

Gemini North NIFS Observations of Galactic HII Regions

Robert Blum (NOAO)
Peter McGregor (ANU)
Cassio Barbosa (UNIVAP)

Using the NIFS near-infrared integral-field spectrograph behind the facility adaptive optics module, ALTAIR, on Gemini North, we have identified massive O-type stars that are responsible for the ionization of the Galactic Ultra-Compact HII regions G45.45+0.06 and W51d (IRS2W).

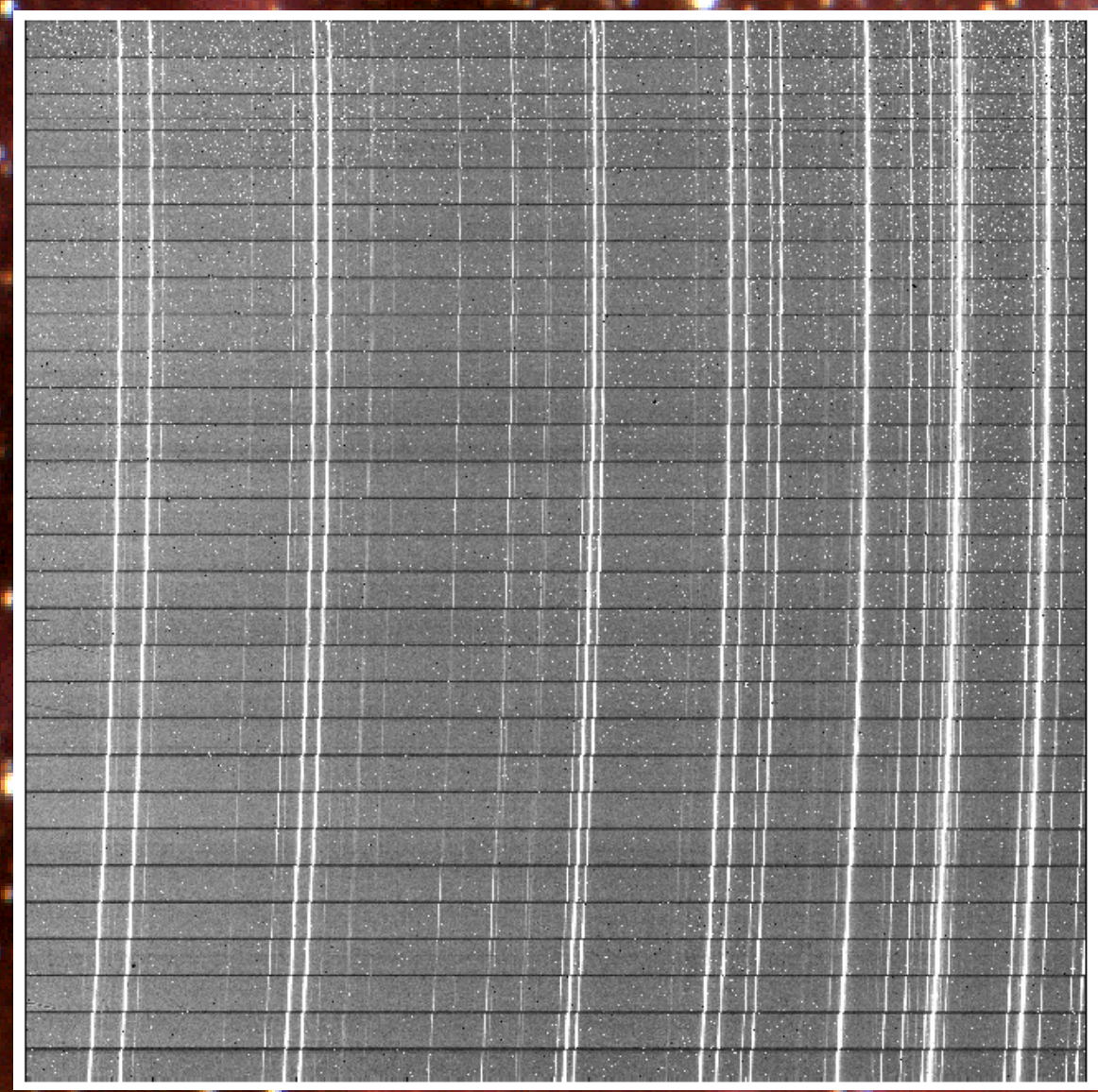
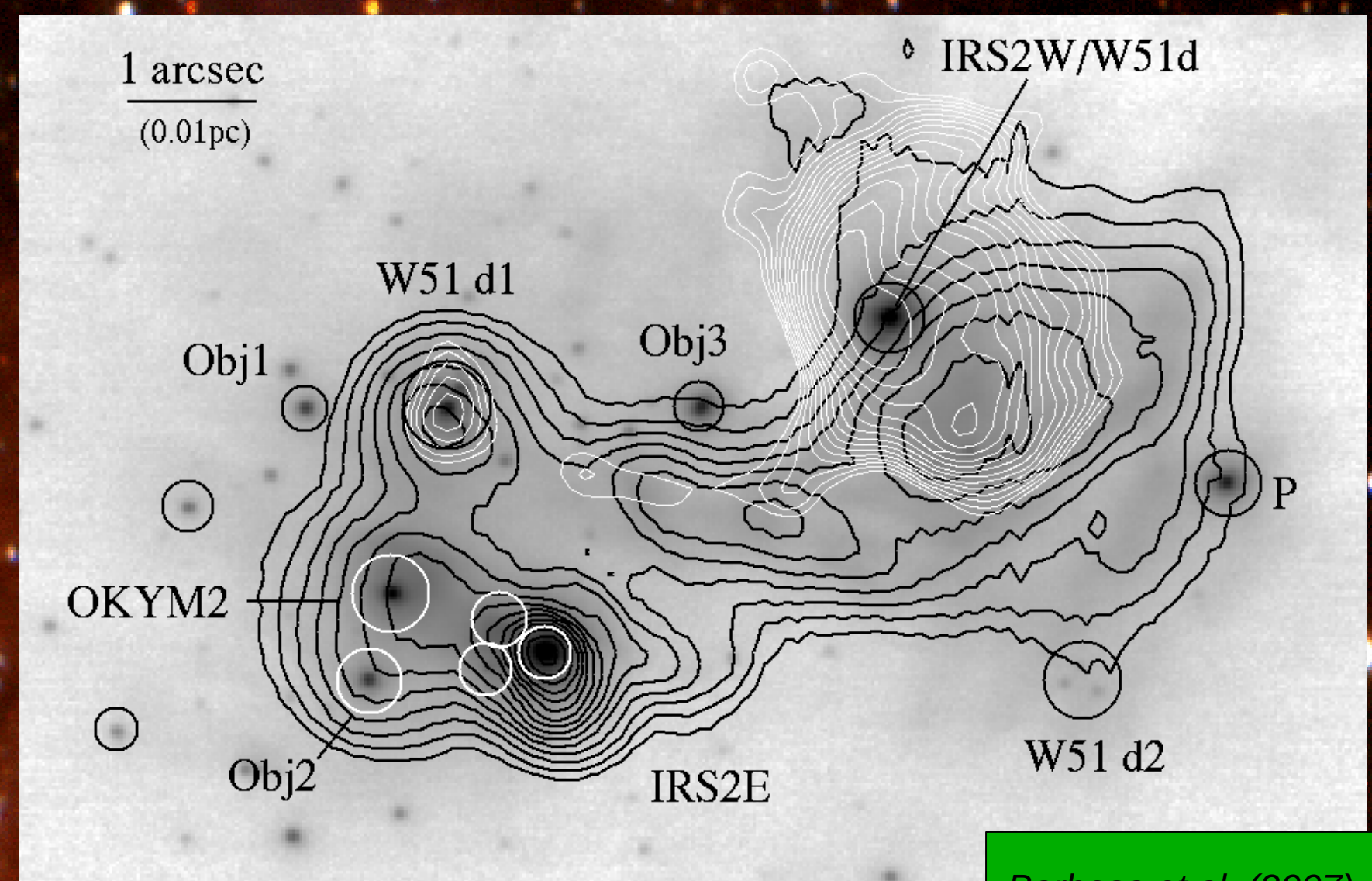


Figure 1- NIFS Argon lamp image showing the 29 slit-lets stacked on the 2048 x 2048 HgCdTe H2RG array. Each slice has 69 pixels in the spatial dimension.

