



iDaVIE

immersive Data Visualisation Interactive
Explorer for volumetric rendering

Thijs van der Hulst



iDaVIE



- developed for immersive viewing of 3D data (spectral line cubes including accompanying mask cubes, and soon also redshift catalogues, simulations, any 3⁺D data set)
- developed by IDIA / UCT and Osservatorio Astronomico di Catania
- description of the system at <https://idavie.readthedocs.io/> and <https://doi.org/10.1016/j.ascom.2026.101109>
- requires Windows system with an Nvidia RTX 3080 GPU or better, >32 GB memory and a VR Headset (Meta Quest)

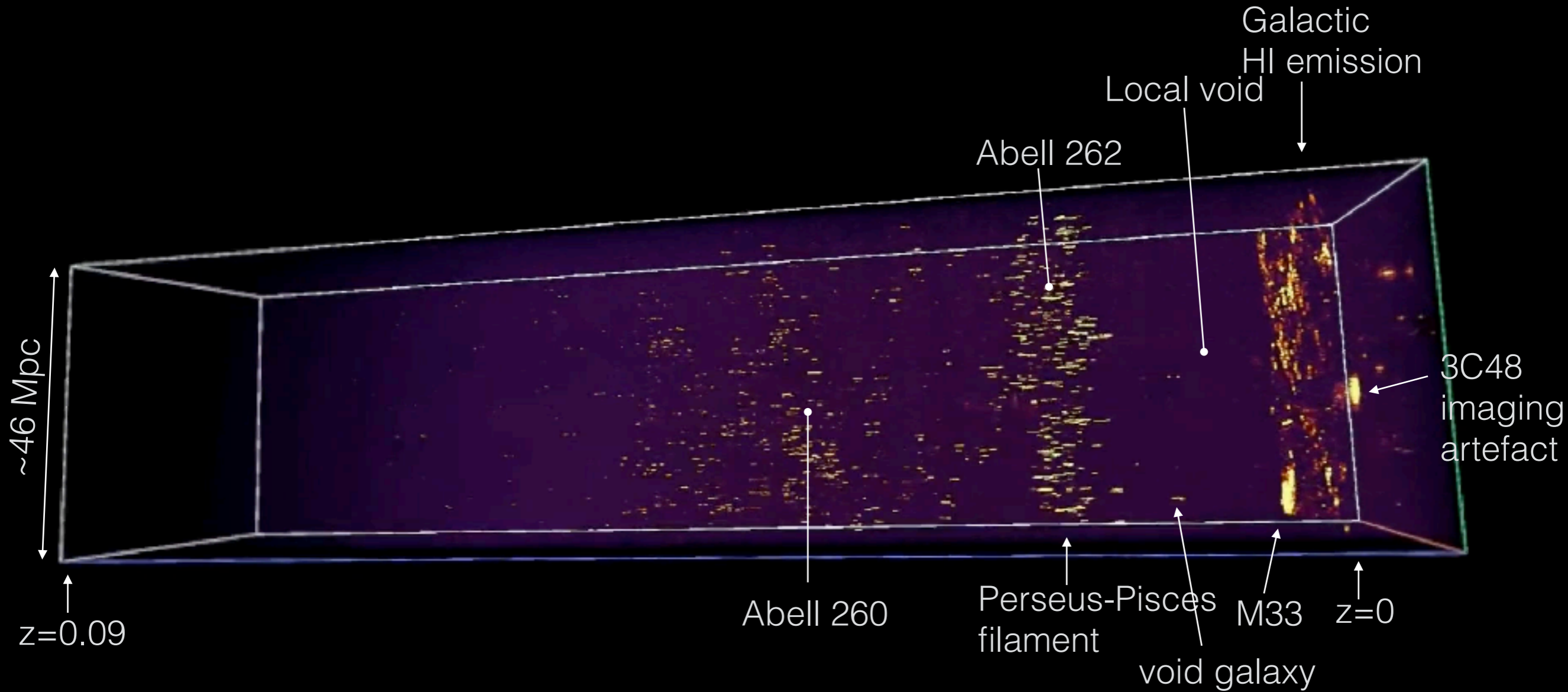
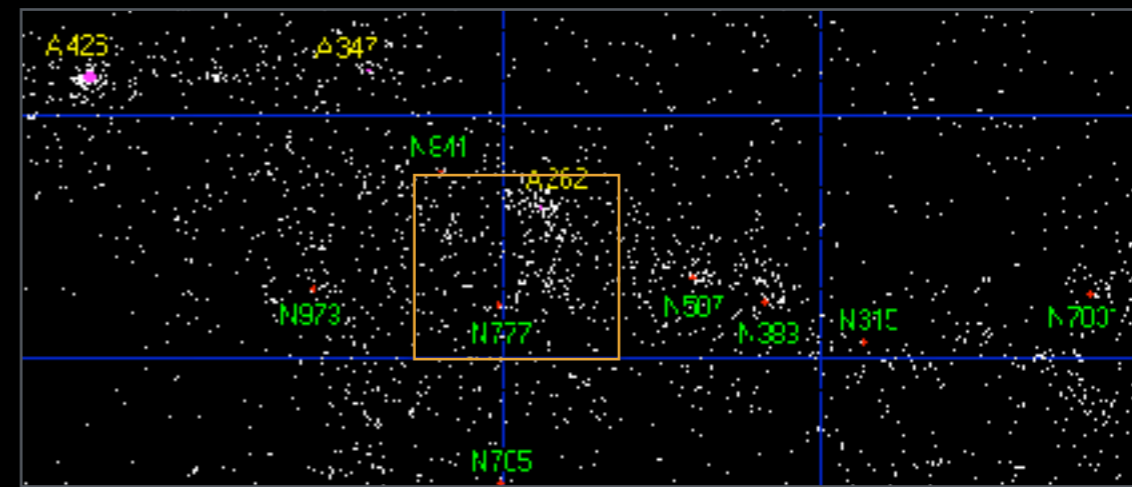


