

Curriculum Vitae for Dr. Peter L. Capak

Education

- 2004 Ph.D. Astronomy, University of Hawaii
- 2002 M.Sc. Astronomy, University of Hawaii
- 1999 B.Sc. Honors Physics and Astronomy, University of British Columbia

Professional Experience

- 2007 – Present Research Scientist, Spitzer Science Center
- 2007 Senior Postdoctoral Fellow, California Institute of Technology
- 2004 – 2007 Postdoctoral Scholar, California Institute of Technology
- 2000 – 2004 Research Assistant, University of Hawaii
- 2000 Lecturer, University of Hawaii
- 1999 – 2000 Teaching Assistant, University of Hawaii
- 1998 – 1999 Research Assistant, University of British Columbia
- 1997 – 1999 Teaching Assistant, University of British Columbia

Current Grants

Spitzer Program 50310, PI P. Capak, “A detailed study of the high redshift universe”

Spitzer Legacy Program 50286, “The Green Valley IRS Legacy Survey”, PI N. Scoville

Management

- Spitzer Archive Responsible for planning and implementing a pipeline to produce science quality images and catalogs for all IRAC and MIPS data taken during the Spitzer Cryogenic mission. These data will be part of the Spitzer Heritage Archive. Duties involve working with a team of ~15 scientists, data base managers and software engineers along with an oversight board to implement the software and quality analysis procedures.
- COSMOS Currently leading the high-redshfit working group in COSMOS and a member of the Science Steering Committee. Oversee the observation,

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reduction, and archiving of all ground based optical and near-IR imaging including data from the CFHT, CTIO, LBT, Subaru, UH2.2m, and UKIRT. This involves coordinating ~14 individuals at seven institutions, developed software for new instruments, and delivered data products for use by the general astronomical community (Capak et al. 2007).

Observing

Optical/IR	Extensive experience (over 200 nights) with both optical and IR imaging and spectroscopy including over 75 nights on the Subaru 8.3m telescope, over 30 nights on the Keck 10m telescope, and over 50 nights on the CFHT 3.6m, along with many more on the UH2.2m, UKIRT, Palomar, the CTIO 4m and the KPNO 4m.
Sub-mm	15 nights on JCMT with SCUBA and Heterodyne spectrographs, 6 nights on CSO, queue observing on PdBI and CARMA.
Radio	Several programs totaling over 60h on the VLA, One program of 20h on the VLBA
Space	HST, Spitzer, Chandra, XMM, and Galax Data

Community Service

Time Allocation	Member of the VLA extra-galactic TAC. Past member of the University of Hawaii TAC.
Publication Referee	Referee for MNRAS and A&A.

Instrumentation

Software	<p>Developed a reduction pipeline for mosaic CCD and IR instruments that uses parallel processing and I/O on computing clusters. Currently works with ACS, Suprime-Cam, Megaprime, CFHT-12K, WIRCAM, WFCAM, and ULBCAM data. (Capak et. al. 2004, 2007).</p> <p>Currently overseeing the development of the Spitzer Heritage Archive super-mosaic and source list pipeline. This software will reduce the majority of IRAC and MIPS 24um data taken with Spitzer and produce science quality images and catalogs.</p>
Commissioning	Assisted in commissioning the Rockwell NGST detector test system (ULBCAM) on the UH2.2m telescope. This instrument was the first IR mosaic camera in operation and the first to use HAWAII-2 arrays. Was a shared risk observer with Suprime-Cam and CISCO on Subaru, DEIMOS

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on Keck, WFCAM on UKIRT, and MEGAPRIME and WIRCAM on CFHT.

Development Assisting in developing the science case and camera specifications for the ESA DUNE mission (Abdalla et al., 2007 including capak).

Teaching and Mentoring

2006 Mentor for Caltech SURF program, Student: R. Cook, “Testing Evolutionary Population Synthesis Models using Average Galaxy Templates in the Wavelength Range 0.09 – 2.5 μ m”, now a Ph.D. student at Brown.

