

CCD Astroimaging Information

From Observational Astronomy Web Site by David Haworth
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CCD Astroimaging Books

- *Choosing and Using a CCD Camera*, Richard Berry, <http://www.wvi.com/~rberry/books.htm>
 - This is an excellent first book to start learning about CCD astronomy.
 - Book includes Quikpix software for PCs.
- *Introduction to Astronomical Image Processing*, Richard Berry, <http://www.wvi.com/~rberry/books.htm>
 - A beginners guide to CCD image enhancement for PCs.
 - This is a great book to read on CCD imaging processing.
 - Book includes AIP245 Astronomical Image Processing software
- *The Art and Science of CCD Astronomy*, David Ratlidge, <http://www.astrovid.com/CCDBOOKS.HTM>
 - 12 chapters by different authors about their CCD experiences.
- *CCD Astronomy Construction and Use of an Astronomical CCD Camera*, Christian Buil
 - An intermediate to advanced understanding of CCD camera design, operation and imaging processing.
 - <http://www.astrovid.com/CCDBOOKS.HTM>
- *The CCD Camera Cookbook*, Richard Berry, Veikko Kanto & John Munger, <http://www.wvi.com/~rberry/books.htm>
 - This book shows you how to build your own CCD camera.
 - Subscribe to *The Cookbook Camera Newsletter*, Richard Berry. <http://www.wvi.com/~rberry/cookbook.htm>
- A Practical Guide to CCD Astronomy, Patrick Martinez and Alain Klotz
 - A guide to choosing and using CCD cameras for amateur astronomers
- *Electronic Imaging in Astronomy - Detectors and Instrumentation*, Ian S. McLean
 - This book covers how professional observatories use CCDs and other imaging devices
- *FOSTER CCD Imaging Series*, Software Bisque, <http://www.bisque.com/thesky>
 - Covers the fundamental requirements for obtaining good CCD images.
- Astronomical Equipment for Amateurs, Martin Mobberley
 - Chapter 8 is on electronic imaging, 43 pages
- Amateur Telescope Making, Stephen F. Tonkin
 - Chapter 14 is on Building and Using a Cookbook CCD Camera by Al Kelly, 14 pages
- Splendors of the Universe : A Practical Guide to Photographing the Night Sky, Terence Dickinson, Jack Newton, Terence Dickinson
 - This guide covers all aspects of astrophotography including CCD imaging
- Deep Space CCD Atlas: North and South books by John Vickers
 - A good reference of CCD images to verify your objects
 - P.O.B. 1292 Duxbury, MA 02331

Book Stores

- Willmann-Bell, Inc. <http://www.willbell.com>
 - Large astronomy book vendor, Most of the above CCD books can be order from Willmann-Bell,
- Amazon.com book store online search, <http://www.amazon.com/>
- Powells a local Portland book store with online search, <http://www.powells.com/>

CCD Astronomy Magazine

- CCD Astronomy was published from spring 1994 to winter 1997 with four issues per year.
- Obtain the back issues of CCD Astronomy from Sky Publishing Corp., <http://www.skypub.com>
 - Especially summer 1995 for the article *Starting Out Right* by Douglas George.
 - This is a must to read article for anyone starting in CCD imaging.
 - Also, this article is online at <http://www.skypub.com/imaging/ccd/startout.html>
- Sky Publishing Corp. CCD Astronomy articles are online at <http://www.skypub.com/imaging/ccd/ccd.shtml>

Special thanks for those who sent me their URLs and for Gene A. Lucas, IAPPP-Western Wing Editor, in his extra effort in helping update this CCD reference list.

