Nederlandse Astronomenconferentie 2022



Contribution ID: 22 Type: not specified

The chemical footprint of AGN feedback in the outflowing circumnuclear disk of NGC1068

Monday, 30 May 2022 17:50 (15 minutes)

In the nearby (D=14 Mpc) AGN-starburst composite galaxy NGC 1068, it has been found that the molecular gas in the CND is outflowing, which is a manifestation of ongoing AGN feedback (García- Burillo et al. 2014). The induced interaction between the AGN ionized wind & jet with the molecular gas on the CND has produced large-scale molecular shocks on spatial scales of up to 400 pc from the AGN. The outflowing gas has a large span of velocities, which likely drive different shock chemistry signatures at different locations in the CND. In this talk we are presenting our recent ALMA multi-line molecular study (Huang et al. 2022; Huang et al. in prep.) using SiO, HNCO and methanol as tracers of chemical differentiation across the CND. With a radiative transfer analysis coupled with Bayesian inference processes, we are able to determine the gas properties of the potentially shocked gas in the CND.

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Session Classification: Parallel Session: Galaxies & Cosmology