**HAYATO NASU**, Kyoto University, Research Institute for Mathematical Sciences Double categories of relations relative to factorization systems and fibrations

The applications of (virtual) double categories have expanded in recent years. In this talk, we explore double categories of relations at varying levels of generality. We begin with the double category of sets, functions, and relations; we will also generalize it, first using factorization systems and then using (Grothendieck) fibrations. We will discuss the problem of characterizing those double categories arising from factorization systems and fibrations in double-categorical terms. In addition, we will show how virtual double categories naturally come into play to deal with generalized relations.

This talk is partly based on joint work with Keisuke Hoshino (Kyoto Univ) as well as my master's thesis.