



The MACRO Consortium



The Diversity of Research at MACRO: Scientific Highlights

AAS 244
Madison, WI

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Knox College



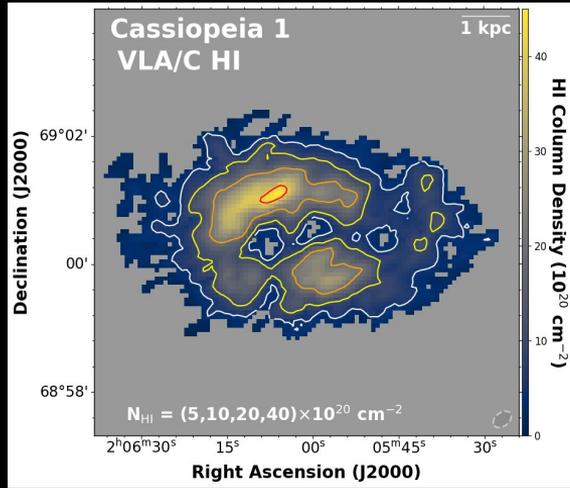
IOWA



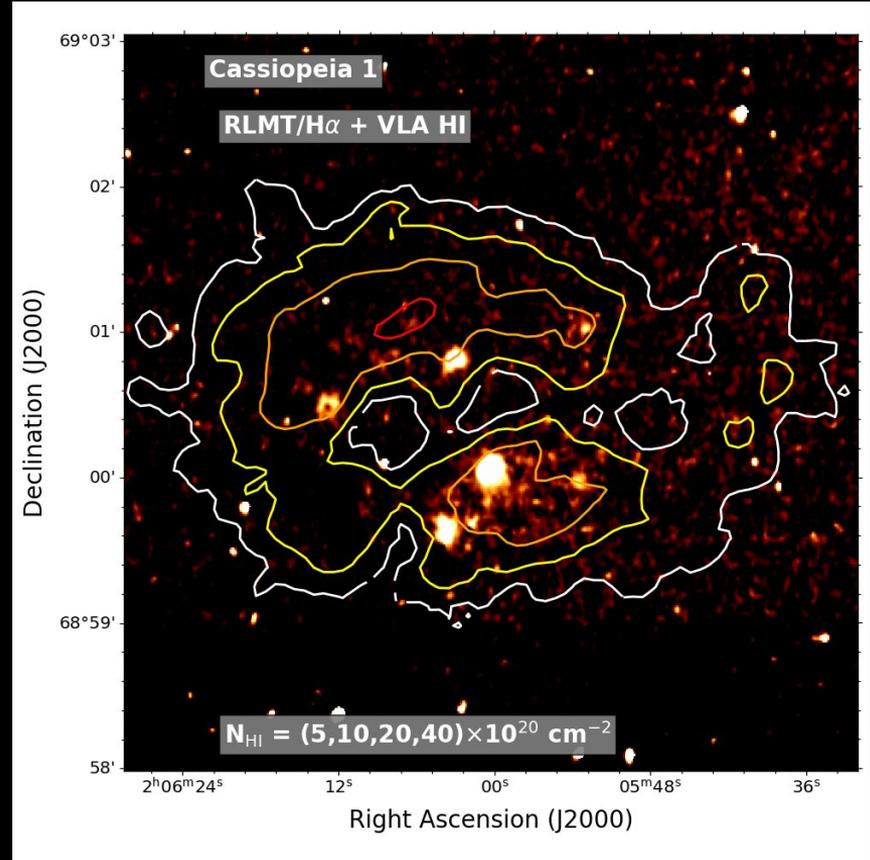
Multi-Wavelength Astronomy



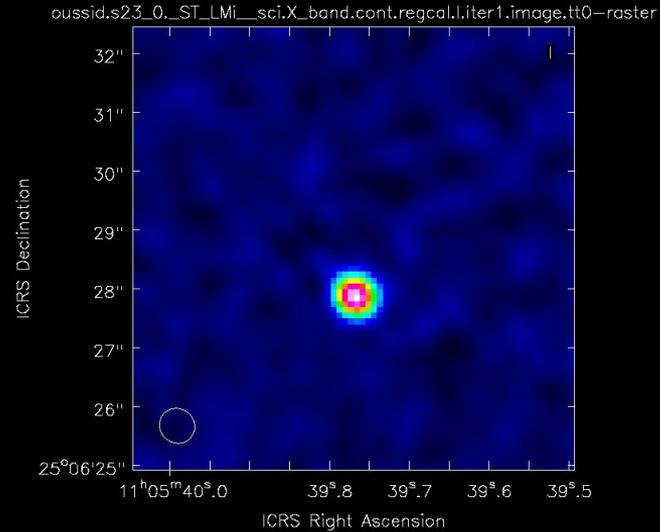
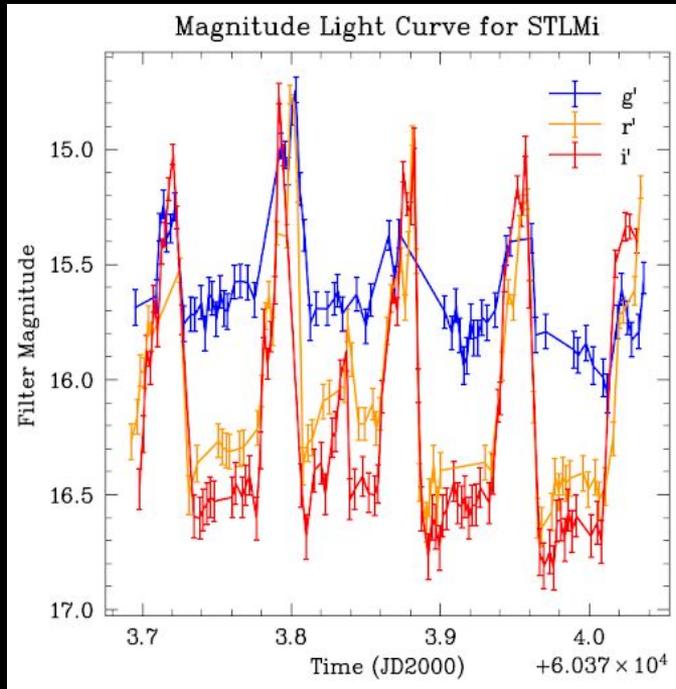
— Star Formation in the Dwarf Irregular Galaxy Cassiopeia 1