Meta Quest headset



AperTIF Medium-Deep Survey

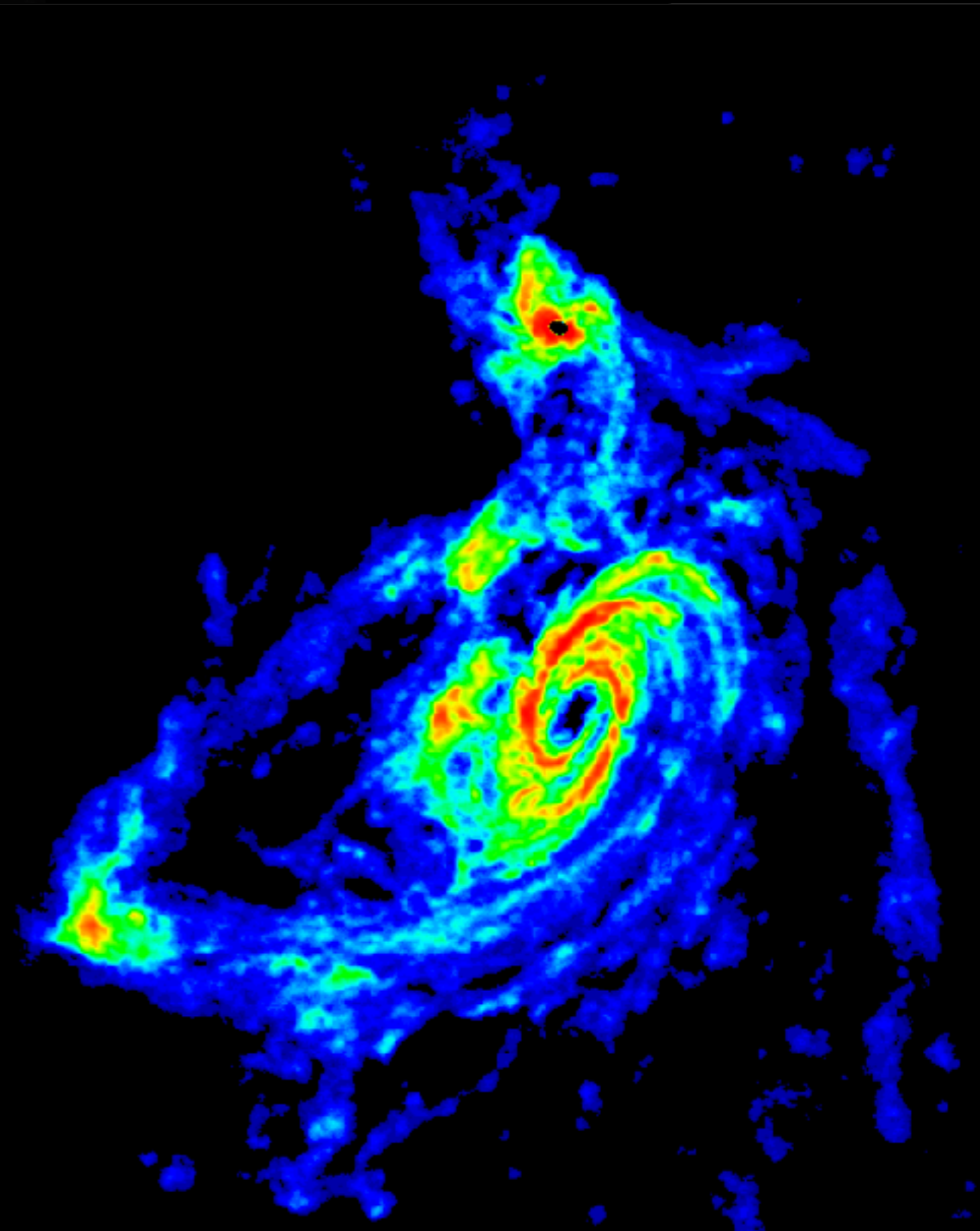
- 70 deg² , $z < 0.09$
- $\Theta = 15'' \times 27''$, $R = 7.6 \times (1+z)$ km/s
- ~1100 HI detections



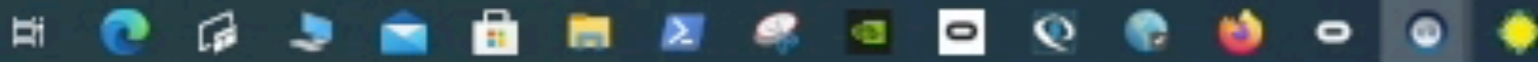
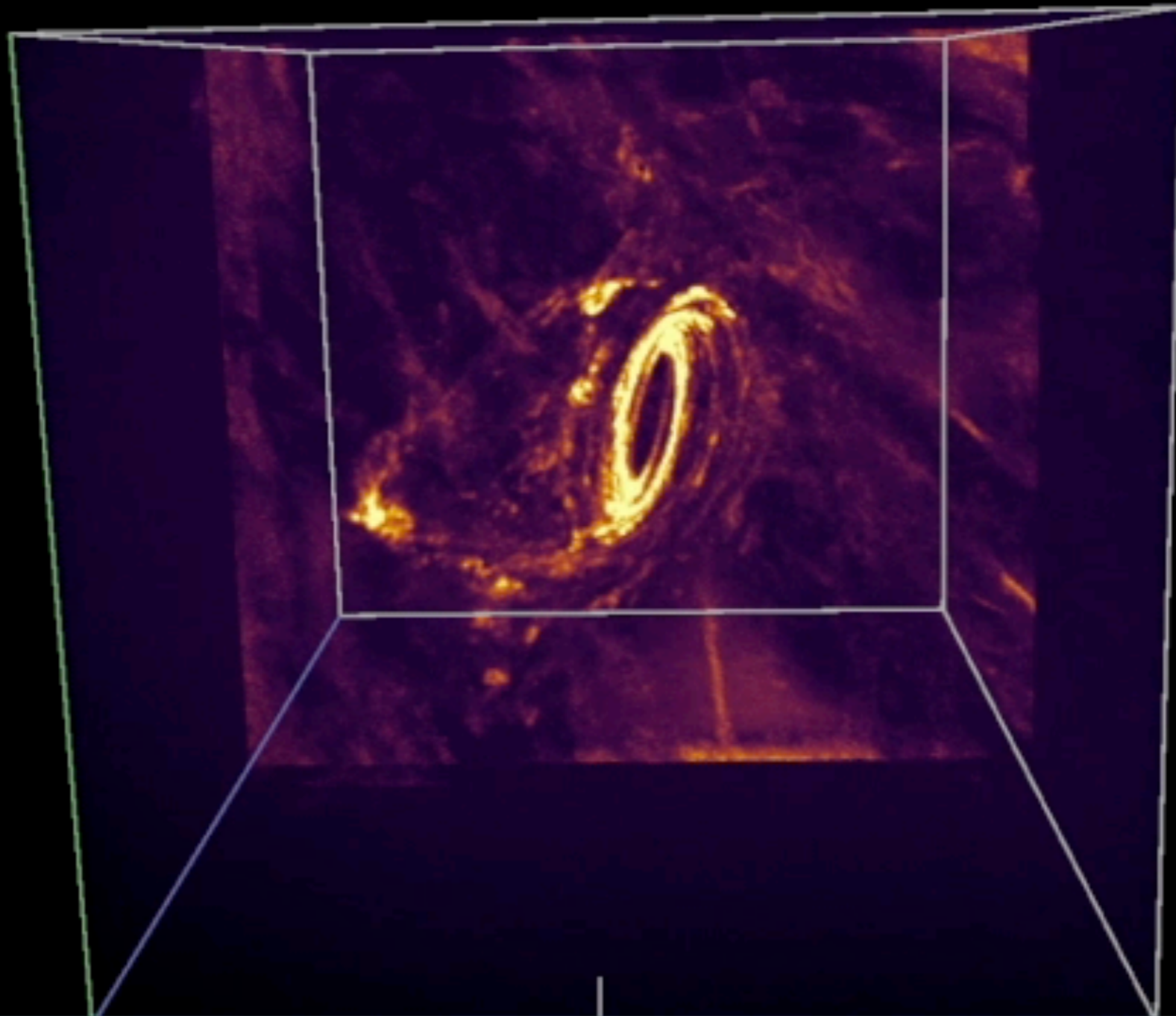
courtesy Marc Verheijen

