

## Stellar Photometry in NGC253

NGC 253 is one of the nearest spiral galaxies outside the Local Group, and is the closest example of star-burst activity. However, although much effort has been devoted to studying the large-scale properties of the central star-burst region, little is known about the stellar content of the outer regions of this galaxy; to our knowledge, the only published study of individual stars in NGC 253 is that of Davidge and Pritchett (1990, *A. J.*, 100, 102) who resolved bright giants in the halo.

During a recent night devoted to performance characterization of the SAIC1 CCD B, V, and R images were obtained of a field in the disk of NGC 253 during conditions of very good seeing (0.7 arcsec FWHM). The image quality is especially remarkable considering that NGC 253 is a southern hemisphere object  $\delta \sim 25^\circ$ , and never rises above 1.4 airmasses at Mauna Kea.

The SAIC CCD is well suited to the study of NGC 253, as a single exposure covers roughly one third of the disk of the galaxy. The bias subtracted and flat-fielded B exposure is shown in Figure 19, and numerous stars can be resolved.

The field covers portions of both the inner and outer disk regions of NGC 253, as defined by the near-infrared surface brightness measurements of Scoville et al. (1985, *Ap. J.*, 289, 129). The outer disk occupies the bulk of the image and has a much lower surface density of resolved stars than the inner disk, part of which is visible in the upper left hand corner of Figure 19.

Stellar brightnesses in the outer disk region have been measured with CFHPHOT, a version of DAOPHOT modified by R. McGonegal to run in the IRAF environment at CFHT. The (V,V-R) color-magnitude diagram of the outer disk portion of our data is shown in Figure 20. Evolutionary tracks for 20 and 40 $M_\odot$  stars from Maeder and Meynet (1988, *Astr. Ap. Suppl.*, 76, 411) have been superimposed for comparison, with an assumed distance modulus of 27.0 (Puche and Cargnani 1988, *A. J.*, 95, 1025). The most conspicuous feature in Figure 20 is the clump of stars at intermediate colors, which are supergiants of spectral-types A, F, and G. Based on the evolutionary tracks, the most luminous of these stars have masses in the range 20 to 40 $M_\odot$ . We are currently measuring stellar brightnesses in the much more crowded inner disk region, and hope to construct a color-magnitude diagram for comparison with that of the outer disk.

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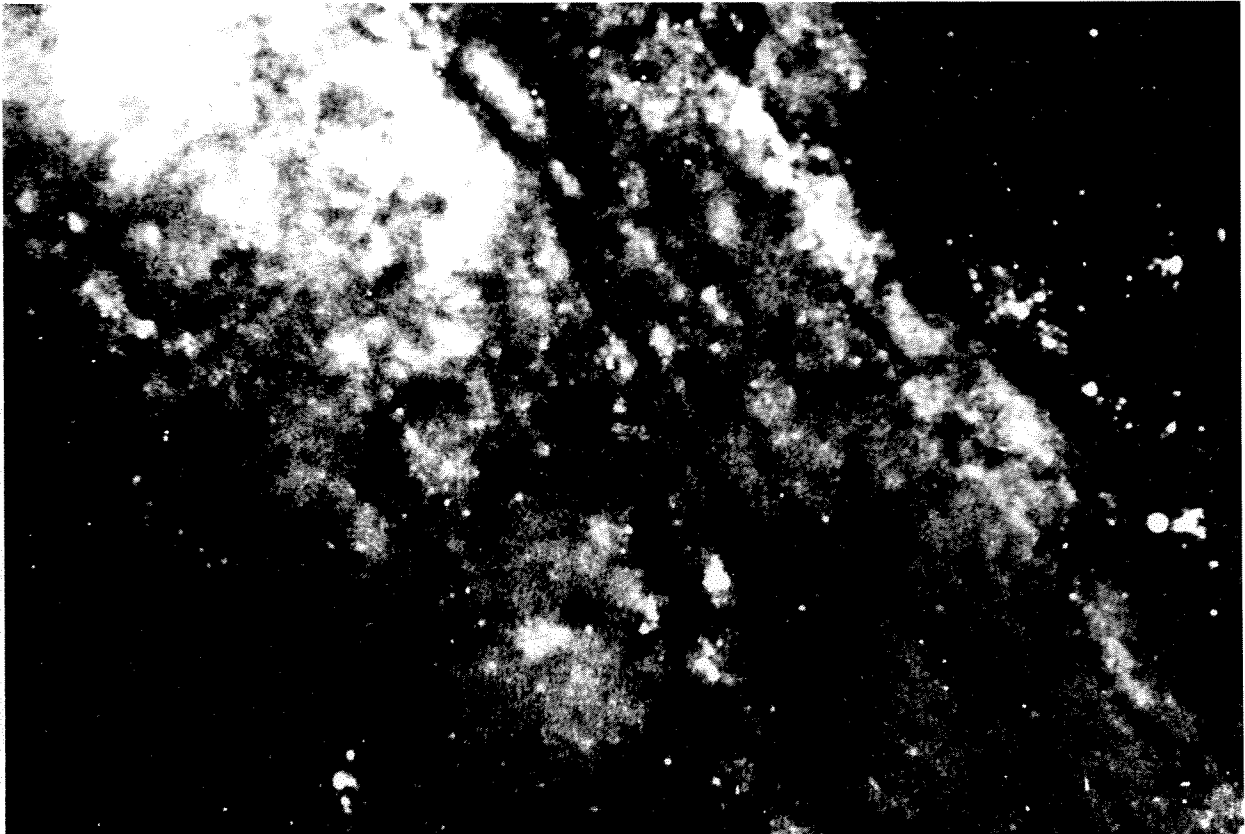


Figure 19: B CD image of NGC253 field. North is to the right and east is at the top.

