

Dedication



Tsuyoshi Ando was born on February 1, 1932 and grew up in Sapporo, the provincial capital of Hokkaido, a northern island of Japan. In 1949 he entered Hokkaido University. When Ando was a junior, Dr. Hidegoro Nakano was invited to be a professor for the chair of real and functional analysis. After receiving the B.S. degree, Ando enrolled in the newly opened graduate school and began to study functional

analysis under Prof. Nakano. The influence of Prof. Nakano is seen in the life-long interest of Ando in the order structure.

In 1958 Ando received his Ph.D. with a thesis entitled “Positive linear operators in semi-ordered linear spaces”. After this he got a junior academic position at the Division of Applied Mathematics in the Research Institute of Applied Electricity of Hokkaido University. In 1969 he was promoted to full professorship.

From 1988 to 1994, Ando served as the director of the Research Institute. Although he was much occupied with the management of the Institute, he kept up his research activity even during this period.

After his retirement from Hokkaido University in 1995 at the age of 63, Ando moved to Hokusei Gakuen University, a private university in Sapporo, to teach freshman mathematics. In March of 2002 he will retire from this university at the age of 70. During this period he devoted much time to refereeing and editing works for several journals including LAA, and he served as the president of the Society of Mathematical Education in Hokkaido, a society of mathematics teachers in primary, middle and junior high schools.

Ando’s research interests vary widely from measure theory, ordered Banach space, operator theory to matrix analysis. His first important contribution was an extension of the theorem of Nikodym on equicontinuity of countably additive measures to the case of finitely additive measures. Then he turned his attention to predual characterization for ordered Banach spaces. One of his significant contributions, known sometimes as Krein–Ando theorem, gives a predual characterization for the lattice property of the dual space in terms of the “Riesz interpolation property”.

The most famous work of Ando for Hilbert space operators is in the area of dilation theory. He showed that a pair of commuting contractions admits a pair of commuting unitary dilations. This result has been refined by several mathematicians and has led to the “commutant lifting theorem”, which is now a key tool in the mathematical theory of linear systems.

Around the end of 1970s, Ando’s research focus shifted to matrix theory. He has applied several powerful methods of operator theory to solve problems in matrix analysis. His work in matrix theory ranges from matrix inequalities, operator (matrix) means, numerical ranges, majorization for eigenvalues and singular values, nonnegative matrices to Hadamard products.

In the area of the numerical range, Ando gave a useful characterization for an operator to have numerical radius one in terms of a special factorization. Later (in a paper with K. Okubo) he obtained a characterization of matrices whose Hadamard multiplier norm with respect to the numerical radius is bounded by 1.

He (together with F. Kubo) unified definitions of arithmetic–geometric–harmonic means of two positive definite matrices to develop a general theory of operator means, based on a deep analysis of the Löwner theory of operator monotone functions. He used this theory to obtain several striking, beautiful and powerful matrix inequalities.

In the field of majorization, Ando established several results on majorization relations especially in connection with Hadamard products. Also, he (together with F. Hiai) studied logarithmic majorization to show that many known determinantal inequalities can be extended to logarithmic majorizations.

Apart from his many important papers Ando has written several lecture notes and scientific reports on different subjects such as completely positive matrices, operator inequalities, majorizations and quadratic matrix equations. These provided overviews of the subjects and have become basic references in the respective areas.

Ando has been a member of the organizing committees of several international meetings, including the Workshop on Operator Theory and Complex Analysis in 1991 and the Third Workshop on Numerical Ranges and Numerical Radii in 1996. For many years, he has been on the editorial boards of *Linear Algebra and its Applications* and *Linear and Multilinear Algebra*. He was a member of the editorial board of *SIAM Journal on Matrix Analysis and Applications* from 1991 to 1996. In addition, he has been associated with several journals in other subjects.

Among his former students and research associates are M. Takaguchi, K. Nishio, T. Nakazi, M. Uchiyama, K. Okubo, F. Kubo, Y. Nakamura, N. Sakakibara, T. Hara, K. Furuta, T. Yamamoto, F. Hiai, T. Furuta, S. Watanabe, K. Izuchi, S. Kawamura, who are now active mathematicians in their respective fields.

To us, and many others, Ando has been an inspiring colleague. His beautiful papers have given us joy and influenced our work in many ways. It is our privilege to have edited this special volume to celebrate his 70th birthday. The papers presented here cover several areas and have been submitted by authors around the globe. Their authors, and all the editors of LAA, join us in acknowledging Ando's important mathematical contributions, and in wishing him a good life in the years to come. We all express our sincere congratulations to Prof. Ando on this occasion of the 70th anniversary of his birth. We hope that he will continue to be active and productive, and will enjoy a happy retirement.

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C.-K. Li
K. Okubo
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