

## 8. The future

There are several instruments being considered for the future which may make a huge impact on gravitational lens surveys.

In the radio part of the spectrum, the major advances in the next few years are likely to come from upgrades to existing radio interferometers such as the VLA and MERLIN. Both instruments have plans to link the telescopes together with optical fibres instead of the existing links; this allows a larger bandwidth to be observed at once and increases the sensitivity. The resulting instruments, known as [EVLA](#) and [e-Merlin](#), will have considerably greater sensitivity than the original instruments (a factor 30 in the case of e-Merlin).

This sensitivity will mean that we can find many more radio gravitational lenses: at present, lensing is such a rare phenomenon that all the bright, easily recognisable radio lenses in the sky have already been found! More lenses impact on much of the astrophysics discussed in the next section, providing better estimates of galaxy masses and better constraints on cosmology.

In other wavebands, similar advances are likely. In the optical, the major advance is likely to come with the [Next Generation Space Telescope](#), a 6-metre telescope to be launched into space in 2008. It will operate mainly in the near infra-red and will have a sensitivity at least a factor of 10 better than existing instruments for imaging distant objects. Gravitational lenses will certainly be discovered in large numbers.

### Further reading

This course is partly based on a review article written at Jodrell Bank which is available as a pdf from the [overview section](#).

The Bible of gravitational lensing studies is **Gravitational lensing** by Falco, Appenzeller, Schneider and Ehlers (December 1999). This is a complete guide to all aspects of lensing. It is also highly technical.

There are some good review articles available, in particular **Refsdal & Surdej**, Reports on Progress in Physics, vol. 57, p. 117, 1994, includes a section on making optical-lens analogues of gravitational lenses.

Some books have sections on gravitational lensing, for example **Unsolved Problems in Astrophysics**, ed. Bahcall, has a chapter by Roger Blandford (Caltech) on gravitational lensing.

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