

Dec. 11, 2016.

Dear CBAers,

(Mostly) new targets for the new season.

1. The CLASSICAL NOVAE have been very good to us. A long-standing problem in CV science has been that short-period (<2.5 hours) stars are too rare - by a factor of ~5 - to be understood as the evolutionary descendants of long-Perb stars. The problem could be solved if there were a convenient way to **destroy** short-Perb CVs. Our studies of BK Lyn and T Pyx suggest such a way. Their puny secondaries transfer matter at unnaturally high rates for at least 100-2000 years after their nova outbursts. That drastically shortens the lifetime of the binary. So one of our top-priority goals is now to track the orbital-period evolution of all short-period nova remnants (and a few long-period guys too). Here are the seasonally appropriate stars:

V959 Mon	7 hr
GQ Mus*	1.43 hr
V Per*	2.57 hr
T Aur	4.9 hr
T Pyx	1.7 hr

\*These stars are faint! Probably about 18; good for big scopes and good conditions.

2. The DQ Hers (INTERMEDIATE POLARS), Enrique and Shawn Dvorak are getting a lot of observations on these guys, and Enrique will advise on which ones need more. He has already done so (earlier), and I'm really excited to see how many time series that effort is yielding this year. We will have a killer paper in 2017 on the spin period changes - over a baseline of many years (as many as 35). Here are a few more DQs needing observation and/or comment:

FO Aqr - just for a few weeks if possible  
DW Cnc  
V598 Peg = RX233325.92+152222 - FAINT! but try  
IGR 08390+4833  
HZ Pup

These supplement the ones Enrique mentioned earlier. The present-day theory for spin-period changes is this: matter accretes most easily onto a magnetic white dwarf at the co-rotation radius in the disk. The angular momentum at that radius is easy to estimate ( $mR^2\Omega$ ), and that spins up the WD. The theory can't be quite right, because some DQs spin down, while others alternate between spin-up and spin-down. Theorists haven't improved on this model in 30 years, and the fault is mostly ours, because we haven't been reporting the observational results. (It's hard; you have to keep track of the timings for >10 years at least, and you can't miss years or the cycle count gets lost!)

BTW if you have been observing one of the other DQs this season, it's likely that continuing on it would be good, especially late in the observing season, since that's how we get a period accurate enough to

bridge between seasons. If the light curve looks good with a clearly visible fast signal, keep it up!

3. Two northern MYSTERY STARS - not yet clear \*what\* they are, but with another season of coverage we can complete our study of them:

Paloma = RX J0524+4244  
FS Aur

4. Finally, there are two SUPERHUMPING NOVALIKES which we have observed in the past, but not yet with enough - and enough sufficiently dense - coverage to complete our study:

LT Eri (0407-06)  
V1294 Tau

Both equatorial stars, which present challenges to us since no one can get really long runs on them (thus introducing the possibility of a 24-hour alias). But now with good coverage in Europe-Africa and also AU-NZ, we should be able to solve this.

joe

p.s. I'm omitting the new dwarf nova OT J030205.67+254834.3, which several of you - especially Tonny - are observing with great success. But only because you're already wise to it. We're not as squarely in the dwarf-nova business any more, but this one is definitely an important star. So keep up your observing as long as it stays bright.

p.p.s. And the usual CBA rule-of-thumb applies to nearly all targets: as long as you're getting good data on a star, keep the faith on it. A time series with dense sampling is much better for period-finding than 3 sparsely-sampled time series. Not true in every case, but a good rule of thumb.