- Detection of star-formation throughout the disk in Cassiopeia 1 (low mass star-forming dwarf irregular)
- Apparent dearth of HI and SF in central regions



— A Detailed Study of the Cataclysmic Variable ST LMi



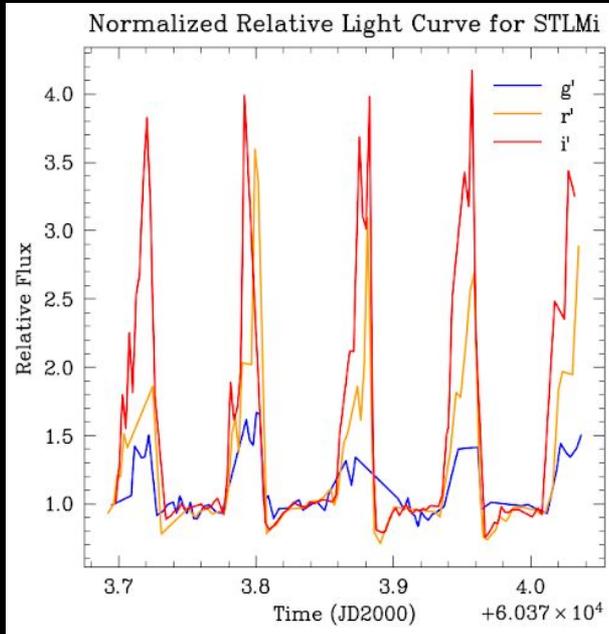
ST LMi - AM Her type CV (Polar)

- Periodic variability detected in optical
- Simultaneously observed at VLA and RLMT to monitor variability in optical and radio

