

# The Extended Molecular Gas of Circinus and NGC 1097 seen by APEX

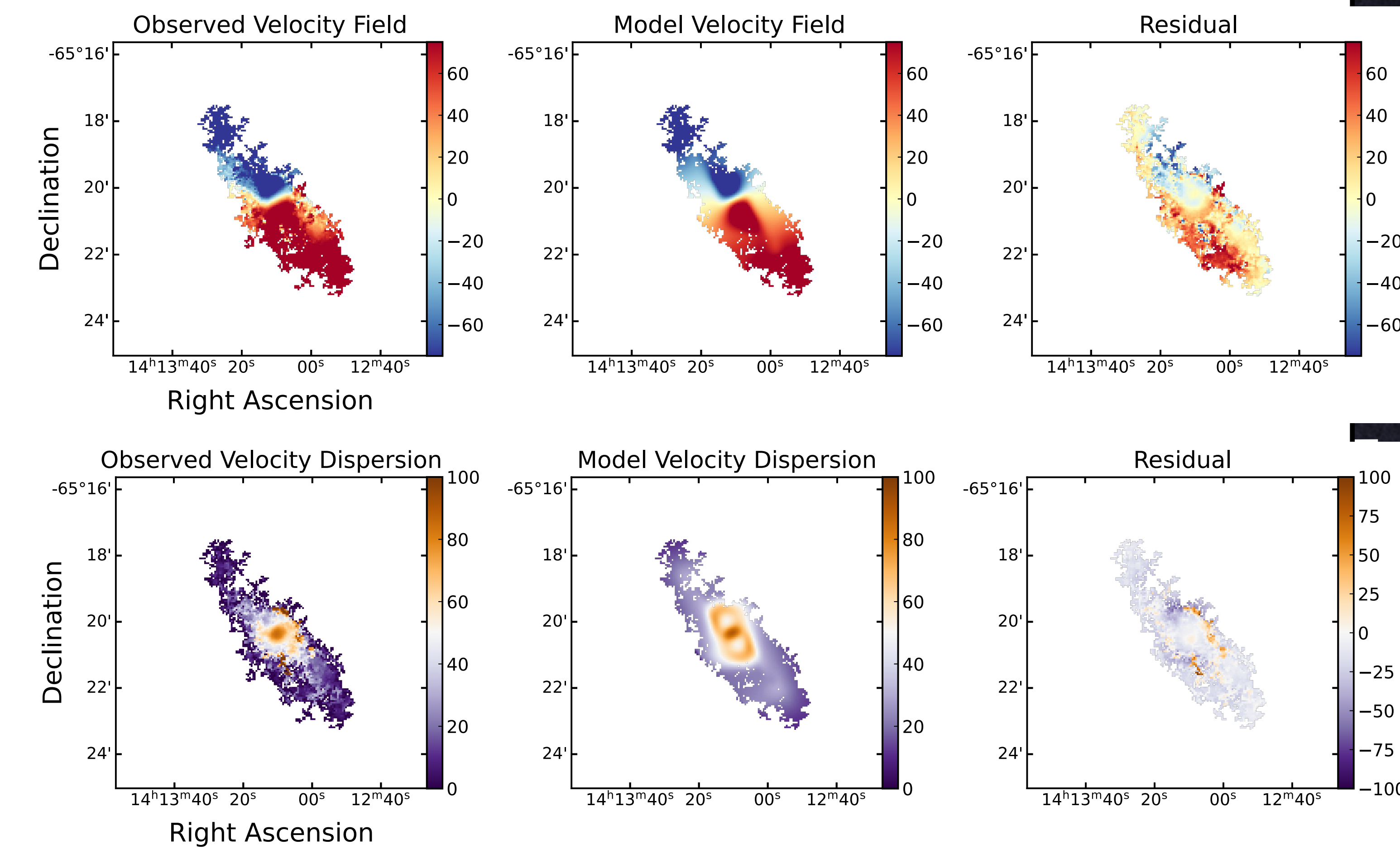
Akhil Lasrado<sup>1</sup>, Claudia Cicone<sup>1</sup>, Axel Weiss<sup>2</sup>

<sup>1</sup>Institute of Theoretical Astrophysics, University of Oslo, <sup>2</sup>Max Planck Institute for Radio Astronomy, Bonn

