Preface

This is Part 1 of a three-part special issue dedicated to Ivo G. Rosenberg to whom we express the deepest respect and sincere gratitude for his warm and everlasting friendship.

Ivo George Rosenberg
1934 – 2018

Ivo Rosenberg was born on December 13, 1934, in Brno, Czechoslovakia (now, the Czech Republic) and passed away on January 18, 2018, in Brossard, Canada.

Throughout his life, Ivo Rosenberg was a highly active and productive mathematician. His work always shone with new ideas and deep insight.

All who have known him will agree that Ivo was an extremely kind and truly humble man.

Photo taken by R. Pöschel

Academic career

Ivo Rosenberg spent his formative years in Brno at Masaryk University, renamed J. E. Purkyně University during 1960–1990, where he obtained his Ph.D. degree in 1965. He started his career at VUT Brno (Brno University of Technology) in 1958. From 1966 to 1968 he held appointments at J. E. Purkyně University and the University of Khartoum (Sudan).

In 1968 Ivo and his family moved to Canada, and Ivo worked at the University of Saskatchewan. In 1971 Ivo obtained a position at the Université de Montréal, where he was a full professor until his retirement in 2011.

Awards

Ivo Rosenberg received the honorary degree *Doctor Honoris Causa* from the Vienna University of Technology (TU Wien, Austria) in 2006 and from the University of Rostock (Germany) in 2013.

Mathematics

Ivo Rosenberg made significant and extensive contributions to mathematics, mostly in the fields of universal algebra, multiple-valued logic, and discrete mathematics. He published over 220 papers, and collaborated with 62 different co-authors.

The most celebrated work of Ivo Rosenberg is undoubtedly the complete classification of maximal clones on finite sets. A brief report of the result appeared in 1965 (in *Comptes Rendus de l'Académie, Paris*), and the result with full proofs was published in 1970 in his 91-page paper;

Ivo G. Rosenberg, "Über die funktionale Vollständigkeit in den mehrwertigen Logiken", *Rozpravy Československé Akad. Věd. Řada Mat. Prírod. Věd.*, **80**, no. 4, 3–93, 1970.

This is truly a monumental result that has had great impact on clone theory as well as universal algebra in general. Much of Ivo Rosenberg's later work was also influenced in some way or other by this result.

Ivo Rosenberg also made remarkable contributions to the areas of partial clones and hyperclones, and maintained a strong interest in clones on infinite sets as well.

For these achievements, Ivo Rosenberg is widely known as the leading figure of clone theory. This, however, does not mean that his activities were restricted only to that area. His interests and contributions had no border, spanning over many other areas of mathematics and computer science.

Reminiscences

• On a small hill near the center of Brno lies Špilberk castle, constructed in the 13th century. Surrounding the castle is a large park full of trees. Ivo

grew up close to this park and often played there as a child. Some 30 years earlier, the famous logician Kurt Gödel, still a boy then, also lived near Špilberk castle. Ivo's grandmother was a good friend of Kurt's mother; they met frequently and enjoyed talking with each other. ... This is what Ivo sometimes told us, when he was remembering Brno.

● Being such a friendly and kind person, Ivo had many friends to work with and talk with. He often invited them to Montreal and was also invited by them to their places.

It was customary for Ivo to spend his summers in Europe. There are three cities in Europe which Ivo particularly liked to visit: Lyon (France) with M. Pouzet, Udine (Italy) with P. Corsini, and Kaiserslautern (Germany) with D. Schweigert. From the second half of May to the end of July, he usually stayed at these places, each for a few weeks.

● The Saint Lawrence River separates Montreal, where Ivo worked, and Brossard, where he lived. Ivo used metro and buses (2 lines) to commute between home and university. His bus crossed the Champlain Bridge (about 4 km long) above the river.

I (H. M.) often visited Ivo at the Université de Montréal, usually for a couple of weeks. Every day during my stay, we had lunch together and, after that, we did some joint work at the university. We stopped our discussion when we got stuck in the middle of an attempt, say, to prove some statement. Next day, Ivo told me, "I did some calculation and found a proof for yesterday's problem." "Great ! When did you do it?" "I did it on the bus going back home yesterday." This kind of thing happened several times.

The bus was one of Ivo's research laboratories. Or, maybe, every place in the world was his laboratory. Ivo did not like me to say this, but, I dare say, Ivo was doing mathematics always !

● In the autumn of 2002, Ivo was invited to stay at International Christian University in Tokyo for a few months. One Sunday, Ivo went for a hike to a mountain in the outskirts of the city, and was injured. He was hospitalized for ten days. I (H. M.) thought he must be bored being alone in the hospital and would appreciate having some kind of pastime. Therefore I gave him a mathematical problem to solve while he was in the hospital; the problem was to characterize the centralizer of the alternating group. Three days later I visited him again in the hospital. With a smile, he handed me three sheets of paper. The problem was completely solved, and the proof was given in detail. I was happy to see it and thought Ivo was also happy. ... A few years later, Ivo told me that it was not at all an easy task to solve the problem with strong pain in the chest, being unable to move freely, but just lying quietly in

a hospital bed. (It seems that what I gave him was more like a torture than an amusement. Sorry, Ivo!)

• One of Ivo's favorite towns in Canada was Magog, Quebec, where he owned a pretty cottage located near some mountains and a lake. Ivo was fond of spending weekends at this cottage, about 100 km east of Montreal.

The cottage was the family's nest. From the time when his children, Misha and Marc, were small, Ivo and his wife Loty (who passed away in 2001) enjoyed their family life there. For most of August and Christmas time, the cottage was the family's meeting place. In the last few years of his life, Ivo particularly enjoyed staying there with his adorable grandchildren.

Ivo Rosenberg has made immense contributions to the realm of mathematics, in particular, to the mathematical disciplines represented by this journal and the contributors of this special issue. With our heartfelt gratitude, we dedicate this special issue to this great mathematician.

As noted at the beginning, this is Part 1 of the special issue of this journal dedicated to Ivo Rosenberg. Parts 2 and 3 will follow soon.

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Editors of the special issue

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