Hunting for exploding red supergiant stars

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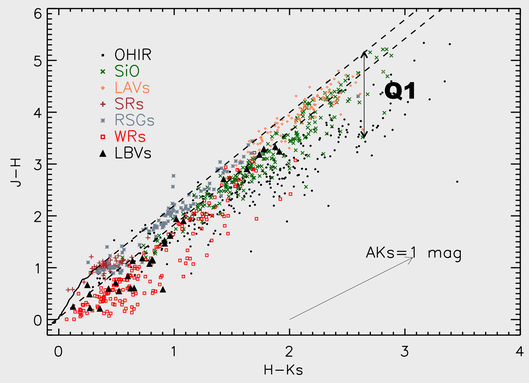
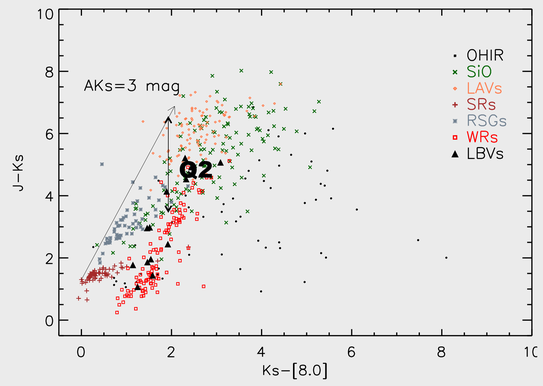
Astronomy & Astrophysics, 2012, A&A, 537,10; 2014, 569, 20; 2014, 571, 43.

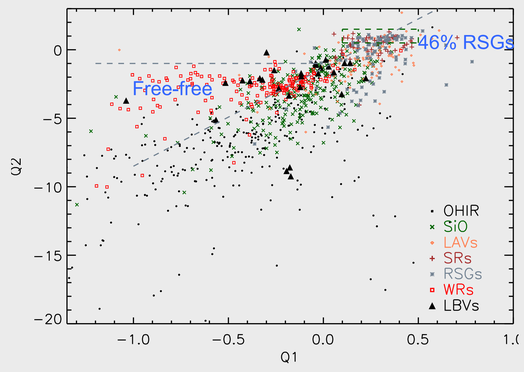
Red supergiants (RSGs) are among the brightest Galactic stars at infrared wavelengths. They lose mass at high-rates and, eventually, explode as supernovae, enriching the interstellar medium.
Here some results on searches for candidate obscured-far-luminous late-type stars, which are based on 2MASS, UKIDSS, and GLIMPSE data, and on extinction-free colors (Messineo et al. 2012, A&A, 537).



2MASS J-H vs. H-Ks diagram of Galactic evolved stars. See Messineo et al 2012, A&A, 537 for details.

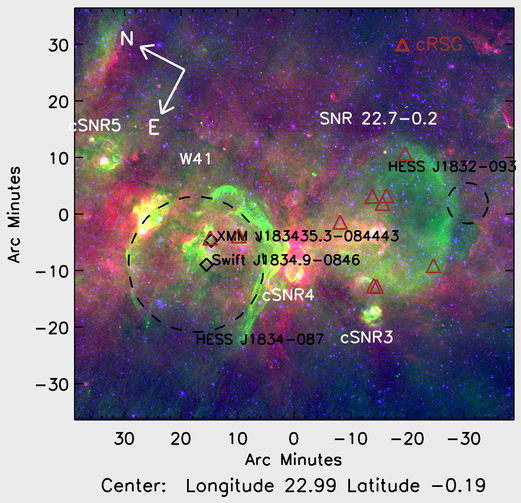


2MASS-GLIMPSE J-Ks vs. Ks-[8.0] diagram of Galactic evolved stars.

