

The problem and the solution: The optics behind the Hubble 1st servicing mission

Kevin Thompson

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Resumo

A key to the success of the Hubble 1st Servicing mission was a creative concept put forth by Murk Bottema of Ball Aerospace. He realized that one of the 4 instrument “booths” could be replaced by an optical bench, which came to be called COSTAR, that positioned corrective mirrors in each of the three remaining instrument paths using remotely deployed arms that were designed and implemented at Ball. These new mirrors were by necessity off-axis aspheres that needed to be fabricated and placed essentially perfectly to meet the mission requirements. To support these needs, Dr. Thompson’s role was to develop both primary and backup optical designs for nulling optics (the source of the initial error) for use during the fabrication process. This talk will explain from an optics perspective the details of what caused the initial failure and details on what features and factors drove the optical design and testing process for these critical new components. Interspersed will be some of the inspiring images that have resulted from the successful correction.