

Clip: George Abell

Video: S354/13

Contributor: George Abell

George Abell:

This plate marks the beginning of a new era in astronomy. It's a photograph of the Andromeda Nebula made by Edwin Hubble with a hundred inch telescope on October 6th 1923. Here's the middle of the Nebula. Here we find the date – 6th October 1923. We see that Hubble has marked on the negative three tiny little insignificant specks. At first Hubble thought that these were novae, novae are stars that suddenly flare up and brighten. But it seems that Hubble changed his mind or had second thoughts upon the uppermost of these specks. The letters VAR stand for variable star. That variable held the clue of the enormous distance of the Andromeda Nebula. Indeed it's not a nearby cloud of gas at all but an enormous stellar system far beyond our own Milky Way. Now the idea that there are other galaxies was not new, in fact it was probably Emmanuel Kant in 1755 who speculated that many of these little nebulous patches of light that could be seen with telescopes, were actually, as he called them, "island universes". Then the great German English astronomer William Herschel, built the first large reflecting telescopes and used these telescopes to systematically survey the sky, and in the process Herschel discovered and catalogued tremendous numbers of these patches of light, these nebulae. At one time, he himself believed them to be exterior galaxies. He remarked to his sister Caroline after one observing session, "I have tonight discovered thousands of universes". But later in his life Herschel changed his mind and doubted this hypothesis. The problem is that, unlike Hubble, he had no means of testing the idea with observations. In fact the whole problem of astronomical distances really plagued observational astronomy in Herschel's time.