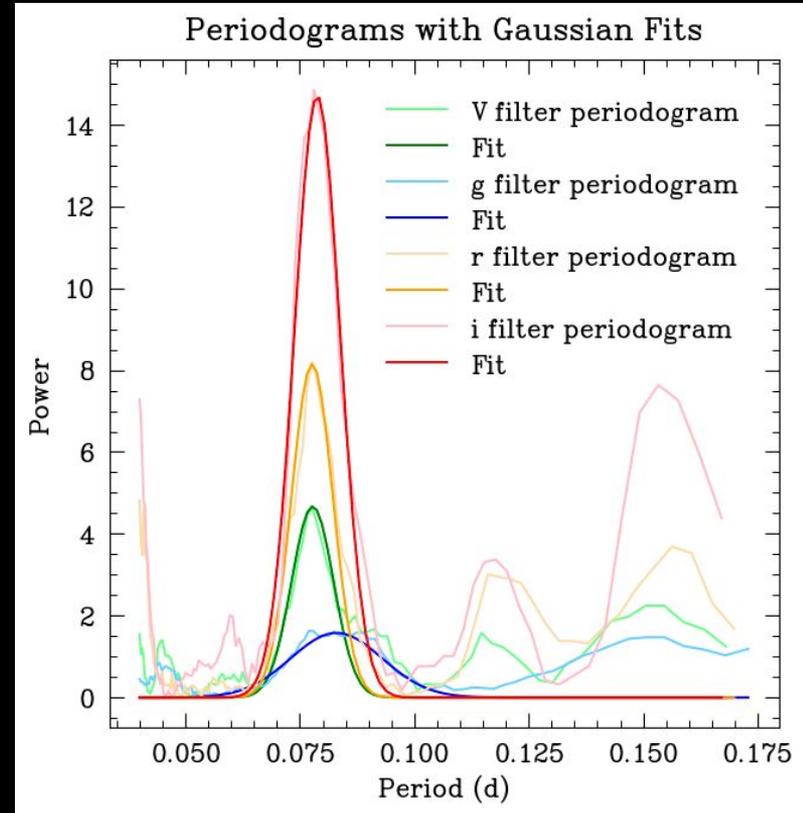
Time-Domain Astronomy



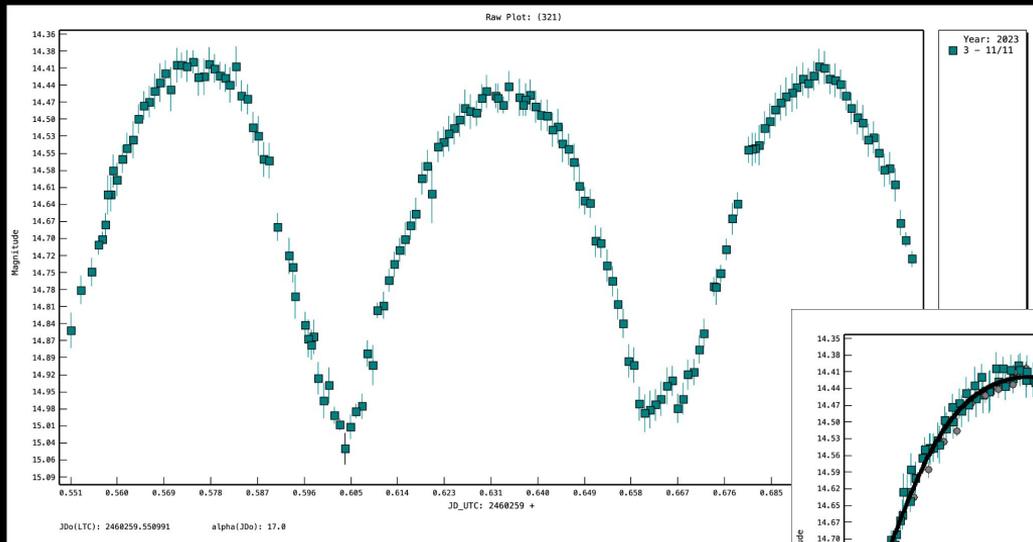
— A Detailed Study of the Cataclysmic Variable ST LMi



