

which have gone from a being novelty at the time of *Hubble's* launch to becoming omnipresent today.

As a historian of technology and someone who has been an amateur astronomer since the days when the *Hubble Space Telescope* was just an idea, I have been led by Kessler's article to ponder the role that *Hubble* played in the transformation of amateur astrophotography. There is no doubt that the availability of CCD cameras, powerful personal computers, image-processing programs, and, of course, the Internet, drove the digital revolution in astrophotography. While I have only dabbled in astrophotography, I certainly remember that the changeover from film to CCDs was not a painless one for my friends who had spent long hours learning how to hyper and process photographic film and prints. With the arrival of digital cameras, they then had to master the new “dark arts” of digital processing.

I use the word “arts” deliberately, because of the processing options made available by computers and digital images. Images of distant stars, galaxies, and nebulae do not, and so far cannot, replicate what the eyeball sees through the eyepiece, either on film or CCD. Each image involves several judgment calls by the person processing the final image, which is often produced from multiple

originals.

I wonder how often the well-known images taken by *Hubble* or by astronomers working at facilities such as the Canada-France-Hawaii Telescope influence – consciously or unconsciously – the choices made by amateur astronomers at their computer terminals in deciding the “right” colour or orientation?

Ultimately, this question is one for further study by astronomers and historians, but it is certainly worth consideration today as new cameras, telescopes, processing programs, and computers give amateur astronomers new means to better view distant objects. ●

### Further Reading

- Kessler, Elizabeth (2010). The Hubble's Anniversary. *Quest: The History of Spaceflight Quarterly*, Vol.17, (No. 2), 34-43.
- Smith, Robert W. (1993). *The Space Telescope: A Study of NASA, Science, Technology, and Politics*. Cambridge: Cambridge University Press.
- Villard, R. & Levay, Z. (2002). Creating Hubble's Technicolor Universe. *Sky & Telescope*, September 2002, 28-34.
- The Hubble Heritage Web site: <http://heritage.stsci.edu>

## Papers, Posters, and Panel Discussions at the Fredericton GA

### The Helen Sawyer Hogg Lecture The First Images of Exoplanets

René Doyon, Université de Montréal

Detecting exoplanets, ultimately rocky ones like the Earth, is an inescapable step towards detecting life outside our Solar System. One step was taken in 1995 with the first “indirect” detection of a Jovian planet orbiting the nearby star 51 Pegasi. Since then, more than 400 exoplanets have been identified, the vast majority through indirect techniques. Only recently has it been possible to “see” planets,

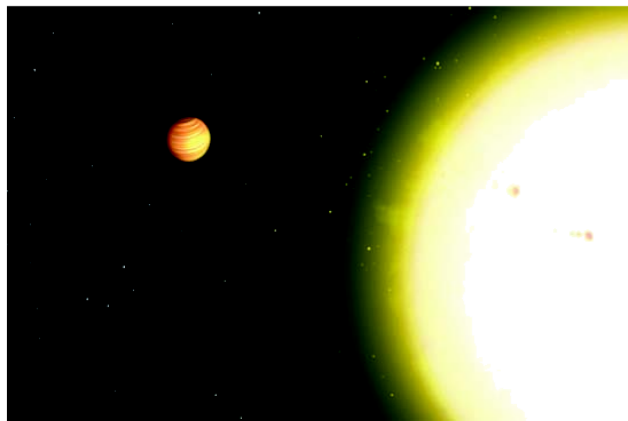


Figure 1 – An artist's concept of the planet orbiting 51 Pegasi. Image Wikipedia.

that is, detect light from the planets themselves. One such discovery was made by Canadians, of a system comprising three planets. How does one take pictures of exoplanets that are millions to billions of times fainter than their parent stars? What have we learned from these recent imaging discoveries? What is the next step in exoplanet science? These are the questions that I will briefly address in my presentation.

### Papers

#### Imaging Arp Galaxies

Rémi Lacasse

Within ten years of beginning astrophotography, I went from imaging different objects with short exposures to taking long exposures of single objects. Then, looking for a long-term challenge, the *Arp Atlas of Peculiar Galaxies* provided a project for me. Starting in the early 1950s, Halton Arp conducted a photographic investigation of those galaxies that did not fit into Edwin Hubble's “tuning fork” diagram. In November 1966, his *Atlas* was published.

His observations had led him to believe that the spectral red shifts of many quasars, whose locations on the sky were close to certain kinds of peculiar galaxies, were not due to cosmological recession but instead to certain inherent properties. This controversial hypothesis led him into a number of career difficulties.

In April 2007, I decided to image the 338 Arp galaxies in colour over a period of five years. Although some are spectacular, many are extremely small and challenging. Three years into the project, 327 are completed and can be seen on my Web site at [www.astror1.ca](http://www.astror1.ca).