

Supernovae in M74

By Greg Morgan

I got quite a surprise when I decided to shoot some pictures of M74 last month. When I was done processing the image (figure 1), I decided to compare it to an image that I had taken two years earlier (figure 2). To my surprise, my older image contained a bright star that wasn't in my new image. After a little investigation, I realized that my older image, taken on February 3, 2002, captured a supernova only five days after its discovery. It was designated SN 2002ap. It also turned out that the image showed the supernova on the night of maximum brightness at magnitude 12.3. This Supernova was determined to be a type Ib/c. With its progenitor star estimated to be at least 40 solar masses, some called this a hypernova or super-luminous supernova, much bigger than the average type Ia supernova.

M74 put on another light-show this past summer (figure 3). Supernova SN2003gd was discovered just before dawn on June 13, 2003 at magnitude 13 by Robert Evans. There is a similar photo of this supernova in *Sky and Telescope*, November 2003, page 99. Both of M74's supernovae have been some of the brightest seen in the last two years.

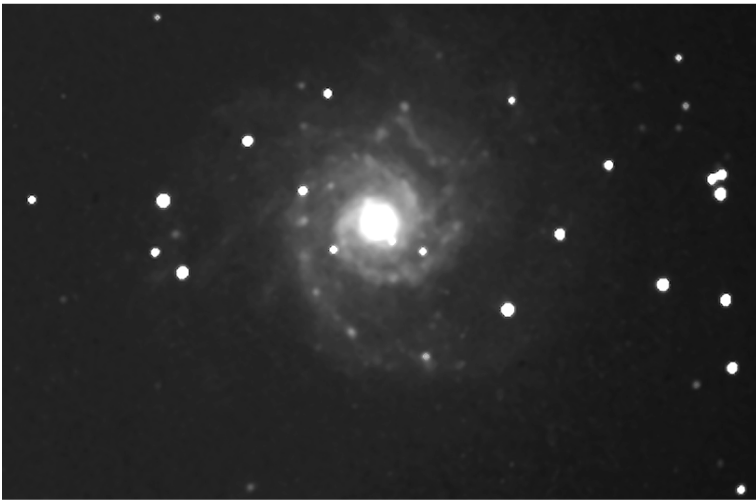


Figure 1: January 3, 2004. M74 as it appears now. Compare this image with the supernovae outlined in figures 2 and 3. This is an unfiltered summation stack of 3x15 minute and 2x60 minute exposures at 2x2 binning and -30 degrees C for a total time of 2.75 hours with the 10 inch SCT at f/5.75 and the ST-10XME/AO-7 at 2 Hz. Calibrations included bias, darks, flats, and darks for the flats. The near full moon was up, bright and only 37 degrees away.

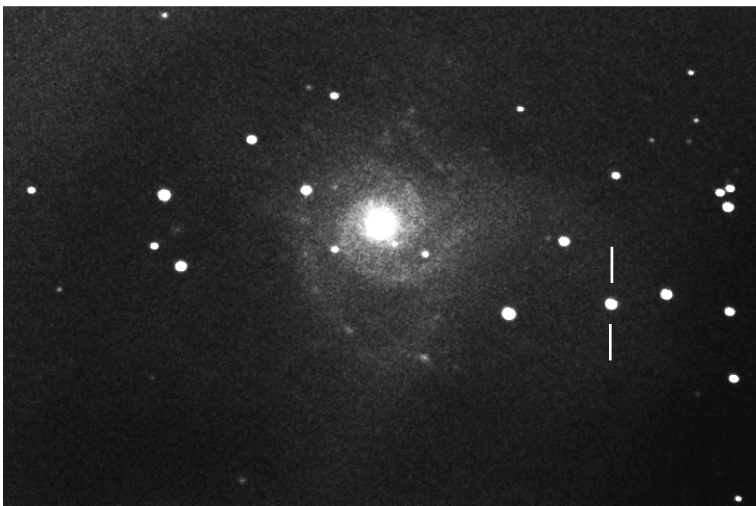


Figure 2: February 3, 2002. Two years ago M74 displayed supernova SN 2002ap. This image shows the supernova shining at maximum brightness, magnitude 12.3, only five days after its discovery. This 30 minute image was taken with the Meade 10 inch SCT f/6.3 and the ST-7 on loan from the Kingsberg Observatory (thanks Randy and Steve). North is up and East is to the left. Both figures 1 and 2 were taken from my backyard in Clovis, California.

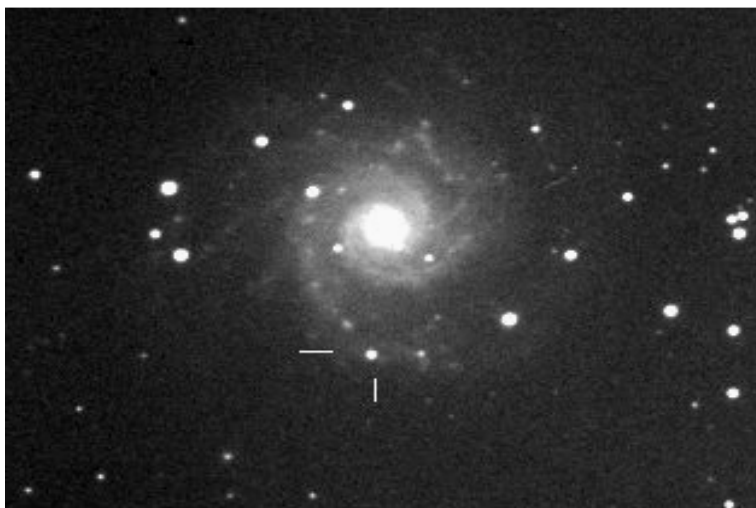


Figure 3: July 12, 2003. M74 gave us another bright supernova that was discovered just before dawn on June 13, 2003 by Robert Evans. This image was taken by Joseph Bosch, an amateur from Spain, on July 12, 2003. This image has a field scale similar to those that I took in figures 1 and 2. It shows the position of the supernova designated SN 2003gd at magnitude 14.6, one month after its discovery. There is a similar photo of this supernova in *Sky and Telescope*, November 2003, page 99.