

C Common Abbreviations and Acronyms

Michael A. Strauss

This glossary of abbreviations used in this book is not complete, but includes most of the more common terms, especially if they are used multiple times in the book. We split the list into general astrophysics terms and the names of various telescopic facilities and surveys.

General Astrophysical and Scientific Terms

- **Λ CDM:** The current “standard” model of cosmology, in which Cold Dark Matter (CDM) and a cosmological constant (designated “ Λ ”), together with a small amount of ordinary baryonic matter, together give a mass-energy density sufficient to make space flat. Sometimes written as “LCDM”.
- **AAAS:** American Association for the Advancement of Science.
- **AAVSO:** American Association of Variable Star Observers (<http://www.aavso.org>).
- **ADDGALS:** An algorithm for assigning observable properties to simulated galaxies in an N-body simulation.
- **AGB:** Asymptotic Giant Branch, referring to red giant stars with helium burning to carbon and oxygen in a shell.
- **AGN:** Active Galactic Nucleus.
- **AM CVn:** An AM Canum Venaticorum star, a cataclysmic variable star with a particularly short period.
- **AMR:** Adaptive Mesh Refinement, referring to a method of gaining dynamic range in the resolution of an N-body simulation.
- **APT:** Automatic Photometric Telescope, referring to small telescopes appropriate for photometric follow-up of unusual variables discovered by LSST.
- **BAL:** Broad Absorption Line, a feature seen in quasar spectra.
- **BAO:** Baryon Acoustic Oscillation, a feature seen in the power spectra of the galaxy distribution and in the fluctuations of the Cosmic Microwave Background.
- **BBN:** Big-Bang Nucleosynthesis, whereby deuterium, helium, and trace amounts of lithium were synthesized in the first minutes after the Big Bang.
- **BD:** Brown Dwarf star.
- **BH:** Black Hole.
- **CCD:** Charge-Coupled Device, the sensors to be used in the LSST camera.

- **CCSN:** Core-Collapse Supernovae, due to the implosion of a massive star. As opposed to Type Ia supernovae, in which a white dwarf exceeds the Chandrasekhar limit.
- **CDM:** Cold Dark Matter. See Λ CDM.
- **CMB:** Cosmic Microwave Background.
- **CMD:** Color-Magnitude Diagram, relating the brightnesses and colors of stars or galaxies.
- **CME:** Coronal Mass Ejection, from the Sun.
- **CMR:** Color-Magnitude Relation; see CMD.
- **CPU:** Central Processing Unit, referring to processing power in a computer.
- **CV:** Cataclysmic Variable, a close binary star consisting of a white dwarf with mass transfer from a secondary.
- **DAV:** Pulsating white dwarf stars with hydrogen atmospheres.
- **DBV:** Pulsating white dwarf stars with helium atmospheres.
- **DETF:** Dark Energy Task Force, which produced an influential report ([Albrecht et al. 2006](#)) outlining future experimental probes of dark energy.
- **DWF:** “Deep-Wide-Fast”, characterizing LSST’s ability to survey the sky.
- **EOS:** Equation of State, referring to the relationship between density and pressure of dark energy.
- **EPM:** Expanding Photosphere Method, a method of measuring distances to Type II supernovae.
- **EPO:** Education and Public Outreach.
- **ETC:** Exposure Time Calculator, which returns estimates of survey depth and S/N under different assumptions.
- **EXors:** EX Lupi-type stars, a type of T Tauri star that undergoes irregular outbursts. See also FUOr.
- **FMF:** First Mass Function, referring to the mass distribution of the first generation of stars.
- **FOV:** Field of View (of a telescope).
- **FUOr:** FU Orionis Stars, which differ from EXors in that their outbursts last for a longer time.
- **FWHM:** Full Width at Half Maximum.
- **GCVS:** General Catalogue of Variable Stars.
- **GRB:** Gamma-Ray Burst.
- **GZK:** Greisen-Zatsepin-Kuzmin effect, whereby photons and cosmic rays with energies above $\sim 10^{19}$ eV scatter off CMB photons inelastically to produce pions. This causes the Universe to be opaque to such high-energy particles at distances above roughly 100 Mpc.
- **HOD:** Halo Occupation Distribution, referring to the distribution of galaxies within dark matter halos.
- **HFC:** Halley Family Comet.

