Funeral Speech for Helmut Veith

Dear Veith Family, in particular, dear Anna, dear Nikita, dear Mrs. Herta Veith, dear Wolfgang; dear further relatives and family friends, dear colleagues, ladies and gentlemen:

Helmut was a very special person. This was immediately evident to everyone who got to know him, whether in their private or professional lives. He looked into your eyes. He paid attention to whoever was in front of him, and quickly built up a relationship. He built authentic and honest relationships that were almost always permanent, and often led to deep friendships. He had many friends around the world, and his early and unexpected death has triggered dismay and sadness not only here, but worldwide.

I myself got to know and appreciate Helmut in three roles: first as a PhD supervisor, then as a friend, and finally as a colleague at TU Vienna. I would first like to speak about Helmut's career and appreciate his contributions as a scientist, and then say a few words to his personal nature and his character. In reality though, it is difficult to separate these aspects in him, when it comes to Helmut. His scientific style was marked by humanity and imbued with understanding of others, and was always brightened by his cheerful and friendly temperament. In his private actions, he was welcoming and direct, but always with a good logical analysis of the situation.

Helmut studied *Computational Logic* from 1989 to 1994 at the TU Vienna. Such a core course of study, however, was not available at the TU at that time. Rather, he came together with his friend Richard Zach, and they defined their own curriculum together, and received permission from the Technical University and the Ministry to enroll in in it in the form of a *studium irregulare* (irregular course of studies). This was already Helmut's first academic achievement of note, because this new field of study was a great success and soon became institutionalized. It has continued for many years as a Master's program, partially under other names, as well as a study course in the Erasmus Mundus program.

By that time I had already gotten to know Helmut as brilliant student and extremely clever thinker. He attended my lectures in database theory and complexity theory, solved difficult problems in original ways, and asked very clever questions. I recognized his high intelligence immediately, and it was already clear to me at that time that he had the makings of a very good scientist.

Helmut was interested in finite model theory, which is a branch of mathematical logic which has important applications in computer science. He wrote his Master's thesis with the title "*Logical Reducibilities in Finite Model Theory*," and this was of excellent quality. To express it in a somewhat colloquial manner, his Master's thesis contained valuable results and elaborated on the transformation of problems into other problems.

He then did his doctoral studies under my supervision, and wrote the excellent PhD thesis "*Succinct Representation and the Complexity of Logic and Database Query Languages*." He introduced new methods to prove that certain problems are difficult to calculate. He

completed his doctoral studies in 1998 with the mention *sub auspiciis praesidentis* (under the auspices of the president of the Republic of Austria, who personally conferred him his doctorate; the highest possible laudation in Austria). During and after his doctorate, he was also an assistant in our department (1995-2001). Helmut already published outstanding scientific work during this period, and collaborated fruitfully not only with me but also with other members of the TU Vienna.

Helmut was one of my best students, he worked very independently, and our meetings were always a pleasure. I learned a lot from him in these meetings. I have a motto that has been on my website for a very long time, which says "My students are my teachers and my teachers are my students" — I indeed had such a relationship with him. Actually, my work with Helmut and a few other brilliant students contributed to creating this motto in the first place.

After his doctoral studies, we sat down and discussed how he should go forth. He was already a very good theoretician, but he wanted now to stake out new territory for his own, where he could combine logic with applications. I suggested the field of computer-aided verification (CAV) to him, which is in short, a branch of computer science which examines how you can ensure with logical methods (and in particular, the so-called method of model checking) that computer hardware and software does what it is expected to do. Helmut, who already had attended guest lectures by Orna Grumberg at TU Vienna on model checking, was excited because he immediately recognized how promising this was, and that this area offered a chance — in the truest sense of the word —to improve the world through logic. What followed was a research stay with one of the founders of this area, Ed Clarke, at Carnegie Mellon University in the USA.

