

THE EARLY BIRD GETS THE VARIABLE

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In his classic book "Starlight Nights", Leslie Peltier describes a lost opportunity on a cold February morning back in 1946. He had been observing the old nova **T CrB** for over 25 years, and had planned to observe it again on this particular morning. His alarm clock roused him at 0230, but he did not feel well and returned to bed in spite of the sky being very clear. Unluckily for him, this happened to be the very night that **T CrB** confirmed its recurrent nature, and rose to its second spectacular outburst. He went on to say that after missing this event, he no longer held a warm feeling towards this particular variable star.

This story reminded me of my own experience with another famous recurrent nova, **RS Oph**. Its last outburst occurred whilst it was hidden behind the sun, and the first observer to pick it up in the morning sky in 1985 was guaranteed to discover the outburst. In 1983 and 1984, I had secured observations as early as 18th January, but in 1985 bad weather prevailed throughout most of January. On the 22nd I braved heavy snowfall to visit my girlfriend, and did not return home until 0215. The snow had stopped falling at that time, and the sky was beginning to clear. I then faced a dilemma; should I stay up to observe in freezing conditions, or retire to bed, as I had to get up for work at 0650. Unfortunately I chose the latter, and it was crystal clear at 0650. This was fully 4 nights before Warren Morrison of Canada was credited with discovering the 1985 outburst of **RS Oph**. Unlike Peltier, I did not fall out with the variable star, but I did dump the girlfriend! Since then I have redoubled my efforts to observe both **T CrB** and **RS Oph** in the morning sky, particularly in the months of January and February.

When the light curves of variable stars with seasonal gaps are closely examined, the period immediately following the gap is often sparsely populated with observations. This is because the majority of our observers are only active in the evening, no doubt due to lifestyle and work commitments. However, those who do make a special effort to observe in the morning are up against less competition to find the interesting activity occurring in variable stars that are emerging from solar conjunction. There are other significant advantages to observing in the morning as well:

Dark Adaption

If you get up to observe after several hours of sleep your dark adaption is optimized.

Fatigue

Sleep replenishes oxygen to the eyes and you are less fatigued after sleep than if you have been awake for 12 - 18 hours.

Light Pollution

There are less people about, than in the evening, resulting in less lighting. Some local councils (sadly only a few so far) switch off some streetlights during the early hours of the morning.

Sky Transparency

Emissions from factories and building heating systems are reduced, often resulting in improved transparency.

Aurorae

Magnetic midnight is around 2200, so the risk of auroral activity interfering is reduced compared with the evening.

To outline the potential scope for observing some of the well known and visually rewarding variable stars from the British Isles in the morning, here is a month-by-month journey throughout the calendar year:

January

The year starts with the best possible conditions for observing in the morning. For a week either side of the 10th, it is possible to observe variable stars right up to 0700. The first week of the new year also often has good sky clarity, due to factories being shut down over the Christmas and New Year holiday period.

Aquila, Cygnus, Ophiuchus, Sagitta, Scorpius, Scutum and **Serpens Cauda** all come into view this month.

RS Oph emerges at the start of the month; I have seen it at minimum as early as the 3rd. The last outburst in 1985 occurred during solar conjunction, and it was more than 3 weeks into its morning apparition before it was picked up.

R Aql appears around the 10th only a few days after it is lost in the evening.

R Sct can be seen from about the 11th onwards having been lost in the evening close to the Winter solstice date 3 weeks earlier.

V818 Sco the visible component of Sco X1, that varies significantly on a nightly basis, is visible from mid month onwards having been lost the previous August.

A challenge for large telescope owners is **WZ Sge**. **SV Sge** on the other hand is usually brighter and can be seen at the start of the month just as it disappears from the evening sky.

February

The northerly movement of the sun starts to make an impact this month. The limit for observing variable stars is around 0620 at the start of the month, but this recedes to 0540 by the end.

Delphinus, Lacerta and **Vulpecula** appear in the northeastern sky this month.

U Del and **EU Del** can be seen with binoculars right at the start of the month.

V Aql and **S Sct** rise sufficiently high for useful binocular observations around mid month.

BL Lac is visible in the second half of the month to those equipped with large telescopes.

March

As winter turns to spring, the cut off for morning observing is 0530 at the start, and 0420 at the end of the month.

Pegasus and **Sagittarius** become visible this month.

RU Peg and **AG Peg**, hidden from view for a month, reappear during the first week. **AG Peg** usually requires a small telescope to render it visible, until it gains altitude above the advancing twilight a month or so later.

SX Lac on the southeastern limit of **Lacerta** is an easy binocular object right from the start of the month.

The spring months of March and April are ideal times for the nova hunter to observe in the late morning, with the Milky Way arcing across the eastern sky. George Alcock discovered **Nova Vul 1968** and **Nova Her 1991** on the 15th April and 25th March respectively, both after 0300 in the morning.

April

The time available for morning observing rapidly shortens this month from 0410 at the start, to 0300 by the end.

Andromeda slowly creeps up from the northeastern horizon this month.

R And and **RX And** lost in the evening right at the end of March, become morning objects during the first week of April to telescopic observers.

EG And on the edge of M31 is an easy binocular object throughout the month.
GO Peg rises sufficiently high enough for binocular observers to recover it (having lost it in mid February).

