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In memoriam: Yuri Lvovich Klimontovich

The passing of Yuri Lvovich Klimontovich saddened deeply his numerous friends and colleagues. I had the privilege of knowing him for many years and, though not meeting very often, such meetings were always an opportunity for fruitful scientific discussions and for a warm human contact. In this short article, rather than discussing his great scientific achievements, I wish to recall some personal memories of this great friend.

Our first meeting occurred in 1965. This was my first visit to the Soviet Union, where I attended a symposium on the *N*-body problem in Novosibirsk. I was feeling pretty nervous before this first trip to the East of a former Romanian refugee. My anxiety soon calmed down upon receiving a very warm welcome from my Russian colleagues, many of whom I knew by name. Among them I soon established a privileged contact with Yuri Lvovich. We knew each other's works, which were addressing very similar problems. The scientific discussion was, therefore, very straightforward. Our common interest was in the kinetic equations for plasmas, a hot subject at that time. Its interest laid directly in the fact that it represented the first new, nontrivial result of the 'newly young' discipline of nonequilibrium statistical mechanics. Yuri's and my methods had a different starting point and used a different methodology. But their general philosophy and the end results were the same. We spent a long time comparing the two methods and establishing their equivalence. During these discussions, followed by additional ones in Moscow after the symposium, we rapidly became close friends.

The atmosphere in Novosibirsk (more exactly, in Akademgorodok, its scientific 'suburb') at that time was extraordinarily exciting. An air of freedom was present everywhere. People were walking in the streets reciting subversive poems of Akhmatova, Evtouchenko or Pasternak, passing policemen who would never react. The hot place, which I visited every night with Yuri and the other Russian and foreign colleagues, was the café 'Pod Integralom' ('Under the integral'). We would meet there wonderful young students who were developing numerous literary, musical and other intellectual and artistic activities. They were eager to have discussions with us on all the subjects in the world. All this was accompanied by a lot of vodka and would sometimes finish 'under the integral—table'. (Several years later I read a small announcement in 'Le Monde' saying that the café 'Pod Integralom' was closed by the Soviet authorities, because its managers planned to organize an exhibition of pictures by Chagall. I was sure that the special atmosphere of Akademgorodok would be finished forever. This was later confirmed by my Soviet friends.)

Our collaboration and our friendship was further strengthened a few years later (1967), when Yuri Lvovich visited Brussels for the first time. In the forthcoming years we often met at conferences, either in Moscow or Kiev, or in the West. In 1971, an amusing story shows Yuri's great kindness and helpfulness. I received, at that time, some money in Moscow, as royalties for the translation of my book on Statistical Mechanics of Charged Particles (by Rukhadze and Silin). I had to spend that money in the USSR, and I figured out that it would suffice for buying a cello, as my daughter was beginning to study that instrument. I imagined naively that it would be a simple matter to find one in Rostropovich's country! But Yuri told me that it was an illusion. However, one of his students was married to a musician. So, with their help I

was guided to the only shop where I did find a unique cello (made in the DDR, i.e., East Germany) and a bow (made in Czechoslovakia), but no case. Thus it was carefully wrapped in old newspapers. After that I had a big problem at the customs, where I had to undo this beautiful package, so that the officer could inspect the inside for the possible presence of dollars or of prohibited documents. (My daughter never used this cello, because she gave up its study soon after this.)

During my visits to Moscow we would have long scientific and non-scientific discussions, walking through the streets of Moscow, where Yuri would show me the interesting monuments; we visited some of the beautiful churches and museums. One particularly moving visit was to Pasternak's tomb. I was often invited to Yuri Lvovich's home, and had the privilege of meeting his family. Another interesting incident is related to these visits. Yuri's charming daughter was studying psychology, and was complaining that Freud's works were not taught at the university. I offered to send her some of his works. Upon returning to Brussels I collected a few of Freud's books, and mailed them to her. Strangely, I got no response. The following year I met Yuri Lvovich. He then thanked me for the shipment, and gently asked me what determined my choice of books? It soon appeared that they received a box with several low-grade criminal novels! It turned out that Freud's books were confiscated at the customs and substituted by whatever trash they had available.

