



Illustrations by David A. Hardy, F.R.A.S., S.A.S.

THE EXPLODING UNIVERSE

by Roger Dunn

If you stand on top of a hill on any clear day the most distant object you can pick out is not likely to be more than 20 or 30 miles away. But if you look up into the sky on a dark night your eyes can detect light from enormous distances away. Believe it or not, the actual distance is about 12 million million miles. The light we can see from so far away comes from outside our own galaxy. Its source is M31, a neighbouring galaxy of the Milky Way, which is also known as the Great Spiral Nebula in Andromeda. A good time to look for it is in the autumn, when it appears as a faint haze in the constellation Andromeda, high in the Northern sky, between the "W" of Cassiopeia and the square of Pegasus.

The luminous glow we see comes from M31, not as it is today, but as it was 10 million years ago. It has taken all that time to reach us though it has been travelling—the all light—at the incredible speed of 198,000 miles a second. Yet M31 is one of the nearest galaxies to our own. We both belong to a group of about 20 galaxies, which are loosely linked together by interlocking gravitational fields.

Far beyond this local group of galaxies are countless others, stretching out further than anyone can imagine—to the blackness of space. We know that about 10,000 million galaxies exist, because this number lies within the range of the world's biggest optical telescope, the 200-inch reflector at Mount Palomar.

They all seem to be rushing away from each other at a terrific rate. The further away they are the faster they recede. Some distant ones appear to be moving at speeds approaching the speed of light.

It all this seems difficult to grasp, it is partly because our normal yardsticks of measurement and time—

miles and years—are meaningless when we think about the immensities of outer space. Even the scientists who are studying the universe find it difficult to visualise the distances involved.

Most scientists believe, however, that all the galaxies are flying away from each other because the faint light from them can be analysed by a spectrograph which is used in conjunction with big telescopes. It spreads out the light into a spectrum or coloured bands. This is photographed, and by the information it gives, astronomers can tell that the galaxies are moving and how fast they are travelling.

One way of trying to imagine the galaxies and the universe is to think of a large balloon that is constantly expanding. It is covered with tiny dots—which represent the galaxies. They stay the same size, but move away from each other as the balloon expands.

WHIRLING SPIRALS

Through big telescopes most galaxies look like a flattened, spiral whirlpool of stars. No two are exactly alike, however. Some, like the Sombrero flat galaxy, have names which describe their special shape. Others are oval and some have no distinctive shape.

By studying M31 scientists have learned a lot about our own galaxy, for it is a big brother of the Milky Way. Both have the familiar catharine-wheel shape, and both contain thousands of millions of stars separated by huge clouds of gas and dust.

The only two galaxies which are closer to the Milky Way than M31 are the Magellanic Clouds, but they are not visible in the Northern hemisphere. They can be seen clearly in southern skies and look as if they are parts of the Milky Way which have broken loose.

Above left is shown the Great Andromeda Galaxy, which is very similar to our Milky Way. The top illustration shows the "Sombrero Hat" Galaxy (edged on from Earth), and the lower drawing is a typical barred spiral galaxy, which is in the constellation of Eridanus. The bright forward stars in each illustration are in our own Milky Way.

Photographed below is the Great Nebula in Andromeda.



The Exploding Newspaper

Jicheng Xie



The Exploding Newspaper:

The Enigmatic Realm of **The Exploding Newspaper**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing short of extraordinary. Within the captivating pages of **The Exploding Newspaper** a literary masterpiece penned with a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of people who partake in its reading experience.

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