetings were intended to foster the collaboration between Russian and German scientists (at that time, quite some money was available for such activities); but they soon evolved into recognised international conferences with proceedings published by Springer-Verlag. Vladimir invited me as a plenary speaker at the second CASC conference in 1999 in Herrsching near Munich. In the following year, I joined the CASC programme committee on which I stayed until 2013. From 2014 until 2019, Vladimir and I jointly organised the CASC conferences as General Chairs. When it came to searching venues or invited speakers, he had an incredible network of contacts all over the world and a great overview over most areas of computer algebra and neighbouring fields.

Vladimir was a passionate and enthusiastic researcher with a broad knowledge and a great creativity in many fields. I really enjoyed our long discussions on many topics within and outside of science. He was a very warm and always good humoured person who easily made friends everywhere. We had just acquired a new project in the field of constrained dynamics securing funding for further visits by him to Germany and were finalising the administrative paper work, when he unexpectedly died. I will miss him a lot!

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