2004 Mentor for REU summer program, Student: J. Blazek, “Evolution of the Two-point Correlation Function in Narrow Redshift Bins at $z < 2$ ” research presented at 2005 summer AAS, now a Ph.D. student at Stanford

2000 Lecturer for Astronomy 101, “Introduction to Astronomy”, summer session at the University of Hawaii

1998-1999 Lab instructor for Physics 101 and Astronomy 101 at the University of British Columbia

Honors and Awards

2007 Promotion to Senior Research Fellow at Caltech

2004 University of Hawaii Graduate Student Research Travel Award

1994 University of British Columbia David Crombie Entrance Scholarship

Colloquia and Conferences

Nov 2008 Colloquia at UC Davis

Nov 2008 Colloquia at Lawrence Berkley National Lab

Sept 2008 Colloquia at University of Hawaii, Institute for Astronomy

June 2008 “High mass and High starformation rates at High redshifts”, Cosmos Team Meeting”, Paris, France

December 2007 “New views of galaxy formation with COSMOS-21”, Panoramic Views of Galaxy Formation and Evolution, Hayama, Japan

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- August 2007 “New views of galaxy formation with COSMOS-21”, Legacy of Multi-wavelength surveys, Xining, China
- June 2007 “A detailed study of the $4.5 < z < 6$ universe”, COSMOS team meeting, New York, New York
- May 2007 “Evolution of the Morphology Density and Star Formation Density Relation Between $0 < z < 1.2$ ”, American Astronomical Society Meeting 207, Honolulu, HI
- April 2007 Colloquia at the University of California, San Diego
- Feb 2007 Colloquia at the NASA Jet Propulsion Laboratory
- September 2006 “A possible Mass-Density relation at $z=5.7$ ”, COSMOS team meeting, Munich, Germany
- April 2006 “Evolution of the Morphology Density Relation Between $0 < z < 1.2$ ”, Galaxies and Structures through Cosmic Times, Venice, Italy
- January 2006 “Evolution of the Morphology Density Relation Between $0 < z < 1.2$ ”, American Astronomical Society Meeting 207, Washington DC
- May 2005 “Evolution of the Morphology Density Relation Between $0 < z < 1.2$ ”, COSMOS team meeting, Kyoto, Japan
- January 2005 “Evolution of the Galaxy Luminosity Function Between $0.5 < z < 5$ ”, American Astronomical Society Meeting 205, San Diego, CA
- October 2003 “Constraining the Star Formation History with Photometric Redshifts”, Multiwavelength mapping of galaxy formation and evolution, Venice Italy

Press Releases

“Rare Star Forming Machine Found In Distant Universe”,
<http://www.spitzer.caltech.edu/Media/releases/ssc2008-12/release.shtml>

“New 3-D Map of Dark Matter Reveals Cosmic Scaffolding”
http://mr.caltech.edu/media/Press_Releases/PR12939.html

“University of Hawaii astronomers release first image from gigantic new infrared camera”,
<http://www.ifa.hawaii.edu/~hall/NGC-891/pressrelease/>

“Galaxy’s Light Pushes Back Dark Ages Of The Universe”,
<http://www.ifa.hawaii.edu/info/press-releases/hu3-06-02.html>

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Citations

2584 total
207 on first author papers

First Author publications

- 1) Capak et al., ApJL, Submitted Nov 2008, "Spectroscopy and Imaging of three bright $z > 7$ candidates in the COSMOS survey"
- 2) Capak et al., ApJL, 2008, ApJL, 681, 53, "Spectroscopic Confirmation Of An Extreme Starburst At Redshift 4.547"
- 3) Capak et. al., 2007, ApJS, 172, 284, "The effects of environment on morphological evolution between $0 < z < 1.2$ in the COSMOS Survey"
- 4) Capak et. al., 2007, ApJS, 172, 99, "The First Release COSMOS Optical and Near-IR Data and Catalog"
- 5) Capak, 2004, Ph.D. Thesis, "Probing global star and galaxy formation using deep multi-wavelength surveys"
- 6) Capak et. al., 2004, AJ, 127, 180, "A Deep Wide-Field, Optical, and Near-Infrared Catalog of a Large Area around the Hubble Deep Field North"

