CANDELS: THE COSMIC ASSEMBLY NEAR-INFRARED DEEP EXTRAGALACTIC LEGACY SURVEY

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ABSTRACT

The Cosmic Assembly Near-IR Deep Extragalactic Legacy Survey (CANDELS) is designed to document the first third of galactic evolution, from $z \sim 8 - 1.5$. It will image $> 250,000$ distant galaxies using three separate cameras on the *Hubble Space Telescope*, from the mid-UV to near-IR, and will find and measure Type Ia supernovae beyond $z > 1.5$ to test their accuracy as standard candles for cosmology. Five premier multi-wavelength sky regions are selected, each with extensive ancillary data. The use of five widely separated fields mitigates cosmic variance and yields statistically robust and complete samples of galaxies down to a stellar mass of $10^9 M_\odot$ to $z \sim 2$, reaching the knee of the UV luminosity function of galaxies to $z \sim 8$. The survey covers approximately 800 square arcminutes and is divided into two parts. The CANDELS/Deep survey (5σ point-source limit $H = 27.7\,\mathrm{mag}$) covers ~ 125 square arcminutes within GOODS-N and GOODS-S. The CANDELS/Wide survey includes GOODS and three additional fields (EGS, COSMOS, and UDS) and covers the full area to a 5σ point-source limit of $H \gtrsim 27.0$ mag. Together with the *Hubble* Ultradeep Fields, the strategy creates a three-tiered "wedding cake" approach that has proven efficient for extragalactic surveys. Data from the survey are non-proprietary and are useful for a wide variety of science investigations. In this paper, we describe the basic motivations for the survey, the CANDELS team science goals and the resulting observational requirements, the field selection and geometry, and the observing design. The *Hubble* data processing and products are described in a separate companion paper (Koekemoer et al. 2011).

Subject headings: Cosmology: observations — Galaxies: high-redshifts —

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