ELVIS rocks ...

The Local Volume HI Survey (LVHIS)

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The Local Volume HI Survey (LVHIS) comprises deep HI line and 20-cm radio continuum observations for ~100 nearby, gas-rich galaxies, supplemented by multi-wavelength data.

Our sample consists of all galaxies with v_{LG} < 550 km/s or D < 10 Mpc that are detected in the HI Parkes All-Sky Survey (HIPASS). A declination limit of approx. δ < −30 degrees was chosen for observations with the Australia Telescope Compact Array (ATCA).

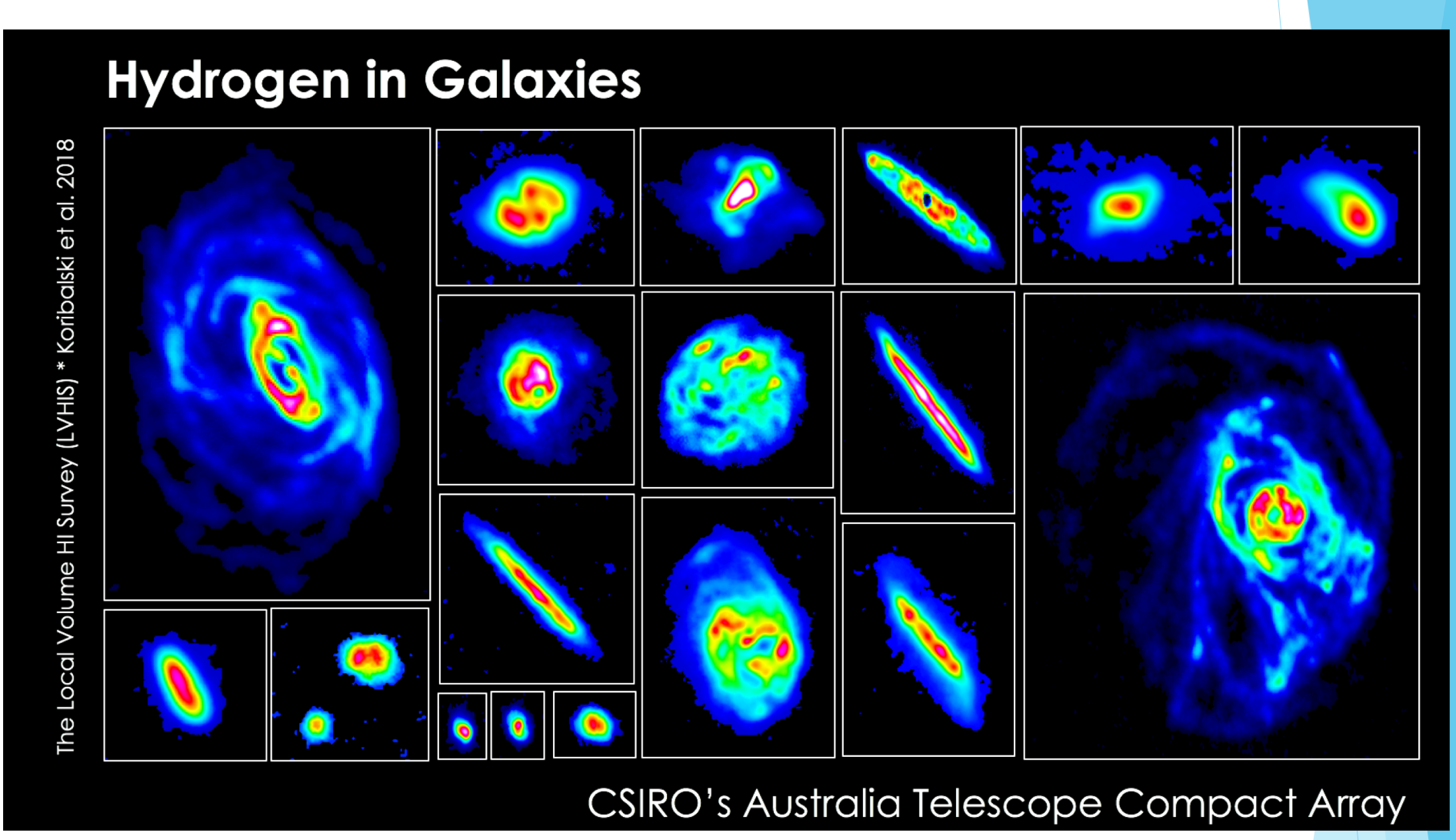

Figure 1: Collage of galaxies from the Local Volume HI Survey (LVHIS; Koribalski et al. 2018) observed with CSIRO's Australia Telescope Compact Array (ATCA). The distribution of cold hydrogen gas in galaxies mapped via the 21-cm spectral line of atomic neutral hydrogen (HI) typically extends a factor 2 – 3 beyond their bright stellar disks. The red and yellow-coloured reservoirs of dense hydrogen gas pinpoint where most of the galaxy's star formation is happening, while the dark blue areas indicate large amounts of dormant fuel (cold gas) not yet forming stars.

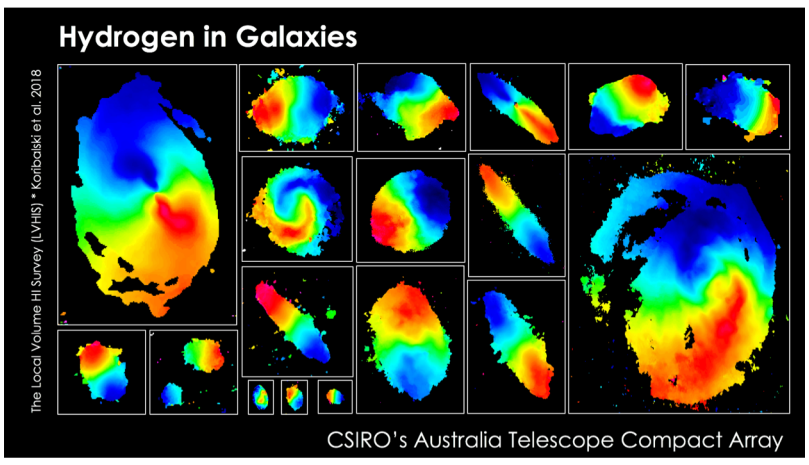

