

Box 1. Brace yourself for the data deluge

From the following article:

[Astronomy: The heavens at your fingertips](#)

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Nature **420**, 262-264 (21 November 2002)

doi:10.1038/420262a

The mass of data already produced by sky surveys could be dwarfed by the output of a proposed new telescope.

A consortium of US astronomers is currently developing plans for the 8.4-metre Large Scale Synoptic Survey Telescope (LSST). The \$120-million project will use a special three-mirror design to reduce distortion around the edge of its images, creating an exceptionally wide field of view. Together with an advanced digital camera, this will allow the telescope to catalogue 18 terabytes (1.8×10^{13} bytes) of data each evening, enough to survey the entire sky in only three nights, says project spokesman Tony Tyson, an astronomer at Bell Laboratories in Murray Hill, New Jersey.

The speed with which the LSST could scan the sky would give astronomers an almost real-time picture of the heavens, allowing them to spot unusual changes such as supernovae and near-Earth asteroids. "There's a huge laundry list of exciting astrophysical science to do," says Tyson.

Detecting matter that does not emit light — 'dark matter' — is another item on the list. Dark matter is intrinsically difficult to study because it does not show up directly in an image of the sky. But dense clusters of dark matter exert a gravitational pull that can distort the light from galaxies behind them. By measuring these distortions, Tyson believes that the LSST can shed light on dark matter's distribution throughout the Universe. In doing so, it could also provide a measure of 'dark energy', the mysterious force that seems to be pushing the Universe apart.

Within a decade, Tyson says, the LSST could catalogue 15 petabytes (1.5×10^{16} bytes) of data, enough to fill about 1.5 million compact discs. That will be far too much for LSST collaborators to hoard, he says. So the project calls for the group to put all of their data online almost as quickly as they can record them — a promise of openness that VO advocates hope will soon be common.

Tyson says that the LSST team plans to raise funds from private and public sources, and hopes to complete the project within ten years.

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