

## Dedication

The present issue of Hokkaido Mathematical Journal is dedicated to Professor Noboru Tanaka on the occasion of his sixtieth birthday. We collect in this issue thirteen papers specially contributed to dedicate to him.

Professor Noboru Tanaka was born on April 11, 1930 in Iida (Nagano Prefecture). Entering the graduate course at Nagoya University in 1956, he started his research in differential geometry under the influence of Y. Matsushima, K. Nomizu, M. Kuranishi and others. Soon, he wrote his first paper on projective connections [1], and a second paper on conformal connections [2]. Then a few years later appeared his famous paper on real hypersurfaces in  $n$ -dimensional complex spaces [4], in which, generalizing the result of E. Cartan in 2 dimensions, he solved the equivalence problem for non-degenerate real hypersurfaces by constructing Cartan connections, and opened an epoch in the geometric study of pseudo-complex structures (CR-structures in the current terminology). Through these three papers Tanaka had already established his own style and found rich sources of his later mathematical development.

In 1965 Tanaka moved to Kyoto University and accelerated his research. Motivated by his preceding works, he proceeded to investigate more deeply the equivalence problems of geometric structures. Based on the geometry of differential systems, his theory on the equivalence problems was developed in a series of papers ([5], [6], [7], [9], [17], [19]). One of his main achievements is a prolongation scheme for geometric structures admitting differential systems as underlying structures [9], which gives a more refined method to equivalence problems than that of the usual method of  $G$ -structures. Another important contribution is the construction of Cartan connections for geometric structures associated with simple graded Lie algebras [19], which generalizes and unifies all his previous works on Cartan connections.

His theory found important geometric applications, in particular in the study of pseudo-complex structures ([6], [17]), Siegel domains ([8], [11]) and infinite Lie algebras [10].

In developing these works, Tanaka has learned very much from E. Cartan, having Cartan's *Œuvres complètes* by his side, and realized many of Cartan's ideas in modern geometry. In fact, we may say that Tanaka is one of the true geometers who inherited the spirit of E. Cartan.

Tanaka also paid attention to analytic problems in geometry. This

interest was due in part to the influence of his late friend Mikio Ise and to the seminar of Global Analysis held in Japan annually since 1970s. He made contributions to Weyl and Minkovski problems and the rigidity problems for isometric embedding ([12], [13], [14]), and the harmonic theory of strongly pseudo-convex manifolds ([15], [16]).

In particular his lecture note at Kyoto University [16] is highly regarded.

In 1978 Tanaka became a professor at the Faculty of Science, Hokkaido University. Since then he has devoted himself to the geometric study of differential equations, especially ordinary differential equations, a theme almost forgotten after Lie, Tresse and Cartan but still fundamental in present days. Through geometrization of differential equations and a full use of his theory on geometric structures, especially Cartan connections, Tanaka is developing a deep and detailed theory. Some of its applications were published in a long paper[22]. The whole extent of his theory will be published in the near future.

Professor Tanaka is also an excellent teacher. His lectures have been always lucid, impressive and well-prepared in his own style, and they have exerted a strong influence upon his students and seminar members. As a seminar organizer, he has been a patient listener to all the participants and has been a good adviser.

We all express our sincere congratulations to Professor Tanaka on this occasion of his sixtieth anniversary and we hope that he will be even more active and productive than he has been before sixty (as was E. Cartan).

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