Comet 17P Holmes Outburst

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Abstract

Comet 17P Holmes has recently undergone an outburst with its magnitude increasing from an ambient magnitude of 17 to a visual 2nd magnitude star. This presents a unique perspective to study an unusual phenomena as the comet is almost directly in opposition from the sun. Consequently the tail is oriented nearly directly away from us where the solar wind will sweep material away and allow us a most unhindered view of its head. The comet is over 2 AU’s from the Sun and normally would not be nearly as bright under normal circumstances. This presents a rare opportunity to investigate what processes are in action to produce such a dynamic change in brightness. My proposal therefore is to utilize the exceptional resolution of the Wide Field Planetary Camera 2 to look for detailed phenomenon occurring near the nucleus that it would yield information leading to a better understanding of this outburst.
### Observing Summary:

<table>
<thead>
<tr>
<th>Target</th>
<th>RA</th>
<th>DEC</th>
<th>V</th>
<th>Configuration, mode, aperture spectral elements</th>
<th>Total orbits</th>
<th>Flags</th>
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</thead>
<tbody>
<tr>
<td>COMET 17P HOLMES</td>
<td>03 53</td>
<td>49 39</td>
<td>2.7</td>
<td>WFPC2 IMAGING Unknown</td>
<td>3</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td>Grand total orbit request</td>
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<td></td>
</tr>
</tbody>
</table>
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■ **Scientific Justification**

This Comet has presented an opportunity to study an outburst which is uncommon and not well understood. The study will consist of 3 images on successive orbits to observe changes in the Comet which may lead to a better understanding of the outburst. It may be possible to resolve movements in the region of the nucleus to determine the cause of the outburst and thus better insight as to how other comets may be similar. Relatively little time is consumed with potentially valuable results. The Comet may be out gassing. If this is so, then the primary task will be to see if it is possible to identify the out-gassing in the images, which is the reason for taking multiple images. It will be of prime consideration to observe the motion to measure the changes that are occurring, possibly leading in back to the exact source of the phenomena. Some speculation has been expressed that this might also be the result of a collision with orbiting objects in the region. If this is so then it will be an opportunity to find evidence of solar system collisions either through divergent material or objects leaving evidence of their collision.

■ **Description of the Observations**

The Comet is to be imaged with three (3) thirty second images being taken one on each orbit, centered on the head of the comet.

■ **Special Requirements**

The only special requirements are to schedule the images at the first available open time slot. Consequently the coordinates will change depending on the time of available orbits according to the ephemeris of the Comet.

■ **Coordinated Observations**

■ **Justify Duplications**

Since this is the first time that this comet has erupted since the launching of HST, this has not been done before on this comet.

■ **Previous HST Programs**

None