May

Although it is possible to observe up to 0245 at the start of the month, twilight is ever present by the end of the month, and it is difficult to continue beyond 0110 by that time. Therefore, the advantages of observing in the morning are largely eroded by the rapid onset of summer. **W And** can be seen from about the 10th onwards, having been lost in the evening in mid April.

AQ And and **BZ And** might rise sufficiently ahead of twilight for the keen binocular observer. Circumpolar objects like **S Cas** and **T Cas** and **TZ Per** and **UV Per** are now actually higher in the morning sky than in the evening.

June

All night twilight prevails this month, and it is really only possible (except on the south coast) to observe between 2300 and 0100, thus with the application of BST the evening observers are forced to become morning observers.

The autumn zodiac constellations of **Aquarius**, **Capricornus** and **Pisces** creep up above the eastern horizon in strong twilight. **Triangulum** also reappears.

Z Psc and **TX Psc**, lost to binocular observers in February, now reappear in the first week.

VY Aqr and **Markarian 509** can be recovered by telescopic observers mid month.

GK Per, which is usually lost at the end of April, can be picked up by determined telescopic observers towards the end of the month.

W Tri can be seen with binoculars at the end of the month.

July

Dark skies reappear during the third week and by the end of the month observations can continue until 0210.

Aries, **Cetus** and **Taurus** become fully visible this month.

X Per above the Pleiades, emerges during the first week, having been lost at the start of May.

Y Lyn becomes a morning object, having finished its evening apparition at the end of June.

UU Aur, dipping into the northern twilight at the start of June, reappears around the 22nd.

AB Aur was lost during the first week in May, but can be recovered from about the 25th.

Mira, hidden from view since mid March, re-emerges during the third week.

RV Tau can be picked up during the final week of the month.

August

As summer concludes, the scope for morning observations dramatically increases. At the start of the month observations can continue until 0220, but by the month's end this is extended to 0340. Dark skies, warm conditions and meteors should encourage the observer to explore the morning skies this month.

Gemini, **Eridanus**, **Lepus**, **Lynx** and **Orion** appear in the east this month.

U Ori and **SU Tau** (lost at the start of May) and **W Ori** (lost in mid April), reappear during the first week.

TV Gem and **BU Gem**, lost in mid May, are visible from around the 4th onwards.

RX Lep can be seen once the observer has a clear view of Rigel.

U Gem, which is usually lost at the end of May, can be recovered from mid month onwards.

RS Cnc hidden from view since early June, reappears during the final week.

September

This month the morning observer can enjoy the winter constellations in all their glory without having to deal with winter temperatures. Observations of variable stars may continue until

0345 at the start and until 0450 at the end of the month.

Cancer, Canis Major, Canis Minor, Leo, Leo Minor and **Monoceros** are visible this month. I have observed **X Cnc, RV Mon, SX Mon** and **CN Ori** on the 1st day of the month. Under favourable conditions the observer may pick them up at the end of August.

U LMi can be seen from the first week onwards.

U Mon and **W CMa** are visible from mid month onwards.

Markarian 421, lost in July, can be seen during the last week as can **TV UMa** nearby.

X Leo, lost at the start of June, can be picked up at the very end of the month.

October

The morning observer usually encounters the first ground frost this month, when observations are possible until 0500 at the start and until 0540 at the end of the month.

Coma Berenices, Hydra, northern Puppis and **Sextans** emerge in the east this month.

R Com and **W Com** are visible to telescopic observers from the second week onwards.

U Hya, lost at the end of May, can be seen from the middle of the month.

RW Vir and **SS Vir** lost in mid June can be seen during the final week of the month.

November

Fog can hamper morning observers this month, but at least the smoke from bonfires, fireworks, car fumes and heating systems are largely confined to the evening. The cut off for morning observations this month is 0550 at the start, and 0620 at the end.

Bootes, Corona Borealis, Corvus, Crater and **Virgo** are the spring constellations visible in the east this month.

Although still visible in the evening, **R, S, T, V, W, RR** and **SW CrB** can now be seen during the first week of November in the morning. This is worthwhile noting if you are keen to catch the next outburst of **T CrB**.

SW Vir is lost at the start of July reappears around the 9th.

3C-273 can be seen from about the 10th having been lost in mid June.

V, RV, RW and **RX Boo** emerge in the morning sky during the second week just as they disappear in the evening sky.

TT CrI, which was lost at the end of May, can be observed from the middle of this month.

R Ser can be picked up in the third week just as it is lost in the evening sky.

December

This is the worst month for light pollution, as Christmas lights are erected. Fortunately not all these lights are illuminated during the morning hours. Observations can be made up to 0630 at the start and until 0645 at the end of the month.

Hercules, Libra and **Serpens Caput** put in an appearance this month.

AH Her can be picked up right at the start of the month having been lost just a couple of weeks earlier in the evening sky.

R Hya sneaks up above the southern horizon during the first week.

30, X, RU, ST, SX, UW, OP and **AC Her** are now both evening and morning objects.

Hopefully the above calendar highlights might encourage a few more observers to brave the morning skies where the rewards can be potentially much greater than in the evening. Anyone who does will certainly help achieve a more even spread to our light curves and in some cases reduce the gaps that currently appear. Also, the morning skies represent the future and it is a nice feeling to see spring constellations with the promise of more warmth during the depths of a cold British winter. If you do make the extra effort to get up early from bed (and you are luckier than Leslie Peltier) you might even be rewarded with a recurrent nova performing.