Plans of my research.

I am interested in the classification problem on symplectic homogeneous spaces whose transformation groups are real semisimple. The notion of symplectic homogeneous space has been introduced by Bon-Yao Chu, which is as follows:

Definition. The triplet (G, H, Ω) is called a **symplectic homogeneous space** if

(i) G is a connected real Lie group;
(ii) H is a connected, closed subgroup of G;
(iii) Ω is a G-invariant symplectic form on the coset space G/H.

It is known that G-coadjoint orbits are symplectic homogeneous spaces but the converse is not always true. While, when G is semisimple, it is able to be true and there exists a bijective correspondence between G-coadjoint orbits and (G, H, Ω). Thus, study of (G, H, Ω) with G semisimple is an equivalent to that of G-coadjoint orbits, and affects not only symplectic geometry but also mathematical physics.

All Euclidean spaces, spheres and hyperbolic spaces are Riemannian symmetric homogeneous spaces. É. Cartan has solved the classification problem on Riemannian symmetric homogeneous spaces, which affects differential geometry, harmonic analytics and so on.

For the reasons mentioned above, I study to solve the classification problem on symplectic homogeneous spaces (G, H, Ω) with G semisimple. I have classified (G, H, Ω) with G compact semisimple, and (G, H, Ω) with G noncompact simple and H compact. In the future I am going to study the problem on (G, H, Ω) with G noncompact simple, without restriction of H being compact.