

THE HIGH RESOLUTION STRUCTURE OF THE CENTAURUS A NUCLEUS AT
2.29 GHZ AND 8.42 GHZ

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ABSTRACT: VLBI observations of the nucleus of Centaurus A were made in April, 1982 at two frequencies with an array of five Australian radio antennas as part of the Southern Hemisphere VLBI Experiment (SHEVE). Observations were undertaken at 2.29 GHz with all five antennas, while only two were operational at 8.42 GHz. The 2.29 GHz data yielded significant information on the structure of the nuclear jet. At 8.42 GHz a compact unresolved core was detected as well.

We find that the source consists of the compact self-absorbed core and a 100 milliarcsecond jet containing a set of three knots with a very long, narrow component elongated along the same position angle as the knots. The position angle of the jet is in excellent agreement with that of the radio and X-ray structure on arcsecond and arcminute scales. The jet has brightened at 2.29 GHz by a factor of nearly three since the early 1970s, 30% of which occurred in the 1980-82 period. The present data do not distinguish between superluminal and subluminal motion in the core.

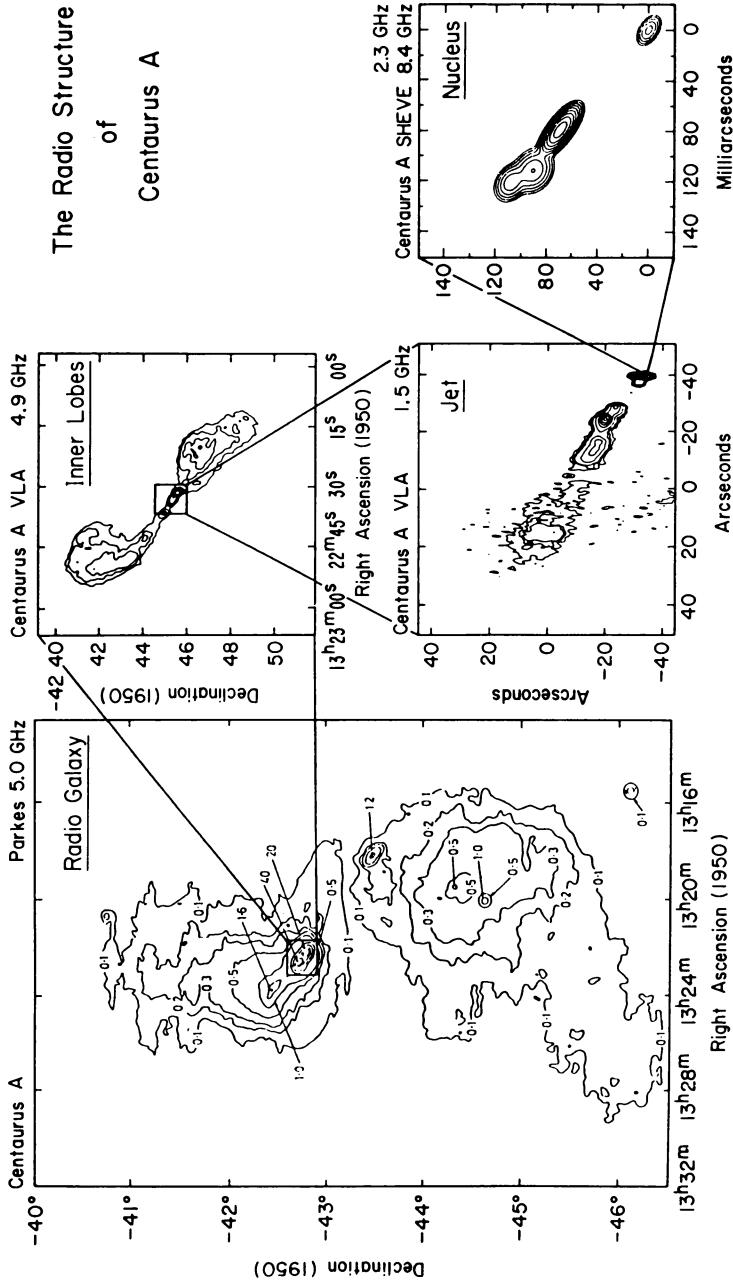


FIGURE 1. Montage of Centaurus A Radio Observations. Scales vary over a factor of 10^6 . First panel displays 5.0 GHz data from Haynes, Cannon, and Ekers (1983, *Proc. Astron. Soc. Australia*, 5, 241). The second and third panels show VLA data from Burns, Feigelson, and Schreier (1983, *Astrophys. J.*, 273, 128). The fourth panel shows our *dual frequency model* which was derived by fitting both 2.29 GHz and 8.42 GHz data simultaneously. The registration of the 2.29 GHz knots with the 8.42 GHz core is uncertain by about ± 4 milliarcseconds along the jet. We do not show the long, slender jet component as its registration is uncertain.