REQUEST FOR VISUAL OBSERVATIONS OF SEYFERT GALAXIES

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I would like to call your attention to the object BL Lacertae, which is quite interesting in that it has recently been observed to be a very strong and variable radio source. As is evident by its designation, this object was thought for many years to simply be a variable star. No one knows very much about it at this time except that it is a very strong and variable, apparently extra-galactic radio source. It seems likely that it is related to the Quasars and Seyfert galaxies.

The characteristic of a Seyfert galaxy is that visually its nucleus appears to be stellar, whereas a standard galaxy appears to brighten more gradually towards its center. These Seyfert galaxies tend to be classified as middle-type spirals, Sb typically, and except for their nuclei are more or less like ordinary spiral galaxies. The real interest comes from the spectrum of what is going on in the nucleus. Examination shows large numbers of very intense emission lines, and these show extremely high states of excitation such as six-times ionized Iron, and in one case nine-times ionized Iron. So there is intense and energetic activity going on. In addition, the lines are very broad, indicating motion of gasses of the same order of magnitude that one sees in a supernova explosion: 5000-10,000 km/second. These objects are also strong emitters in the far infra-red.

I would like to draw attention particularly to the object NGC 4151 which was discovered by Dr. Fitch, Dr. Pacholczyk, and myself to be a variable object. I believe it is the first case of what is "officially" classed as a regular galaxy which has been known to be variable in its nucleus. I want to give you some idea of the kinds of variability and the time scale. The range in the ultraviolet is somewhat more than 1 1/2 magnitudes, over an interval of 200 days, making its variability not dissimilar to common irregular variable stars. The interesting thing about this particular object is that it is quite bright, enough so that many amateurs could quite easily make a contribution by observing it. Moreover, it looks in a small telescope completely stellar, so there is no question of whether you are observing a fuzzy non-stellar object.

I am therefore not really giving a paper, but making an appeal to see if I could interest some of you in monitoring this and other similar objects. We don't understand at all what these variations really mean. Some people have thought for a while that the variation of the Quasi-stellar objects and the Seyfert galaxies was quasi or semi-periodic, once again, something like irregular Mira stars, but no regular periodicity has really been established. We don't really know enough about the relation between quasi-period and amplitude to do very much in the way of theoretical interpretation, so I think it would be useful to have these monitored on a regular basis. There are a number of others bright enough that