In 1975, Yuri Lvovich invited me as a visiting professor at the University of Moscow, where I spent two months. This was a fantastic experience for me. I was living in an apartment in the University building. I thus decided to live as a Muscovite, avoiding restaurants, and doing my own shopping and cooking. I thus learned a lot about life in the USSR at that time. I was delivering a regular course in statistical mechanics, in English (my Russian was too primitive for envisaging lectures in that language). Yuri acted as a translator. After a group of sentences, he would take over and translate them into Russian. I soon discovered that his translations were not really faithful: he would add his own comments, sometimes rather long! They were actually quite welcome.

Our relationship was further strengthened when Yuri Lvovich proposed to translate into Russian (with the collaboration of D.I. Zubarev) my book on Equilibrium and Non-Equilibrium Statistical Mechanics. Reciprocally, I translated his book on Kinetic Theory of Nonideal Gases and Nonideal Plasmas into English.

Upon one of his visits to Brussels (in the eighties) Yuri Lvovich made a memorable statement. He started his lecture, with his charming strong Russian accent with the following statement: 'PHYSICS: POSSIBLE, BUT DIFFICULT!' This was greeted with applause from the audience. Since then, this celebrated Klimontovich statement is quite often quoted, together with its reciprocal: 'PHYSICS: DIFFICULT, BUT POSSIBLE!'

I met Yuri Lvovich for the last time in Brussels in 1989. At that time he was interested in physical interpretations of music, and worked on the subject with J.P. Boon. His health was already rather bad. But I could not think that I would not meet him again. He was a remarkable person and a very dear friend. I miss him very much.

Radu Balescu, September 2004

I would like to share some of the memories of Yuri Klimontovich which I have from our frequent meetings. He was never late for an appointment. However, in essence his pieces of advice wer always very laconic. He would set out his opinion on your problem and then immediately go on, passing over to the tasks which were of major interest to him at that moment. The he would start to discuss them in detail as if changing places with his visitor and wishing to hear the opinion and objections of the person who had come to him for advice. I think this was not due to lack of interest in his counterpart's problems, but first

of all because of his extraordinary excitement with his own scientific ideas, with which he was always overwhelmed and which he was developing all the time, until the last days of his life.

Yuri Lvovich's attitude to any opinion which was distinctly contrary to his own was very peaceful, but during our conversations, I can never remember him changing his own point of view. I think this had to do with the fact that he, as a rule, was not simply discussing a problem trying to find a correct solution during the discussion, but he always had his own well-considered beforehand and mature view on almost all problems he raised.

Let me mention another aspect of his personality. Material living conditions were of little interest to Yuri Lvovich. This seemed merely beyond the sphere of his attention, and he just could not afford to waste his time on such nonessential things. One day, I came to his home and saw that the parquet in his study was swollen and in some places it was just ruined. He explained that it had been flooded by water. But when I came to his place the next time (it was not very soon), everything was still as it had been before.

For scientists in the Soviet Union, one of highest goals was becoming a member of the Academy of Sciences. Yuri Lvovich, however, had a very easy-tempered attitude to Academy membership. I am unaware of any of Klimontovich's internal motives; he probably balloted in the Academy once or several times, but this issue was far beyond his interests. I think, as was the case with material welfare issues, that he never wanted to spend his time on that: he realized what efforts, nerves and sometimes moral concessions even the most talented scientists had to apply in order to participate in the struggle for a prestigeous membership in the Academy of Sciences.

