(A) Variational problem and elliptic equation on the Hardy-Sobolev inequalities

(1) 3-dimensional problem

There are some open problems of the variational problem on the Hardy-Sobolev inequalities in the 3-dimensional case. I will study an asymptotic behavior of solutions of an elliptic equation with the Hardy-Sobolev nonlinearity in the 3-dimensional case which is strictly related to the variational problem.

(2) Properties of solution

I will study symmetry property of solution. Especially, I will study property of solution of an elliptic equation with some nonlinearities having several singularities.

(B) Variational problem and elliptic equation on the Trudinger-Moser inequalities

(1) Uniqueness of maximizer

I will study the uniqueness of maximizer on the Trudinger-Moser inequality. I expect that positive solution of an elliptic equation with the subcritical Trudinger-Moser nonlinearity is unique.

(2) Adams' inequality and related equations

Concerning Adams' inequality, there is a possibility of existence of non-radial extremal, and thus there are some properties different from those of the Trudinger-Moser inequality. I will study this inequality and related equations.