M81/M82/NGC3077

VLA HI mosaic



de Blok et al. 2018 ApJ 865, 26



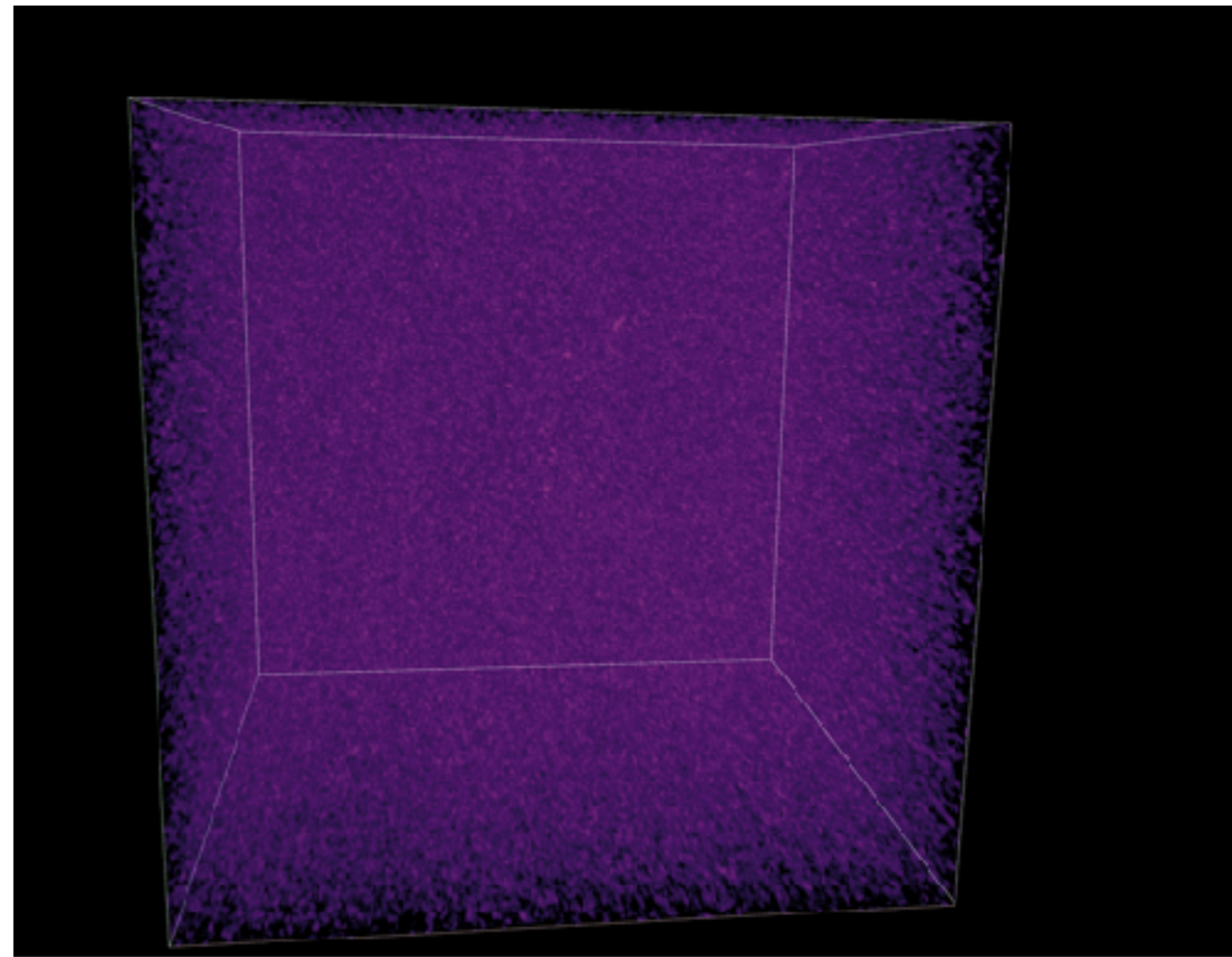
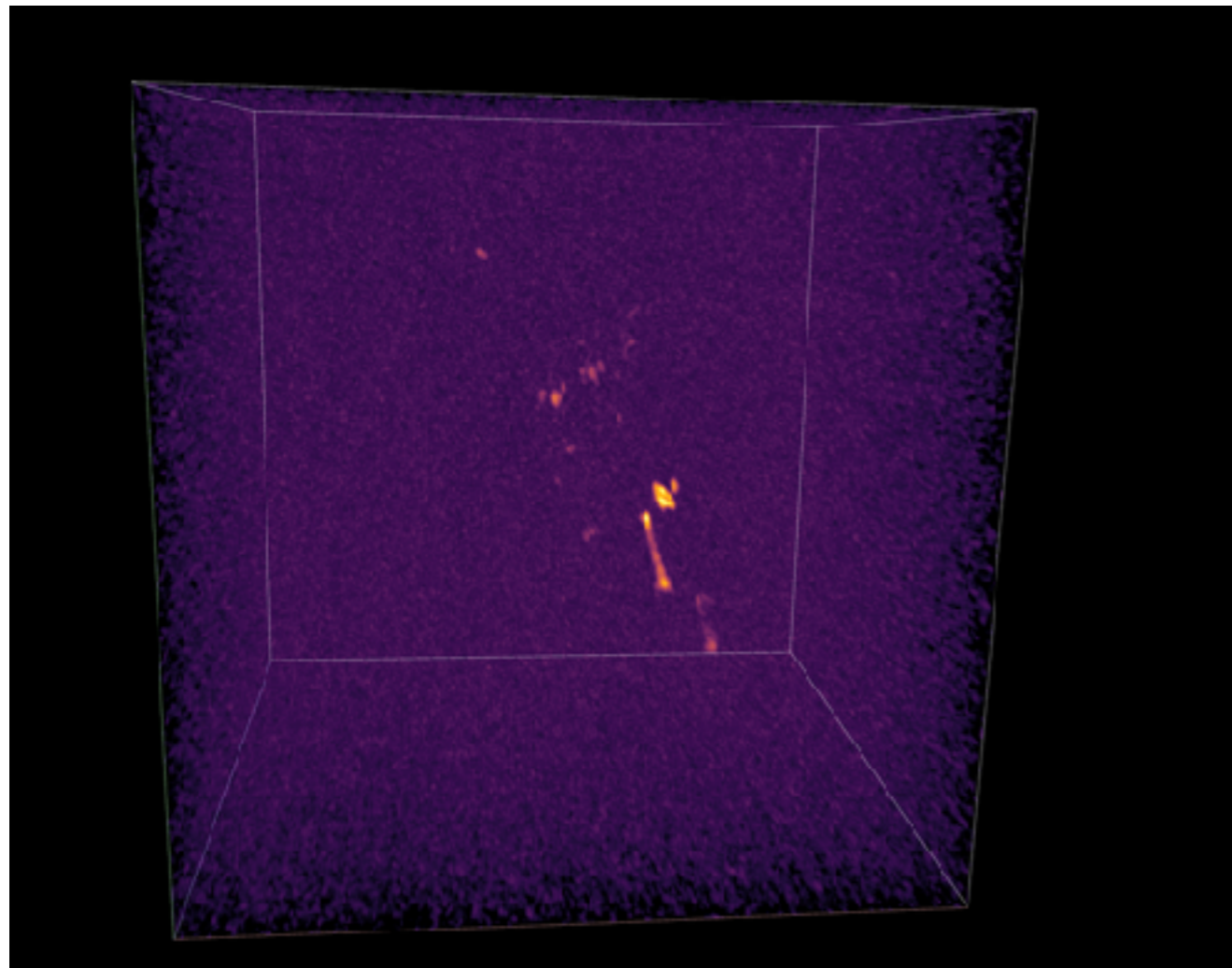