The stay with Clarke (1999- 2000) was groundbreaking for Helmut's further activity. With Clarke and other colleagues, he developed a new method "*Counterexample-Guided Abstraction Refinement*," which garnered great attention in the field (and still does). The relevant publications have now been cited about 3000 times. From that time, Helmut became an internationally respected scientist, and his career skyrocketed forward. Within just 10 years, he developed into a highly-respected top international researcher in his area and into one of the few leading scientists worldwide in his field. I here list only some selected cornerstones of his career:

- 2001 Habilitation in Vienna
- 2003 Appointment to the TU Munich as a C3 Professor
- from 2005, Adjunct Full Professor at Carnegie Mellon University
- 2008 Appointment as Full Professor (W3 Professor) in Darmstadt
- 2010 appointment to TU Vienna as a Full Professor. Development and management of the Working Group *For(syte): Formal Methods in Systems Engineering.*

Helmut's scientific success and his dedication to logic, both at TU Vienna as well as internationally, will be discussed in greater detail elsewhere. Here too, I must limit myself to a few key points:

- 2003 ACM SIGSOFT Distinguished Paper Award
- 2015 CAV Award
- 2016 ERC Advanced Grant
- Helmut's works are frequently cited. Others use his methods, and he lives on through his ideas.

Evidence of his commitment both at the TU Vienna and internationally:

- Co-founder and Director of the Doctoral Program "*Logical Methods in Computer Science*"
- Initiator and Chair of the Vienna Center of Logic and Algorithms (VCLA)
- Main co-initiator and co-Chair of the Vienna Summer of Logic, the biggest logic conference in the world up to now, and Chair of the related FLOC Conference.
- Invited Keynote Speaker at many international conferences
- Work on the Board of the Kurt Gödel Society and the Wolfgang Pauli Institute
- Member of the Senate of the TU Vienna
- Excellence in teaching and promotion of doctoral students

Helmut himself spoke of many satisfying years of scientific life, shortly before his death. In his memory, we will establish the *Helmut Veith Award* for student excellence.

I would now like to return briefly to mention some personal characteristics of Helmut.

Helmut was an *intellectual*. He was very interested in literature and theater, and engaged himself intensity in political and social problems. It was wonderful to talk with him. Helmut was also an *existentialist*. Someone who does not look at the world and its events from a comfortable distance, as if it were a raree-show, but who rather feels existentially touched by events and demonstrates responsibility.

Helmut was a very *dynamic man*. He was extremely proactive, and if he wanted to make a difference, he did not rest until he had changed the situation. He was, as someone recently said, "vital and sparkling with life."

And now to a very important point: Helmut was a *family man*. He loved his wife Anna and his son Nikita more than anything. He spent the best years of his life with them, and was very proud of them. He wanted, as he said shortly before his surgery, to continue to live for many years, because life with Anna and Nikita was so beautiful. His relationship with Anna was symbiotic. The two breathed together and were joined together in a great intimacy. He discussed all important issues and academic decisions with Anna, who always gave him her greatest support. He was particularly proud of Nikita's intelligence and creativity and — in his own words — "Nikita's incredible ability to deal with people."

Helmut had the desire and was secure in the knowledge that if it something were to happen to him, that Anna would always be there for Nikita, enable him to have a good education that will allow him to develop his talents.

Helmut also loved his mother and his brother very much. He was proud of Wolfgang's musical successes, and rejoiced every time his mother presented him with interesting newspaper articles.

It is hard to find consolation in such a loss, but we have to try. All of us, especially the immediate family, should always ask ourselves: What would Helmut want us to do now? And we must remember that Helmut lives on in us, especially of course in his loving family, but also in all of us. He gave something to each of us, and e ach of us carries a part of Helmut in ourselves. All of our lives were changed by Helmut and we will remember it, and hold this Helmut within us not only in our memories, but also by honoring him in our future actions.

I close my speech with a quote from Victor Hugo:

You are no longer there where you were, but you are everywhere we are.

Georg Gottlob, March 23rd, 2016