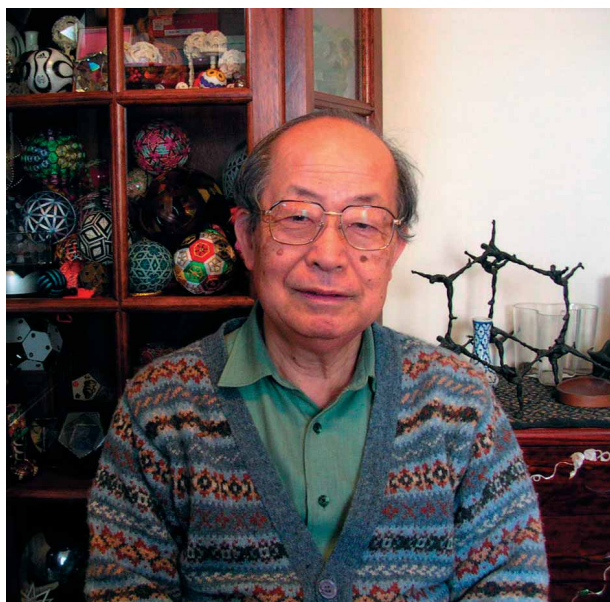


Haruo Hosoya – *Curriculum vitae*

Professor Haruo Hosoya was born in 1936 in Kamakura, 50 km to the south of Tokyo, as the second son of an office worker. As Shogun families of Minamoto and Hohjoh were ruling Japan from Kamakura (1192–1333), famous temples and shrines, together with beautiful historic scenery, are still attracting people not only from Japan but also from foreign countries. That is why Kamakura was not bombed like Kyoto during the Second World War. Haruo entered a newly established mission school in Kamakura where the three key persons, including the principal, were German Catholic Jesuit Fathers. Though he had not been baptized, he was lucky to be able to get there in his very young days some sense of internationalism. The German principal, Father Gustav Voss, conveyed to the pupils his motto: "I dare go into the middle of a million opponents."

Haruo loves not only numbers but also calculations not so much as a numerologist but just for some aesthetic reasons. 1936, his birth year, is a perfect square number as $44 \times 44 = 1936$, and came just 200 years after Euler solved the problem of seven bridges in Königsberg. After the war, all people, including university professors, were poor in Japan. When Haruo was a senior high school student, Kiyoshi Takeda, a professor of mathematics at a private university, started for his living a small mathematics class and taught Haruo and a few other classmates a brilliant introductory course in university mathematics. Haruo was immensely fascinated by mathematics, but he did not dare choose mathematics as a major at the University of Tokyo.

In the mission high school, there was a chemistry teacher, the hermit Yorihiro Koyama, a graduate from the Department of Chemistry, University of Tokyo, who lost his prospective job during the *après guerre* whirl. His attitude to teaching the chemistry course was quite strange: He just read out aloud from the textbook for high school students, and criticized every sentence from the standpoint of an expert in chemistry and chemical industry. As a result, almost all his students developed a dislike for chemistry. However, teacher Koyama gathered a small group of students and taught them extracurricular advanced chemistry. One of Haruo's classmates brought the newly



translated Pauling's book *The Nature of Chemical Bond* and challenged the teacher in the classroom with some problems but neither the teacher nor the pupils could win the debates since they did not understand the essence of quantum chemistry. After this chaos in the chemistry class, Haruo learned from books in the library that some revolution was going on in modern chemistry and he decided to study theoretical chemistry.

Haruo Hosoya entered the University of Tokyo in 1955. Although many professors in the Department of Chemistry were top-ranked in Japan, none of them could quench Haruo's thirst for theoretical chemistry. He was, however, lucky to attend stimulating lectures of Masao Kotani, a leading professor of quantum mechanics, and also to get the fascinating book *Les Théories Electroniques de la Chimie Organique* written by Professors A. and B. Pullman.

Fortunately just before Haruo started his master's course, a new institution was established at the University of Tokyo, the Institute for Solid State Physics, where the specialty of ninety percent professors was physics, and only three chemistry professors could accept graduate

students. Haruo's supervisor, Professor Saburo Nagakura, who later got the presidential position at the IUPAC, was one of the young leaders in molecular spectroscopy and quantum chemistry in Japan at that time.

