Title: On L^∞ theory of the Navier-Stokes equations with its application to geometric regularity criteria

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Abstract: The local-in-time well-posedness of the Navier-Stokes equations has been studied in various kind of spaces, for example L^p spaces. However, it is quite recent that L^∞ well-posedness is discussed when the domain where the fluid occupied has a boundary. For example, the analyticity of the Stokes semigroup was first established in a joint paper with Ken Abe (2013).

In this talk, we survey L^∞ theory both for the Stokes and the Navier-Stokes equations. Moreover, as an application we give a non-blow-up criterion by the direction of the vorticity when the no-slip boundary condition is imposed. Since we apply a blow-up argument, L^∞ theory is crucially invoked to derive compactness of the blow-up sequence.