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

NORMAN A. GROGIN 1, DAE D. KOCESKVI 2, S. M. FABER 2, HENRY C. FERGUSON 1, ANTON M. KOEKEMOER 1, ADAM G. RIESE 1, ALIACACQUAVITA 1, DAVID M. ALEXANDER 1, OMAR ALMAINS 2, MATTHEW L. N. ASHBY 1, MARCO BARDOEN 1, ERIC P. BELL 1, FREDDERIQUE BOUCLAUD 1, THOMAS M. BROWN 1, KARINA I. CAPUTI 1, STEFANO CASERTANO 1, PAOLO CASSATA 13, PETER CHALLIS 22, DAVID ELBAZ 23, GIOVANNI G. FASOZZI 7, ALFREX V. FILIPPENKO 41, STEVEN L. FINKELSTEIN 23, ADRIANO FONTANA 26, JEFFREY P. GARDNER 19, PETER M. GARNAVICH 37, ERIC GAWRIS 1, MAURO GIVALLISO 12, ANDREA GRAZIAN 11, JOSEPHSMIDT 2, JAY H. HUBER 1, DAVID M. ALEXANDER 26, LAURENCE A. ALBERTI 2, JEFFREY A. NEWMAN 31, JONATHAN R. STRUGGLES 2, ALEXANDRA POBLETTI 36, ADAY R. ROBAINA 10, STEVEN A. ROONEY 1, DAVID J. ROSARIO 1, PIERO ROSSATI 1, SARA SALIBIMI 12, CLAUDIA SCARLATA 11, BRIAN SIANA 13, LUC SIMARD 13, JOSEPH SMITH 13, RACHEL S. SOMERVILLE 14, BYRON SPINRAD 14, AMBER N. STRAUGHN 19, LOUIS-GREGORY STROLGER 33, OLIVIA TELFORD 19, HARRY I. TEPLITZ 14, JONATHAN R. TRUMP 4, ARJEN VAN DER WEL 41, CAROLIN VILHFORTH 1, RISA H. WECHSLER 14, BENJAMIN J. WEAHER 14, TOMMY WILSON 14, VIVIENNE WILD 13, GRANT WILSON 12, STEFAN WUYTS 7, HAO-JING YAN 16, MIN S. YUN 12

Draft version May 33, 2011

ABSTRACT

The Cosmic Assembly Near-IR Deep Extragalactic Legacy Survey (CANDELS) is designed to document the first third of galactic evolution, from $z \sim 8 - 10$. It will image $\sim 250,000$ 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 prime 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 (5$\sigma$ point-source limit $H = 27.7$ mag) covers $\sim 125$ 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 5$\sigma$ point-source limit of $H \geq 30.0$ 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 —