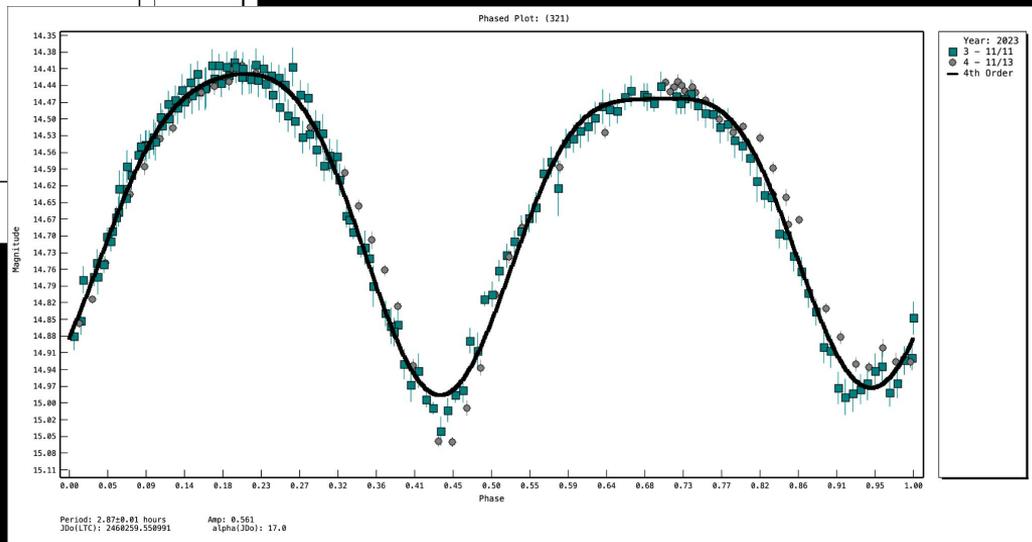
ST LMi Light Curve



Asteroid Photometry and Light Curves



Asteroid Light Curves

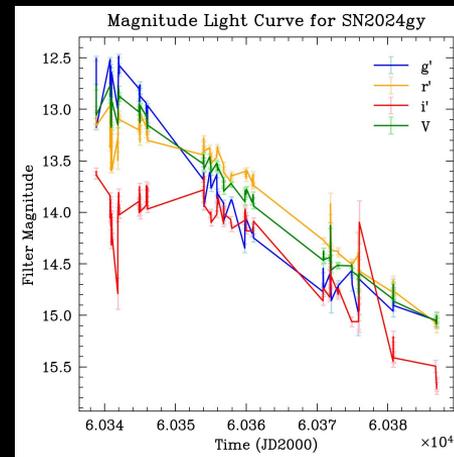
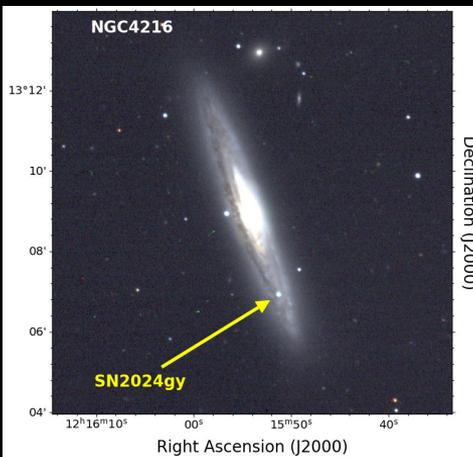
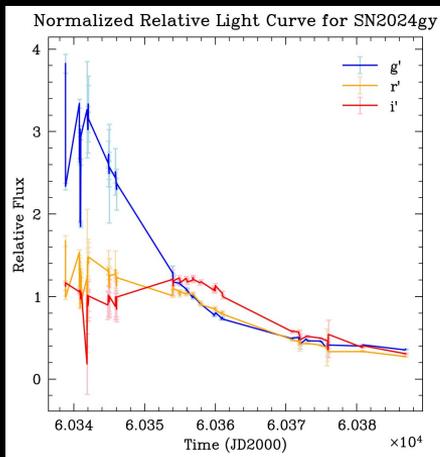


321 Florentina observed on multiple nights for greater than a period.



(Adams, Macalester)

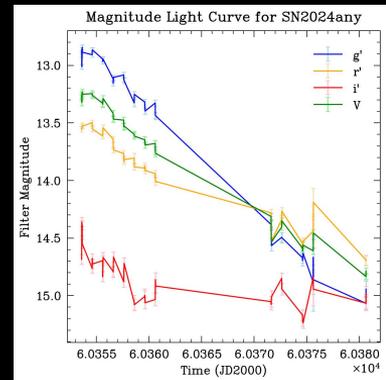
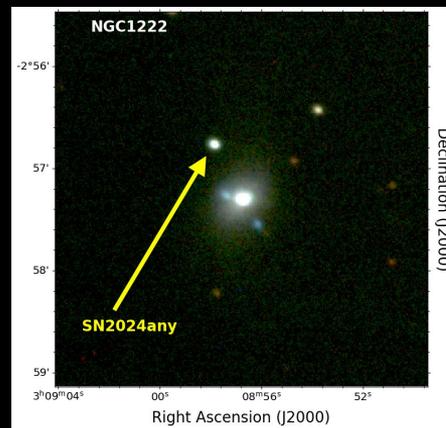
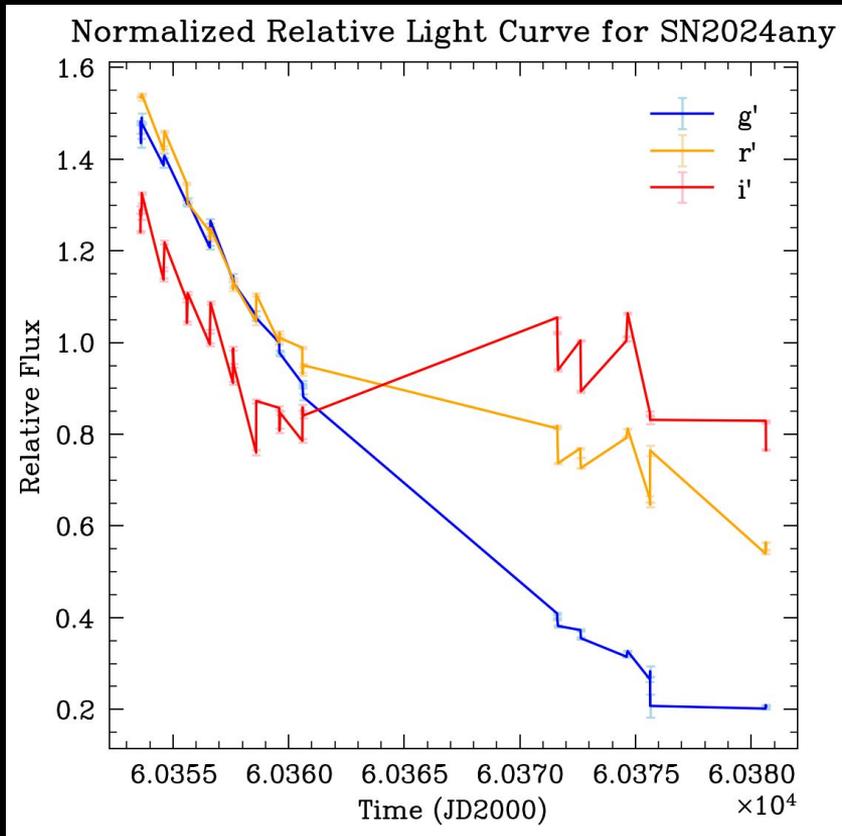
Photometric Monitoring of Optical Transients



