

Motivation

We search for extended neutral hydrogen emission and improve on ALFALFA (Haynes et al. 2011) pipeline estimates (which are optimized for unresolved sources) of total H I flux around interacting galaxies in Hickson Compact Groups.

Procedure

On a map showing the velocity-integrated H I emission around each Hickson Compact Group, a polygon is drawn encompassing all discernable flux. The flux within the polygon is integrated channel by channel. This result is contaminated by sidelobe contributions. To correct for sidelobe contamination, we compute (following Dowell 2010) effective beams from all the ALFA beams that contribute to each pixel, then average over the effective beams for the pixels within the polygon. Dividing the measured fluxes by the integral over the averaged effective beams within the polygon gives a reasonable estimate of the true flux from the source, as verified by comparison of large angular diameter galaxies in ALFALFA to total fluxes from the Green Bank 140 Foot telescope.

Results

Of the six HCGs with measurable H I flux in the ALFALFA 40% footprint, only one (HCG 001) has significantly more flux within the marked polygon than is reported in the ALFALFA catalog. If there is significant extended H I around the remaining 5 groups, it is either not distinguishable from noise in the ALFALFA data cubes (i.e., column density $< \text{a few } \times 10^{18} \text{ cm}^{-2}$), or negligible compared to the more centrally concentrated flux.

HCG	Flux in Polygon (Jy-km/s)	Pipeline Flux (Jy-km/s)
1	8.6	6.37
58	6.73	7.94
59	6.31	5.78
69	10.09	8.96
71	11.5	10.72
76	1.99	1.84

References

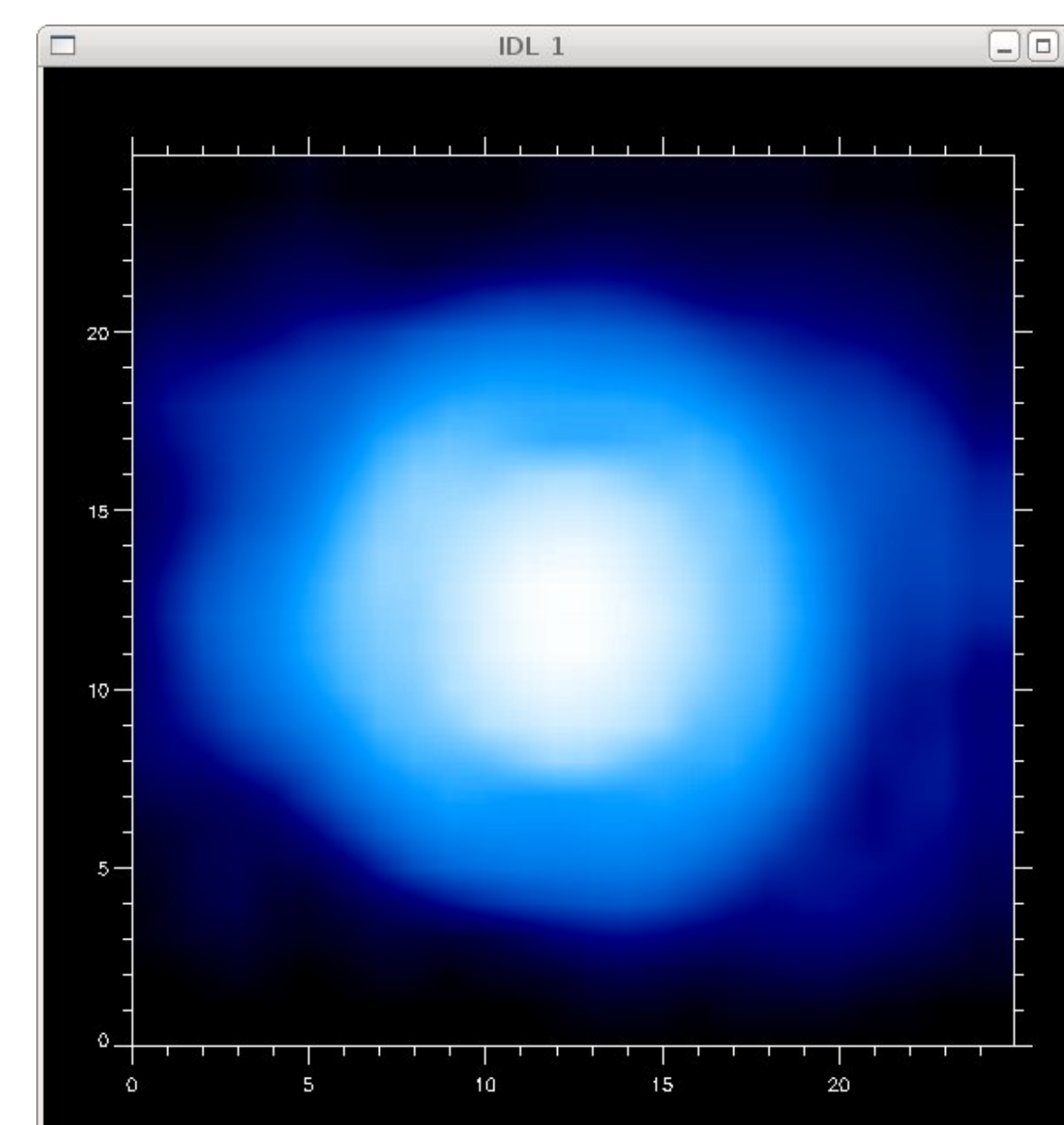
Haynes, M.P., et al. 2011, AJ, 142, 170
 Dowell, J.D. 2010, PhD Thesis, Indiana Univ.