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- **HR** or **H-R diagram**: The Hertzsprung-Russell diagram, plotting the luminosity (or absolute magnitude) of stars versus their surface temperature (or color).
 - **HVS**: Hypervelocity stars, i.e., stars in the Milky Way travelling above the escape speed of the Galaxy.
 - **ICM**: Intercluster Medium, i.e., the hot gas within clusters of galaxies.
 - **ICME**: Interplanetary Coronal Mass Ejections, i.e., the gas associated with the CME at large heliocentric distances.
 - **ICRF**: International Celestial Reference Frame, with respect to which astrometric calibration will be done.
 - **ISM**: Interstellar Medium, the gas and dust between the stars.
 - **ISW**: Integrated Sachs-Wolfe Effect, an imprint in the CMB fluctuations due to the propagation of photons through the potential field of matter in an $\Omega_m \neq 1$ Universe.
 - **IFU**: Integrated Field Unit, an instrument which can obtain spatially resolved spectra of objects.
 - **JFC**: Jupiter Family Comet.
 - **KBO**: Kuiper Belt Object, an asteroid with an orbit beyond that of Neptune.
 - **LBV**: Luminous Blue Variable star.
 - **LGRB**: Long duration Gamma-Ray Burst
 - **LGSAO**: Laser Guide Star Adaptive Optics, a technique to correct for atmospheric turbulence in imaging from ground-based telescopes.
 - **LMC**: Large Magellanic Cloud, a companion galaxy to the Milky Way.
 - **LPC**: Long Period Comet.
 - **LPV**: Long Period Variable star.
 - **LRG**: Luminous Red Galaxy.
 - **LRN**: Luminous Red Novae.
 - **LSB**: Long Soft gamma-ray Burst, or Low Surface Brightness galaxy.
 - **LV**: Local Volume, referring to the galaxies with 10-20 Mpc of the Milky Way.
 - **MBA**: Main Belt Asteroid, i.e., with an orbit between that of Mars and Jupiter.
 - **MBC**: Main Belt Comet, i.e., with an orbit between that of Mars and Jupiter.
 - **MCMC**: Markov-Chain Monte-Carlo, a technique for exploring likelihood surfaces in multiparameter space.
 - **MDF**: Metallicity Distribution Function of stars.
 - **ML**: Machine Learning
 - **MMR**: Mean-Motion Resonance, referring to resonance between orbits of different Solar System bodies.
 - **MMRD**: Maximum Magnitude Rate of Decline, referring to the rate at which transient objects, such as novae, decline in brightness.

- **MN:** Macronova, a subrelativistic stellar explosion with sub-supernova energies and emission powered by radioactive decay.
- **MOID:** Minimum Orbital Intersection Distance of asteroids.
- **MOPS:** The Moving Object Processing System, the software package LSST will use to determine orbits of asteroids.
- **MS:** Main Sequence (of stars on the Hertzsprung-Russell Diagram).
- **MySQL:** My Structured Query Language, a relational database management system.
- **NAS:** National Academy of Sciences.
- **NASA:** National Aeronautics and Space Administration.
- **NEA:** Near-Earth Asteroid, i.e., an asteroid whose orbit takes it within 1.3 AU of the Sun.
- **NEO:** Near-Earth Object, including Near-Earth Asteroids and Near-Earth Comets.
- **NFW:** Navarro-Frenk-White, referring to a standard density profile for dark matter halos (Navarro et al. 1997).
- **NIR:** Near Infrared, typically referring to the wavelength range from 1 to 2.5 microns (although some will call wavelengths as short as 0.7 microns, and as long as 8 microns, as part of the NIR range).
- **NRC:** National Research Council.
- **NS** Neutron Star.
- **OC:** Oort Cloud, where most long-period comets are thought to reside.
- **PAH:** Polycyclic Aromatic Hydrocarbon, complex organic molecules that are found in the interstellar medium.
- **PDE:** Partial Differential Equation.
- **PDF:** Probability Distribution Function (also **UPDF**, the Universal Probability Distribution Function).
- **PHA:** Potentially Hazardous Asteroid, the subset of NEAs that pass within 0.05 AU of the Earth's orbit.
- **PMS:** Pre-Main Sequence star, i.e., one which is still gravitationally collapsing before coming into hydrostatic equilibrium on the main sequence.
- **PPSN:** Pair-Production Supernova (sometimes called Pair Instability Supernova), the result of collapse of stars in the 140-260 M_{\odot} mass range, where the energy density in the center is large enough to create electron-positron pairs. This reduces the internal thermal pressure, leading to contraction, further heating, and catastrophic collapse.
- **PSF:** Point Spread Function, referring to the response of the telescope plus camera to a point source of light, such as a star.
- **QED:** Quantum Electrodynamics.
- **QSO:** Quasi-Stellar Object, synonymous with Quasar.
- **RGB:** Red Giant Branch. See also TRGB.