Light curves of Type Ia supernovae

- Show characteristic drop off
- Evidence of secondary maximum in i'
 - Due to recombination of Fe III to Fe II emission lines

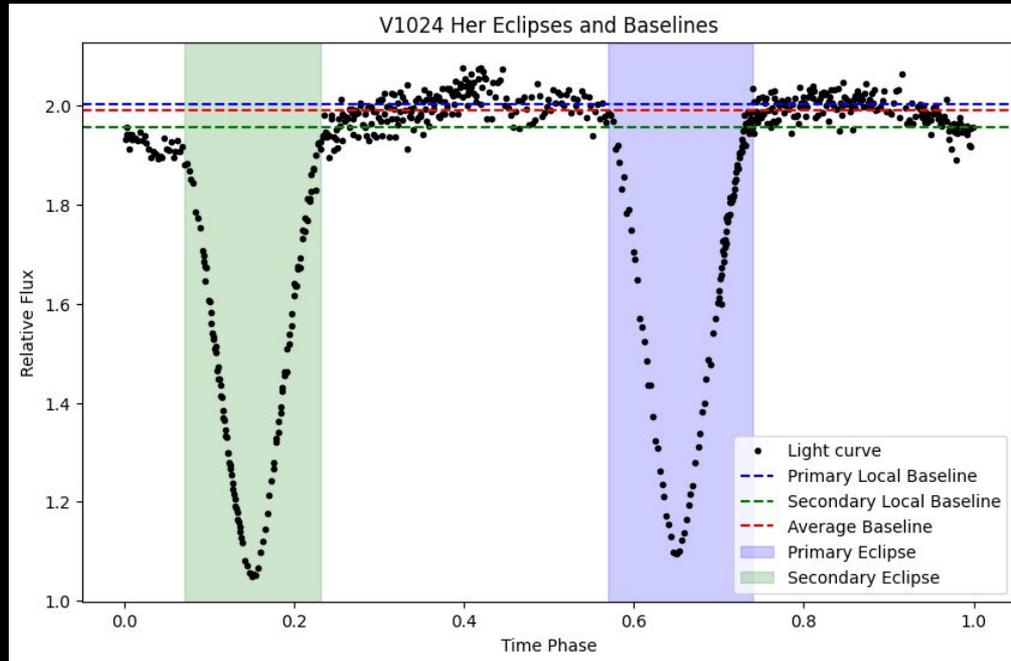
Photometric Monitoring of Optical Transients