iDaVIE-v



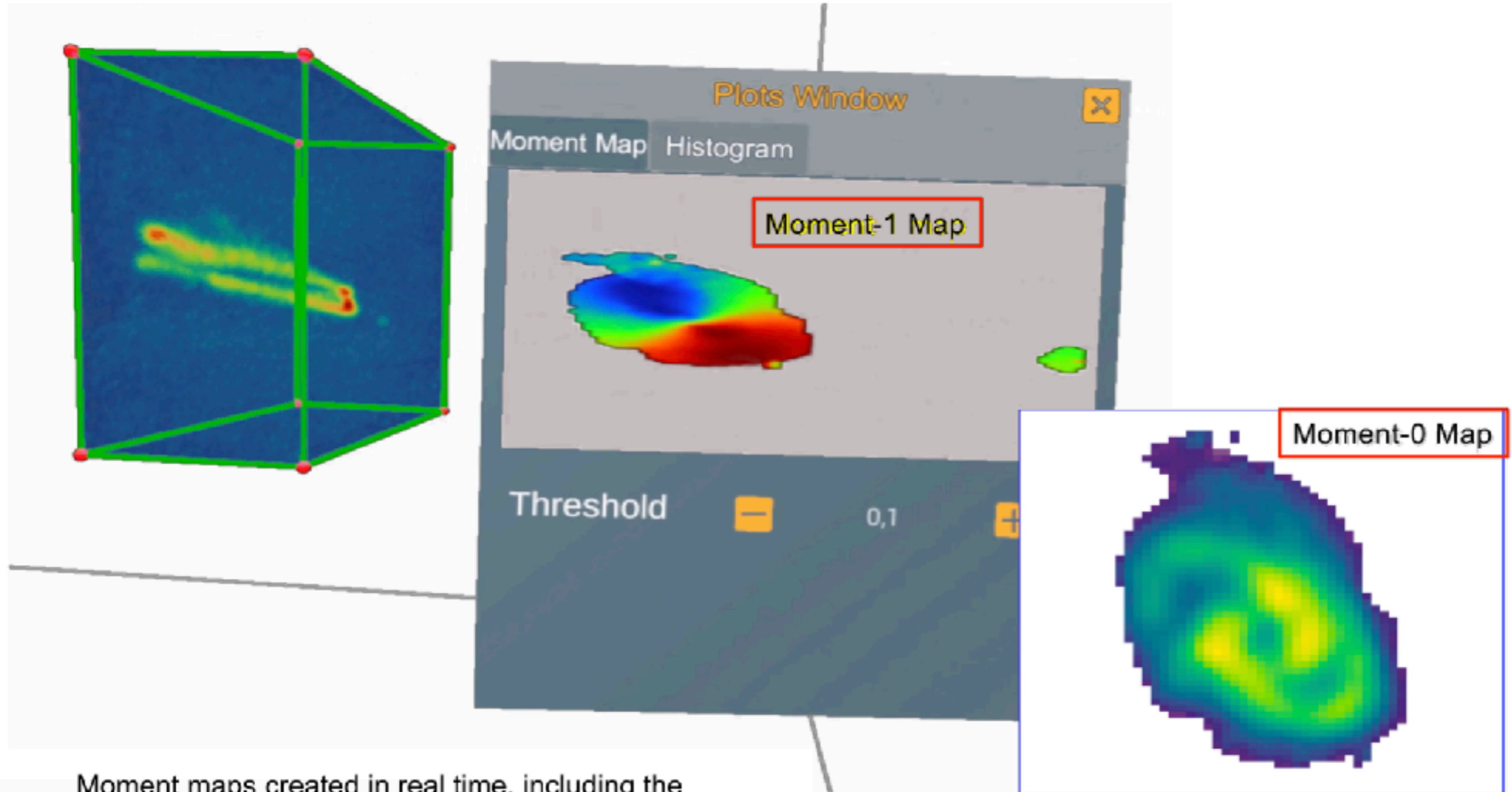
Full data set of HCG 44

all pixels outside the masks





iDaVIE-v

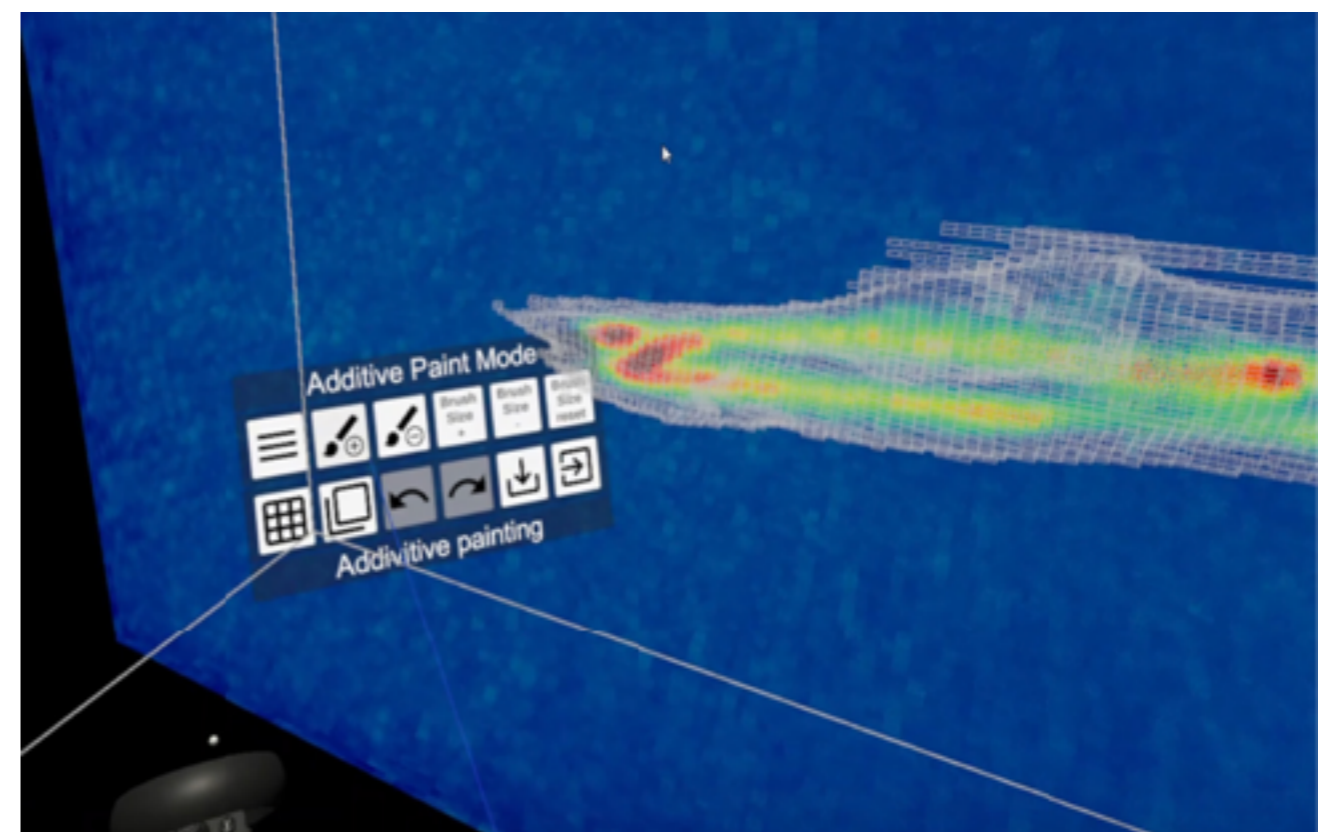
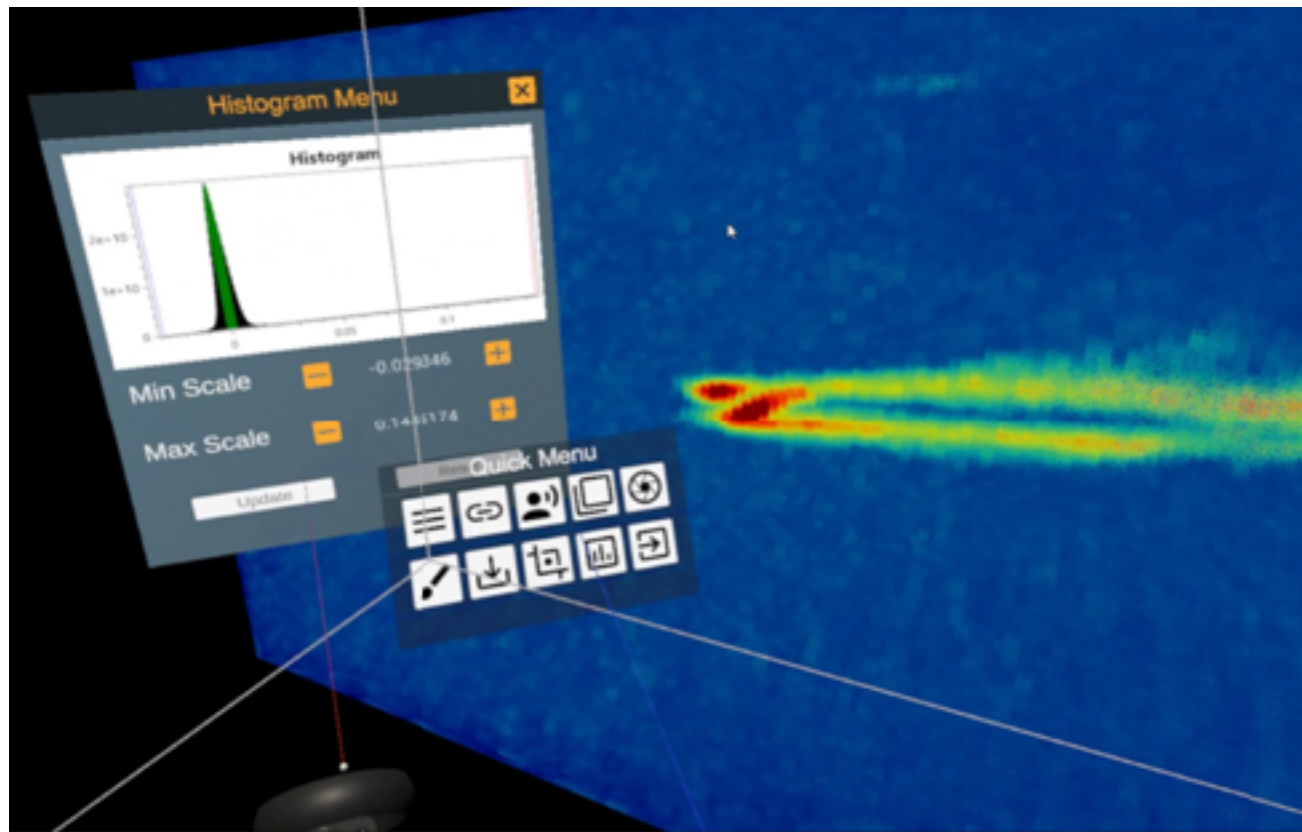


Moment maps created in real time, including the moment-0 (gas distribution) and moment-1 (kinematics)



Handset menu and display

Paint mode allows editing masks