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- **RS:** The Red Sequence, a narrow locus of red elliptical galaxies on a color-magnitude diagram.
 - **RTML:** Remote Telescope Markup Language.
 - **SBF:** Surface Brightness Fluctuation, the mottling of the images of nearby elliptical galaxies due to the finite number of stars in each pixel.
 - **SCM:** Standardized Candle Method, a method of determining the distances to core-collapse supernovae.
 - **SDO:** Scattering Disk Objects, a subclass of Trans-Neptunian Objects in orbits that gravitationally interact with Neptune.
 - **SED:** Spectral Energy Distribution, i.e., the spectrum of an astronomical object over a broad range of wavelengths.
 - **SETI:** Search for Extraterrestrial Intelligence.
 - **SFD:** The Size-Frequency Distribution of asteroids. The acronym can also refer to the paper by [Schlegel et al. \(1998\)](#) giving Galactic extinction maps.
 - **SFH:** Star Formation History.
 - **SFR:** Star Formation Rate.
 - **SGRB:** Short duration Gamma-Ray Burst.
 - **SHB:** Short Hard gamma-ray Burst.
 - **SMBH:** Super-Massive Black Hole.
 - **SMC:** Small Magellanic Cloud, a companion galaxy to the Milky Way.
 - **SNIa:** Type Ia Supernova, i.e., one caused by the collapse of a white dwarf star pushed over the Chandrasekhar limit.
 - **SNR:** Signal-to-Noise Ratio, or Supernova Remnant
 - **SPC:** Short-Period Comet.
 - **SPH:** Smooth-Particle Hydrodynamics, a computational technique for including hydrodynamical effects into N-body simulations.
 - **SZ:** Sunyaev-Zel'dovich effect, whereby Cosmic Microwave Background photons are Compton-scattered to higher energy in interactions with electrons in the hot gas in clusters of galaxies.
 - **TDF:** Tidal Disruption Flare, the disruption of a star by a super-massive Black Hole.
 - **TNO:** Trans-Neptunian Object, an asteroid with orbit beyond that of Neptune.
 - **TO:** Turn-off (of stars from the main sequence on the Hertzsprung-Russell Diagram).
 - **TRGB:** Tip of the Red Giant Branch, referring to the fact that red giant branch stars in a given stellar population have a well-defined upper limit of luminosity, making this a useful distance indicator.
 - **VHE:** Very High Energy Photon, i.e., one with energies of at least TeV.
 - **VLM:** Very Low Mass (stars), i.e., M stars and later.
 - **VLBI:** Very Long Baseline Interferometry, a technique for high resolution imaging at radio wavelengths.

- **VO:** Virtual Observatory.
- **VOEvent:** A National Virtual Observatory standard for exchanging information on astronomical transients.
- **VTP:** Voronoi Tessellation and Percolation method, a way to look for clusters in point data.
- **WCS:** World Coordinate System, a transformation between coordinates on the focal plane and those on the sky (such as right ascension and declination).
- **WD:** White Dwarf star.
- **WDLF:** White Dwarf Luminosity Function.
- **WL:** Weak (gravitational) Lensing, the subtle distortion of galaxy images by the gravitational field of foreground overdensities.
- **YORP:** The Yarkovsky-Radzievskii-O'Keefe-Paddock effect, whereby the spin state of an asteroid is systematically changed by anisotropic thermal emission of its surface.
- **YSO:** Young Stellar Object.

Past, Present, and Future Astronomical Facilities, Surveys, and Organizations

- **2dF:** Two-Degree Field, referring to a wide-field multi-object spectrograph on the Anglo-Australian Telescope.
- **2dFGRS:** The Two-Degree Field Galaxy Redshift Survey, which obtained redshifts for almost 250,000 galaxies. <http://www2.aao.gov.au/2dFGRS/>.
- **2MASS:** Two-Micron All-Sky Survey, which surveyed the entire sky in *J*, *H*, and *K*. <http://www.ipac.caltech.edu/2mass/>.
- **2QZ:** The 2dF Quasar Redshift Survey, which obtained redshifts of over 23,000 quasars. <http://www.2dfquasar.org/>.
- **2SLAQ:** The 2dF-SDSS LRG and QSO survey, which obtained spectra of LRGs (op.cit.) and QSOs from catalogs selected from SDSS imaging data. <http://www.2slaq.info/>.
- **AAOmega:** A multiobject/integral-field spectrograph at the Anglo-Australian Telescope. <http://www.aao.gov.au/local/www/aaomega/>.
- **AAT:** The Anglo-Australian Telescope, 3.9 m in diameter. <http://www.aao.gov.au/>.
- **AGES:** The AGN and Galaxy Evolution Survey, a redshift survey in the NOAO Deep Wide Field. <http://cmb.as.arizona.edu/~eisenste/AGES/>.
- **AKARI:** A Japanese satellite that mapped the sky at infrared wavelengths. http://www.ir.isas.jaxa.jp/ASTRO-F/Outreach/index_e.html.
- **ALMA:** Atacama Large Millimeter Array, operating between 0.3 and 9.6 mm. <http://www.alma.nrao.edu>.
- **A-LIGO:** Advanced LIGO; the proposed next generation of the Laser Interferometer Wave Observatory, <http://www.ligo.caltech.edu/advLIGO/scripts/summary.shtml>.