Finally, let me note that Yuri Lvovich had many students and friends in the scientific community in Germany, where a number of universities have strong scientific groups in the fields of statistical physics, plasma physics and nonlinear dynamics. Activities in these directions, in particular in East Germany, were certainly in several aspects stimulated by contacts with Yuri Lvovich, as a result of numerous visits of his German colleagues to Russia and his visits to Germany. Yuri Lvovich's students and colleagues in Germany, most of whom have become well-known scientists, treated him with invariable respect and loving care, and I would even say, they just deeply honoured him. I could probably give the most precise description of the German specialists' attitude towards Yuri Lvovich by saying that there was a 'cult' of Klimontovich in North-East Germany, in the best sense of this word...

Sergei Trigger[1], September 2004

'Can I write a diploma thesis with you as my advisor?'—this is how I met Yuri Lvovich Klimontovich for the first time in 1983 at the Lomonosov University in Moscow (MGU). He was rather surprised, as he did not have many students at this time and he had never had one from Germany (he had very close ties to German physicists, but all were postdocs or already established scientists visiting for a couple of months). His surprise was justified since at that time I had just become a third grade student at the physics department of the MGU and knew little about modern research directions in this discipline. What I did know was that I wanted to work in theoretical physics and live together with my wife Christine whom I had married in 1981. But why did I come to him? So I explained to him my motives which laid in the (crazy by today's standards) East German science system: Christine and I were both studying in Moscow (she was a veterinarian and two years ahead of me) and such students were assigned a work place already 2–3 years before graduation. So it had already been determined that Christine would work at Rostock University. Before going through the hassle of reversing this decision I had gone to Rostock to get an impression of their theoretical physics. When I mentioned to Prof. G. Kelbg that I was studying physics

[1] Sergei Trigger's recollections have been shortened by the editors.

in Moscow it took him less than a second to answer that there is this great expert in statistical physics, Prof. Klimontovich, if I were able to write my master's thesis under him, I would have best chances to enter the Rostock physics department as a PhD student 3 years later. And that is exactly how it happened.

Even Klimontovich, who was well familiar with the Soviet planned society (he would frequently be rather laconic or even joke about some particularly stupid regulations), was surprised by such an unusual (even by Soviet standards) long-term schedule. He must have been sceptical about the degree of my determination but did not mention this. In contrast, as he always did, he was very friendly and stimulating, saying I should start reading his text book 'Statistical Physics'. I was very soon fascinated by his rigorous derivation of kinetic equations from his microscopic phase space densities, by the vast number of applications he could present and hoped to work myself in that direction. But in our first physics discussion this wish survived just a few moments before Klimontovich showed me his recent paper on the S-theorem (his approach to the entropy in open systems), leaving no doubt that this is, by far, the most interesting question of all physics at the moment. A little reluctant, I started to work on that, did numerical calculations, solved several examples. This was quite successful, we wrote four papers together, and I defended my masters thesis with excellence (the referee even suggested to accept it as a PhD thesis).

The problem I had with this topic was that I could not see a rigorous justification, in particular, for his choice of the generalized nonequilibrium canonical ensemble. Intuitively everything was clear but the rigor which fascinated me in his books on kinetic theory was missing here (and ultimately I left this field and started to work on quantum kinetic theory). We had many discussions on this question, and he tried to motivate his choice. But it was apparent that this issue did not bother him too much, once he was convinced of the main idea. This was becoming a characteristic feature during the following years: he would raise controversial and very interesting ideas, adding fluctuation terms to many equations of theoretical physics without strict derivation, provoking disputes. In lectures he did not care if he convinced his listeners, his strong personality did not require that others confirmed his ideas.

It was amazing to see his openness to new ideas. He was always interested in new developments, he would not hesitate to enter new fields and read the most complicated papers. He learned to handle computers at the age of 55, typed all his papers and books himself, and he was fascinated like a child by scientific programming. We would spend many days and long evenings in his apartment solving all kinds of equations on his Atari. But his interest was not limited to science. He was deeply interested in biology and other sciences, in literature, theatre, movies. Moreover, he was always honestly interested in your personal situation, in your family and seemed to remember every detail.

