

## GRAINS OF SILVER

**Henry Joy McCracken** –There, I spend my time working with the largest images in the world, with the largest cameras. I'm working right now with data from Hyper-SuprimeCam, which is a camera covering 3 sq degrees on the sky. It has the widest field of view and the best image quality of any camera in the world. I am also working on the camera VIS which will be launched on the satellite Euclid and which will make the most precise measurements of all time of galaxy shapes. In fact, these detectors were created for the army, not for astronomers. We use them today in astronomy. After that, professional and amateur photographers are able to use these highly efficient detectors which are capable of taking extremely precise images of the Universe. But is that the thing that we really want as photographers? Do we really want these perfect images?

Living in Paris, which at a certain time was the world centre of photography (there are still ghosts in the streets here) one day I found myself on the rue de Beaumarchais to buy a second-hand Leica. In the evening I go into the photo lab at the Observatoire, which had fallen into disuse in recent years, I was the first person to open the door, to go into this room, to clean the trays and everything, I took my negatives and made my prints at 6pm in the evening after spending a day in front of the computer screens, trying to find the best way to measure the shape of a galaxy. If somebody had told me, a year ago, you will buy chemicals in one last remaining shops in Paris and mix up Rodinal, which is one of the oldest developers in the world, and develop Tri-X film, which has a quantum efficiency of around 4 % compared to the 100 % of my electronic detectors, I would have said you are completely crazy! And it's funny, because when I consider many of my astronomer friends, who are making photographs, many are interested in having highly sensitive cameras, to make images with an ISO 50,000, and take photographs at night which seem to be photographs taken during the day! With the Leica, when you take a photograph at night, it really does look like it's taken at night! And now, when I walk in the street, I am aware of how far away things are, because on my simple camera you must set the distances before taking the photograph. And if you don't know how far things are away, you are dead.

On film, in fact, only 4% of the photons which fall on a photographic plate are converted into silver particles. You need many photons to make a single silver particle. But although the first electronic CCD detectors made by Kodak and friends had a much smaller area than a photographic plate they had the advantage that they were much, much more efficient than photographic emulsion. Almost 100 % of visible photons falling on an electronic detector are converted into electrons and read by computers. It's certain that, as an

astronomer, I don't want to go back, and switch to photographic plates which will lose all those photons which have crossed the universe to arrive on the film. But in the light of day in Paris do we really need a sensitivity of ISO 35,000 to take a picture of a building on the other side of the street?

I don't want to say that film is better than digital. It's a different way to capture the world. I don't think I will continue to develop hundreds of rolls of film in kitchen. Perhaps after I have learned how to observe with film cameras I will go back to digital, I don't know.

**03min 45sec**