



An active 'elbow' prominence is captured by the ultra-violet cameras of Skylab in 1973. The prominence extends about a million kilometres from the solar disc. The looping effect, where some of the material is raining back to the surface, is caused by interactions with magnetic fields. The picture is reproduced in false colours, the brighter colours showing the hotter regions. Ultra-violet studies where observations are made of individual highly ionized atomic species are most valuable because they show regions of specific temperatures.

Below:
A total eclipse of the Sun (1977 October 12) showing prominences on the limb.

of divergent magnetic field lines along which the particles may stream out into space. Similar polar plumes are also known to exist. The high-speed streams (and the coronal holes) are observed to persist over several solar rotations.

The solar wind expands out into space until its pressure is balanced by that of the interstellar gas. It is uncertain at what distance this will occur, but it is thought that this **heliopause** will be present at distances of about 50 to 100 astronomical units. The whole magnetic bubble surrounding the Solar System is itself known as the **heliosphere**, and is expected to be tear-shaped due to the flow of the interstellar gas within the Galaxy. It is hoped that data from Pioneer 10 in particular – now beyond all the known planets – will help to establish the conditions at such great distances from the Sun.

Solar activity

As the solar wind is highly ionized, it interacts strongly with magnetic fields, distorting the Earth's magnetic field as it streams past us with a velocity of 500 km per s. This distortion is only one effect the Sun has on our planet. The X-ray and ultraviolet radiation from the Sun ionizes the atoms of our outer atmosphere producing a region called the **ionosphere**. This is particularly useful to us because radio waves can be reflected from this layer to provide over-the-horizon communication on our planet. However, disturbances on the Sun can alter the balance of the ionosphere, upsetting communications and also producing the beautiful aurorae observed in polar latitudes. These are the end products of