iDaVIE-v

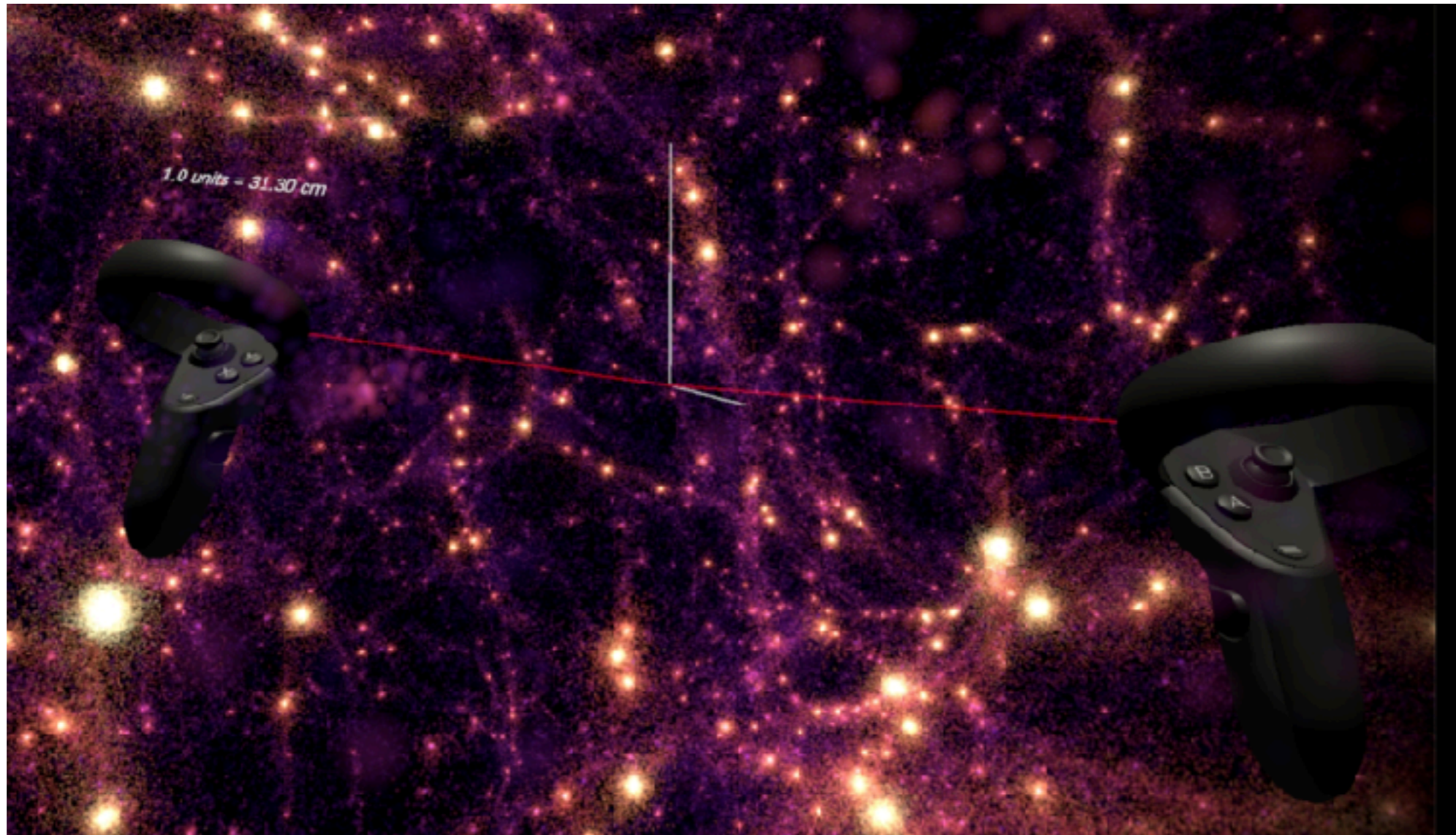


- fast exploration of large data cubes and complex emission structures
- rapid check on how well SoFiA detected sources
- capability to edit masks and add new masks
- instant view of moment 0 and moment 1 images using the loaded masks
- control of the system is easy, especially with voice commands