CCD Astroimaging Magazine Articles

- *Amateur Telescope Making Journal*, Email: capt9999@aol.com
 - Issue #13, Telescopes for CCD Imaging (Revisited) by Richard Berry
 - Issue #12, Noise in CCD Cameras by Richard Berry
 - Issue #11, CCD Imaging In Color by Richard Berry
 - Issue #8, Imaging on a Mountaintop - Telescopes for CCD Imaging Part IV by Richard Berry
 - Issue #7, Telescopes for CCD Imaging Part III by Richard Berry
 - Issue #6, Telescopes for CCD Imaging Part II by Richard Berry
 - Issue #5, Telescopes for CCD Imaging by Richard Berry
- *Astronomy Explore the Universe Magazine*, <http://www.kalmbach.com/astro/astronomy.html>
 - 1999 5th Edition, From Darkroom to Digital
- *Astronomy Magazine*, <http://www.kalmbach.com/astro/astronomy.html>
 - 1999 September, Adaptive Optics Meet CCDs
 - 1998 April, CCD Cameras Get Savvy, ST-7 & ST-8
 - 1997 February, In Search of Faint Galaxies
 - 1996 December, Piece-by-Piece Astrophotography
 - 1996 March, Beyond the Visible with CCDs
 - 1996 Observer's Guide 11991996, Shooting the Sky With an Electronic Camera
 - 1995 September, Tune Up Your Telescope for CCD
 - 1995 February, Catching Comets with a CCD
 - 1994 September, Seeing & Believing (Don Parker)
 - 1994 August, Working in the Digital Darkroom
 - 1993 October, Over the Edge
 - 1993 April, The Digital Darkroom, "Printing" the Image
 - 1993 March, The Digital Darkroom, "Developing" the Image
 - 1992 February, Celestial Seeing: Three Imaging Technologies
 - 1991 August, Snapping the Planets Electronically
- *Astronomy Now Magazine*, <http://www.astronomynow.com/>
 - 1999 May, Recording an Eclipse on Video
 - 1999 March, The Digital Age
 - 1998 December, Finding the Position
 - 1998 September, A CCD Overview
 - 1998 June, CCD Sky: Supernova Patrol
 - 1998 May, Ultimate Observing, Tom Puckett Observatory
 - 1998 March, The Celestron Fastar SCT
 - 1998 March, CCD Sky, General Tips
 - 1998 January, Observations from Portugal, Pedro Re CCD setup
 - 1997 December, CCD Sky: Processing Images
 - 1997 November, An Eyepiece Camera - MX5
 - 1997 September, CCD Sky: Finding Faint Objects
 - 1997 June, CCDs - The Next Quantum Leap
 - 1997 March, CCD Sky, Celestron Pixcel 255 Camera
 - 1997 March, CD-ROM CCD Images
 - 1996 December, Planetary Imager (Don Parker)
 - 1996 September, CCD Time Machines
 - 1996 June, Terry Platt Interview (inventor of the Starlight Xpress CCD cameras)
 - 1995 October, From Camera and Film to CCD and Disk
 - 1995 September, Stars in CCD Color
 - 1995 June, By the Light of a Pixelled Moon
 - 1995 April, Incredible Skies Captured by CCD

- *Sky & Telescope* Magazine, <http://www.skypub.com>
 - 1999 August, A First Look: SBIG's Enhanced ST-7E CCD Camera
 - 1999 August, Video of the Stars (Astrovid 2000)
 - 1999 July, Under One Roof (MaxIm DL)
 - 1999 June, Expanding the View
 - 1999 May, Going to the Limit
 - 1999 March, Warming Up to Digital Imaging
 - 1999 March, Sentinel of the Sky
 - 1999 February, Building a Fiber-Optic Spectrograph
 - 1998 December, True-Color CCD Imaging
 - 1998 November, Astrophotography with a Twist, Digital Image Processing
 - 1998 November, Better Resolution Through Technology, SBIG AO-7
 - 1998 July, Digital Desktop Darkroom
 - 1998 June, QuickCam Astronomy
 - 1998 May, Limiting Magnitudes for CCDs
 - 1998 February, The Starlight Xpress MX5
 - 1998 February, CCDs, Small Scopes, and the Urban Amateur
 - 1997 December, Measuring the Sky with CCDs
 - 1997 October, Visiting Grove Creek Observatory
 - 1997 October, Test Report: Celestron's PixCel 255 CCD Camera
 - 1997 September, Test Report: Meade's Pictor 208XT and 216XT
 - 1997 August, Test Report: Meade's Pictor 201XT Autoguider
 - 1997 August, A CCD Camera Buzzword Primer
 - 1997 July, Digitally Enhance Your Astrophotos
 - 1997 June, Of Pixel Size and Focal Reducers
 - 1997 May, A Do-It-Yourselfer's Primer for Digital Deep-Sky Imaging
 - 1997 January, Amateurs and the CCD Revolution
 - 1996 July, Test Report: SBIG's ST-7 Camera
 - 1995 August, Backyard Astronomy: Guiding for Sky Photography
 - 1994 April, Image Processing in Astronomy
 - 1993 April, An Astrophotographer's Dream Home (Jack Newton)
 - 1993 February, The Limiting Magnitude of a CCD Camera
 - 1991 March, Test Report: An advanced CCD imaging camera for amateurs (Lynxx-PC Plus)
 - 1990 October, Camcorder Assist for Planetary Observers
 - 1990 September, Test Report: A Versatile CCD for Amateurs (ST-4)
- *Sky & Space* Magazine, Australia Magazine +61 2 9369 3344
 - 1997 June, Technical Tips - LunaCam I and II
 - 1997 February, Test Report: SBIG ST-7 by Ted Dobosz
- *Vision Systems Design* Magazine, <http://www.vision-systems-design.com>
 - 1998 June, Off-The-Shelf Software Provides Astronomy Researchers with Deblurred Images
- Back issues of *Observatory Techniques* Magazine, (605) 226-1078, Email: otm@midco.net. This magazine is not being published in any more. Issues 1 - 23 were published and had information on CCD imaging.

