Symbiotic stars in the Magellanic Clouds

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Symbiotic stars

NASA, ESA, and D. Berry (STScI)
Symbiotic stars in Magellanic Clouds

- Known distance
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- Relatively bright

We can get complete magnitude-limited sample extensively monitored by photometric surveys.
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Symbiotic stars in Magellanic Clouds - the story so far
LMC S154 - recurrent symbiotic nova
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The first nova with such a short recurrence times and long outbursts
The first nova with such a short recurrence times and long outbursts
The first nova with a carbon-rich donor
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TWO SMC SYMBIOTIC STARS UNDERGOING STEADY HYDROGEN BURNING

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They seem interesting, but there are so few of them known!

Only 10+10 known in each Magellanic Cloud
SMC map of symbiotic stars
Maybe they are hiding among planetary nebulae?
Distinguishing between symbiotic stars and planetary nebulae

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Six new candidates in LMC - still not enough
A story of the future:
A story of the future:

A deep survey for symbiotic stars in the Magellanic Clouds
A story of the future:

A deep survey for symbiotic stars in the Magellanic Clouds

Problem: all the surveys so far have a success rate of 10% or lower
Solution:

Narrow-band photometric survey in H$_\alpha$ and He II 4686
Hα image of our feasibility study
Three new symbiotic stars in SMC
Three new symbiotic stars

- Confirmed with SALT spectra
Three new symbiotic stars in SMC
Three new symbiotic stars

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- One of the new symbiotic star is an ellipsoidal variable
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- One shows enigmatic light curve similar to GX 1+4 (a symbiotic X-ray binary)
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- One shows enigmatic light curve similar to GX 1+4 (a symbiotic X-ray binary), also has one of the hottest WDs among all symbiotic stars ($T_{WD} = 230 \text{kK}$)
- One has variability that we don’t really understand
Conclusions

- Symbiotic stars in MCs are interesting
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- A new deep survey for symbiotic stars in the Magellanic Clouds in H$\alpha$ and He II 4686

Three new discoveries in SMC only from the feasibility study, while 10 were known thus far. 30% success rate, while other surveys have 10% success rate or lower. Many new symbiotic stars in MCs expected!
Conclusions

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