First Light

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Mooncusser's 21st Century Almanac

By Jim Carlson

First Quarter – Fri. May 05 at 01:15 EDT
Full Moon – Sat. May 13 at 02:53 EDT
Last Quarter – Sat. May 20 at 05:22 EDT
New Moon – Sat. May 27 at 01:27EDT

Object	May 01 (EDT)	May 16 (EDT)	May 30 (EDT)
Sun	R: 05 37 S: 19 39	R: 05 20 S: 19 54	R: 05 09 S: 20 08
Mercury	R: 05 04 S: 18 02	R: 05 13 S: 19 41	R: 05 57 S:21 27
Venus	R: 04 02 S: 15 54	R: 03 44 S: 16 20	R: 03 28 S: 16 50
Moon	R: 08 00 S: 23 23	R: 23 58 S: 07 30	R: 08 54 S: 23 17
Mars	R: 09 08 S: 00 27	R: 08 52 S: 00 01	R: 08 39 S: 23 33
Jupiter	R: 19 42 S: 06 01	R: 18 33 S: 04 57	R: 17 26 S: 03 53
Saturn	R: 11 15 S: 01 52	R: 10 20 S: 00 52	R: 09 28 S: 23 57
Uranus	R: 03 28 S: 14 41	R: 2 30 S: 13 45	R: 01 32 S: 12 47
Neptune	R: 02 25 S: 12 39	R: 01 27 S: 11 40	R: 00 24 S: 10 41
Pluto	R: 22 41 S: 08 53	R: 21 41 S: 07 53	R: 20 40 S: 06 53

May 2006 Events (UT)

02 – Mars 4° south of the Moon.

04 – CCAS meeting. Club President Mike Hunter, having recently returned from Australia, will talk about "Observing Down Under."

04 – Saturn 4° south of the Moon. Jupiter at opposition.

05 – Eta Aquarid meteor shower peaks at approximately 00:00 EDT.

07 – Moon at apogee (251,389 miles).

11 – Spica occulted by the Moon at 00:00 UT (19:00 EDT on the previous day, the 10th).

12 – Jupiter 5° north of the Moon.

17 – Mercury at ascending node. Venus at aphelion.

18 – Mercury at superior conjunction.

19 – Mars at greatest northern heliocentric latitude. Neptune 4° north of the Moon.

21 – Mercury at perihelion. Uranus 1° north of the Moon near sunrise.

22 – Moon at perigee (229,042 miles). Neptune stationary.

24 – Venus 4° south of the Moon.

25 – Mars 5° south of Pollux.

31 – Mars 3° south of the Moon. Vesta occulted by the Moon at approximately 07:00 EDT. Saturn 4° south of the Moon.

Sources: TheSky6, Software Bisque; Observer's Handbook 2006, Royal Astronomical Society of Canada

CCDs

Jim Carlson

Few innovations have had as much impact on astronomy as CCDs. A typical charge-coupled device is capable of detecting 40 to 50% of the incoming light, an efficiency, which at its peak, is 25 times greater than film. The most expensive CCDs are supercooled to record 98% of the incident light. The benefit is shorter exposures and the ability to process and manipulate images with software, thus revealing more about the nature of the object being observed.

A CCD is a silicon chip, similar to the chip in a computer. It contains an array of picture elements, or pixels, each of which is composed of a device called a capacitor (more technically, a metal-oxide semiconductor capacitor). At the beginning of an exposure the capacitors are initialized with a standard charge. When the shutter is opened a photon hits the silicon, dislodging an electron and altering the initial charge on the capacitor. After the exposure is completed, the modified charge is read out and a photograph produced. No dark rooms are involved and no chemical emulsions that require careful monitoring; it is all done electronically with circuits and digitization.

The CCD camera at the observatory is called an SBIG ST-8XE, manufactured by the Santa Barbara Instrument Group in California. Kodak makes the chip. It has an array of 1530 x 1020 capacitors (or pixels), which can be reduced to 765 x 510 or 510 x 340. Each capacitor in the array is capable of storing 100,000 photons, allowing for photographs of