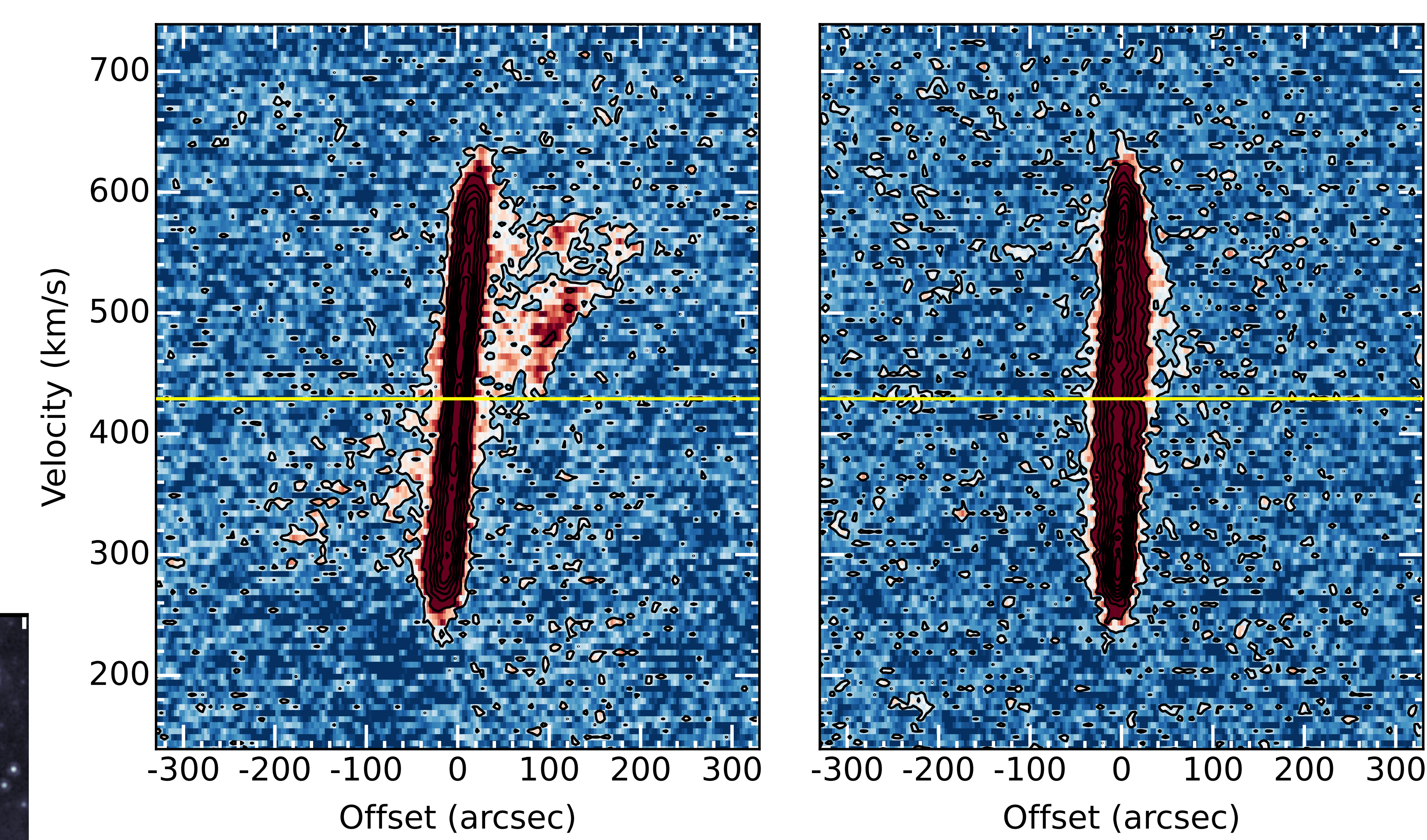
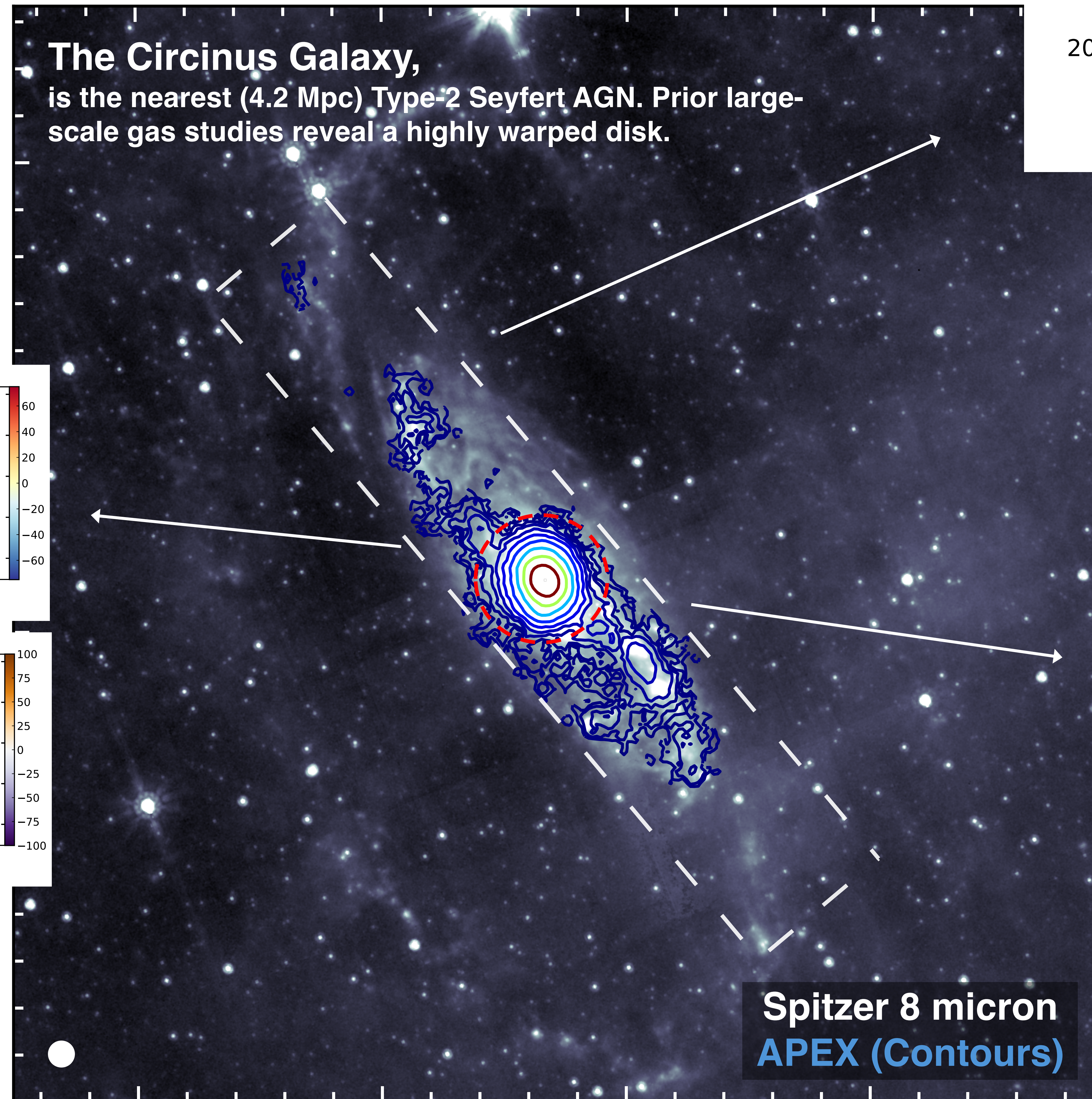
The **extended molecular interstellar medium** is often witness to dynamically important events and structures that affect the evolution of galaxies. **Single dish telescopes** can provide crucial complementary data to high-resolution ALMA data when studying the imprints of these processes in the diffuse, extended molecular gas, and can cover a **large field of view with good sensitivity**. Here we present results from **Atacama Pathfinder EXperiment (APEX)** CO(3–2) observations of the **large-scale molecular gas** of the nearby **Circinus galaxy**.