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- **APEX:** The Atacama Pathfinder Experiment, a 12-meter sub-millimeter telescope placed in the Chilean Andes. <http://www.mpifr-bonn.mpg.de/div/mm/apex.html>.
 - **APM:** Automated Plate Measuring facility, which digitized photographic sky survey plates to make one of the premier galaxy catalogs in the 1990s. Maddox et al. (1990).
 - **ASAS:** All-Sky Automated Survey, which repeatedly images the entire sky to about 14th magnitude to look for variable stars. <http://www.astrow.edu.pl/asas/>
 - **ASTE:** The Atacama Submillimeter Telescope Experiment, a 10-meter sub-millimeter telescope placed in the Chilean Andes. <http://www.ioa.s.u-tokyo.ac.jp/~kkohno/ASTE/>.
 - **ATCA:** The Australia Telescope Compact Array is a six-dish radio interferometer. <http://www.narrabri.atnf.csiro.au/>.
 - **AURA:** Association of Universities for Research in Astronomy, the parent organization that operates the Gemini Observatory and NOAO, among others. <http://www.aura-astronomy.org/>.
 - **BigBOSS:** A proposed multi-object spectrograph to study baryon acoustic oscillations. <http://bigboss.lbl.gov/>.
 - **Black Hole Finder Probe:** A proposed NASA satellite to study accretion onto black holes, as part of their “Beyond Einstein” mission concept. EXIST (see below) is one possible implementation of this concept.
 - **BOSS:** The Baryon Oscillation Spectroscopic Survey, a redshift survey over 10,000 deg² of galaxies to $z = 0.7$ and quasars to $z \sim 3$ to study baryon oscillations. One of the components of the SDSS-III. <http://www.sdss3.org>.
 - **BTC:** Big Throughput Camera, a wide-field imaging camera on the 4-meter Blanco Telescope at CTIO.
 - **CADIS:** Calar Alto Deep Imaging Survey, covering 0.3 deg² in three broad bands and 13 medium bands, Meisenheimer et al. (1998).
 - **CANGAROO:** Collaboration of Australia and Nippon for a GAMMA Ray Observatory in the Outback, an array of imaging Cherenkov telescopes to search for very high-energy gamma-rays. <http://icrhp9.icrr.u-tokyo.ac.jp/>.
 - **Catalina Sky Survey:** Uses telescopes in the US and Australia to look for asteroids and comets. <http://www.lpl.arizona.edu/css/>.
 - **CBA:** Center for Backyard Astrophysics, a global network of small telescopes dedicated to the photometry of cataclysmic variables. <http://cbastro.org/>.
 - **CFHT:** The Canada-France-Hawaii Telescope, a 3.6-meter optical telescope on Mauna Kea in Hawaii. <http://www.cfht.hawaii.edu/>.
 - **CFHTLS:** The Canada France Hawaii Telescope Legacy Survey, which is surveying up to 400 deg² in optical bands. <http://www.cfht.hawaii.edu/Science/CFHTLS/>.
 - **Chandra X-ray Observatory:** One of NASA’s Great Observatories. <http://chandra.harvard.edu/>.
 - **COBE:** Cosmic Background Explorer, which made the first detection of fluctuations in the CMB in an all-sky map. <http://lambda.gsfc.nasa.gov/product/cobe/>.

- **COMBO-17:** Classifying Objects by Medium-Band Observations, an imaging survey carried out on the Calar Alto 3.5m telescope of one deg² through 17 medium bands. http://www.mpia-hd.mpg.de/COMBO/combo_index.html.
- **COROT:** CONvection, ROTation, and planetary Transits, a European space mission to look for transiting planets. <http://smc.cnes.fr/COROT/>.
- **COSMOS:** Cosmological Evolution Survey over 2 deg² with the Hubble Space Telescope, together with follow-up with many other facilities. <http://cosmos.astro.caltech.edu/index.html>.
- **COVET:** A repeat imaging survey of nearby clusters of galaxies to search for transients.
- **CTIO:** Cerro Tololo Inter-American Observatory. Cerro Tololo is adjacent to Cerro Pachón, where LSST will be sited.
- **DEEP and DEEP2:** The Deimos Extragalactic Probe, a redshift survey of roughly 50,000 galaxies with redshifts of order unity, carried out on the Keck Telescopes. <http://deep.berkeley.edu/>.
- **DEIMOS:** DEep Imaging Multi-Object Spectrograph on the Keck-II telescope.
- **DENIS:** The Deep Near Infrared Survey of the Southern Sky, similar in scope to 2MASS. <http://www-denis.iap.fr/denis.html>.
- **DES:** Dark Energy Survey, a wide-angle survey to be carried out on the 4-meter Blanco Telescope at CTIO. <https://www.darkenergysurvey.org/>.
- **DLS:** The Deep Lens Survey, a deep four-band survey of 20 deg² carried out with on the CTIO 4-meter Blanco Telescope. <http://dls.physics.ucdavis.edu>.
- **DMT:** Dark Matter Telescope, an early incarnation of the LSST concept.
- **E-ELT:** The European Extremely Large Telescope, a proposed telescope with a mirror 42 meters in diameter. <http://www.eso.org/sci/facilities/eelt/>.
- **E-LIGO:** Enhanced LIGO; intermediate between LIGO and A-LIGO.
- **EIS:** The ESO Imaging survey, covering several deg² in optical and near-IR bands. <http://www.eso.org/sci/activities/projects/eis/>.
- **eROSITA:** The extended ROentgen Survey with an Imaging Telescope Array, a planned medium-energy X-ray survey of the sky. <http://www.mpe.mpg.de/projects.html#erosita>.
- **Euro50:** A proposed 50-meter optical and infrared telescope <http://www.astro.lu.se/~torben/euro50/>.
- **ESA:** The European Space Agency.
- **ESO:** The European Southern Observatory, which operates telescopes at La Silla and Cerro Paranal in the Chilean Andes.
- **ESSENCE:** “Equation of State: SupErNovae trace Cosmic Expansion”, an imaging survey to find supernovae on the CTIO 4-meter Blanco Telescope. <http://www.ctio.noao.edu/essence/>.
- **EUCLID:** Proposed European near-infrared wide-angle sky survey from space to explore dark energy. <http://sci.esa.int/science-e/www/area/index.cfm?fareaid=102>.