Eclipsing Binaries

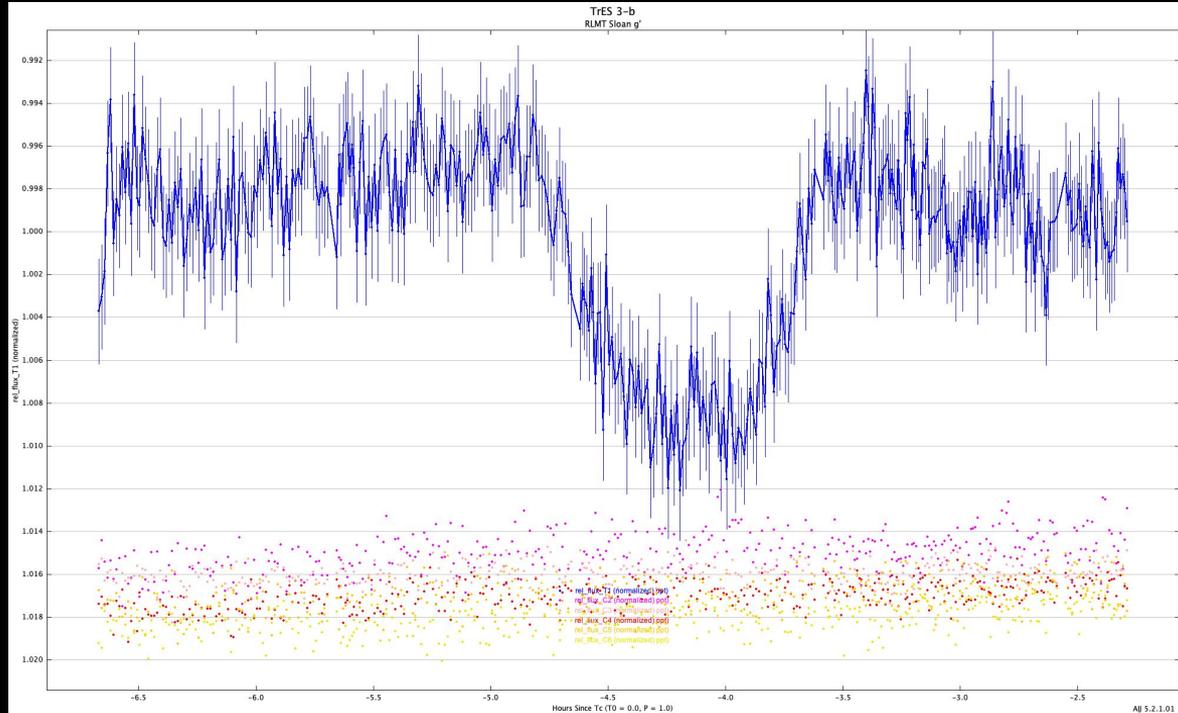
Variable Stars

- Eclipsing Binary V1024 Her
- Depending on how baseline is determined “secondary” deeper than primary