CCD Astroimaging Video Tapes

- M51: the Movie!, Richard Berry, <http://www.wvi.com/~rberry/rberry.htm>
 - A two-hour VHS tape includes imaging Orion with the Cookbook 245 camera, image processing and other information.
- Oct. 1995 Imaging the Sky conference and other CCD videos, STV Press & Video, Tom Cleveland (800) 493-3005
 - <http://www.thinkvideo.com/astronomy.html>
- Astroimage 1995 conference video tapes, Orange County Astronomers, CA <http://www.chapman.edu/oca/special.html>
 - John Sanford johnsan@sosinet.net
- 1996 Santa Barbara Instrument Group CCD Imaging Conference video tapes
 - Keith Gaskins, SBIG (805) 969-1851, <http://www.sbig.com>
 - Try to obtain the only ST-4 tape if you are just starting to use the ST-4.

CCD Astroimaging Equipment, Software & Suppliers

- Adirondack Video Astronomy , <http://www.astrovid.com/>
 - Starlight Xpress cameras
- Apogee Instruments, <http://www.apogee-ccd.com/>
 - Apogee CCD cameras
- Audine cameras
 - French and English language Audine web site <http://astroccd.com/terre/audine/>
 - Genesis CCD camera (Audine compatible) <http://www.genesis16.net>
 - Canadian web site on the Audine cameras <http://www.nseaa.com/audine.html>
- AstroPIX Image Processing Software for the CCD Camera Cookbook <http://www.wvi.com/~rberry/astropix.htm>
 - CB245, Multi245 & Qcolor CCD image processing software
- AstroArts <http://www.astroarts.co.jp/index.html>
 - StellaImage2 image processing software
- Astro-Software (not English) <http://coelum.com/software/software.htm>
- Axiom Research, <http://www.axres.com/>
 - MIRA image processing software
- Bruce Johnston Computing, <http://members.aol.com/BJohns7764/BJCfix.htm>
 - SuperFix & MegaFix CCD image processing software
- Celestron, <http://www.celestron.com>
 - CCD camera vendor
- Cookbook CCD Camera Home Page, <http://www.wvi.com/~rberry/cookbook.htm>
 - Lots of CCD articles in the text information database <http://www.wvi.com/~rberry/textinfo.htm>
 - Very large Frequently Asked Questions (FAQ) section <http://www.wvi.com/~rberry/cb245faq.htm>
 - Lots of useful information on building a Cookbook Camera
- Cyanogen Productions, Inc. <http://www.cyanogen.com>
 - MaxIm DL CCD image processing software, videotape on imaging comets, titled "A Comet Odyssey"
- Earth Centered Universe (ECU) software and digital setting circle kits by David Lane
 - <http://www.nova-astro.com/>
- Hale Research Ltd, CCD cameras, <http://www.haleresearch.com/>
 - CCD camera vendor
- Intricate Micro Systems, <http://www.intricate-ms.com/>
 - Win245 - Image Acquisition Software
- IRAF is the Image Reduction and Analysis Facility, <http://iraf.noao.edu/>
 - A general-purpose software system for the reduction and analysis of astronomical data for UNIX & LINUX.
- Meade, <http://www.meade.com/>
 - CCD cameras and image processing software
- Murnaghan Instruments, <http://www.murni.com>
 - Flip mirrors & optical filters
- Optec, Inc., <http://www.optecinc.com>
 - Telecompressor lens for CCD cameras, PC-controllable filter slides/filter wheels and pre-viewer equipment
- PixelVision <http://www.pv-inc.com/>
 - CCD camera vendor & tutorials
- Santa Barbara Instrument Group (SBIG), <http://www.sbig.com>
 - CCD camera vendor
- Scientific Imaging Technologies, Inc. <http://www.site-inc.com>
 - High end CCD IC manufacturer
- Software Bisque, <http://www.bisque.com/>
 - CCDSoft image processing software
- Software Systems Consulting <http://ssccorp.com/index.htm>
 - CCD Astronomical Software Tools
- SpectraSource Instruments, <http://www.spectrasource.com/>
 - CCD cameras
- Starlight Xpress, <http://www.demon.co.uk/astronomer/sxadd/index.html>
 - Starlight Xpress CCD cameras