- system is being tested at UCT, Armagh Observatory, INAF Sardinia, Royal Observatory Edinburgh and the *Kapteyn Astronomical Institute*



iDaVIE-p



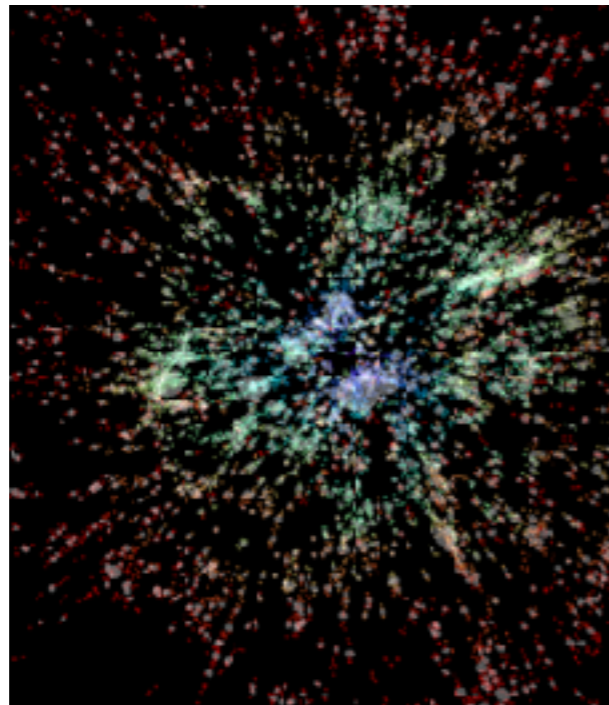
Version for viewing catalogues, simulations, table data etc. will be released end of this year



iDaVIE-p



- rendering of catalogues and tables (including simulations)
- rendering of multiple overlapping data sets
- other parameters can determine form, size and colour



