



NASA'S Voyager missions – exploring the outer solar system and beyond

by Ben Evans and David M. Harland

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Where were you, the Saturday of 20th August 1977? That day, the *Atlas Centaur* rocket carrying NASA's *Voyager 2* spacecraft successfully thundered into the blue sky above Cape Canaveral. Four days earlier, the spirit of Elvis Presley had departed this earthly plane; it could be said that neither was destined to return!

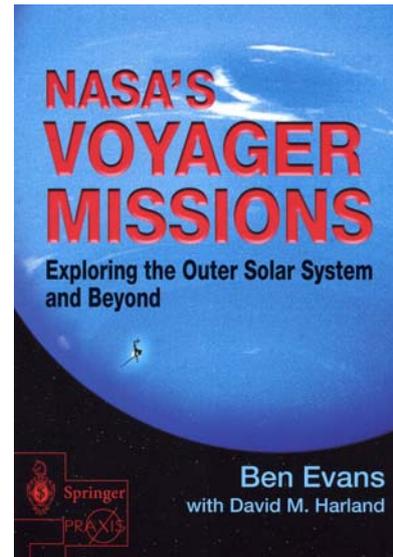
NASA's Voyager missions – exploring the outer solar system and beyond is perhaps at first sight a rather surprising title to appear now, given that the two *Voyager* spacecraft departed Earth for the outer solar system almost three decades ago. In the 27 years that have elapsed since then, one may be forgiven for surmising that all that could be written on the subject has been, but two salient points need to be considered before drawing this hasty conclusion. Firstly, the reviewer would contend that the flight of *Voyager 2* was the most rewarding deep-space mission to date and secondly, despite having a comparatively short design life, both *Voyagers 1* and *2* continue to return data from the environment they are currently travelling through, on the very boundary of the Sun's influence.

The book by self-proclaimed 'space writer' Ben Evans and 'space historian' David Harland, does have a contemporary feel to it, this aspect being enhanced by the inclusion of material relating to the *Galileo* mission to Jupiter and the *Cassini* encounter with Saturn, currently in its early days. The trail to Jupiter and Saturn was blazed by the *Pioneers* in the late 1970s. They were an engineering success but the hazy 'snapshots' they returned were soon replaced by the wonderfully detailed pictures from the *Voyager* twins. Back in the 1960s, NASA's mission planners cast their sights on an ambitious project called the 'Grand Tour'. The two craft envisaged would have exploited a fortuitous alignment of the outer planets to flyby Jupiter, Saturn, Uranus, Neptune and Pluto. Unfortunately, as the technological 'wish list' grew longer, budget costs spiraled to suit, and the 'Grand Tour' never made it off the drawing board. Attention then switched to the concept of two 'Mariner Jupiter-Saturn' craft, later to be christened the *Voyagers*.

Unlike some accounts of the *Voyager* encounters I have seen, the authors wisely have sought not to shower their intended

readership with a surfeit of detail describing the hardware, but have concentrated on the results. To the *Voyagers*, we owe the recognition of the Jupiter system as a miniature 'solar system' in its own right; who could have foreseen the sulphur plumes of Io or the crazed ice flows of Europa? Perhaps we had some inkling of what the outer planets would be like in close-up, but the revelations that came from the direct exploration of the moons of Jupiter, Saturn, Uranus and Neptune, totally stole the show. Not only did Io display geysers, but Neptune's Triton also. The authors succeed in relaying the excitement experienced in the lead up to a *Voyager* flyby of a gas giant. The book brought back memories for this reviewer – the flyby of Uranus in 1986, tempered by the loss of the *Challenger* shuttle, and the gathering of BAA enthusiasts at the Cavendish Laboratory, Cambridge in 1989, for the encounter with Neptune.

In postscript, one wonders which will leave the longer lasting legacy – Elvis or *Voyager*? The only certainty is that the two *Voyagers* will continue on their lonely quest through the Milky Way galaxy, long after



the society that created them has turned to dust.

David Graham

The week that Elvis died and Voyager 2 was launched, a young David Graham was camped next to the Thames near Henley, and paid his first visit to 63 Farringdon Road, London. He still has in his possession the eyepieces and 'Fullerscopes' catalogue acquired that day.

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