

Takuya Hashimoto (Tsukuba University)

■ Title

New developments in the study of distant quasars by observations of absorption and multiple emission lines

■ Summary

ALMA has been playing a leading role in the observations of distant objects, including quasars. Recently, our pioneering work has shown that the OH 119 micron absorption line is a powerful tool to study molecular gas outflows from distant quasars. We have also for the first time successfully detected the [OI] 63 micron line, paving the way to investigate properties of neutral gas in distant objects. In this research project, we will

(1) investigate the presence of molecular gas outflows in a statistical number of very bright distant quasars and test whether outflows leads to the suppression of star formation activity. We will then investigate the relation between distant quasars and passive galaxies that are completing their star formation activity. (2) Based on a combination of multiple fine structure lines, including [OI] 63 micron, we will investigate the interstellar medium of quasar host galaxies. We then try to reveal the similarity/difference of the host galaxies against normal star forming galaxies at similar

epochs.