



In collaboration with: Ruobing Dong, Rob G. van Holstein, Jean-Baptiste Ruffio, Benjamin A. Calvin, Julien H. Girard, Myriam Benisty, Anthony Boccaletti, Thomas M. Esposito, Élodie Choquet, Dimitri Mawet, Laurent Pueyo, Tomas Stolker, Eugene Chiang, Jozua de Boer, John H. Debes, Antonio Garufi, Carol A. Grady, Dean C. Hines, Anne-Lise Maire, François Ménard, Maxwell Millar-Blanchaer, Marshall D. Perrin, Charles A. Poteet, and Glenn Schneider.

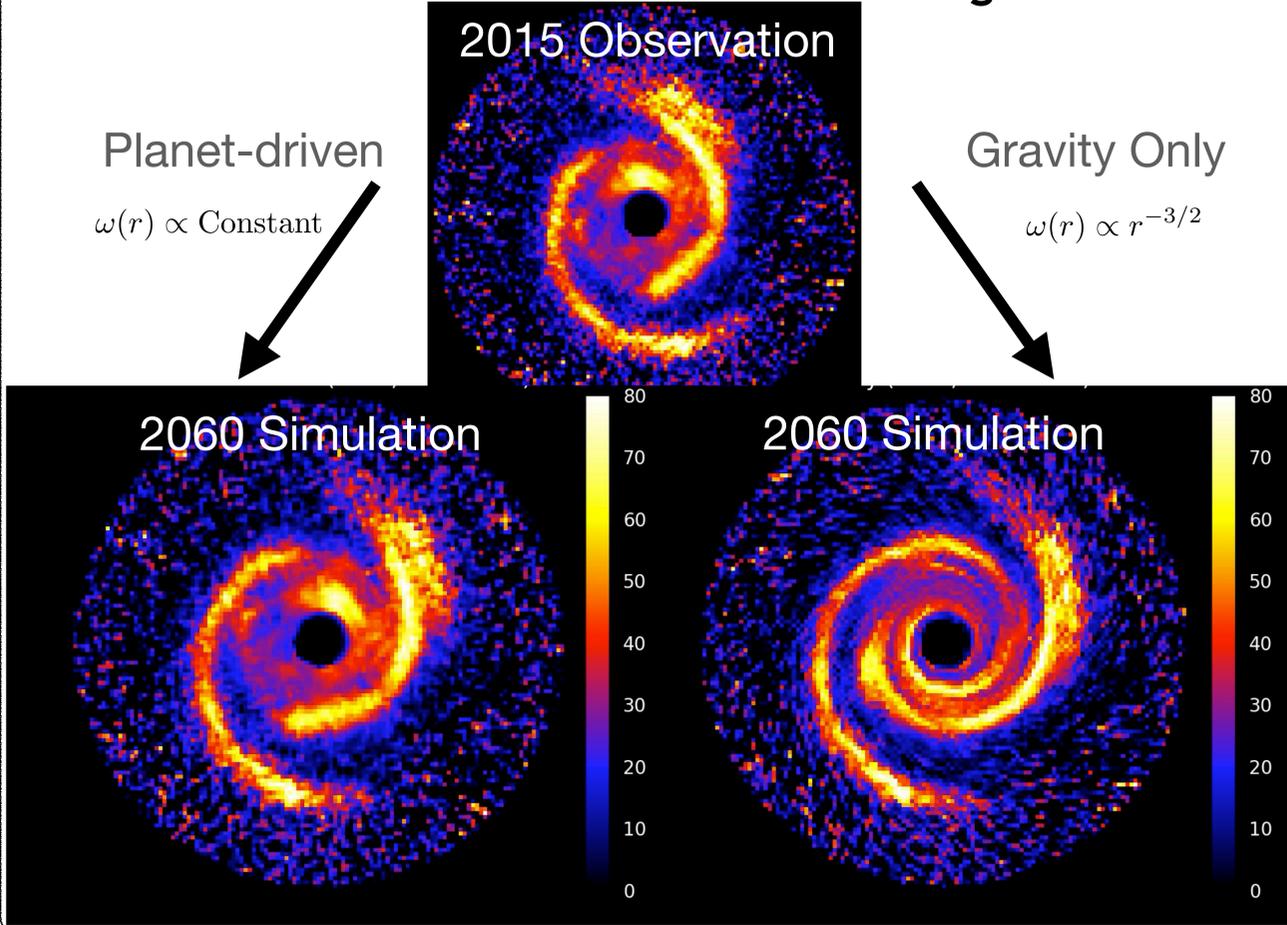
Goal

- Tracing the existence of spiral-arm-driving planets through arm motion.