Selected Publications

- 7) Schinnerer et al., 2008, ApJL, 689, 5, "Molecular Gas in a Submillimeter Galaxy at $z = 4.5$: Evidence for a Major Merger at 1 Billion Years after the Big Bang"
- 8) Carilli et al., 2008, ApJL, astro-ph/0808.2391, "Star formation rates in Lyman break galaxies: radio stacking of LBGs in the COSMOS field and the sub-uJy radio source population"
- 9) Ilbert et al., 2008, astro-ph/0809.2101, "COSMOS Photometric Redshifts with 30-bands for 2-deg²"
- 10) Salvato et al., 2008, astro-ph/0809.2098, "Photometric redshift and classification for the XMM-COSMOS sources"
- 11) Mobasher et al., 2008, astro-ph/0808.2746, "Relation Between Stellar Mass and Star Formation Activity in Galaxies"
- 12) Sheth et al., 2008, ApJ, 675, 1141, "Evolution of the Bar Fraction in COSMOS: Quantifying the Assembly of the Hubble Sequence"
- 13) Scoville et. al., 2007, ApJS, 172, 1, "The Cosmic Evolution Survey (COSMOS) -- Overview"
- 14) Kartaltepe et al., 2007, ApJS, 172, 320, "Evolution of the Frequency of Luminous ($> L^*$) Close Galaxy Pairs at $z < 1.2$ in the COSMOS Field"
- 15) McCracken et al., 2007, 172m 314, "The angular correlations of galaxies in the COSMOS field"
- 16) Abdalla et al., 2007, MNRAS, 387, 969, "Photo-z for weak lensing tomography from space: the role of optical and near-IR photometry"
- 17) Leauthaud et. al., 2007, ApJS, 172, 219, "Weak Gravitational Lensing with COSMOS: Galaxy Selection and Shape Measurements"

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- 18) Massey et. al., 2007, Nature, 445, 7125, p. 286, " Dark matter maps reveal cosmic scaffolding"
- 19) Massey et. al., 2007, ApJS, 172, 239, "COSMOS: 3D weak lensing and the growth of structure"
- 20) Mobasher et. al., 2007, ApJS, 172, 117, "Photometric Redshifts of Galaxies in COSMOS"
- 21) Murayama et. al., 2007, ApJS, 172, 523, "Lyman- α Emitters at Redshift 5.7 in the COSMOS Field"
- 22) Scoville et. al., 2007, ApJS, 172, 150, "Large Structures and Galaxy Evolution in COSMOS at $z < 1.1$ "
- 23) Cowie et. al., 2004, ApJ, 603, 69, "The Evolution of the Ultraluminous Infrared Galaxy Population from Redshift 0 to 1.5"
- 24) Hu et. al., 2004, AJ, 127, 563, "The Luminosity Function of Ly- α Emitters at Redshift $z \sim 5.7$ "
- 25) Hu et. al., 2002, ApJL, 576, 99, "A Redshift $z = 6.56$ Galaxy behind the Cluster Abell 370"

