OSIRIS-REx Camera Suite (OCAMS)
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Synopsis: OSIRIS-REx is a New Frontiers mission that will launch in September 2016 and rendezvous with asteroid 1999RQ36 in 2018. The goal of the mission is to retrieve a surface sample of this carbonaceous asteroid and return it to Earth. To further this goal, the asteroid must be mapped to find a sampling site that is both safe and scientifically interesting. OCAMS is a set of three cameras designed to support the mission through all its phases from approach to sample collection (shown below).

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Launch</td>
</tr>
<tr>
<td>2019</td>
<td>Outbound Cruise (672 days)</td>
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<tr>
<td>2019</td>
<td>R236 Acquisition (615/19)</td>
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<tr>
<td>2019</td>
<td>Approach (67 days)</td>
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<tr>
<td>2019</td>
<td>Survey (48 days)</td>
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<td>2019</td>
<td>Orbit (63 days)</td>
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<tr>
<td>2019</td>
<td>Reconnaissance (64 days)</td>
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<tr>
<td>2019</td>
<td>Rehearsal (43 days)</td>
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<tr>
<td>2019</td>
<td>Sample Collection (10 days)</td>
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<tr>
<td>2020</td>
<td>Asteroid Operations (95 days)</td>
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<td>2020</td>
<td>Operations Margin (28 days)</td>
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<tr>
<td>2020</td>
<td>Return Cruise (934 days)</td>
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<tr>
<td>2021</td>
<td>Earth Return (9/24/23)</td>
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</tbody>
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PolyCam:
- f/3.1, 630 mm narrow angle Ritchey-Chretien
- Aperture = 200 mm
-IFOV = 13.6 μrad, FOV 0.8x0.8°
- Focusable from 200 m to inf
- Navigation aid
- Photometry as point source
- Shape model provider
- High resolution examination of regolith—sub-cm
- Help choose sampling site

MapCam:
- f/3.4, 125 mm refractor
- IFOV = 68 μrad, FOV = 4x4°
- 4-color plus 1-panchromatic filters, diopter to focus at 30 m
- Maps surface for safety and scientific interest
- Searches for companions
- Photometry
- Shape model provider
- Search for dust plumes
- High resolution color ratio maps
- Help choose sampling site

SamCam:
- f/5.6, 24 mm wide angle lens
- FOV = 22°
- Produce video of sample collection sequence
- Examine the surface dust on the collection pad

Camera Control Module:
- Fully redundant system
- Interface between s/c and cameras
- Sends housekeeping and science data to s/c

Summary: The OCAMS was specifically designed to meet the needs of the OSIRIS-REx mission, it utilizes proven concepts to deliver performance in critical phases of the O-R mission. The 3 cameras offer overlapping capabilities so that with the loss of one camera another can take its place although at a different range. Each camera has an identical focal plane array with a CCD of 1024x1024 pixels. The focal planes are cooled by the white radiators that are labeled in the graphic; after all, the thermal environment at the dark asteroid (R~0.03) is quite hot. Two cameras can be powered at once and high and low resolution images can be alternated.