Very characteristic was his unshakable optimism. He lived through so many difficult and terrible situations in his life which are impossible to imagine for someone from the West. Yet I cannot remember ever seeing him melancholic or sad. The sources of his optimism were his deep faith in the Russian people, in particular, their intelligenzia, and in the progress of science. He loved physics and he loved his Moscow University, deeply convinced that it compares to any university in the world and that it will live through any political and economic problems.

It was always extremely interesting to hear his opinion about people, in particular other scientists. I was lucky to speak his language and to understand the undertones. He was very rigorous when he spoke about colleagues who were not honest or who took advantage of the work of others. At the same time his voice was full of respect and warmth when he talked about 'true scientists' who had raised new ideas and original concepts—among them Leontovich, Vlasov, Zubarev, Prigogine, Stratonovich, Khochlov, Haken or Ebeling—as well as personalities who stood up against authorities and for others, not fearing discrimination, including Kapitza and his advisors Fursov and Bogolyubov.

I cannot finish these notes without recalling Yuri Lvovich's favorite joke (he loved to hear funny anecdotes, but even more enjoyed telling them himself): During the time of Gorbachev's 'Perestroika' in the Soviet Union (1985–1990) one of the first (of his many, of course, unsuccessful) activities was to educate the Russian people to a life without Vodka. Supplies to stores were greatly reduced, and each of

the shops which received a consignment immediately drew huge crowds of angry customers. One day a man came across such a shop and stood at the end of the very long line. He stood there for a long time, but nothing moved. He became so mad and frustrated that he told his co-waiters: 'I have had enough. I will go to the Kremlin and shoot Gorbachev!' Many hours passed, and nothing happened. Then, finally the man returned to the line —quiet and even more frustrated. 'So, did you shoot him?' he was asked. 'No' he answered, 'there the line is even longer than here.'

Michael Bonitz, September 2004

During the workshop in Kiel, the participants shared numerous memories of Yuri Lvovich Klimontovich quite similar to those presented above. The idea of this workshop in his honour was greatly appreciated by his former colleagues in plasma physics. Unfortunately, some were not able to attend, but sent their warmest regards to the workshop, among them his early colleagues and friends Viktor Silin and Anri Rukhadse.

Everybody who knew Yuri Klimontovich agreed that he was a remarkable scientist and an impressive personality... In addition to the personal memories devoted to Yuri Klimontovich given above, the next few pages of this volume contain photographs of various stages of his life.

