

NIR Imaging of Star-Forming Regions in Cen A's Dustlane

Karín Menéndez-Delmestre and Paul van der Werf

Sterrewacht Leiden, P.O. Box 9513, 2300 RA Leiden, the Netherlands

Abstract. With NIR images of Cen A we uncover a stellar disk within the dustlane. We also determine the color of a dustlane stellar region and conclude that it is distinctly bluer than the underlying elliptical galaxy, supporting the idea that young stellar populations are present within Cen A's dustlane.

1. Introduction

Cen A's main body has all the characteristics of an elliptical galaxy, but it is optically obscured by a prominent dust belt. The NIR observations here reported give an unprecedented view of the Cen A nuclear region and enshrouded stellar regions, which have been previously proposed to be younger stellar populations.

We have *J*, *H* and *Ks* SOFI-NTT observations for the central $5' \times 5'$ region of Cen A. We modelled the underlying elliptical galaxy and subtracted it from our observations to study the dustlane itself. A region NW of Cen A's center with very low extinction provided us with a *stellar window* into a dustlane stellar population.

2. Results and Discussion

We combined ISOCAM observations of dust emission at $6.4 \mu\text{m}$ with our elliptical-galaxy-subtracted NIR images (Fig. 1). SE of the nucleus the ISO dust emission corresponds to an NIR lane of extinction, while on the NW side it coincides with a region dominated by NIR stellar emission. This asymmetry indicates that NW of the nucleus the dust layer lies behind a dustlane stellar region, while to the SE the dust layer lies in front of other dustlane stellar populations. This agrees with the proposal of a bar in Cen A's dustlane by Mirabel et al. (1999), although other antisymmetric configurations (e.g. Quillen, Graham, & Vogel 1993) may produce similar features.

For the color analysis we defined a set of regions along Cen A's dustlane (Fig. 2). The colors for most regions lie along the extinction vector, and can be accounted for by taking the color of a normal elliptical galaxy and an increasing amount of reddening as the nucleus is approached. The NIR *stellar window* with the underlying galaxy subtracted has $(J-H) = 0.655$ and $(H-Ks) = 0.473$. This color is incompatible with the colors of the old elliptical galaxy population, regardless of extinction, but indicates a younger population, presumably formed in an evolved starburst.

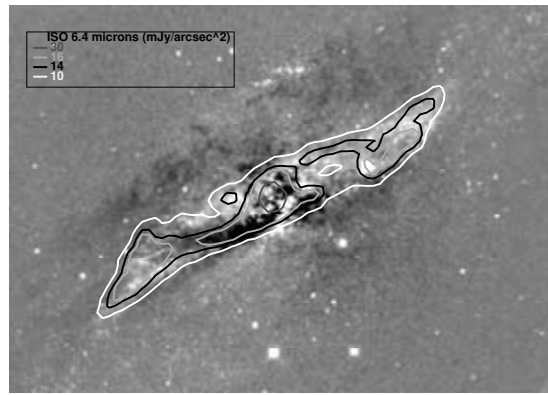


Figure 1. ISO at $6.4 \mu\text{m}$ on SOFI elliptical-galaxy-subtracted Ks image.

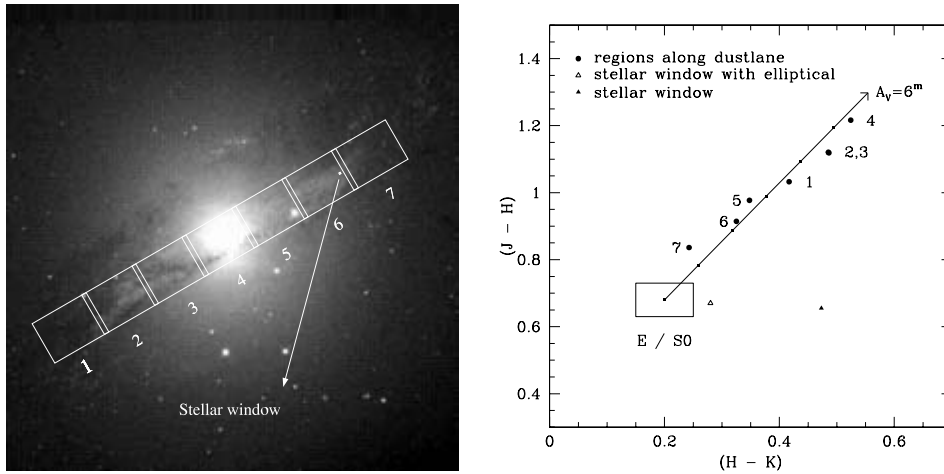


Figure 2. *Left:* Color analysis regions on Ks image. Stellar window indicates the studied dustlane stellar population. *Right:* Color analysis results. Extinction vector shown in steps of $A_v = 1^m$. Rectangle denotes typical color range for E and S0 galaxies (Frogel et al. 1978).

References

- Frogel, J. A., Persson, S. E., Matthews, K., & Aaronson, M. 1978, ApJ, 220, 75
 Mirabel, I. F., Laurent, O., Sanders, D. B., et al. 1999, A&A, 341, 667
 Quillen, A. C., Graham, J. R., & Frogel, J. A. 1993, ApJ, 412, 550