Exoplanet Transits

- Transit of TrES 3-b

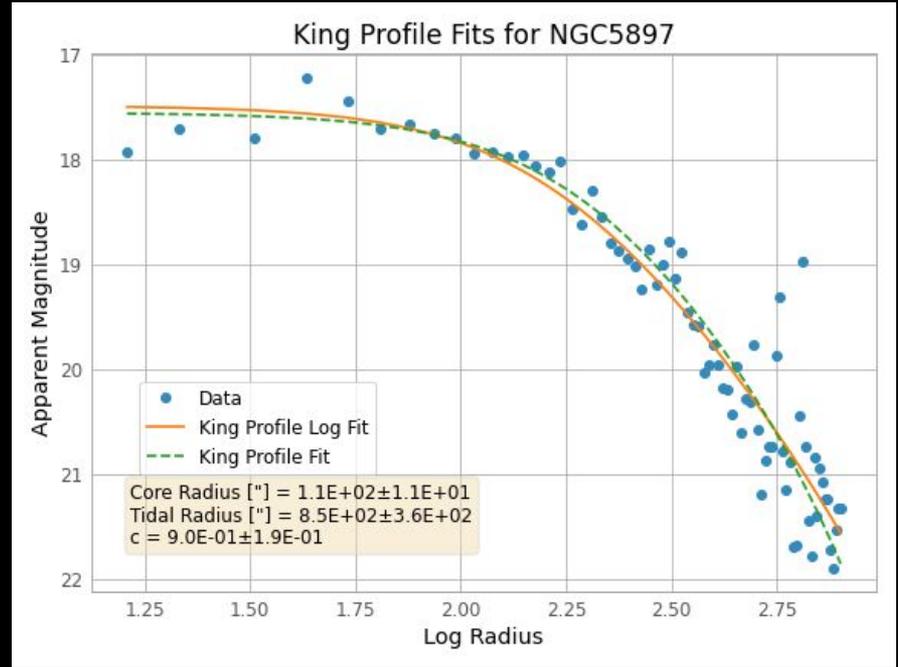


Photometric Studies

— King-fitted Structural Parameters of Globular Clusters



Surface Brightness Fits of Globular Clusters



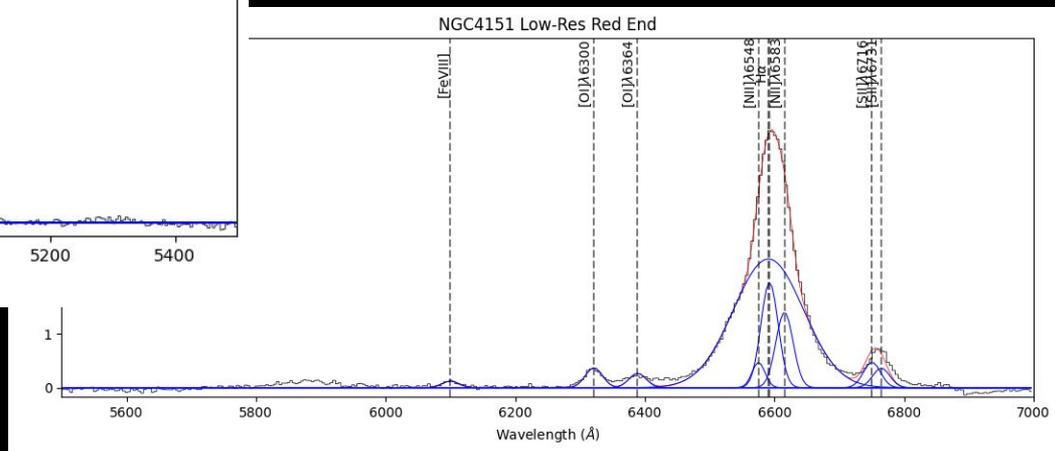
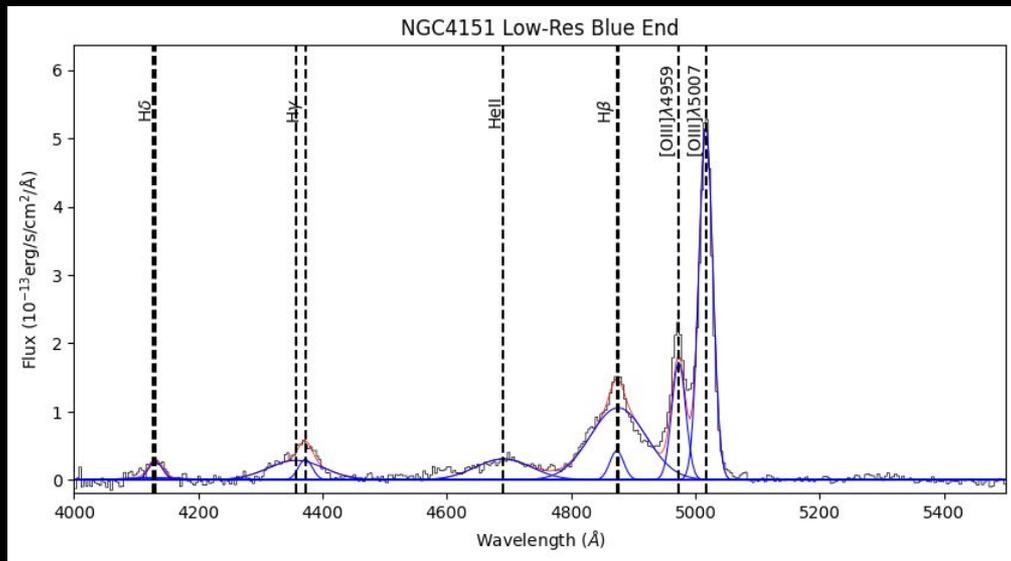
- Derivation of structural parameters from King model fitting.

Spectroscopic Studies

— First Spectroscopic Results of Extragalactic Objects

Low Resolution Grism

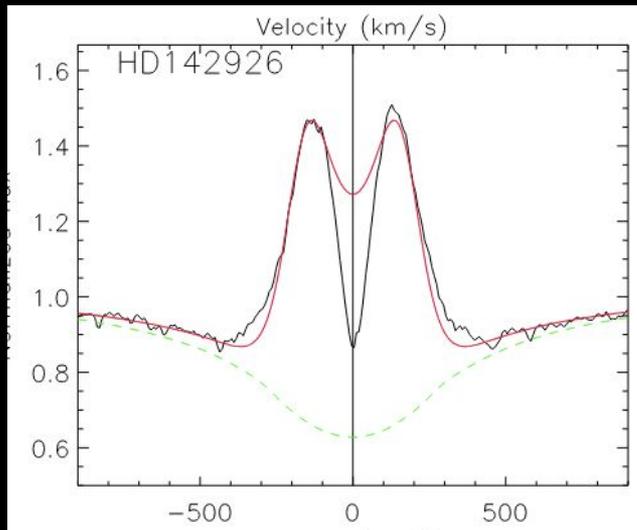
- Line profiles in the Seyfert 1 Galaxy NGC 4151



