

IN MEMORIAM OF KONSTANTIN GUDIMA



(September 9, 1942—March 8, 2018)

This year, in March, the Moldavian scientific community suffered a great loss in the person of Konstantin Gudima. He was a scientist with world-wide reputation known in the field of the theory of nuclear reactions. He has made an inestimable contribution to the development of theoretical nuclear physics of the Republic of Moldova.

I was lucky to work together with this marvelous man during recent five decades. I met K. Gudima 50 years ago, in February 1968. At that time, I was just sent to Dubna Scientific Research Institute of Nuclear Physics—affiliate of the Moscow State University—to continue my study at the University. It was just in the first days of my stay in Dubna when I got acquainted

with the young family of Gudima—Konstantin and his wife Mariya. At that time, he was a postgraduate student of the Joint Institute for Nuclear Research (JINR).

Since then, our lives have been bound together for a long time. Actually, we lived our whole life side by side. We worked in the same field of science and tackled the same scientific problems. For the last 15 years, we worked sitting in the same room. Our friendship became even stronger due to close relationships between our families.

Konstantin Gudima was born on September 9, 1942 in the village of Byrnova, Oknitsa region, Moldova. In 1959 he entered the faculty of physics and mathematics of the Kishinev State University (at present, Moldova State University); in 1964 he graduated from it. In 1965 he started his work as a laboratory assistant at the Institute of Mathematics of the Academy of Sciences of Moldova. This year he was sent for specialization in the field of the theory of atomic nuclear and elementary particles to the Dubna affiliate of the Moscow State University. It was the beginning of his scientific career in the team of well-known Russian scientist Vladilen Sergeevich Barashenkov. That school of physicist theoreticians has laid the foundation of a new direction of fundamental and applied nuclear physics, namely, computer modeling of interactions between the particles at intermediate energies and nuclei with atomic nuclei and macroscopic targets. The proposed models made it possible to identify the mechanisms of those interactions and reveal new fundamental effects; the generated codes were used as the basis for generators of events of complex transport codes to calculate the interaction of radiation with matter. In 1969, upon completion of the work at the JINR in Dubna (in the period of 1965—1968, there was a break for forced military service) Konstantin Gudima publicly defended a doctoral dissertation with specialization in “Physics of Atomic Nucleus and Elementary Particles.” Having an academic rank, the young scientist returns to the Academy of Sciences of Moldova, to the Institute of Applied Physics (IAP), being appointed to a post of a senior scientific worker (1971). In 1975, a Laboratory of Theory of the Atomic Nucleus and Elementary Particles was organized in the IAP. Konstantin Gudima remained to be the chief of this laboratory till 1993, when the Department of Statistical Physics headed by acad. V. Moskalenko was combined with the Laboratory of Theory of the Atomic Nucleus and Elementary Particles to form the Laboratory of Statistical Nuclear Physics of the IAP (2011–2015); Konstantin became a deputy assistant of acad. V.A. Moskalenko. Since 2015, after the reorganization—integration of physicist theoreticians—Konstantin was a leading researcher in the Laboratory of Theoretical Physics of IAP. His entire scientific work was devoted to studying the mechanisms of nuclear reactions of intermediate and relativistic energies initiated by elementary particles and heavy ions.

For over 50 years of fruitful scientific work, Konstantin Gudima collaborated with leading researchers from various authoritative nuclear centers of Russia, France, Germany, and the USA, where the global projects were developed on new levels of modern physics: the Higgs boson, the origin of exotic dark matter, supersymmetry, antimatter, quarks, and gluons. Having experience in this field, Konstantin took part in the development of calculation programs used for the modeling of spectra, in which new effects could be revealed, in particular, nuclear transitions of nuclear matter into quark–gluon state at densities and temperatures which significantly surpass the values of a normal state of the nuclear matter. Some of the studies were focused on the formation of hypernuclei and nuclear fragments, which were predicted by theory and supported by experiments with collisions of particles and heavy ions with atomic nuclei at high energies, together with studies of the Frankfurt Institute for Advanced Studies (FIAS) in Germany. The generators of nuclear events (calculation codes) developed by Konstantin Gudima were effectively brought into use in the Los Alamos National Laboratories and Fermi Laboratories of Accelerators in Batavia, the USA, as well as at the JINR in Dubna. Along with the theoretical

studies in the field of nuclear reactions, K. Gudima participated in a number of international projects; among them, the project of MultiPurpose Detector (MPD) for the NICA collider in Dubna, BM&N (studies of Baryonic Matter at Nuclotron) and “E&T–RAW” (Energy and Transmutation of RadioActive Waste) at the JINR.

The research results were published in more than 300 top international journals. Konstantin Gudima took part in the training of over 20 specialists in nuclear physics both at the IAP in Chisinau and the JINR in Dubna.

The models of nuclear reactions proposed and developed by our colleague, which are cited and known as CEM (Cascade-Exciton Model) and QGSM (Quark-Gluon String Model), are extensively used for analysis, calculation, and interpretation of phenomena occurring during collisions of elementary particles and heavy ions with atomic nuclei at high energies.

The year 2017, when Konstantin Gudima celebrated his 75th jubilee, was especially fruitful for him, since he published seven papers in specialized international journals: two in Phys. Rev., one paper written also for this journal was published in arxiv-nucl-th, and four appeared in journal EPJ Web of Conferences as reports presented at international conferences. In 2017, for a series of works “Kinetic Models of Nuclear Reactions CEM (Cascade Exciton Model) and LAQGSM (LosAlamos QuardGluonString Model)—A Theoretical Instrument for Studying the Mechanism of Nuclear Reactions Initiated by Elementary Particles and Heavy Ions at Intermediate and Relativistic Energies,” Konstantin Gudima was awarded with the annual premium of the IAP for high achievements in studies in the field of theoretical nuclear physics. On the occasion of 75th anniversary and 50-year scientific activities, Konstantin Gudima was awarded with the medal “Meritul Scientific.”

Our dear colleague Konstantin Gudima was a real friend, world-known scientist, devoted researcher. Kind memory of him will remain forever in our hearts.

Mircha Baznat,
leading researcher