A Cloud-Scale View of the Molecular Gas Disk in the Whirlpool Galaxy

E. Schinnerer¹, S. Meidt², A. Hughes³,⁴, A. Leroy⁵, J. Pety⁶,⁷, M. Querejeta⁸, and F. Bigiel⁹

¹ MPIA, Königstuhl 17, 69117 Heidelberg, Germany
²Sterrenkundig Observatorium, Universiteit Gent, Krijgslaan 281 S9, B-9000 Gent, Belgium
³CNRS, IRAP, 9 Av. du Colonel Roche, BP 44346, F-31028 Toulouse cedex 4, France
⁴Université de Toulouse, UPS-OMP, IRAP, F-31028 Toulouse cedex 4, France
⁵Department of Astronomy, The Ohio State University, 140 West 18th Ave, Columbus, OH 43210, USA
⁶IRAM, 300 rue de la Piscine, F-38406 Saint Martin d’Hères, France;
⁷Sorbonne Université, Observatoire de Paris, Université PSL, École normale supérieure, CNRS, LERMA, F-75005, Paris, France
⁸Observatorio Astronómico Nacional (IGN), C/Alfonso XII 3, Madrid E-28014, Spain
⁹Argelander-Institut für Astronomie, Universität Bonn, Auf dem Hügel 71, 53121 Bonn, Germany

The cloud-scale view of the molecular gas disk in the nearby spiral galaxy M51a (the Whirlpool galaxy) as obtained by the IRAM instruments has provided new insights into the organization of the bulk molecular gas and the relation of these properties to the gas’ star formation capabilities. Here I will review the key results of the IRAM Large Program PAWS (PdBI Arcsecond Whirlpool Survey) and provide an outlook of the insights that we expect to gain from the newly approved NOEMA Large Program to obtain cloud-scale imaging of multiple molecular gas tracers in the 3mm window.