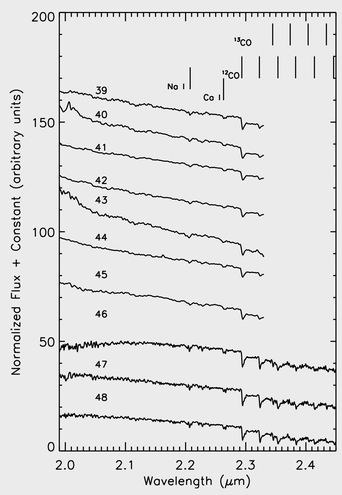


Q2 vs. *Q1* diagram of Galactic evolved stars. A large fraction of known Galactic RSGs are confined in the gray box.

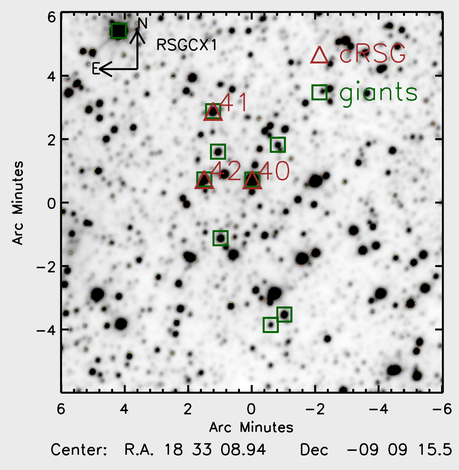
In the GMC G23.3-0.3, Messineo et al. (2014, A&A, 569, 20) have found several RSGs in the core of SNR W41 and within the area covered by the SNR G22.7-0.2. Therefore, SNR G22.7-0.2 appears to be most likely a type II SNR.



GLIMPSE/MAGPIS composite image of the GMC G23.3-0.3. This GMC is rich in HII and SNRs (e.g., Green et al. 1991, Helfand et al. 2006), and collapsed objects (e.g., Aharonian et al. 2005, Laffon et al. 2011, Mukherjee et al. 2009, and Kargaltsev et al. 2012.) A number of 10 new candidate RSGs were found. Star formation commenced 20-30 Myr ago.

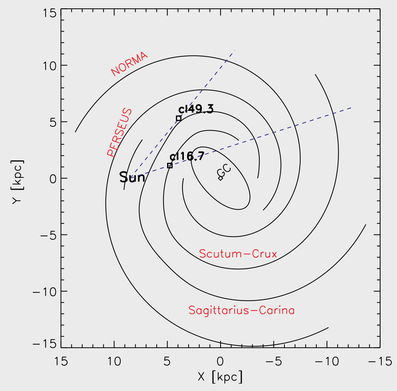


SofI and SINFONI spectra of 10 new candidate red supergiants in GMC G23.3-0.3.



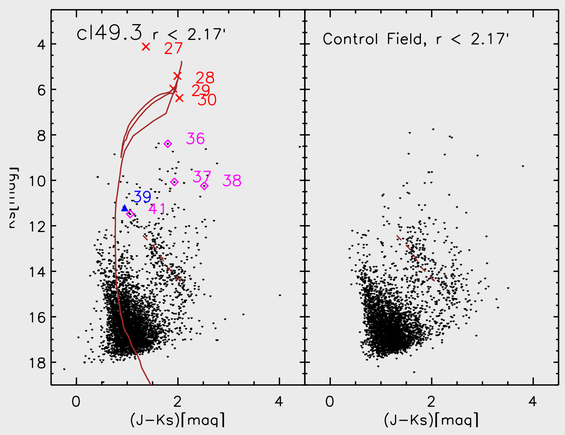
WISE 3.4 um image of RSGX1. This is a candidate RSGC cluster in the core of SNR 22.7-0.2.

Messineo et al. (2014, A&A, 571, 43) spectroscopically confirmed two clusters of red supergiants (RSGs), one on the Sagittarius-Carina spiral arm at a distance of ~7 kpc, and another on the Scutum-Crux arm at a distance of ~4 kpc;



XY view of the Galactic disk. The locations of the clusters cl49.3 and cl16.7 are indicated. Spiral arms are from Cordes&Lazio 2002.

JHK composite image of the RSGC cluster cl49.3.



2MASS-UKIDSS CMD of the RSGC cluster cl49.3.

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