

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

STANDING COMMITTEE ON OBSERVATIONAL ACTIVITIES

AURORA SECTION

Bulletin No.3

The Standing Committee on Observational Activities is interested in expanding the present visual survey of aurora borealis (northern lights) in the skies over Canada. Many individual members of the R.A.S.C. are currently reporting their observations of aurora to their Centres and to the National Research Council Aurora Survey. Two Centres, Edmonton and Montreal, have been carrying out extensive visual studies of the aurora for many years. Other programmes of aurora reporting are known to exist in the Calgary and Halifax Centres. More recently some members of the Hamilton Centre have expressed an interest in beginning a study of aurora.

At present, the sun-spot activity is at a minimum as a new eleven-year cycle begins. At any given station in the mid-latitudes, the number of auroras occurring can be shown to follow the solar cycle. As the number of sun-spots increases, so does the number of aurora observed.

For the benefit of those amateur astronomers not familiar with the appearance of the aurora, some characteristics will be briefly outlined:

BRIGHTNESS: Auroras vary in brightness from WEAK (comparable with the Milky Way) to BRIGHT (that of a moonlit cumulus cloud). The majority of aurora seen are classified as MEDIUM (with brightness resembling a moonlit cirrus cloud).

COLOUR: Auroras are usually coloured yellow green; the intensity of colour depends on the brightness, the brighter the display the more colour observed. In the brightest displays, reddish or violet hues may show as well as the yellow green, and should be noted.

FORM: Sometimes the aurora appears as a faint GLOW near the northern horizon resembling the dawn, except in colour. Cirrus clouds near the northern horizon, if illuminated by city lights or moonlight, will tend to be more reddish in colour and thus are easily distinguished from aurora.

Generally higher in the northern sky a HOMOGENEOUS ARC may appear as a thin band of light with a diffuse upper edge and a sharply defined lower edge. Several such arcs may occur at one time with some joining at the ends. A homogeneous arc may increase in brightness and break into a RAYED ARC. For long rays, this may resemble a drapery or curtain hanging from overhead points in the sky.

In active displays of aurora, several rayed arcs may appear parallel to one another. Waves of motion along the form may develop in such displays, folding and unfolding as these waves move along the length of arc. The brightest part of the arc may drift slowly or rapidly east or west, or alternate in direction rapidly.

Bundles or patches of isolated RAYS accompany many displays of aurora, resembling a searchlight beam in a dusty atmosphere and mixed in with other auroral forms.

OBSERVING THE AURORA

New observers should gain experience by searching the sky for aurora whenever taking part in outdoor astronomical observing. Presence or absence of aurora, area of the sky covered, brightness, and colour, will form the basis of your initial reports. The forms of aurora can be classified with more experience. Eventually, the elevations of the forms of aurora in the sky can be measured along the magnetic meridian.

For recording aurora, the sky has been divided into four quadrants. The most important quadrant for your observations is the one centred on your north and extending from NW to NE at the horizon up to the zenith (Figure 2). Each quadrant has been divided into three zones, from 0° to 30° elevation, 30° to 60° , and from 60° to the zenith. In reporting, you should note the quadrant and zones containing glows, lower borders of arcs and ends of isolated rays. An illustration of this procedure is shown in figures 1 and 2.

TIME OF OBSERVATION

Observations should be made approximately on the hour whenever no aurora is in the sky or whenever only quiet forms such as the glow or a faint homogeneous arc are present. However, when an arc begins to show some signs of becoming active (greatly increased brightness or the appearance of motion or rays) the display should then be observed half hourly.

It is important that observations be collected from many locations to chart completely the course of an auroral display. Thus a single report of the presence or absence of aurora from Winnipeg may fill a gap left by a Regina observer not able to make an observation. Even if you can not report regularly, your occasional reports will be most helpful. Contribute as much data on the report form as your experience allows. If a report originating in London states that aurora occurred low in the north between 20 hours (8 PM) and 23 hours (11 PM) on March 10/11, 1965, this may confirm another observation from north Toronto where some uncertainty existed about the observation.

Upon request, the Auroral Centre, National Research Council, Ottawa 2, Ontario, will forward to interested observers a supply of report forms, mailing envelopes and a complete set of observing instructions.

I am anxious to contact representatives of local Centres concerning the accumulation of duplicate copies of visual aurora reports so that an independent R.A.S.C. survey can be made over the next eleven-year sun-spot cycle.

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