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ALFALFA Results for Hickson Compact Groups

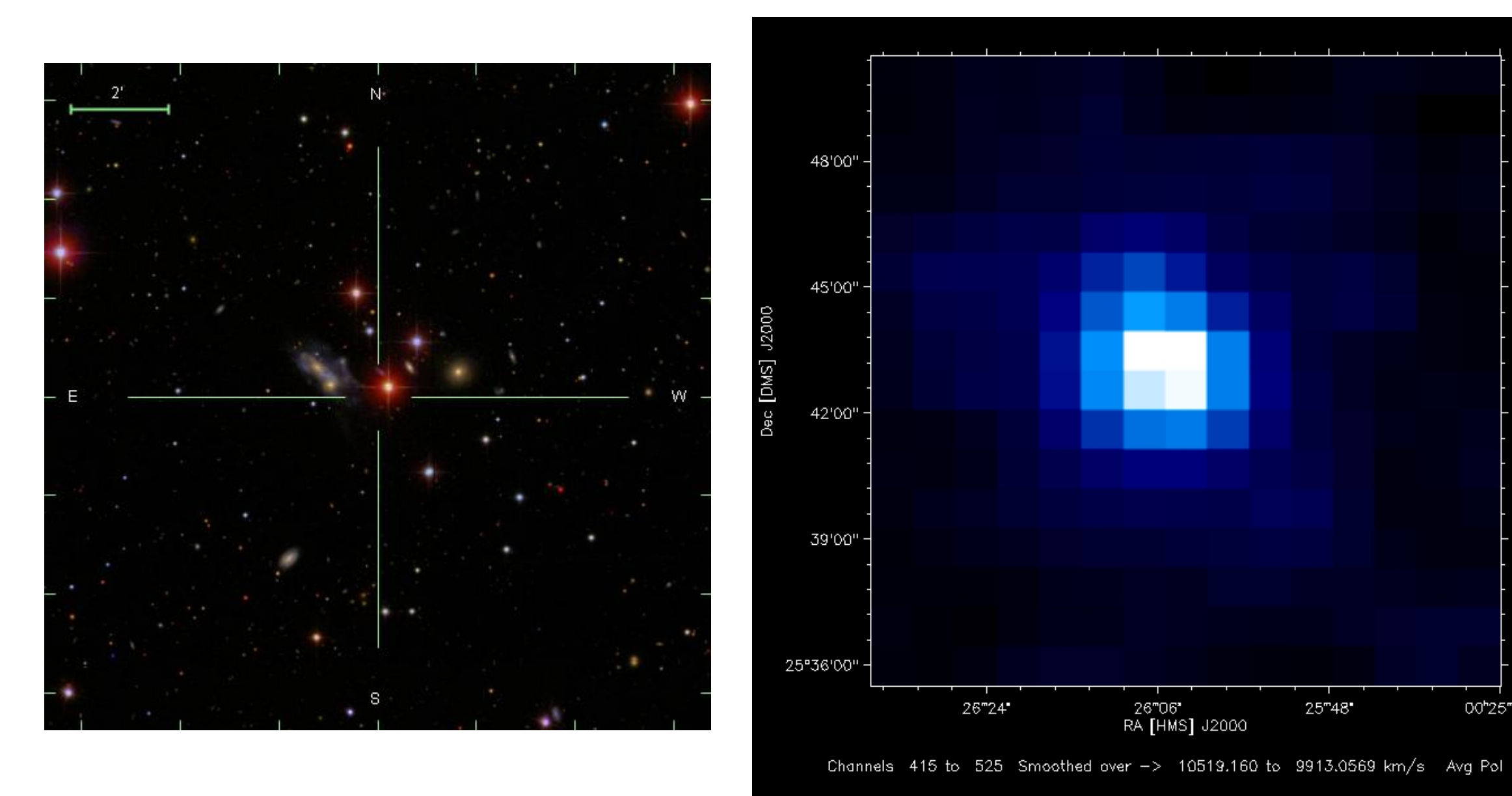
G. Lyle Hoffman
 Lafayette College
 Undergraduate ALFALFA Team