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- **EVLA:** The Expanded Very Large Array, an extension of the premier radio interferometer facility in the world. <http://www.aoc.nrao.edu/evla/>.
 - **EXIST:** Energetic X-ray Imaging Survey Telescope, a proposed hard X-ray survey of the sky. <http://exist.gsfc.nasa.gov/>
 - **FASTSOUND:** Fiber Multi-Object Spectrograph Ankoku Shindō Tansa Subaru Observation Understanding Nature of Dark Energy, a proposed spectroscopic survey on the Subaru Telescope to study baryon oscillations.
 - **Fermi Gamma-Ray Space Telescope:** Formerly known as GLAST, this is surveying the sky at 10 keV to 300 GeV. <http://fermi.gsfc.nasa.gov/>.
 - **FIRST:** Faint Images of the Radio Sky at Twenty Centimeters, a VLA survey at 1.4 GHz. <http://sundog.stsci.edu>.
 - **FORS:** Visual and near UV FOcal Reducer and low dispersion Spectrograph for the Very Large Telescope. <http://www.eso.org/instruments/fors1/>.
 - **Gaia:** A planned European satellite for precision astrometry. <http://www.rssd.esa.int/Gaia>.
 - **Galaxy Zoo:** A project to visually classify over a million galaxies from the Sloan Digital Sky Survey. <http://www.galaxyzoo.org/>
 - **GALEX:** The Galaxy Evolution Explorer, which is surveying the sky in the ultraviolet. <http://www.galex.caltech.edu/>.
 - **GCN:** Gamma-Ray Burst (GRB) Coordinates Network.
 - **GTC:** The Gran Telescopio Canarias, a 10.4-meter telescope on the Canary Islands. <http://www.gtc.iac.es/en/>.
 - **Gemini:** A pair of 8-meter telescopes, one on Mauna Kea (Hawaii), and the other on Cerro Pachón (Chile). <http://www.gemini.edu>.
 - **GEMS:** Galaxy Evolution From Morphology and SEDs, a wide-field imaging survey with the Hubble Space Telescope. <http://www.mpia-hd.mpg.de/GEMS/home0.htm>.
 - **GMOS:** Gemini Multi-Object Spectrographs (one on each of the two telescopes). <http://www.gemini.edu/node/10625>.
 - **GMT:** The Giant Magellan Telescope, a proposed telescope with an effective aperture of 24.5 meters. <http://www.gmto.org/>
 - **GOODS:** The Great Observatories Origins Deep Survey, a wide-field imaging survey with the Hubble Space Telescope and other facilities. <http://www.stsci.edu/science/goods/>.
 - **Google Sky:** A display of wide-field imaging data for the public. <http://www.google.com/sky/>.
 - **GSMT:** The Giant Segmented Mirror Telescope, a generic name for a future US 20-30 meter telescope.
 - **HAT:** The Hungarian-made Automated Telescope, a network of small wide-field telescopes to survey the sky. <http://www.cfa.harvard.edu/~gbakos/HAT/>.
 - **HDF, HUDF:** Hubble Deep Field and Ultra Deep Field, extremely deep exposures of the sky with the Hubble Space Telescope.