Figure 2: The colourful LVHIS velocity fields (left) show each galaxy's rotating disk as measured with CSIRO's Australia Telescope Compact Array (ATCA). We find a veritable zoo of shapes and sizes ranging from irregular dwarf galaxies to majestic grand-design spiral galaxies. The green colours correspond to each galaxy's systemic velocity from which their Hubble distance is derived. The fast rotating disks of spiral galaxies (blue = approaching side, red = receding side) are typically flat in the inner region but can be strongly warped in their outer parts. Using the HI velocity fields we can determine both the shapes of their disks and their mass distribution, including their dark matter content as a function of radius. – The ATCA is a radio interferometer situated near the town of Narrabri in northern New South Wales (NSW) and consists of six 22-m dishes which together form a 6-km diameter telescope. Five of the movable dishes are shown on the right side in a beautiful sunset photo by LVHIS team member Angel R. Lopez-Sanchez.

LVHIS webpage: www.atnf.csiro.au/research/LVHIS

FOR FURTHER INFORMATION

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REFERENCES

Koribalski, B.S. et al. 2018, MNRAS 478, 1611
Oh, S.-H. et al. 2018, MNRAS 473, 3256
Wang, J., Koribalski, B.S. et al. 2017, MNRAS 472, 3029
Shao, L., Koribalski, B.S. et al. 2018, MNRAS 479, 3509
Wang, J., Koribalski, B.S. et al. 2016, MNRAS 460, 2143
Kamphuis, P., et al, 2015, MNRAS 452, 3139

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