## Kinematic modelling with 3D BAROLO

- We perform 3D tilted ring modelling using Bbarolo (Teodoro+2015), to test the presence of **radial flows**.
- Models including a radial component indicate the presence of a radial component, but the limited spatial resolution leads to high uncertainties.

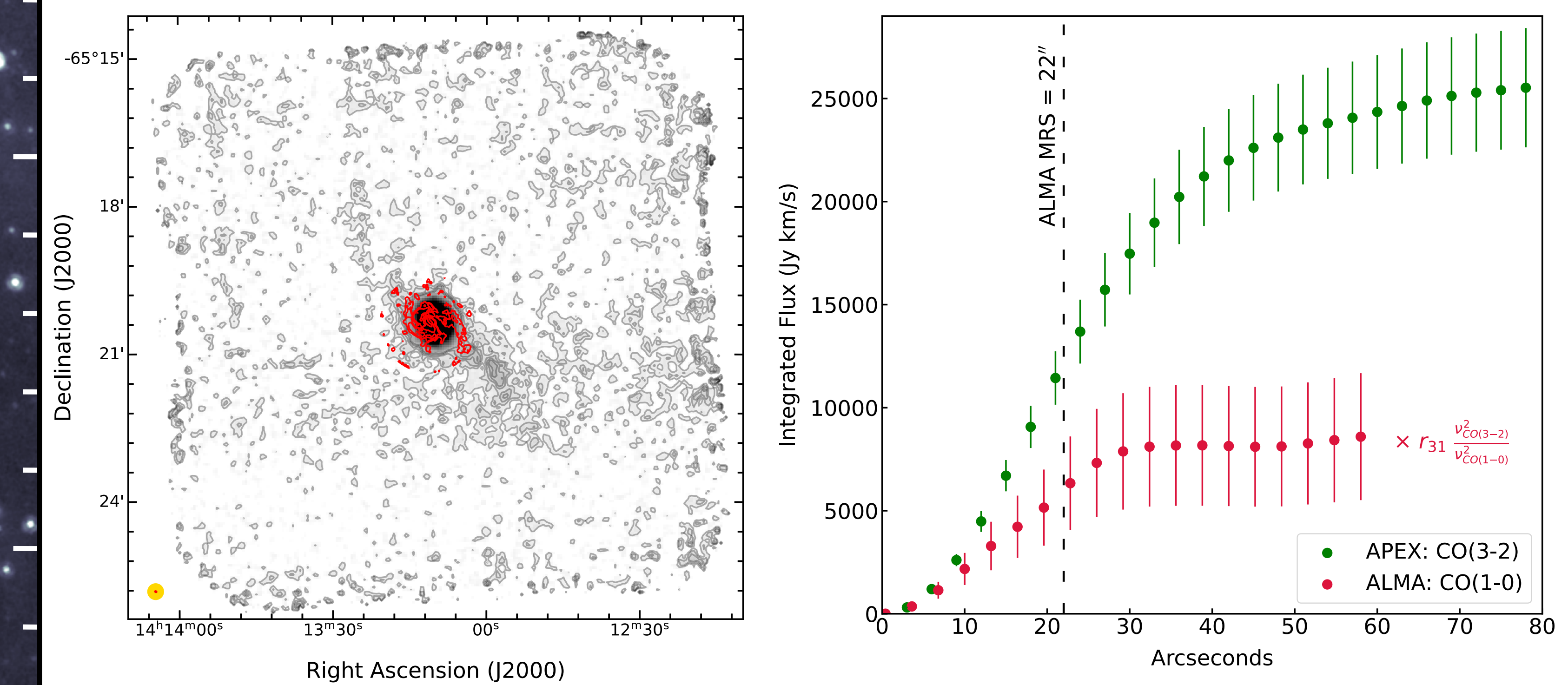


**The Circinus Galaxy,** is the nearest (4.2 Mpc) Type-2 Seyfert AGN. Prior large-scale gas studies reveal a highly warped disk.



## Kinematic signatures of a large-scale bar?

- An **X-shape** in the position-velocity diagram suggests the gas following two distinct families of resonant orbits: the slow-rotating **x<sub>1</sub> orbits**, and the fast-rotating **x<sub>2</sub> orbits**.
- **Slower rotating** gas corresponds to the **large-scale** gas, while **faster rotating** gas corresponds to the **bright inner molecular region**.

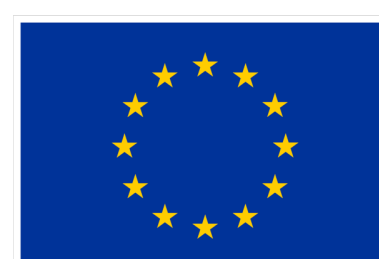


## Flux recovery comparison with ALMA

- Comparison with Zschaechner+2016 CO(1-0) data.
- APEX recovers **~3.5 times more flux** in the central 1 kpc.



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For more details, refer to Lasrado et al. (2024) (in prep), or contact [akhil.lasrado@astro.uio.no](mailto:akhil.lasrado@astro.uio.no)