- Also check Adirondack Video Astronomy <http://www.astrovid.com/>
- What In The World shop in Lake Arrowhead, CA, Bob Bell <http://www.whatintheworld.com>
 - Supplier of CCD imaging products, including a focusing aperture cover & articles on CCD imaging
- Willmann-Bell, Inc. <http://www.willbell.com/ccd/ccd5.htm>
 - CCD Cookbook camera book & upgrade (245Plus) <http://www.willbell.com/ccd/camcookupg.htm>

CCD Astroimaging Web Articles

- *Astronomy* magazine Image Processing article, <http://www.kalmbach.com/astro/Bytes/ImageProc.html>
- Apogee CCD University, <http://www.apogee-ccd.com/ccdu.html>
- Dr. Arne Henden of Naval Observatory-Flagstaff has a tutorial on beginning CCD photometry
 - Dr. Henden is the co-author with Dr. Ronald Kaitchuck of the standard reference book, "Astronomical Photometry", which is being updated. Software for photometry <http://www.flagstaff.az.us/~ccdir/tutorial.html>
- Image Processing in Astronomy Education <http://www.phy.duke.edu/~kolena/talks/aapt99.html>
 - A talk presented at the January 1999 meeting of the American Association of Physics Teachers Anaheim, CA
- PixelVision <http://www.pv-inc.com/>
 - CCD tutorials
- Richard Berry, <http://www.wvi.com/~rberry/cookbook.htm>
 - Lots of good CCD articles in <http://www.wvi.com/~rberry/textinfo.htm>
 - *How CCDs Challenge Your Telescope, Refractor or Reflector, Tune Up Your Drive, etc.*
- Sky Publishing Corp. CCD Astronomy articles are online at <http://www.skypub.com/imaging/ccd/ccd.shtml>
- SITE CCD tutorial <http://www.site-inc.com/tutorial.htm>
- U. of Virginia
 - History of Photometry in Astronomical Observations <http://www.astro.virginia.edu/~afs5z/photometry.html>
 - History of Photography in Astronomical Measurements <http://www.astro.virginia.edu/~afs5z/photography.html>
 - Virtual Museum of Measuring Engines <http://www.astro.virginia.edu/~afs5z/engines.html>

CCD Astroimaging Computer CD-ROMs

- *CCD Imaging CD-ROM*, Software Bisque, <http://www.bisque.com/thesky>
 - Includes *FOSTER CCD Imaging* electronic book.
 - Before and after processed images
 - SkyPro CCD astronomy software demo (V2.04) with over 1,000 sample images taken with a wide range of optical instruments.
- *The Ultimate CCD Collection*, Images by Jack Newton & Don Parker
 - SkyPro CCD astronomy software demo (V2.04) with over 300 color images.
 - Images are provided in 24-bit TIFF, JPEG and 8-bit bitmap files.
 - <http://www.bisque.com/thesky>
- *Deep Sky Imaging Using a CCD*, Pedro Re, Kunihiko Okano, Dennis Luse, Rik Blondeel, Michael Purcell, William McLaughlin and Luc Vanhoeck, http://ourworld.compuserve.com/homepages/Luc_Vanhoeck/ccd.htm
 - Also try, <http://www.astrovid.com/CCDBOOKS.HTM>
- CCD DEEP SKY ATLAS by PEDRO RE'
 - <http://www.astrovid.com/CCDBOOKS.HTM>