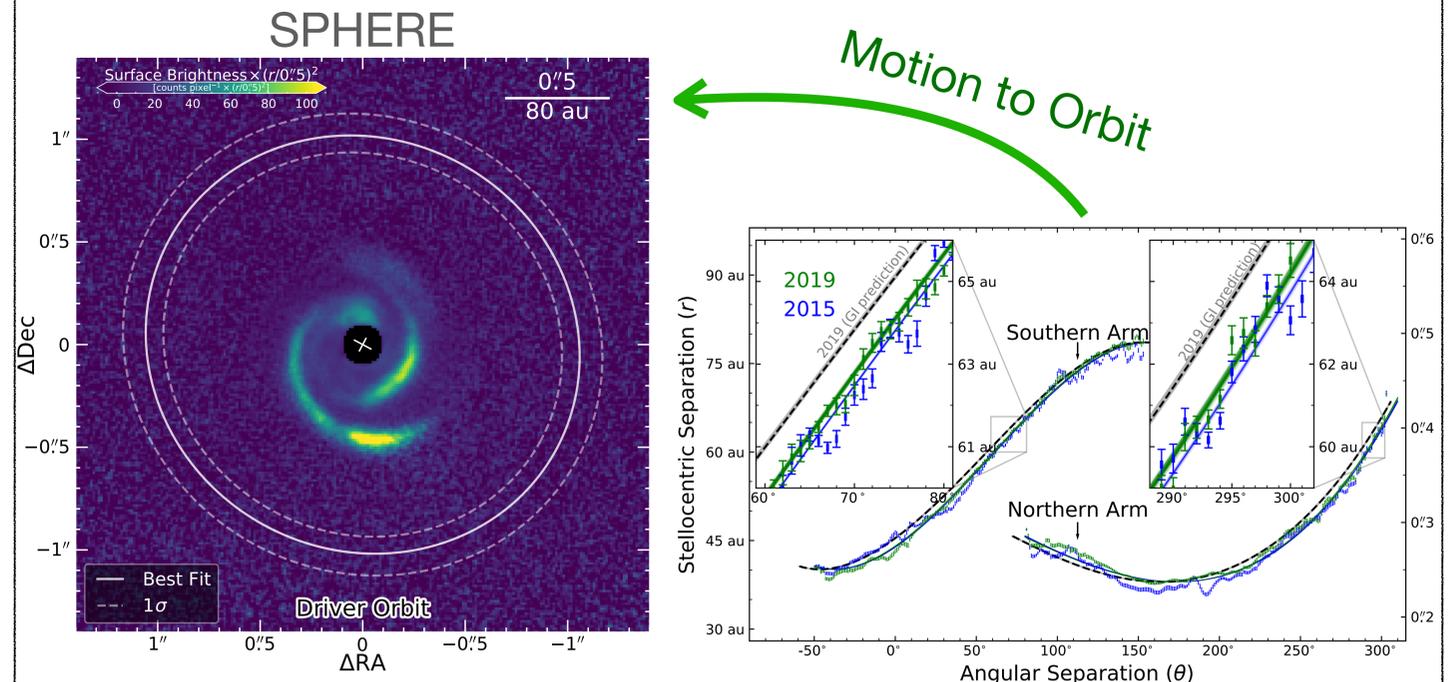
Background

- Two leading theories of spiral arms formation—companion-driven and gravitational instability (GI) induction—predict **distinct motion patterns**.
- Approach: using multi-epoch observations to constrain spiral arm motion, thus
 - * Informing the location for the “missing” planetary drivers, or
 - * Measuring the mass for the protoplanetary disks.

Distinct Motion Pattern under Leading Theories



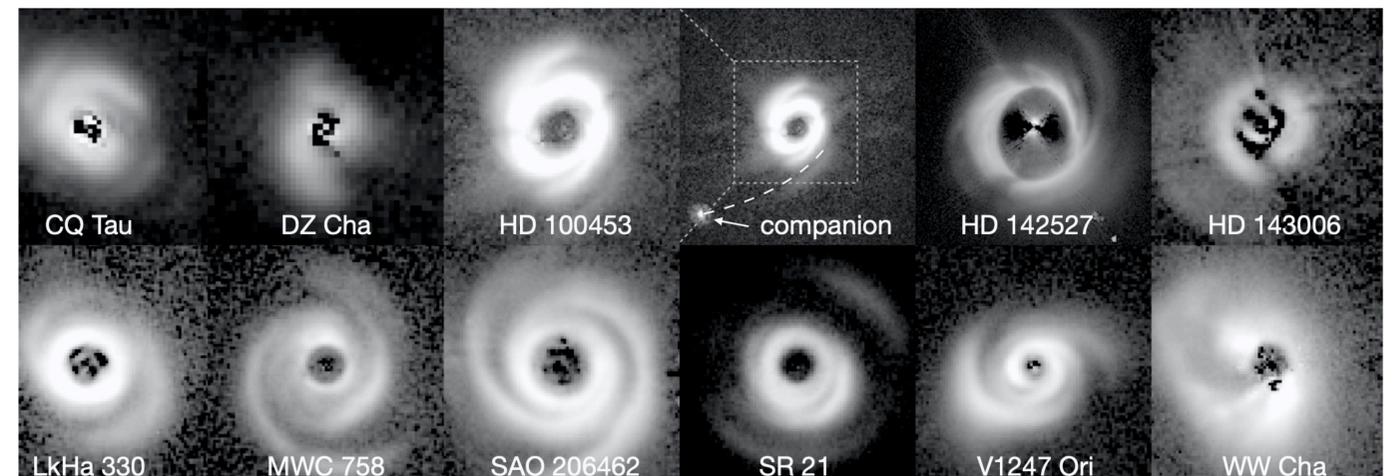
5-year Spiral Motion: One Unseen Planet around MWC 758



- Dynamically **rules out GI** for the first time (Ren et al. 2020).
- Predicts the semi-major axis of the 1 arm-driving planet.

Ideal for *targeted* imaging

Future: Hunting Hidden Drivers



Summary

- Spiral arm motion enables
 - (1) formation mechanism **characterization**, and
 - (2) planetary **driver location** prediction, thus targeted planet hunting.

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