Other Publications

- 26) Trump et al., 2008, astro-ph/0811.3977, "The COSMOS AGN Spectroscopic Survey I: XMM Counterparts"
- 27) Huertas-Compay et al., astro-ph/0811.1045, "A robust morphological classification of high-redshift galaxies using support vector machines on seeing limited images. II. Morphological evolution from $z \sim 2$ in the COSMOS field from Ks-band imaging"
- 28) Gilli et al., astro-ph/0810.4769, "The spatial clustering of X-ray selected AGN in the XMM-COSMOS field"
- 29) Mignoli et al., astro-ph/0810.2245, "The zCOSMOS redshift survey: the three-dimensional classification cube and bimodality in galaxy physical properties"
- 30) Fiore et al., astro-ph/0810.0720, "Chasing highly obscured QSOs in the COSMOS field"
- 31) Brusa et al., astro-ph/0809.2513, "High redshift quasars in the COSMOS survey: the space density of $z > 3$ X-ray selected QSOs"
- 32) Caputi et al., astro-ph/0808.3407, "The close environment of 24 micron galaxies at $0.6 < z < 1.0$ in the COSMOS field"
- 33) Caputi et al., 2008, ApJ, 680, 939, "The Optical Spectra of 24 μm Galaxies in the COSMOS Field. I. Spitzer MIPS Bright Sources in the zCOSMOS-Bright 10k Catalog"
- 34) Gabor et al., astro-ph/0809.0309, "AGN Host Galaxy Morphologies and Environments in COSMOS"
- 35) Faure et al., 2008, ApJ, 176, 19, "First catalog of strong lens candidates in the COSMOS field"
- 36) Smolcic et al., ApJ, 2008, 177, 14, "A new method to separate star forming from AGN galaxies at intermediate redshift: The submillijansky radio population in the VLA-COSMOS survey"
- 37) Casey et al., 2008, ApJS, 117, 131, "Optical Selection of Faint AGN in the COSMOS Field"
- 38) Liu et al., 2008, ApJ, 672, 198, "The Faint-End Slopes of Galaxy Luminosity Functions in the COSMOS Field"

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- 39) Bertoldi et al., 2007, ApJS, 172, 132, "COSBO: The MAMBO 1.2 Millimeter Imaging Survey of the COSMOS Field"
- 40) Mahdavi et al., 2007, ApJ, 668, 806, "A Dark Core in Abell 520"
- 41) Kulkarni et al., 2007, Nature, 447, 458, "An unusually brilliant transient in the galaxy M85"
- 42) Robin et. al., 2007, ApJS, 172, 221, "The Stellar Content of the COSMOS Field as derived from morphological and SED based Star/Galaxy Separation"
- 43) Koekemoer et al., 2007, ApJS, 172, 196, "The COSMOS Survey: Hubble Space Telescope / Advanced Camera for Surveys (HST/ACS) Observations and Data Processing"
- 44) Finoguenov et. al., 2007, ApJS, 172, 182, "The XMM-Newton wide-field survey in the COSMOS field: VI. Statistical properties of clusters of galaxies"
- 45) Kampczyk et al., 2007, ApJS, 172, 329, "Simulating the COSMOS: The fraction of merging galaxies at high redshift"
- 46) Brusa et. al., 2007, ApJS, 172, 353, "The XMM-Newton wide-field survey in the COSMOS field. III: optical identification and multiwavelength properties of a large sample of X-ray selected sources"
- 47) Cassata et. al., 2007, ApJS, 172, 270, "The Cosmic Evolution Survey (COSMOS): The morphological content and environmental dependence of the galaxy color-magnitude relation at $z \sim 0.7$ "
- 48) Faure et. al., 2007, ApJS, submitted for special issue, "The first strong galaxy-galaxy lensing candidates in the COSMOS field"
- 49) Guzzo et. al., 2007, ApJS, 172, 254, "The Cosmic Evolution Survey (COSMOS): a large-scale structure at $z=0.73$ and the relation of galaxy morphologies to local environment"
- 50) Lilly et al., 2007, ApJS, 172, 70, "zCOSMOS: A Large VLT/VIMOS redshift survey covering $0 < z < 3$ in the COSMOS field"
- 51) Mainieri et. al., 2007, ApJS, 172, 368, "The XMM-Newton wide-field survey in the COSMOS field. IV: X-ray spectral properties of Active Galactic Nuclei"
- 52) Sanders et. al., 2007, ApJS, 172, 86, "S-COSMOS: The Spitzer Legacy Survey of the HST-ACS 2 square degree COSMOS Field I: survey strategy and first analysis"
- 53) Sargent et al., 2007, ApJS, 172, 434, "The evolution of the number density of large disk galaxies in COSMOS"
- 54) Scarlata et. al., 2007, ApJS, 172, 434, "COSMOS morphological classification with ZEST (the Zurich Estimator of Structural Types) and the evolution since $z=1$ of the Luminosity Function of early-, disk-, and irregular galaxies"
- 55) Scarlata et al., 2007, ApJS, 172, 494, "The redshift evolution of early-type galaxies in COSMOS: Do massive early-type galaxies form by dry mergers?"
- 56) Scoville et. al., 2007, ApJS, 172, 38, "COSMOS : Hubble Space Telescope Observations"
- 57) Smolcic et. al., 2007, ApJS, 172, 295, "A Wide Angle Tail Radio Galaxy in the COSMOS Field: Evidence for Cluster Formation"
- 58) Takahashi et. al., 2007, ApJS, 172, 456, "The O[II] 3727 Luminosity Function and Star Formation Rate at $z \sim 1.2$ "
- 59) Tanaguchi et. al., 2007, ApJS, 172, 9, "The Cosmic Evolution Survey (COSMOS): Subaru Observations of the HST COSMOS Field"

