

**Understanding the state of the gas surrounding Andromeda's black hole.  
Anne-Laure Melchior & Françoise Combes**

A millimeter CO survey has been performed at IRAM of the gas surrounding Andromeda's black hole. Several velocity components are detected supporting the presence of a relic 1-kpc ring, signaling a possible frontal collision with M32. A multiwavelength analysis of this central field of M31 has been carried out in order to get clues on the location and state of this gas. In this area, the CO gas content suggests a star formation rate of  $3 \times 10^{-4}$  Msol/yr. Beside a 200 Myr A-star cluster detected close to the black hole, no trace of recent star formation is observed in UV. In parallel, H $\alpha$  gas is present but due to shocks as the [NII]\H $\alpha$  ratio is larger than 3. The issue is thus to understand why the cold molecular gas is quenched and not forming stars.