The editors

Photographs

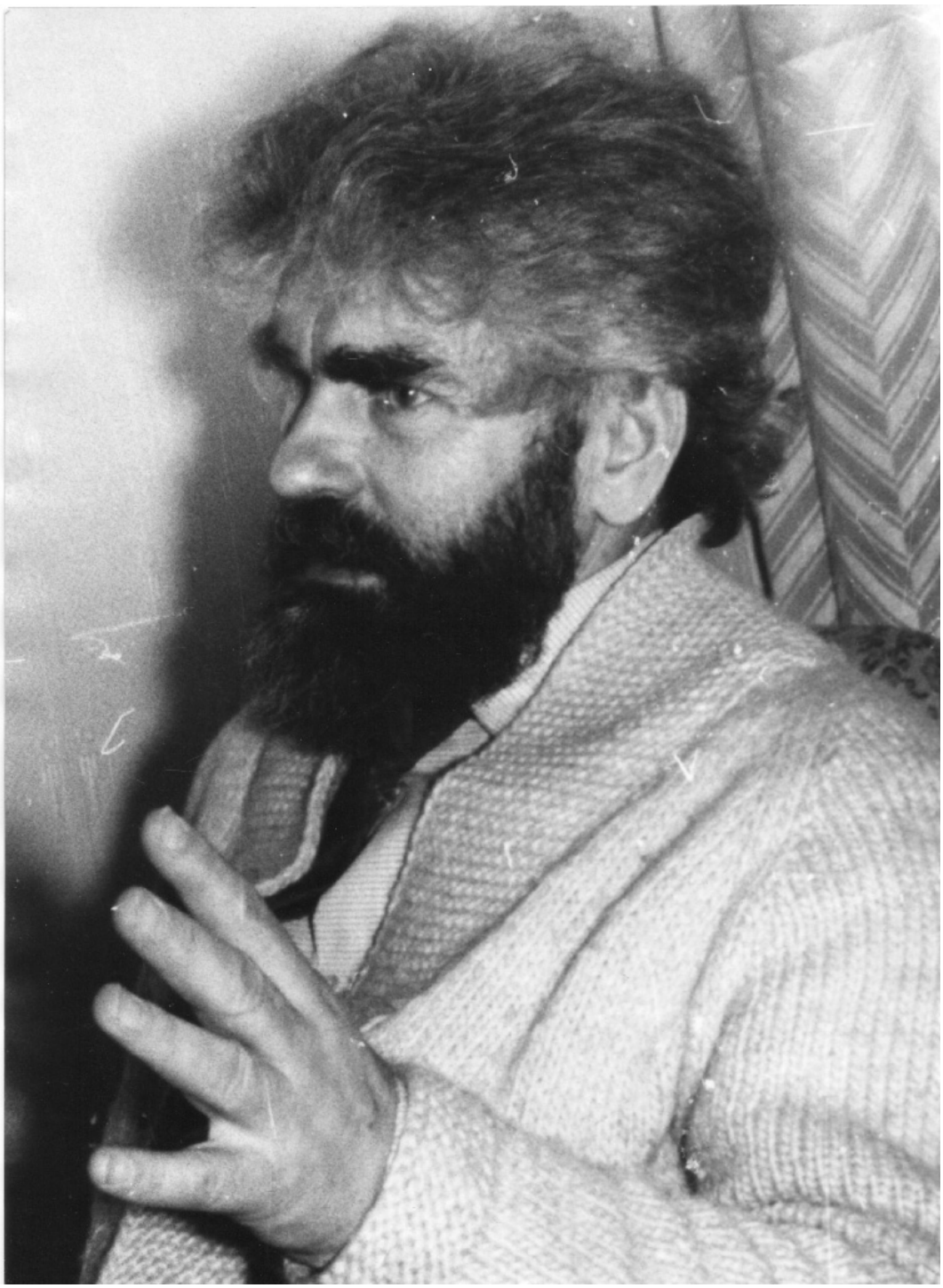
A.A. Rukhadse, V.P. Silin, P.S. Zyrjanov, Y.L. Klimontovich and Gurevich at a Winter school in Swerdlowsk, Russia, in the early 1960s (photo by L. Kobelev).

Yuri Klimontovich and Slava Belyi, Summer 1969 in the village of Sosnovka, Leningrad region. Here, Yuri Klimontovich, his wife Svetlana Iosifovna, his daughter Katya and his dog Urs spend holidays with Prof. D.N. Zubarev (photo by S. Belyi).

Yuri Klimontovich and Hermann Haken during the conference “Synergetics”, 1983 in Pushchino, Russia (photo from the archive of the Klimontovich family).

