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Alexei Caşu (Kashu)

On his 75th Anniversary



On August 20, 2015, an outstanding algebraist, one of the oldest members of the Editorial Board of our journal, Professor Alexei Caşu turns 75. The influence of Caşu's results on the development of algebra in Moldova is significant.

Alexei Caşu was born on 20 August, 1940, in Sadaclia village, Basarabeasca district, Republic of Moldova. Starting his studies in 1947, he graduated from the secondary school in his native village in 1957. During the years 1958–1963 he studied at the Faculty of Physics and Mathematics of the Moldova State University (Chişinău). After graduating from the university he served for two years in the army (1963–1965). Alexei Caşu joined the staff of the Institute of Physics and Mathematics of the Academy of Science of Moldova in 1965 and continues his association with this institution till the present.

His first appointment at the institute was as a laboratory assistant (1965–1967), then promoted to a Junior Researcher (1967–1971), Senior Researcher (1971–1991), and Leading Researcher (1991–1992). He served as Deputy Director of the Institute of Mathematics and Computer Science from 1992 to 1998. Since 1998 Alexei Caşu has been a Principal Researcher.

His main research field has been algebra, specializing in the theory of rings, modules and categories. The problems he has studied are mainly related to radicals and torsions in module categories. He obtained in this domain a large number of results, among which the following should be mentioned.

A relationship was established between (pre) radicals and classes of R-modules, on the one hand, and special sets of left ideals of the ring R, on the other hand, thereby generalizing the classical results of well-known algebraists such as P. Gabriel, S. E. Dickson, J.-M. Maranda, etc. It is remarkable that much later the methods of Alexei Caşu were used in order to describe important new classes (natural, prenatural, etc.) of modules, introduced and investigated by J. Dauns.

Another cycle of works is devoted to the study of radicals and torsions in some special constructions, such as Morita contexts and adjoint situations. Here the main role is played by methods of category theory: the behavior of torsions and localizations on the transition from one category to another is analyzed using principal functors of a category of modules. Thus he continued and essentially improved some results, ideas and methods of K. Morita and J. Lambek that lead to the remarkable equivalences of some special subcategories of categories of modules.

A problem was solved concerning the (anti-) isomorphism of lattices of submodules on action of principal functors, showing necessary and sufficient conditions to obtain such a situation. Some quotient rings were described which were constructed by torsions using bicommutators of modules that determine these torsions. In the case of Morita contexts an elegant relationship was obtained which refers to lattices of torsions, namely it was proved that special sublattices of these lattices are isomorphic.

The latest results refer to (pre) radicals accompanying principal functors of a category of modules: properties, relationships, criteria of coincidence. The technique of (pre) radicals in R-Mod allows one to define four new operations in a lattice of characteristic submodules, that opens up new research perspectives in this area.

Based on the obtained results Alexei Caşu defended his Ph. D thesis in 1969 at the Moldova State University (Chişinău), and then Doctor of Science (habilitation thesis) in 1991 at the State University of St. Petersburg. He was awarded the title of Senior Researcher in 1978, Full Professor in 2000. In 1986 he attended LOMI (Leningrad Department of Steklov Institute of Mathematics of the USSR Academy of Sciences) for one year in St. Petersburg (former Leningrad). He had been an invited professor for cycles of lectures for 1–2 months: Tashkent, 1978; Iaşi, 1991; Lviv, 1987 and 2005.

Professor Alexei Caşu is the author of more than 130 publications, including articles, preprints, synthesis papers, surveys and four books (2 monographs and 2 textbooks for universities). Some of his published results were included in several basic monographs written by J. Golan, B. Stenstrom, L. Bican, T. Kepka, P. Nemec, L. A. Skornyakov. Numerous references to his results can be found in works published by scientists from Austria, Hungary, Ukraine, Germany, Romania, Czech Republic, Sweden, Russia, etc.

Professor Alexei Caşu is undeniably one of the leading specialists in the field of rings, modules and categories. He took part with invited lectures and communications in international conferences in various countries: Austria, Germany, Hungary, Poland, Bulgaria, Romania, Russian Federation, Ukraine. As the organizer, moderator and person with responsibility for programs and sections he participated in all conferences organized by the Mathematical Society of the Republic of Moldova and numerous international specialized conferences in Ukraine, Romania and Moldova, among which are the international conference on radicals (Chişinău, 2003), national algebra conferences in Romania and international conferences on algebra in Ukraine. Also as organizer he took part in some national conferences dedicated to the memory of V. Andrunachievici and C. Sibirschi (Chişinău, 2007). He gave plenary lectures during some major international algebraic conferences: St. Petersburg (1997, in memory of D. K. Faddeev), Moscow (1998, in memory of A. G. Kurosh). He was an invitated speaker at the workshop held in Warsaw, Stefan Banach International Mathematical Center, 2009.

Alexei Caşu contributed much through his scientific work, the organization and development of research in mathematics, and in the preparation of highly qualified staff. Over more than 47 years Alexei Caşu taught general, special and optional courses for students in their forth and fifth years or master students at the Faculty of Mathematics and Computer Science of the Moldova State University. Since 2009 he has collaborated with the University of Academy of Sciences of Moldova. Two handbooks for students, master and PhD students were published.

Professor Caşu was a scientific advisor of two PhD students, who defended their theses (and one of them later defended a habilitation thesis).

Professor Alexei Caşu held several positions related to research work: vicepresident of the Mathematical Society of Moldova (2000–2009); Chief of scientific seminar "Algebra and mathematical logic" (2000–2008); member of the NCAA (National Council for Accreditation and Attestation) experts in mathematics; member of the Executive Board of the journal "Bul. Acad. Ştiinţe Repub. Mold. Mat."; member of the Editorial Board of the journal "Algebra and Discrete Mathematics" (Ukraine); reviewer of zbMATH, Berlin (1980–2015); member of the Editorial Board (and also one of the authors) of the book "Academician Vladimir Andrunachievici" (ASM, Chişinău, 2009).

Scientific results obtained by Alexei Caşu are highly appreciated by experts from our country, as well as abroad, he was official reviewer of over 30 PhD theses and 3 habilitation theses. For valuable results in research and the training of highly qualified scientific staff Professor Alexei Caşu was awarded the Prize "Academician Constantin Sibirschi" (2006), the medal "Dimitrie Cantemir" and the Order "Labour Glory" (2010).

Professor Alexei Caşu is totally devoted to mathematics and the propagation of its ideas, beauty and importance, which have brought him the deep respect and gratitude of the mathematical scientific community.