Effective ALFALFA beams averaged over a typical polygon, displayed using histogram equalization.

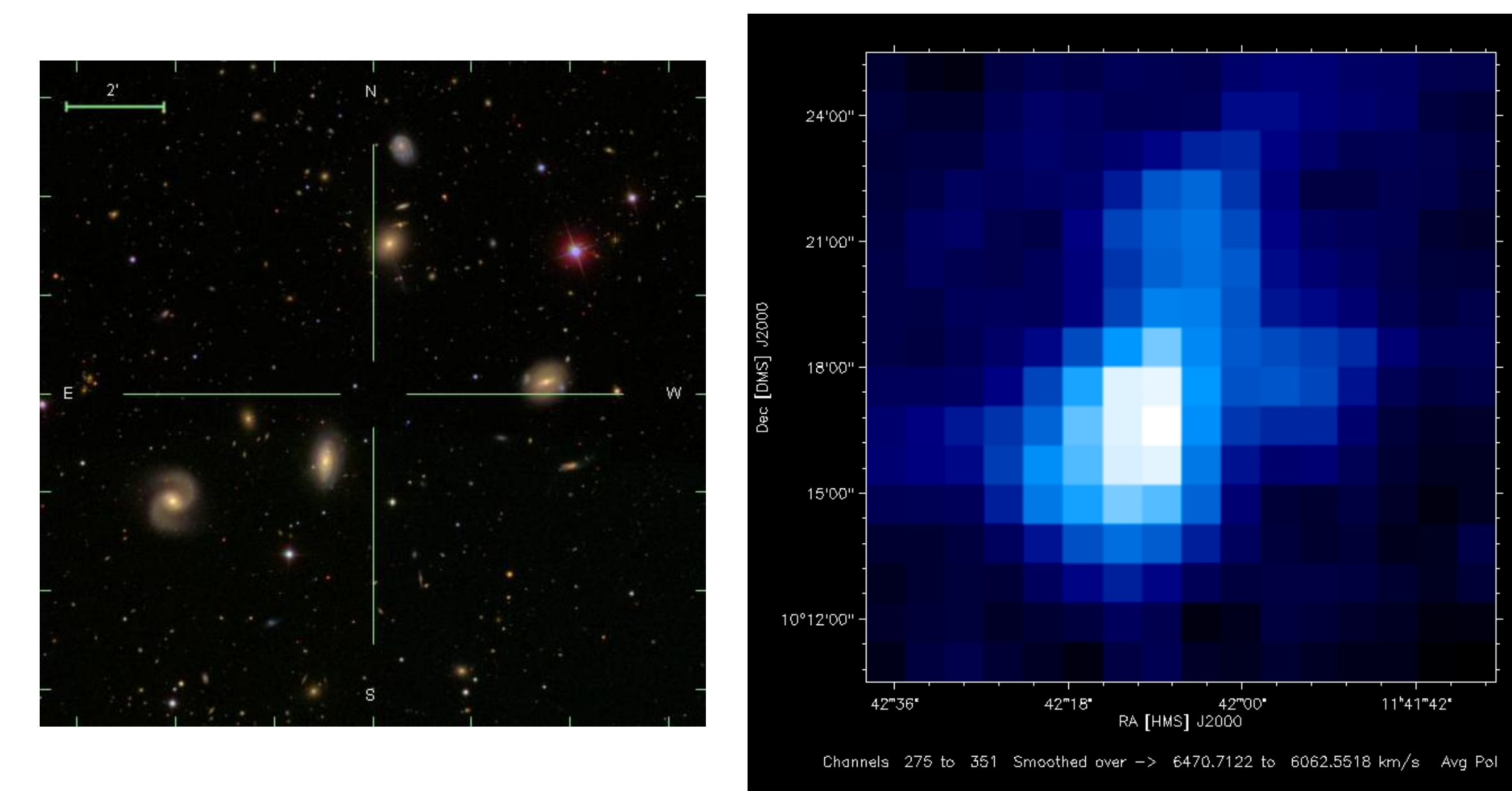


Optical images from SDSS (left) and velocity-integrated HI images from ALFALFA (right) to the same scale.