- **HEAO-1:** The High-Energy Astrophysics Observatory, one of the first X-ray surveys of the sky in the 1970s. <http://heasarc.gsfc.nasa.gov/docs/heao1/heao1.html>.
- **Hectospec:** A moderate-resolution, multi-object optical spectrograph fed by 300 optical fibers, on the Multiple Mirror Telescope. <http://www.cfa.harvard.edu/mmti/>.
- **HESS:** The High Energy Stereoscopic System, a system of Imaging Atmospheric Cherenkov Telescopes that investigates cosmic gamma rays in the 100 GeV to 100 TeV energy range. <http://www.mpi-hd.mpg.de/hfm/HESS/>.
- **HIPPARCOS:** High Precision Parallax Collecting Satellite, which did accurate astrometry of bright stars over the entire sky. <http://www.rssd.esa.int/index.php?project=HIPPARCOS>.
- **HSC:** Hyper-SuprimeCam, a planned wide-field imager for the Subaru Telescope.
- **HST:** The Hubble Space Telescope.
- **IceCube:** A telescope in Antarctica which uses Cherenkov light in deep ice from secondary particles due to collisions from high-energy neutrinos. <http://icecube.lbl.gov/>.
- **IMF:** Initial Mass Function, the distribution of masses of stars when they are first born.
- **IMACS:** The Inamori Magellan Areal Camera and Spectrograph, for the Magellan Telescope at Las Campanas, Chile.
- **IRAC:** The Infrared Array Camera on the Spitzer Space Telescope, with filters at 3.6, 4.5, 5.8, and 8 microns. <http://ssc.spitzer.caltech.edu/irac/>.
- **ISO:** Infrared Space Observatory, a European space-based mission of the 1990s. <http://iso.esac.esa.int/>.
- **IXO:** International X-ray Observatory, a proposed facility with superior collecting area and spectral resolution. <http://ixo.gsfc.nasa.gov/>.
- **JANUS:** A proposed near-infrared low-resolution spectroscopic survey of the sky, designed to find high-redshift quasars and gamma-ray bursts.
- **JDEM:** The Joint Dark Energy Mission, the generic name for the proposed NASA satellite mission to study dark energy.
- **JWST:** James Webb Space Telescope, a 6.4-meter telescope sensitive from 0.6 to 25 μ m, which NASA will launch in 2014. <http://www.jwst.nasa.gov/>.
- **KAIT:** The Katzman Automatic Imaging Telescope, which is surveying nearby galaxies to search for supernovae. <http://astro.berkeley.edu/~bait/kait.html>.
- **Kepler:** A NASA mission doing photometry of stars to look for transiting planets. <http://kepler.nasa.gov>.
- **KPNO:** Kitt Peak National Observatory. <http://www.noao.edu/kpno>.
- **LAMA:** Large-Aperture Mirror Array, a proposed array of 10-meter liquid-mirror telescopes. <http://www.astro.ubc.ca/lmt/lama/>.
- **LAMOST:** Large Sky Area Multi-Object Fibre Spectroscopic Telescope, a Chinese 4-meter telescope devoted to spectroscopic surveys. <http://www.lamost.org/en/>.
- **LBT:** The Large Binocular Telescope, a pair of 8.4-meter telescopes on a common mount. <http://medusa.as.arizona.edu/lbto/>.

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- **LCOGTN:** Las Cumbres Observatory Global Telescope Network, dedicated to study of transient and variable objects. <http://lcogt.net/>.
 - **LIGO:** The Laser Interferometer Gravitational Wave Observatory, now in operation. <http://www.ligo.caltech.edu/>.
 - **LISA:** The Laser Interferometer Space Antenna, a proposed space-based gravitational-wave detector. <http://lisa.nasa.gov>
 - **MACHO:** Massive Compact Halo Object, which can cause gravitational microlensing of background objects. Also, a survey carried out with the Anglo-Australian Telescope to find such objects, [Alcock et al. \(1997\)](#).
 - **MAGIC:** Major Atmospheric Gamma Imaging Cherenkov. A pair of telescopes looking for Cherenkov radiation from high-energy cosmic rays. <http://magic.mppmu.mpg.de/>.
 - **MaxAT:** the Maximum Aperture Telescope, a generic name for a future 30-50 meter telescope. See also GSMT.
 - **MGC:** Millennium Galaxy Catalog, a 37.5 deg^2 imaging survey carried out on the Isaac Newton Telescope to a depth of $B \sim 24$. <http://www.eso.org/~jliske/mgc/>.
 - **Micro-FUN:** Microlensing Follow-Up Network, which uses small telescopes to get high time resolution on microlensing stars. <http://www.astronomy.ohio-state.edu/~microfun/>.
 - **MIPS:** The Multiband Imaging Photometer for SIRTF, on the Spitzer Space Telescope, with filters at 24, 70, and 160 microns. <http://ssc.spitzer.caltech.edu/mips/>.
 - **MIRI:** Mid-Infrared Instrument, for the JWST. <http://ircamera.as.arizona.edu/MIRI/>.
 - **MMT:** Multiple Mirror Telescope, a 6.5-meter single-mirror telescope, despite its name. <http://www.mmt.org/>.
 - **MOA:** Microlensing Observations in Astrophysics, a 0.6-meter telescope in New Zealand used for studies of gravitational microlensing. <http://www.phys.canterbury.ac.nz/moa/>.
 - **MOSAIC:** A wide-field imaging camera used on the 4-meter telescopes at CTIO and KPNO.
 - **MOSFIRE:** Multi-Object Spectrometer for Infra-Red Exploration, being built for the Keck Telescopes. <http://irlab.astro.ucla.edu/mosfire/>.
 - **NANTEN:** A 4-meter submillimeter telescope in Chile. <http://www.astro.uni-koeln.de/nanten2/>.
 - **NCSA:** National Center for Supercomputing Applications at the University of Illinois. <http://www.ncsa.illinois.edu/>.
 - **NDWFS:** NOAO Deep Wide-Field Survey, an optical/near-IR imaging survey of 9 deg^2 . <http://www.noao.edu/noao/noaodeep/>.
 - **NEWFIRM:** The NOAO Extremely Wide-Field Infrared Imager, a imaging camera with a field of view of $1/4 \text{ deg}^2$ for the KPNO 4-meter Mayall Telescope. <http://www.noao.edu/ets/newfirm/>.
 - **NOAO:** National Optical Astronomical Observatory, the parent organization of CTIO and KPNO. <http://www.noao.edu>.
 - **NVSS:** The NRAO VLA Sky Survey, which covered the entire Northern sky at 1.4 GHz. <http://www.cv.nrao.edu/nvss/>.

