Research plan

- Writing [p4]. The title will be an introduction of analysis on manifolds. I am going to prepare chapters of vector bundles and connections, and to proceed to ordinary differential equations. After these basic subjects, I will take up the Frobenius theorem—integrability conditions, and the theory of linear elliptic partial differential equations—the Hodge theory. The emphasis will be on these topics. Among results concerning the Frobenius theorem, the Newlander-Nirenberg theorem on integarability of almost complex structures and the global Hessian equation of Obata type will be explained in detail. These topics are now classical but do not seem to be very well understood. It is also not easy to find readable modern textbook on the linear elliptic theory. Recently the analysis of non-linear partial differential equations on manifolds is indispensable knowledge for geometers. It is still important to learn the linear theory. To make the writing up to date, I need to use library facility.

- Some theorems reported in [p1] and [p5] are still in my private research notes. I would like to complete them as research papers.

- On some problems on projective differential geometry and conformal differential geometry mentioned in [p5].

- In Omori's theory of infinite dimensional Lie groups, some problems are left and still interesting to me. One is proper formulation of Fourier analysis on manifolds and the other is some symplectic geometry.