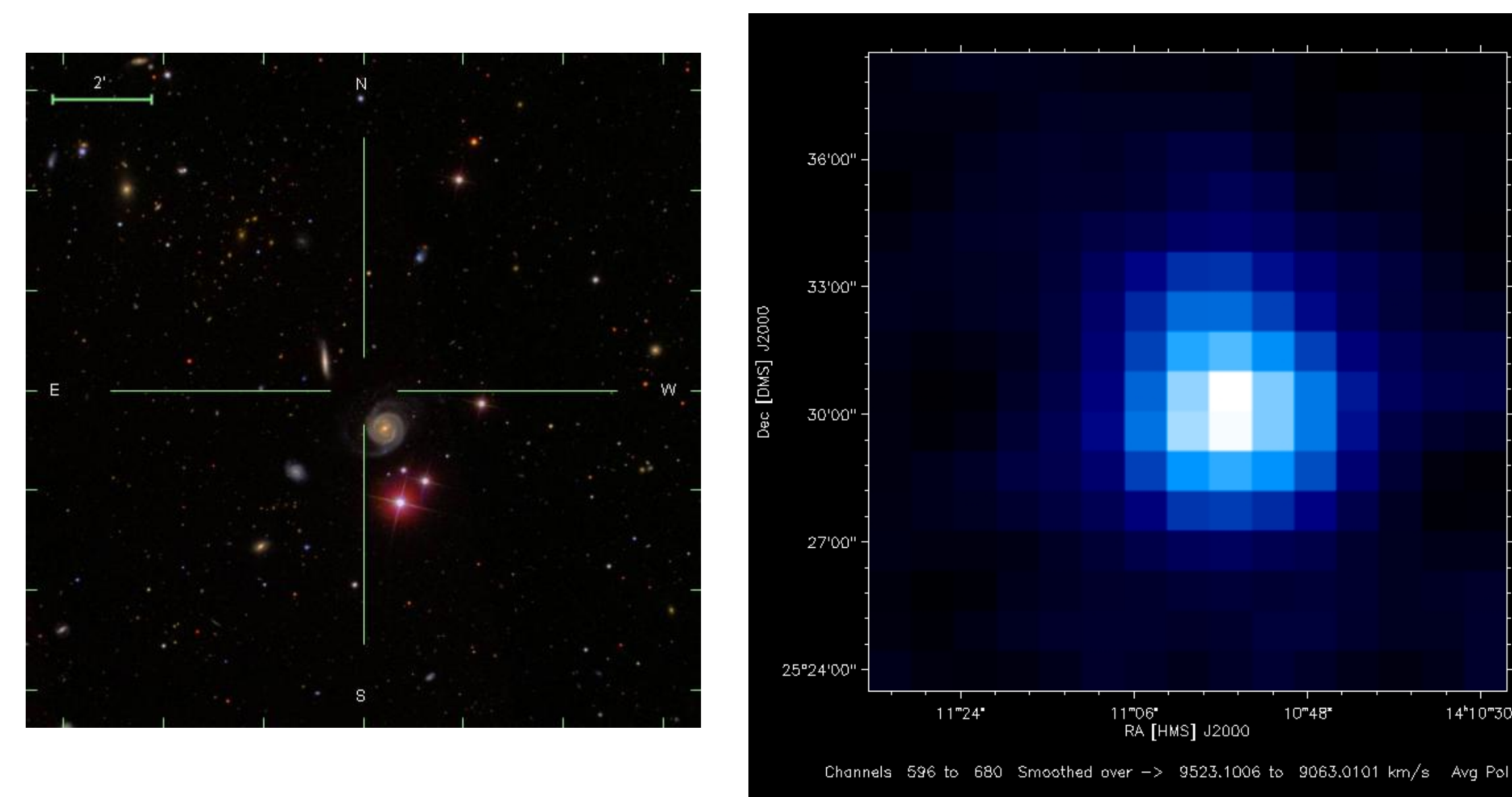
SDSS and ALFALFA Images



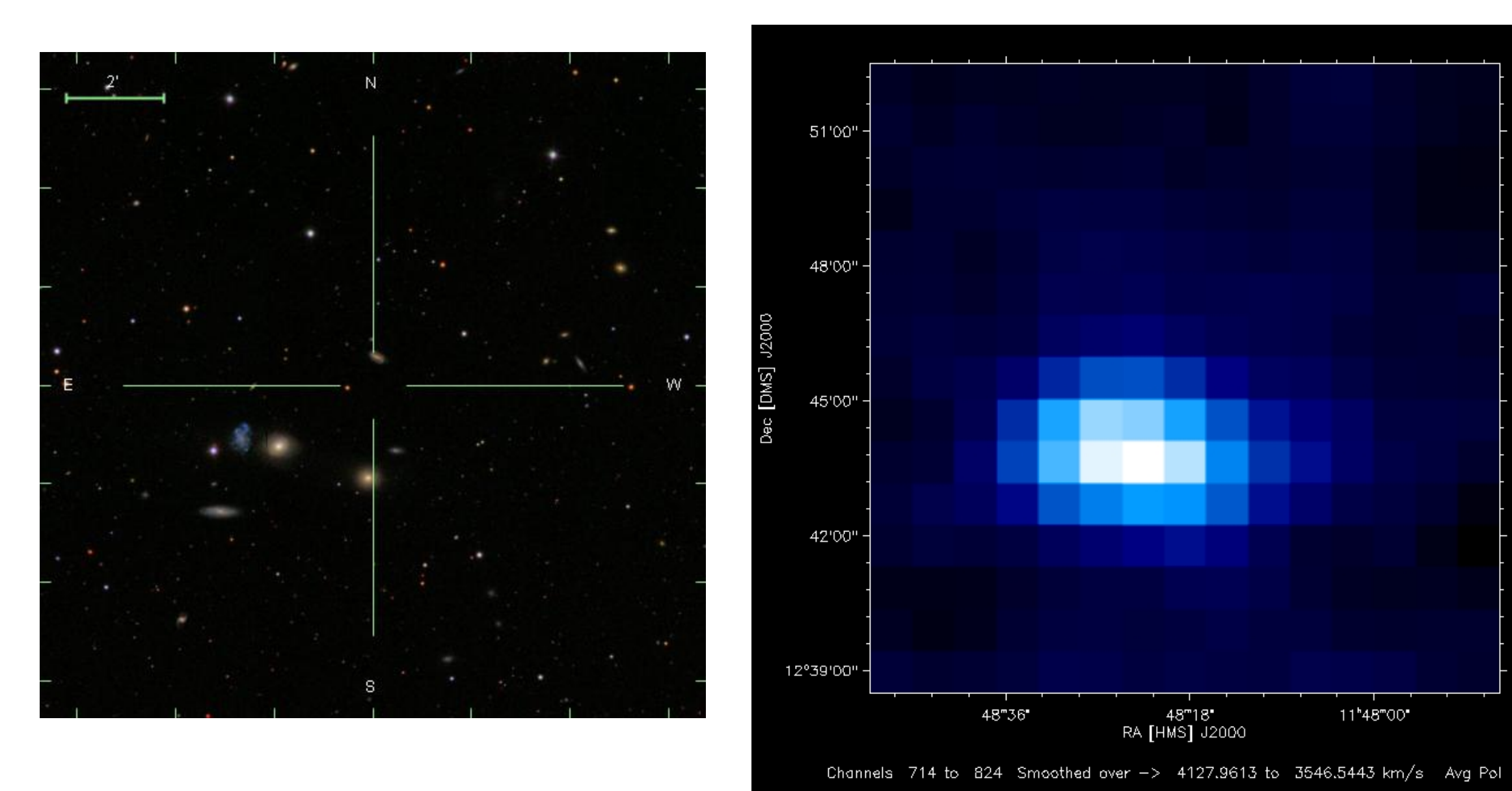