2MRS survey

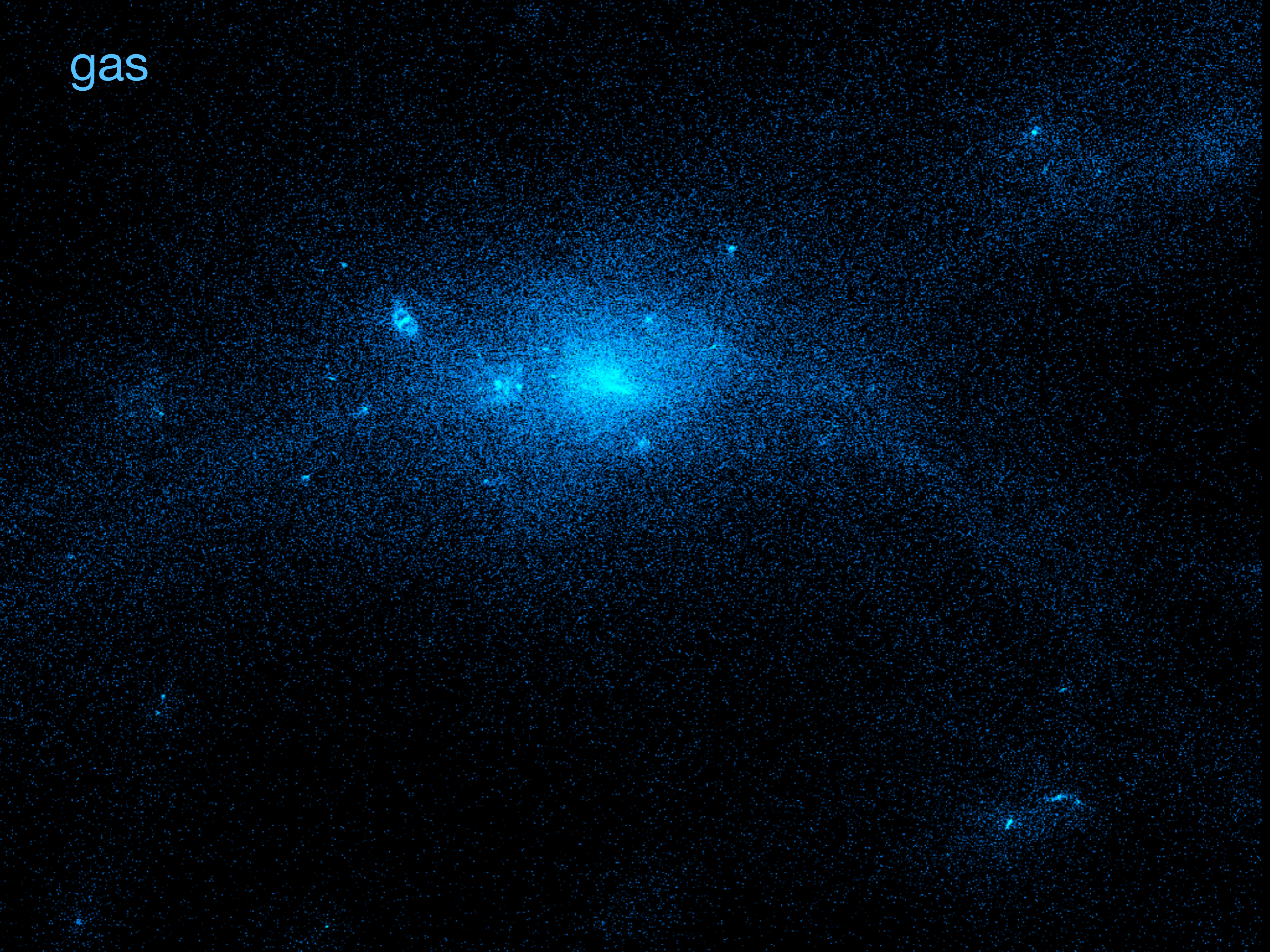


cosmological simulation

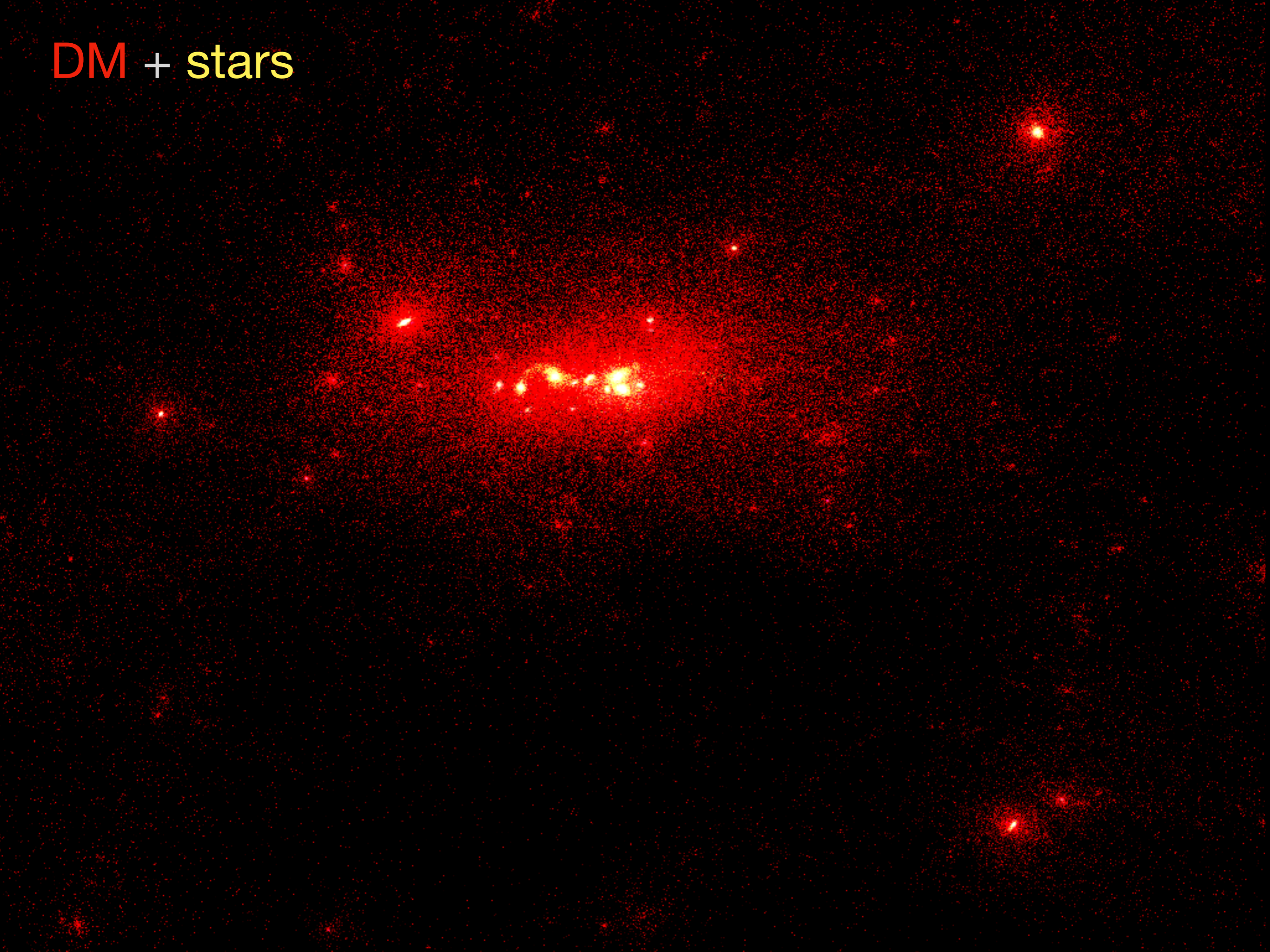
DM



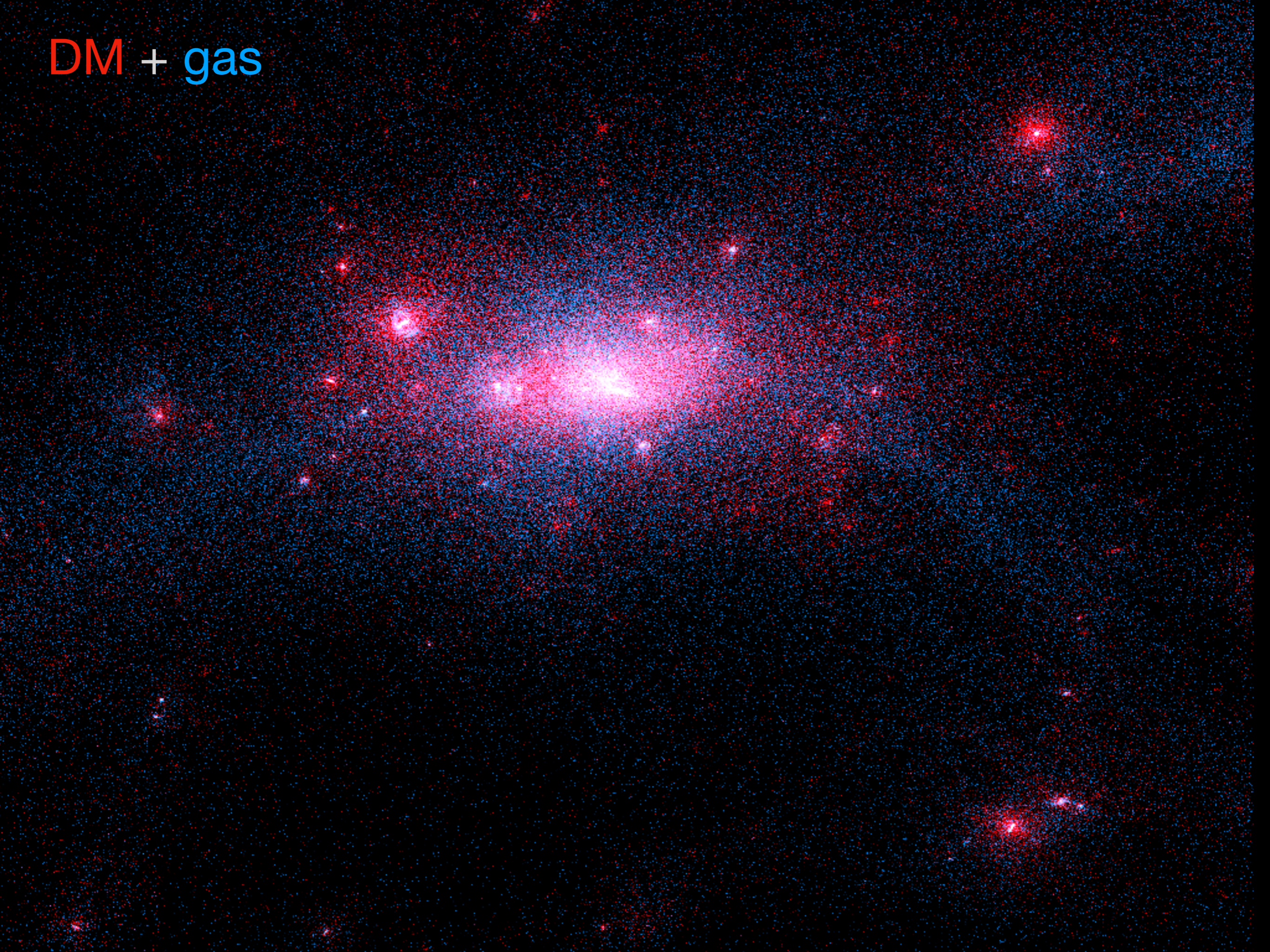
gas



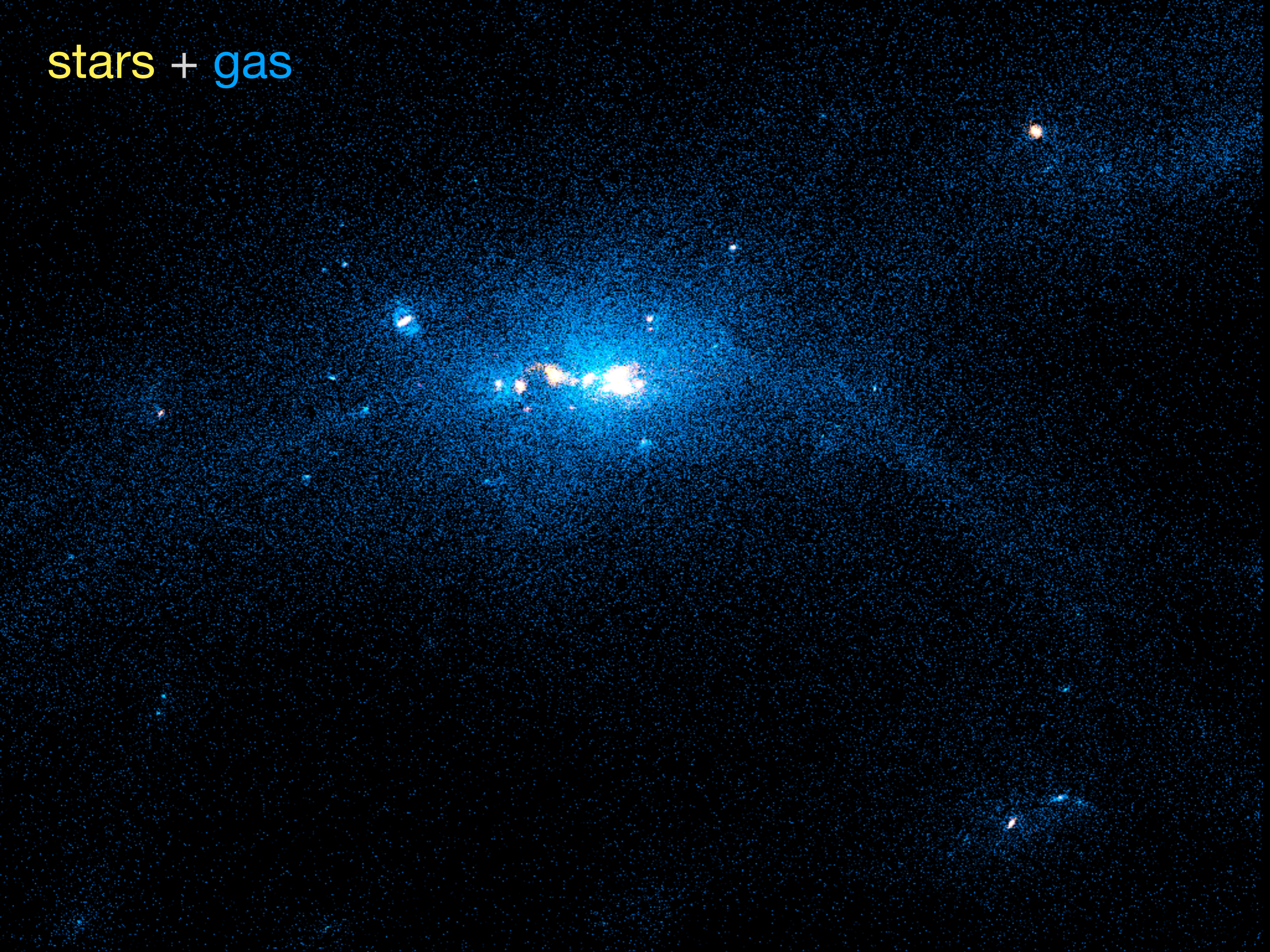
DM + stars



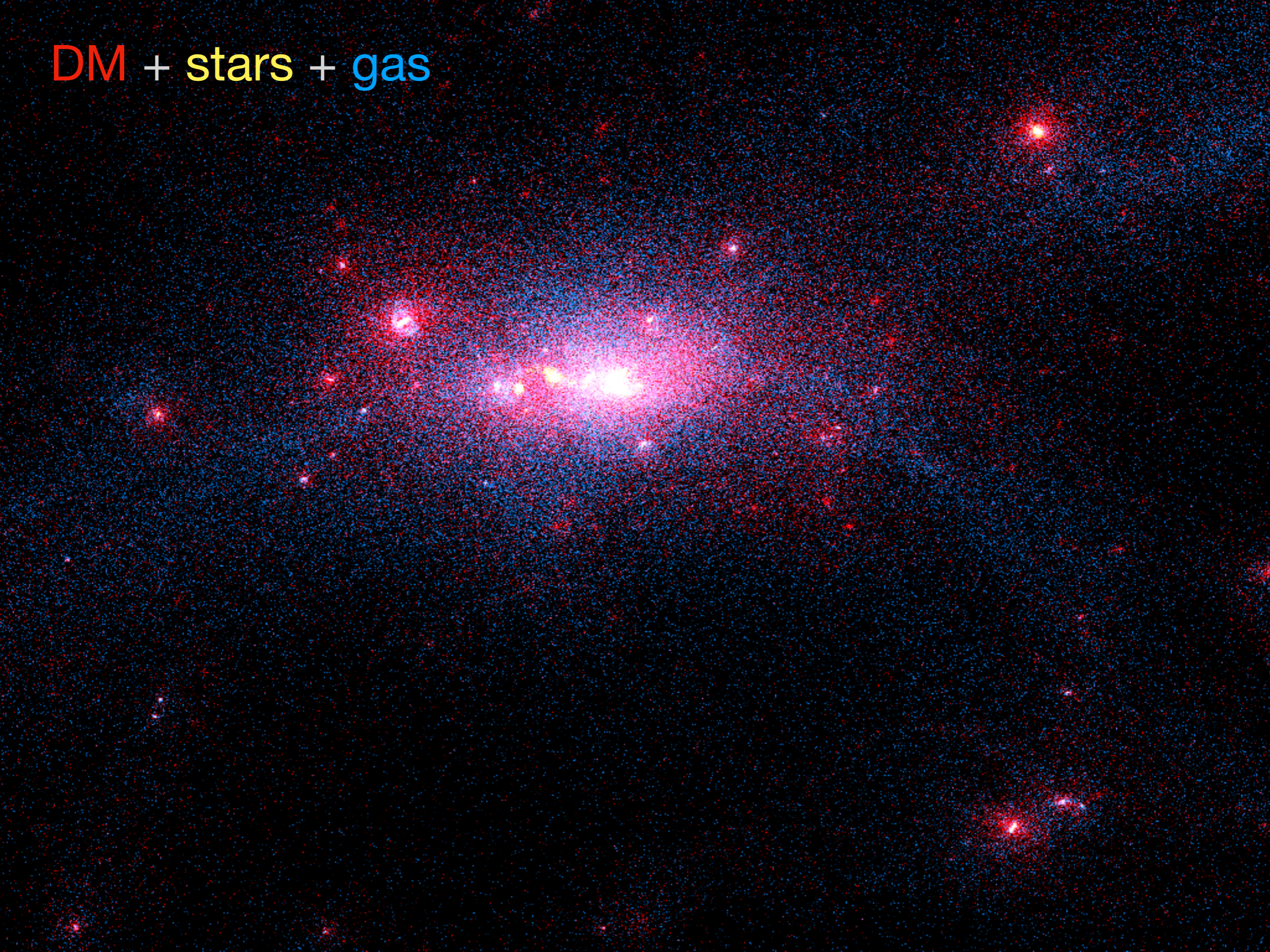
DM + gas



stars + gas



DM + stars + gas





iDaVIE



Summary

- fast exploration of large data cubes and complex emission structures
- flexible viewing of simulations and catalogue data
- Powerful tool for validation of source finding
- next steps:
 - *multiple player mode*
 - *remote viewing*