The Lunar Reconnaissance Orbiter Camera (LROC) is a system of three cameras onboard the Lunar Reconnaissance Orbiter (LRO): Two Narrow Angle Cameras (NACs) that capture 0.5 meter-scale panchromatic images over a 5 km swath at 50 km altitude, a Wide Angle Camera (WAC) that captures images in seven color bands at 100 meters/pixel over a 60 km swath at 50 km altitude, and a Sequence and Compressor System (SCS) that supports communications between the cameras and the spacecraft. The LROC cameras, built by Malin Space Science Systems, have been in orbit around the Moon since 2009, alongside seven other instruments, as part of the LRO mission.

LROC was originally designed to achieve eight measurement objectives during the LRO Exploration Mission phase: 1) Find potential landing sites; 2) map regions of permanent shadow or illumination; 3) create high-resolution maps of polar massifs; 4) observe regions from multiple angles to derive high-resolution topography; 5) improve maps of mineralogical components of the lunar crust; 6) create a global morphology base map; 7) characterize the regolith; 8) determine impact hazards. These objectives were created in preparation for future human and robotic lunar flights in contribution toward NASA's goals for the Moon, Mars, and beyond.

Following the highly successful completion of initial objectives, LROC adjusted its focus, addressing further lunar science in chronology and bombardment history, crustal evolution, regolith evolution, and polar volatile content. Now, more than a decade after launch, the LROC team continues to explore our beautifully enigmatic Moon, expanding on an already enormous amount of collected lunar data and helping humankind prepare for future crewed and robotic missions.

ser.sese.asu.edu — quickmap.lroc.asu.edu — apollo.sese.asu.edu — tothemoon.ser.asu.edu
### LROC Science Team

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### Narrow Angle Cameras Specifications

- **Pixel Scale**: 0.5 meter* (10 micro-radian IFOV)
- **Maximum Image size**: 2.5 x 26 km*
- **Optics**: f/3.59 Cassegrain (Ritchey-Chretien)
- **Effective FL**: 700 mm
- **Primary Mirror Diameter**: 195 mm
- **FOV**: 2.85° per NAC
- **MTF (@Nyquist)**: > 0.23
- **Structure + baffle**: graphite-cyanate composite
- **Detector**: Kodak KLI-5001G
- **Pixel format**: 1 x 5,064
- **Noise**: 76 e-
- **A/D Converter**: Honeywell ADC9225
- **FPGA**: Actel RT54SX32-S
- **Mass**: 8.2 kg per NAC
- **Volume**: 70 cm x 27 cm diameter
- **Peak Power**: 9.3 W
- **Average Power**: 6.4 W
- **Sensitivity**: 400-750 nm
- **Voltage**: 28 V DC
- **Radiometric Accuracy**: 1% relative, 10% absolute
- **Detector Digitization**: 12-bit, encoded to 8-bit

* At an altitude of 50 km

### Wide Angle Camera Specifications

- **Image Format**: 1024 x 14 pixels monochrome (push frame)
- **Pixel Scale**: 1.50 milli-radian, 75 m/pix* (visible)
- **Image Frame Width (km)**: 105 km* (visible monochrome)
- **Optics**: f/5.05 (visible)
- **Effective FL**: 6.0 mm (visible)
- **Entrance Pupil Diameter**: 1.19 mm (visible)
- **FOV**: 92° (monochrome)
- **MTF (@Nyquist)**: 0.37
- **Electronics**: 4 circuit boards
- **Detector**: Kodak KAI-1001
- **Pixel format**: 1024 x 1024
- **Noise**: 66±4 e−
- **Mass**: 0.9 kg
- **Volume (W×L×H)**: 15.8 cm x 23.2 cm x 32.3 cm (incl. radiator)
- **Peak Power**: 2.7 W
- **Average Power**: 2.6 W
- **Filters (nm)**: 321, 360, 415, 566, 604, 643, 689
- **Detector Digitization**: 11-bit, encoded to 8-bit

* At an altitude of 50 km

From left to right: LROC NAC front looking down the barrel, back of NAC viewing the electronics, side view (and 45 deg. view) of WAC, electronics, and radiator (behind).