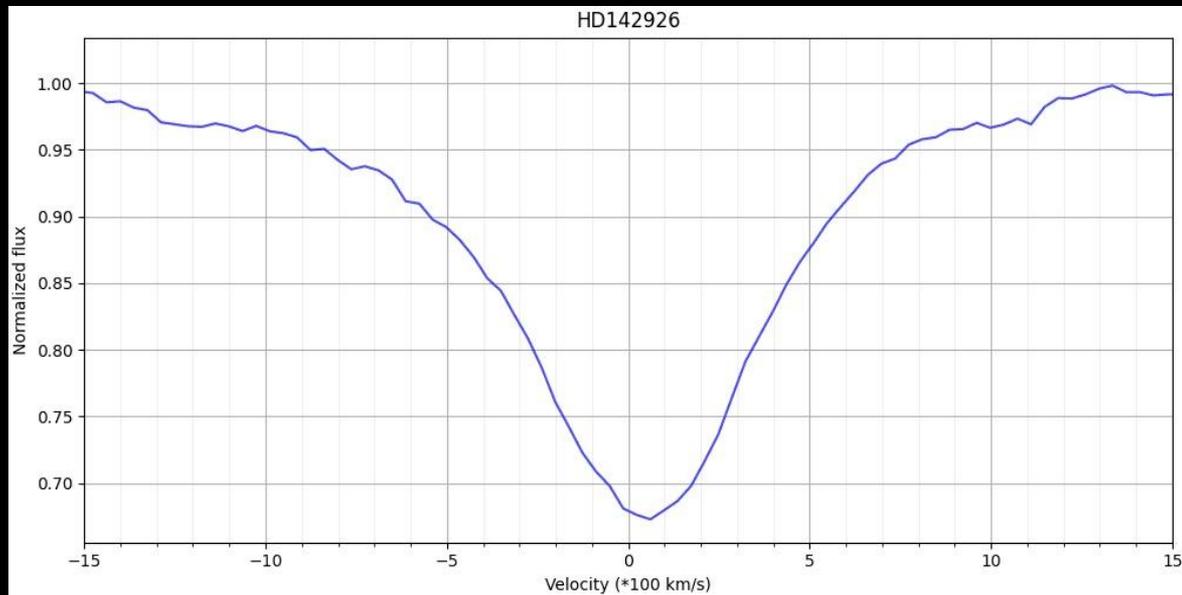
First Spectroscopic Results of Stellar Objects

High Resolution (“H-alpha”) Grism

- Variable profiles of H α line in Be stars



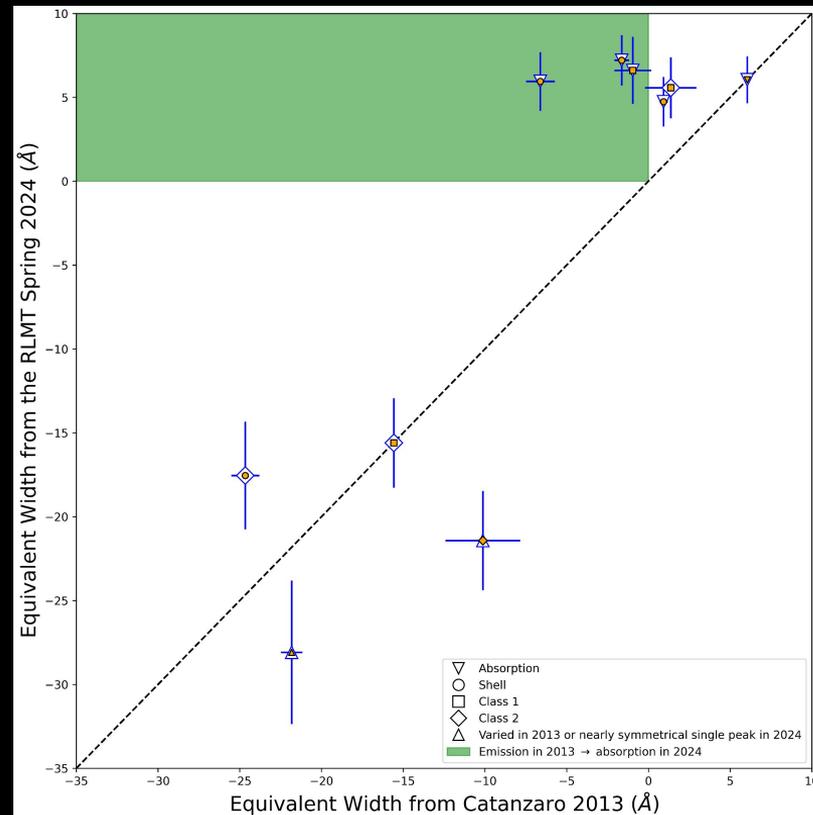
Catanzaro (2013)



First Spectroscopic Results of Stellar Objects

High Resolution (“H-alpha”) Grism

- Profiles of H α line in Be stars
- Class and EW of lines found to vary



Thanks!