NIFS is an all reflective image slicing integral field spectrograph. The instrument provides 0.048" x 0.1" sampling on the sky and a FOV of 3"x3". The spectral resolution is ~5200 and each image covers a full Z, J, H, or K atmospheric window. See Figure 1.



Barbosa et al. (2007)

Figure 2- ESO VLT K-band Image of the IRS2 complex in W51A. White overlay: radio continuum (Wood & Churchwell 1989). Black: Gemini TreCs 10 um. W51d is the radio peak.

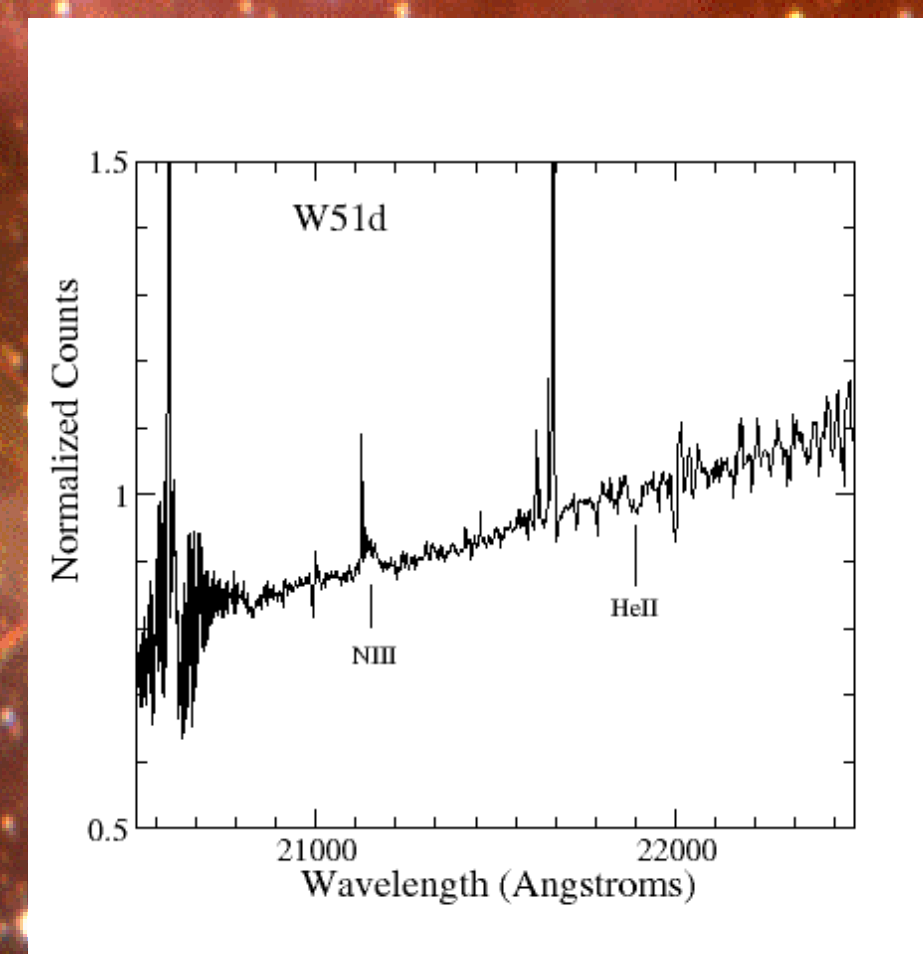
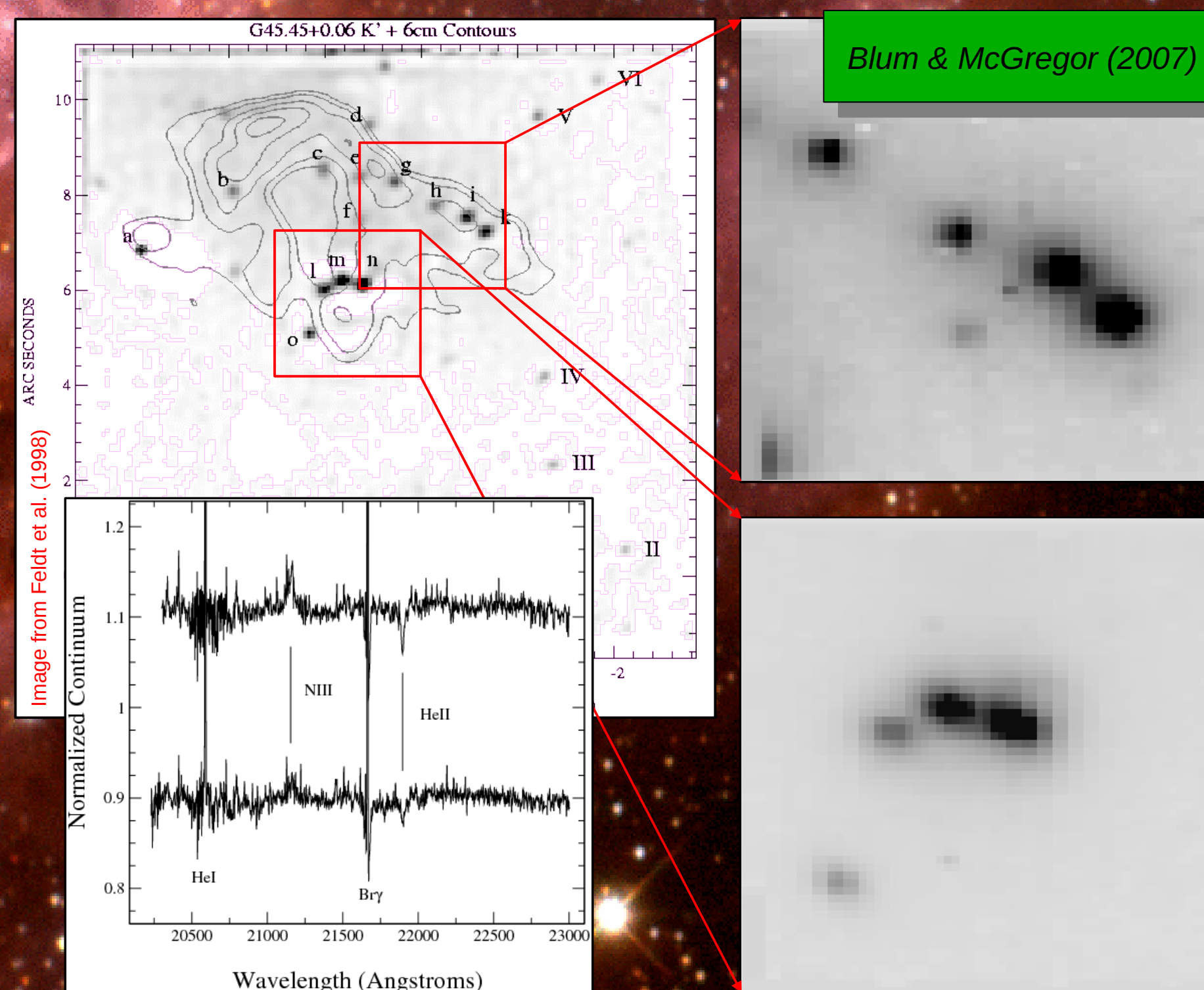


Figure 3- NIFS K-band spectrum of W51d showing photospheric features of NIII and HeII. This source is classified as O3 or O4.

NIFS is ideal for point source extraction in dense regions with strong nebular background. We have used NIFS with the AO module ALTAIR in both NGS and LGS mode to identify massive new born stars in W51A and G45.45+0.06.



Blum & McGregor (2007)

Figure 4- Two NIFS pointings in the field of Feldt et al. (1998). Sources "m" and "n" are massive, young O-type stars (see spectra above). Sources "o" and "k" (spectra not shown) exhibit CO band head emission.

references

Feldt et al. 1998, A&A, 339, 759

Wood & Churchwell 1989, ApJS, 69, 831