Haruo wrote his thesis *Study on the Structure of Reactive Intermediates and Reaction Mechanism* in 1964. Since *ab initio* electronic structure computations were not available to most of the theorists there, Haruo had to do some semi-empirical PPP or *molecules in molecule* type calculations. Haruo then confessed in despair: "I have no confidence in my calculations even though some agreement between experimental and calculated results was obtained. The more precisely we go, the more digits of numbers we need. Has the truth beyond us to be described by so many digits of muddled numbers? God must have not known mathematics."

It has to be mentioned here that in 1957 when Haruo was a third year undergraduate student of chemistry he found some interesting regularities in the boiling points of alkane isomers and was able to predict them by using rather simple arguments. Here one finds the seeds of what will later become an internationally recognized career.

In 1967, Haruo went to Ann Arbor, Michigan, as a postdoc in biophysics with Professor John Platt, in order to clarify reaction mechanisms involving rhodopsin intermediates in the retina of albino rats. Professor Platt was famous for his free electron model and classification of UV spectra of aromatic hydrocarbons. Although living very modestly there, Haruo was able to afford a six-week round trip of Europe with his pregnant wife, Sumie, and their baby boy, Ryutaro, just before his second birthday. They stayed at Menton in France for a week to attend the International Summer School of Quantum Chemistry organized by Professor Daudel and Professors A. and B. Pullman.

He had to come back to Japan only one month after this trip for his next job of an associate professor at the Ochanomizu University, Tokyo. In Japan, there are almost one hundred national universities, along with 400 private universities and 400 colleges, but among the one hundred national universities there are only two, Ochanomizu and Nara, for women students only. The Ochanomizu University accepts merely 500 students per year in its three Faculties (Science, Literature and Education, and Home Economics). When he started to teach there in 1969, Haruo wanted to find new research targets because without manpower, money, and powerful computers he could never gain an advantage over Nagakura's large group if he played in the same field as his former boss. Fortunately, however, he soon got an idea of the topological index, *Z*, which was hinted by his own, though primitive, QSAR study from his undergraduate days. The data and

memo had been sleeping for more than ten years in his notebook.

The celebrated *Z* index was born at the end of 1969 at the Ochanomizu University; however, his first paper submitted to *Chemical Physics Letters* was rejected in 1970. In the same year, Haruo read a paper on his *Z* index at the annual meeting on molecular structure in Tokyo. It was a kind of culture shock to many theoretical chemists not only in Japan but also abroad. Then it took a long time for his first graph-theoretical paper to be published in *Bulletin of the Chemical Society of Japan* in September 1971. Professor Heilbronner confessed to Haruo in 1973 that it was him who had rejected his paper three years before.

Haruo made his first contact with the Zagreb Theoretical Chemistry Group of the "R. Bošković" Institute in 1974 after attending the First International Conference on Quantum Chemistry in Menton, which celebrated the 50th anniversary of de Broglie's brilliant paper on matter waves, where he met Dennis Rouvray and Roger Mallion. He made a trip around Europe to meet his supposed-to-be rivals in graph-theoretical chemistry, Nenad Trinajstić, Ante Graovac and Ivan Gutman in Zagreb, and Alexandru T. Balaban in Bucharest. According to his own words, it was a very important trip for his academic career.

Academic activities after these experiences are well documented in *Internet Electronic. J. Mol. Design* **1** (2002) 428–442, where his numerous contributions to theoretical chemistry are presented in detail. Although he retired from the Ochanomizu University in 2002 ($= 2 \times 7 \times 11 \times 13$) after serving for 33 ($= 2 + 7 + 11 + 13$) years, he keeps working in mathematical chemistry but with a shift to pure mathematics.

More than 140 students have graduated from his Lab and nearly twenty of them won PhD degrees. Now more than ten of these PhDs are working at major universities in Japan either as full professors, associate professors or assistants. Besides, many of his former students are actively doing research in companies and teaching at high schools.

After his first contacts in 1974, Professor Hosoya has visited Zagreb and Dubrovnik many times, before 1986 lecturing at the meetings on aromaticity and mathematical chemistry organized by Professor Trinajstić and after that at the Dubrovnik MATH/CHEM/COMP Courses & Conferences. He maintains his close collaboration with theoretical chemists in Croatia, publishes regularly in *Croatica Chemica Acta*, and serves as a referee for this journal.

Ante Graovac