CCD Astroimaging Conferences and Presentations

- Imaging the Sky conferences, http://www.rca-omsa.org/its_99/its99_info.htm
- AstroImage conferences by the Orange County Astronomers, <http://www.chapman.edu/oca/special.html>
- The IAPPP-Western Wing holds an annual Astronomical Photometry and CCD Imaging Conference at Lake Arrowhead, California, just before the Riverside Telescope Makers Conference (<http://www.rtmc-inc.org/>), which is held at nearby Camp Oakes in Big Bear, California. Next year's IAPPP-West conference will be held at the Lake Arrowhead Resort, CA on Wednesday and Thursday, May 24 and 25, 2000. Tentative plans include a half-day workshop on photometry on Wednesday, May 24th, and a full day of speakers on photometry and CCD imaging on Thursday, May 25. Hands-on, nighttime demonstrations of the latest CCD hardware and software are planned for both Wednesday and Thursday nights. <http://www.iappwest.org>

CCD Astroimaging Email List Servers

- CCD list send **subscribe** to ccd-request@wwa.com
- Santa Barbara Instrument Group (SBIG) list send **subscribe** to sbiguser-request@lists.best.com

CCD Astroimaging Images on the Web (Also check Astroimaging Astronomer's Web Sites below)

- Cookbook CCD Camera Image Gallery, <http://www.wvi.com/~rberry/gallery.htm>
- CCD Images of Messier Objects, <http://zebu.uoregon.edu/messier.html>
- SBIG CCD Image Gallery, <http://www.sbig.com>
- Software Bisque Cool Images, <http://www.bisque.com/thesky>
- Grove Creek Observatory, <http://www.gco.org.au/images.html>
 - ST-4, ST-5 and ST-6 images

CCD Astroimaging Astronomer's Web Sites

- Bartels, Mel <http://www.efn.org/~mbartels/>
 - Hale Research camera with SITE 502AB MPP camera images
- Berry, Richard <http://www.wvi.com/~rberry/cookbook.htm>
 - Author of many books, articles & software programs.
 - Richard is the Cookbook CB245 expert.
- Brewster, Jon <http://astro.brewsters.net>
 - Meade LX200 and 416XT techniques and images
- Burnell, James <http://www.frontiernet.net/~burnell/>
 - Cookbook CB245 camera images and Prep245 imaging processing software for the CB245
- Carrico, Tom <http://www.proaxis.com/~carrico/main.htm>
 - SBIG ST-7 camera images
- Catterall, Adrian Modern Observatory <http://www.observatory.demon.co.uk/>
 - Hale Eac512 & SBIG ST-8 camera images
- Cole, Michael The Urban Imager <http://www.pacifier.com/~mcole/interest.htm>
 - SBIG ST-7 camera images
- Denny, Bob ? <http://www.acp.dc3.com>
 - Astronomer's Control Panel software
- Dillinger, Don <http://www.serv.net/~dillingr/>
 - Meade Pictor 416xt CCD camera, SBIG ST-8 camera & Starlight Express MX916
- Girard, Jim <http://www.teleport.com/~argo/>
 - SBIG ST-7 camera images
- Graham, Glenn Imaging Web Page, <http://www.easystreet.com/rca/members/graham/graham.html>
 - Meade Pictor 216xt camera images
- Haworth, David, <http://www.stargazing.net/david/>
 - Cookbook CB245 camera images of 70 Messier objects with a small refractor
- Hoot, John <http://ssccorp.com/index.htm> or <http://ssccorp.com/astrostf.htm>
 - Image processing software, spectroscopy software and notes on constructing an objective grating spectroscope, and software and products for receiving weather satellites.
 - 1999 AstroImage'99 talk on acquiring time-lapse CCD images and creating animated GIFs <http://www.chapman.edu/oca/ai99/hoot.htm>
- Johnson, Wayne <http://www.chapman.edu/oca/benet/mrgalaxy.htm>
 - Web site devoted to Supernova searching, which features a number of CCD images of galaxies and SNe.
- Jones, Greg <http://hometown.aol.com/gregj888/DAC/DAC.htm>
 - No CCD images yet but some information on the adaptive optics and scope project.
- Kelly, Al <http://www.ghg.net/akelly>
 - Cookbook CB245 camera images
- Kenyon, Dave <http://www.vfr.net/~drdkccd/>
 - SBIG ST-7 camera images and CCD articles
- LaBelle, George <http://www.teleport.com/~glabelle/>
 - SBIG ST-8E camera images
- Lodriguss, Jerry <http://www.astropix.com/INDEX.HTM>
 - Film images and digital imaging techniques articles
- Luse, Dennis <http://www.teleport.com/~gemini/>
 - SBIG ST-7 camera images
- MacQuarrie, Jeff <http://members.aol.com/tchphysics/index.htm>