HCG 001



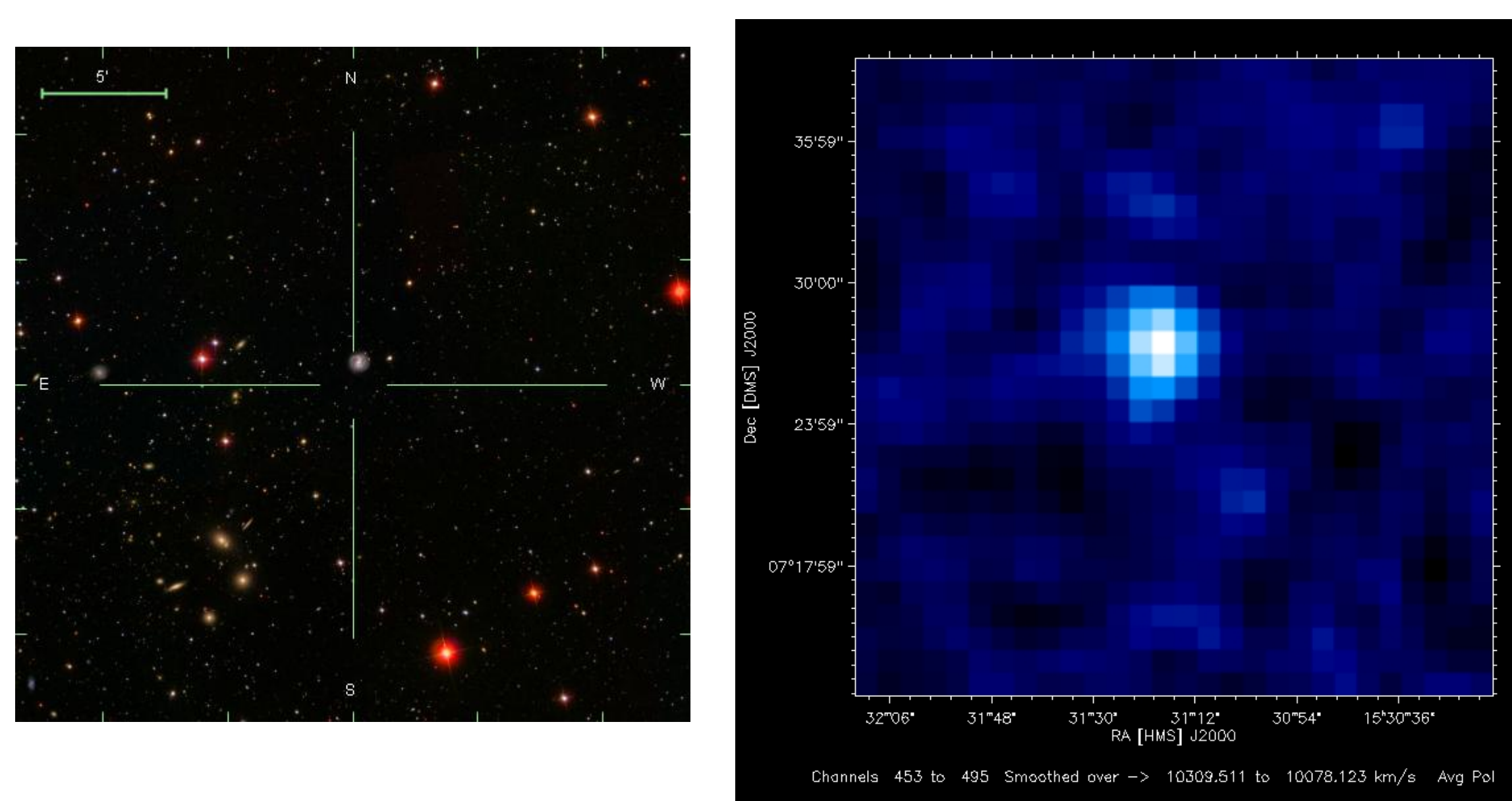
HCG 058



HCG 071