- **ODI:** One Degree Imager on the WIYN 3.5-m telescope at Kitt Peak.
<http://www.noao.edu/wiyn/ODI/>.
- **OGLE:** Optical Gravitational Lensing Experiment, which carries out repeat imaging of the sky. <http://www.astrouw.edu.pl/~ftp/ogle/>.
- **P60-FasTING:** Palomar 60-inch Fast Transients in Nearby Galaxies carries out repeat imaging of nearby galaxies. <http://www.astro.caltech.edu/ptf/>.
- **Pan-STARRS:** Panoramic Survey Telescope and Rapid Response System. A dedicated survey telescope based at the University of Hawaii. Pan-STARRS1 consists of a single 1.8-meter telescope with a 3° field of view, and has seen first light. Pan-STARRS4 will consist of four such telescopes on a common mount. <http://pan-starrs.ifa.hawaii.edu/public/>.
- **Planck:** A recently launched satellite which is mapping fluctuations in the Cosmic Microwave Background. <http://www.rssd.esa.int/index.php?project=planck>.
- **POSS:** Palomar Observatory Sky Survey, a photographic survey of the sky started in the 1950s. <http://www.astro.caltech.edu/~wws/poss2.html>.
- **PS1, PS4:** Abbreviations for Pan-STARRS1, Pan-STARRS4. See above.
- **PSCz:** Point-Source Catalog Redshift Survey, of galaxies detected by the Infrared Astronomical Satellite at 60 microns, [Saunders et al. \(2000\)](#).
- **PTF:** Palomar Transit Survey. See P60-FasTING above.
- **ROSAT:** The Röntgen Satellite, which carried out an X-ray survey of the sky.
<http://www.mpe.mpg.de/xray/wave/rosat/>.
- **RSS:** The Robert Stobie Spectrograph on the SALT telescope.
<http://www.salt.ac.za/telescope/instrumentation/rss/>.
- **SAGE:** Surveying the Agents of Galaxy Evolution, a Spitzer imaging study of the Magellanic Clouds. <http://sage.stsci.edu>.
- **SALT:** Southern African Large Telescope, with a primary mirror 11 meters across.
<http://www.salt.ac.za/>.
- **SASIR:** The Synoptic All-Sky Infrared Survey, a dedicated 6.5-meter telescope which will go appreciably deeper than 2MASS. <http://sasir.org>.
- **SDSS:** The Sloan Digital Sky Survey, an imaging and spectroscopic survey of the Northern Sky. <http://www.sdss.org>.
- **SEGUE:** Sloan Extension for Galactic Understanding and Exploration, a component of the SDSS focussed on the structure of the Milky Way. <http://www.sdss.org/segue>.
- **SERVS:**, The Spitzer Extragalactic Representative Volume Survey, an imaging survey of 18 deg² of high-latitude sky at 3.6 and 4.5 microns.
<http://www.its.caltech.edu/~mlacy/servs.html>.
- **SINGS:** Spitzer Infrared Nearby Galaxies Survey, a comprehensive survey of 75 nearby galaxies in the infrared. <http://sings.stsci.edu>.
- **SKA:** The Square Kilometre Array, a proposed enormous radio survey telescope.
<http://www.skatelescope.org/>

