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# Galaxy transformation in action! The spiral galaxy WKK 6176

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## 1 WKK 6176

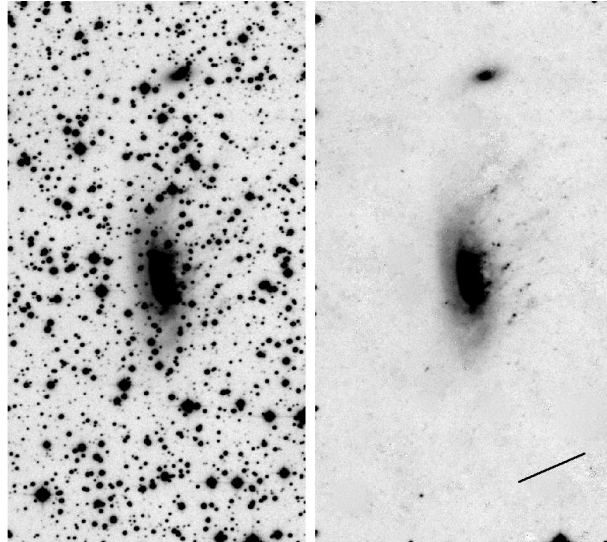
Recently, the presence of a 70-kpc long X-ray tail and a 40-kpc H $\alpha$  tail, respectively, was reported [5, 6] in WKK 6176, a spiral galaxy in the nearby ( $cz = 4871 \pm 54$  km/s) and massive ( $M_{R<2\text{ Mpc}} = 1 \times 10^{15} M_{\odot}$ ) Norma cluster [7]. This galaxy is the low-redshift equivalent of the two recently detected spiral galaxies in massive rich clusters (Abell 2667 and Abell 1689) at  $z \sim 0.2$  which show clear evidence for strong galaxy transformation [3].

The X-ray tail of WKK 6176 is aligned with the major axis of the galaxy-density profile of the cluster which is indicated by the diagonal line in the right panel of Fig. 1, which itself is aligned with the main large-scale structure of the Norma wall [7]. Fig. 1 shows our deep  $R_C$  image of WKK 6176 before and after star-subtraction; it demonstrates the effectiveness of the star-subtraction. Numerous low-luminosity filaments and bright knots (not foreground stars) stand out, giving the galaxy its ‘jelly-fish’ appearance.

## 2 Galaxy transformation in dense environments

Given the proximity of the Norma cluster, WKK 6176 provides an excellent opportunity to study the interaction of a galaxy with the intracluster medium (ICM) at high resolution and sensitivity. Deep  $BVR_CJHK_s$  photometry of WKK 6176 (already obtained) will be used to generate pixel-by-pixel colour-magnitude diagrams and colour-colour diagrams [4] and to study the star formation history of WKK 6176 in detail in combination with GALEV [1].

The GALEV models now include an ever growing grid of refined models of undisturbed Sa, Sb, Sc and Sd galaxies falling into a cluster environment at a wide range of redshifts and experiencing various effects on their star formation



**Fig. 1.** A deep  $R_C$  image of WKK 6176 ( $2.2' \times 4.0' = 43 \times 77$  kpc). The left image shows the original data, the right image shows WKK 6176 after star subtraction using the KILLALL routine [2]. Low surface brightness filaments and bright knots are clearly visible.

rates (e.g., starbursts at various strengths and with various time scales). For all those models, the evolution of the galaxies' spectra (ultraviolet, optical and near-infrared) and broad band spectral energy distribution is determined.

WKK 6176 is the nearest galaxy observed in a state of strong transformation through visible interactions with the ICM of a rich and massive cluster. Based on our multiwavelength observations and a comparison with galaxy evolution synthesis models, we aim to constrain the recent star formation history of this galaxy.

## References

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