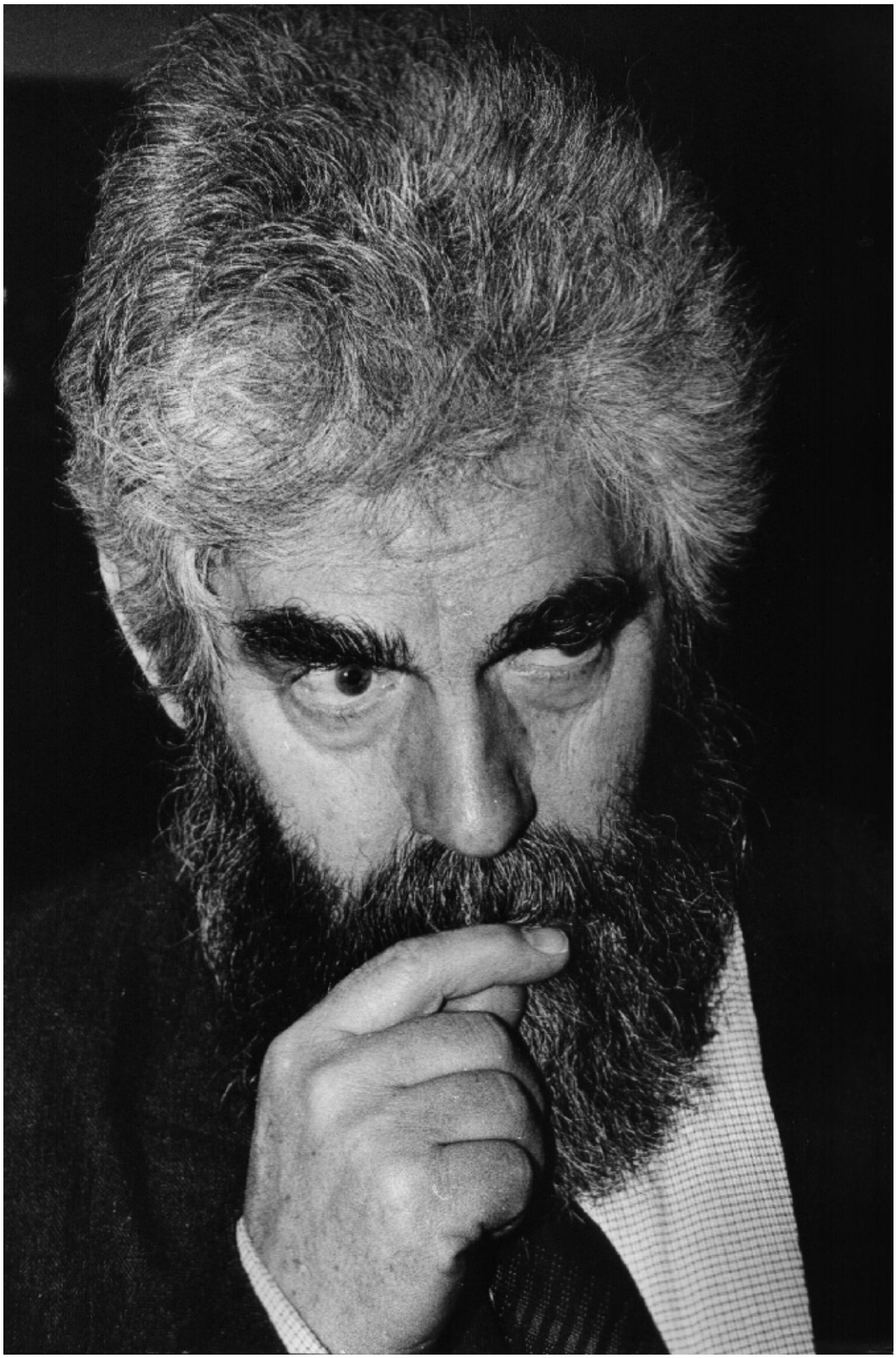
Yuri Klimontovich and Ilya Prigogine at Moscow University 1993 (photo from the archive of the Klimontovich family).

(Color online) Berlin, September 2001, at the 65th birthday of Werner Ebeling. In the front row: Barbara and Werner Ebeling, Yuri Klimontovich and Michael Bonitz (photo by A. Förster).



Yuri Klimontovich in 1986 (photo by M. Bonitz).

(Color online) Yuri Klimontovich in 1999 in Moscow (photo by M. Bonitz).



Yuri Lvovich Klimontovich, 1924–2002.