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- 60) Zamojski et. al., 2007, ApJS, 172, 468, "Deep GALEX imaging of the HST/COSMOS field II: A first look at the morphology of $z \sim 0.7$ star-forming galaxies"
- 61) Sargent et. al., 2007, ApJS, accepted, astro-ph/0609042, "The evolution of the number density of large disk galaxies in COSMOS"
- 62) Trump et. al., 2007, ApJS, 172, 383, "Magellan Spectroscopy of AGN Candidates in the COSMOS Field"
- 63) Meurer et al., 2007, AJ, 134, 77, "Automated selection and characterization of emission-line sources in ACS WFC grism data"
- 64) Fomalont et. al., 2006, ApJS, 167, 103, "The Radio/Optical Catalog of the SSA13 Field"
- 65) Feldmann et. al., 2006, MNRAS, 1047, "The Zurich Extragalactic Bayesian Redshift Analyzer and its first application: COSMOS"
- 66) Taniguchi et al., 2005, JKAS, 38, 187, "The HST Cosmos Project: Contribution from the Subaru Telescope"
- 67) Barger et al., 2005, AJ, 129, 578, "The Cosmic Evolution of Hard X-Ray-selected Active Galactic Nuclei"
- 68) Steffen et. al., 2004, ApJS, 128, 1483, "An Optical Catalog of the Chandra Large Area Synoptic X-Ray Survey Sources"
- 69) Cowie et. al., 2004, AJ, 127, 3137, "A Large Sample of Spectroscopic Redshifts in the ACS-GOODS Region of the Hubble Deep Field North"
- 70) Wirth et. al., 2004, AJ, 127, 3121, "The Team Keck Treasury Redshift Survey of the GOODS-North Field"
- 71) Barger et. al., 2003, AJ, 126, 632, "Optical and Infrared Properties of the 2 Ms Chandra Deep Field North X-Ray Sources"
- 72) Champan et. al., 2003, ApJ, 585, 57, "The Properties of Microjansky Radio Sources in the Hubble Deep Field-North, SSA 13, and SSA 22 Fields"
- 73) Barger et. al., 2003, ApJ, 584, 61, "Very High Redshift X-Ray-selected Active Galactic Nuclei in the Chandra Deep Field-North"
- 74) Barger et. a., 2002, AJ, 124, 1839, "X-Ray, Optical, and Infrared Imaging and Spectral Properties of the 1 Ms Chandra Deep Field North Sources"
- 75) Cowie et. al., 2001, ApJL, 551, 9, "Detecting High-Redshift Evolved Galaxies as the Hosts of Optically Faint Hard X-Ray Sources"