## Staff Changes

Three technicians with a combined total of sixteen years of service resigned early in 1990. **John Fellenstein** and **Steven Hill**, two members of the optical instrumentation group, left respectively in February for new employment in Northern California and in March to pursue personal ventures on Maui. At the beginning of March **Mark Barbour** traded his duties within the electronic systems group for work on his Kawaihae-berthed boat, before returning to school in Oregon.

**Jim Wright**, who holds an M.S. from Iowa State and worked in its Neurobehavioral Toxicology Laboratory, joined CFHT as a system programmer at mid-March.

After a tenure exceeding three years as CFHT resident astronomer supported by CNRS, **Jean Arnaud** returned to Toulouse in April. In addition to the support he regularly provided to visiting observers, he has contributed importantly to our understanding of the combined factors which degrade image quality, and hence to the constant improvement of our seeing. Recently he has oriented his personal research toward gravitational lensing and quasars. His successor, **Jérôme Bouvier**, moved to Waimea in January from Institut d'Astrophysique de Paris, where he had earned a doctorate in 1987.

**Roland Bacon**, on leave from Observatoire de Lyon, came to CFHT in April. For about a year he will assist in developing the high-level software for MOS/SIS while enjoying the privileges of a visiting scientist.

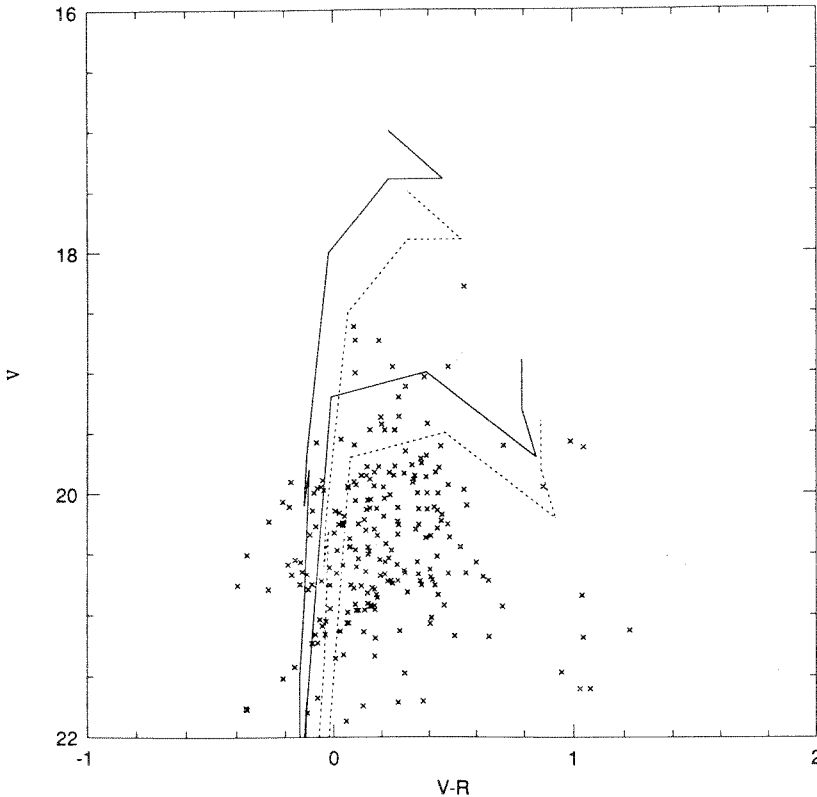


Figure 20:  $V$ ,  $V-R$  color-magnitude diagram of the outer disk component of NGC 253. The solid lines are evolutionary tracks for 20 and 40  $M_{\odot}$  stars with  $\Delta_V=0$ , while the dashed lines are the same tracks with  $\Delta_V=0.5m$ .

### CANADIAN AGENCY

Canadian Applications Committee CFHT  
c/o Director Herzberg Institute of Astrophysics  
National Research Council Canada  
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CANADA K1A 0R6

DEADLINES (Postmark date)  
For time in first semester — September 1  
For time in second semester — March 1

### FRENCH AGENCY

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77, avenue Denfert-Rochereau  
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DEADLINES (Date of receipt):  
For time in first semester — September 1  
For time in second semester — March 1

### UNIVERSITY OF HAWAII

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DEADLINES (Date of receipt):  
For time in first semester — September 1  
For time in second semester — March 1

Requests for observing time on the Canada-France-Hawaii Telescope are made to the member agencies. There are two competitions per year—one for the first semester (January–June) and the other for the second semester (July–December). The mailing addresses and deadlines for proposal submission are given below for each of the three agencies.

Les demandes de temps d'observation avec le Télescope Canada-France-Hawaii doivent être soumises aux agences associées. L'attribution de temps, sur une base compétitive, est effectuée deux fois par année: une fois pour le premier semestre (janvier à juin) et une fois pour le deuxième semestre (juillet à décembre). Les adresses postales et les délais de soumission sont indiqués ci-après pour chacune des trois agences.

### AGENCE CANADIENNE

Comité canadien de demandes CFH  
c/o M. le Directeur  
Institut Herzberg d'astrophysique  
Conseil national de recherches Canada  
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DATES LIMITES (cachet de la poste):  
Pour le premier semestre — 1er septembre  
Pour le deuxième semestre — 1er mars

### AGENCE FRANCAISE

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DATES LIMITES (date de réception):  
Pour le premier semestre — 1er septembre  
Pour le deuxième semestre — 1er mars

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