- Cookbook CB245 camera images
- McLaughlin, William <http://www.harborside.com/home/n/ngc253/>
 - Author of the *Astronomy Magazine* article *In Search of Faint Galaxies*.
 - SBIG ST-7 & ST-8e camera images & articles
- Mobile Astronomical Society <http://hometown.aol.com/RMOLLISE/index.html>
 - Astrovideography
- Okano, Kunihiko <http://www.asahi-net.or.jp/~rt6k-okn>
 - SBIG ST-7E camera images, DDP image processing techniques and images
- Polakis, Tom <http://www.psiaz.com/polakis/>
 - SBIG ST-7 camera images & articles
- Puckett, Tim <http://www.cometwatch.com>
 - Apogee AP7 camera images
- Rushford, Mike <http://www.hooked.net/~tvs/eyes/> or <http://sunmil1.uml.edu/eyes.index.html>
 - LINUX-powered web site "Eyes in the Skies", featuring live solar images with an automated telescope, with lots of links and information on using LINUX
- Stephens Robert <http://home.earthlink.net/~rdstephens/index.htm>
 - SBIG ST-7 camera images
- Torres, Jose <http://www.dogtech.com/ccdast>
 - SBIG ST-7 camera images
- Vanhoeck, Luc http://ourworld.compuserve.com/homepages/Luc_Vanhoeck/
 - SBIG ST-8 camera images
- Vaughn, Chuck <http://www.aa6g.org/astro.html>
 - Astrophotography
- Wallis, Brad <http://www.frazmtn.com/~bwallis>
 - SBIG ST-7 camera images
- Weichel, Steen <http://home.worldonline.dk/~jsrsw/index.htm>
 - Comparison of the general properties of CCD-cameras for astronomical use
 - Cookbook CB245 camera images
- West, Rob <http://members.aol.com/wmti/ccd.html>
 - Cookbook CB245 camera images
- Wong, Alison <http://home.earthlink.net/~alsonwong/index.htm>
 - Astrophotography with a ST-4 autoguider
- Wisniewski, Jan <http://www.freeyellow.com/members7/jwisn>
 - Cookbook CB245 images & CCD mosaics

List of Astronomy Lists

- *Astronomy Magazine's* list of links, <http://www.kalmbach.com/astro/HotLinks/HotLinks.html>
- Brad Wallis and Robert Provin ASTRO IMAGING LINKS PAGE <http://voltaire.csun.edu/links.html>
- Dennis Luse's list of links, <http://www.teleport.com/~gemini/pages.htm>
- Mel Bartels's list of links, <http://www.efn.org/~mbartels/>
- More Info on CCDs and Astronomical Image Processing <http://www.phy.duke.edu/~kolena/talks/moreinfo.html>
- OPTEC's list of links. <http://www.optecinc.com/astronomy/links.html>
- Rick, Bright very large list of astrophotography links http://www.fred.net/rick_b/
- *Sky & Telescope Magazine* list of links, <http://www.skypub.com/links/astroweb.shtml>

Organizations

- International Amateur-Professional Photoelectric Photometry (IAPPP)
 - <http://www.iappp.vanderbilt.edu> or <http://www.dyer.vanderbilt.edu>
- International Occultation Timing Association (IOTA) <http://www.lunar-occultations.com/iota/iotandx.htm>
 - Lunar occultation web site for information on using real-time video cameras for occultations