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- **SkyMapper:** A 1.3-meter telescope at Siding Spring Observatory, which is imaging the Southern skies. It will produce the SkyMapper Southern Sky Survey (SSSS). <http://msowww.anu.edu.au/skymapper/>.
 - **SMEI:** Solar Mass Ejection Imager, which is flying on the US Air Force's Coriolis spacecraft. <http://smei.ucsd.edu/>.
 - **SNLS:** The SuperNova Legacy Survey, which was carried out as part of the CFHTLS (see above). <http://cfht.hawaii.edu/SNLS/>.
 - **SOAR:** Southern Astrophysical Research Telescope, a 4.1-m telescope located on Cerro Pachón in Chile. <http://www.soartelelescope.org/>.
 - **SOFIA:** The Stratospheric Observatory for Infrared Astronomy, a mid-infrared 2.5-meter telescope in development, which flies on a specially modified airplane. <http://www.sofia.usra.edu/>.
 - **SkyAlert:** A website that collects and distributes astronomical events (such as transients) over the Internet in near-real time. <http://www.skyalert.org/>.
 - **Spacewatch:** This project uses telescopes at Kitt Peak to search for asteroids. <http://spacewatch.lpl.arizona.edu/>.
 - **Spitzer Space Telescope:** One of NASA's Great Observatories, it is sensitive from 3 to 160 microns. <http://www.spitzer.caltech.edu/>.
 - **SPT:** South Pole Telescope, a 10-meter millimeter telescope designed to measure fluctuations in the CMB. <http://pole.uchicago.edu>.
 - **STEREO:** The Solar Terrestrial Relations Observatory, a pair of spacecraft which monitor the Sun. <http://stereo.gsfc.nasa.gov/>.
 - **Subaru Telescope:** A 8.2-meter wide-field optical telescope operated by the Japanese astronomical community. <http://www.naoj.org>.
 - **SUMSS:** The Sydney University Molonglo Sky Survey, which covered the Southern sky at 843 MHz. <http://www.physics.usyd.edu.au/sifa/Main/SUMSS>.
 - **SuperCOSMOS:** Digitized scans of photographic survey plates. <http://www-wfau.roe.ac.uk/sss/>.
 - **SUPERMACHO:** A survey for gravitational microlenses and supernovae using the MO-SAIC imager on the CTIO 4-meter Blanco Telescope. <http://www.ctio.noao.edu/supermacho/>.
 - **SuperWASP:** Wide-Angle Search for Planets, which consists of two imaging telescopes looking for planetary transit events. <http://www.superwasp.org>.
 - **Swift:** A gamma-ray burst satellite. <http://swift.gsfc.nasa.gov/>.
 - **SWIRE:** The Spitzer Wide-area InfraRed Extragalactic survey, a legacy mapping program covering 50 deg² with the Spitzer Space Telescope. <http://swire.ipac.caltech.edu/swire/swire.html>.
 - **THINGS:** The HI Nearby Galaxy Survey of 34 galaxies observed with the Very Large Array at 21 cm. [Walter et al. \(2008\)](#).
 - **TMT:** Thirty Meter Telescope, a proposed telescope whose name says it all. <http://www.tmt.org>.

- **TSS:** The Texas Supernova Search, carried out with a telescope from the ROTSE collaboration. <http://grad40.as.utexas.edu/~quimby/tss/index.html>.
- **UKIDSS:** The UKIRT (United Kingdom InfraRed Telescope) Infrared Deep Sky Survey, covering 7500 deg². <http://www.ukidss.org/>.
- **USNO-B:** The United States Naval Observatory astrometric calibration and catalog of the POSS plates. <http://www.nofs.navy.mil/data/fchpix/>.
- **Veritas:** Very Energy Radiation Imaging Telescope System, an array of atmospheric Cherenkov telescopes at Mount Hopkins. <http://veritas.sao.arizona.edu/>.
- **VISTA:** The Visible and Infrared Survey Telescope for Astronomy, a dedicated 4-meter survey telescope operated by the European Southern Observatory. <http://www.vista.ac.uk/>.
- **VLT:** The Very Large Telescope, a set of four 8-meter telescopes at Cerro Paranal in Chile, operated by the European Southern Observatory. <http://www.eso.org/projects/vlt/>.
- **VST:** The VLT Survey Telescope, a 2.6-meter telescope with a 1 deg² Field of View at Cerro Paranal in Chile. <http://vstportal.oacn.inaf.it/>.
- **VVDS:** The VIRMOS-VLT Deep Survey, a spectroscopic redshift survey of 150,000 faint galaxies over 16 deg². <http://www.oamp.fr/virmos/vvds.htm>.
- **WEBDA:** A database of open star clusters, <http://www.univie.ac.at/webda/>.
- **WHTDF:** William Herschel Telescope Deep Field, a 7' × 7' survey imaged to close to LSST co-added depths. <http://astro.dur.ac.uk/~nm/pubhtml/herschel/herschel.php>.
- **Wigglez:** A spectroscopic survey of galaxies to $z \sim 1$ on the Anglo-Australian Telescope to study baryon acoustic oscillations. <http://wigglez.swin.edu.au/>.
- **WISE:** Wide-field Infrared Survey Explorer, a NASA satellite that will survey the sky from 3.3 to 23 microns. <http://www.astro.ucla.edu/~wright/WISE/>.
- **WMAP:** The Wilkinson Microwave Anisotropy Probe, a satellite that has made full-sky maps of fluctuations in the Cosmic Microwave Background. <http://map.gsfc.nasa.gov/>.
- **WWT:** The WorldWide Telescope, a web resource for exploring images of the sky. <http://www.worldwidetelescope.org/Home.aspx>.
- **XMM-Newton:** The X-ray Multi-Mirror Mission is an X-ray telescope with particularly high throughput. <http://xmm.esac.esa.int/>.
- **zCOSMOS:** A spectroscopic follow-up survey of the COSMOS field. <http://cosmos.astro.caltech.edu/index.html>.

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