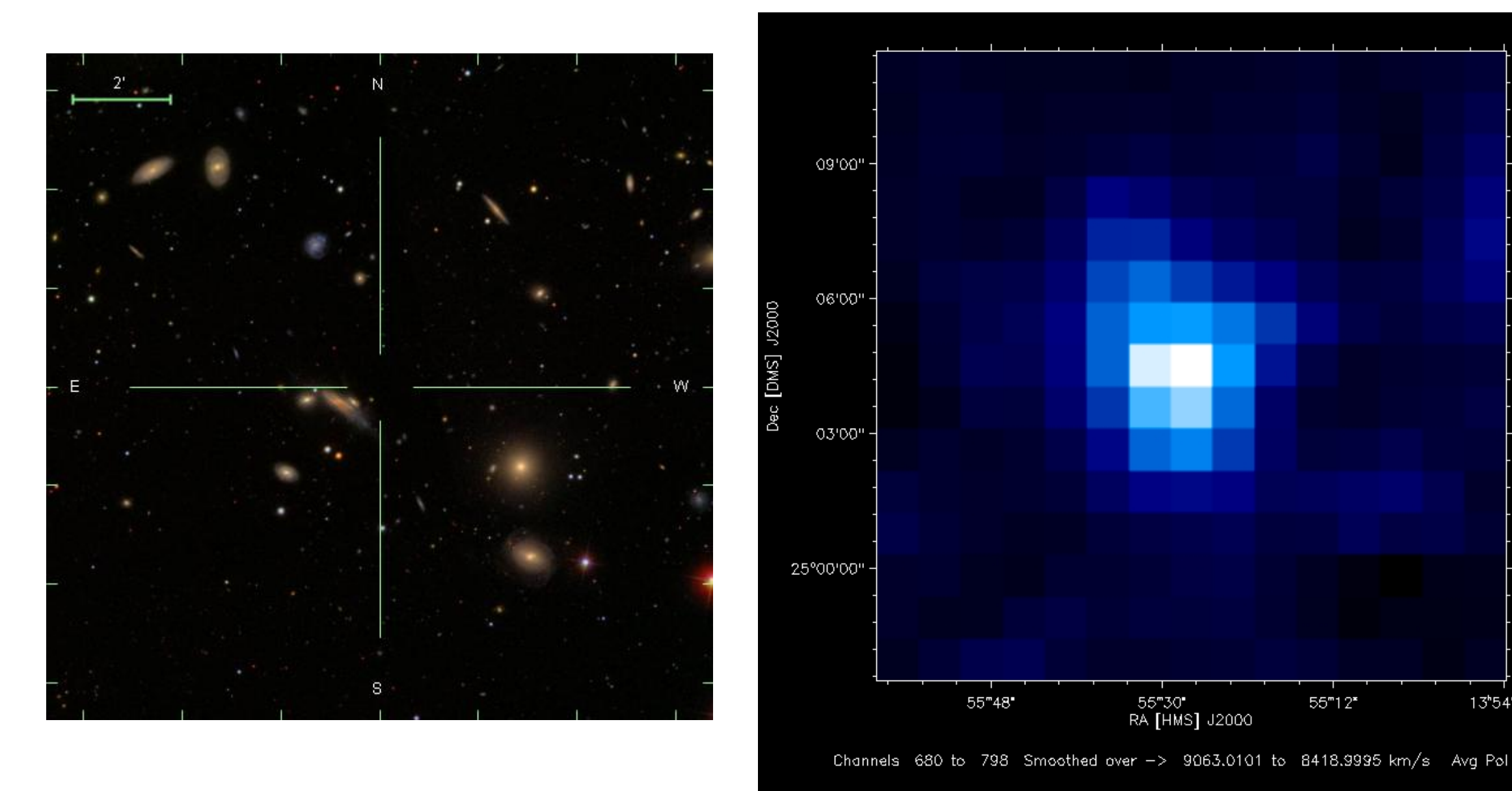


HCG 059



HCG 076

HCG 076 per se appears to be undetected. The detected flux is entirely from a spiral galaxy NW of the HCG.



HCG 069