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# AIAA HRS Technical Seminar Series

## STS-1 Forward RCS Oxidizer Tank Subsystem Preliminary Failure Assessment



The launch of the Space Shuttle Columbia on STS-1 marked the beginning of a new era in American spaceflight. It was the only crewed first flight of a launch vehicle to date, and was also the first crewed system to use large solid rockets as primary propulsion. A potential disaster was narrowly averted at liftoff when an ignition overpressure pulse swept up the Shuttle stack. The frequency of this transient shock wave exceeded pre-launch predictions, and resulted in high, alternating normal accelerations along the length of the vehicle. Among the results of this unexpected loading was failure of an oxidizer tank support strut in the orbiter's forward reaction control system module, which could have led to loss of the mission, crew, and vehicle. This particular incident is investigated in more detail using classical structural mechanics, and the results are discussed to provide additional insight.

Chauncey Wu is an Acquisition Manager in the Science Office for Mission Assessments, supporting the Science Mission Directorate. He started at NASA in 1985 as a co-op from Purdue, and graduated with a BS in 1988. He also earned an MS from the University of Illinois in 1990, and a PhD from the Delft University of Technology in 2006. His research interest is the design, analysis, manufacturing, and testing of advanced composite tow-steered structures.

Date: Thursday, November 19<sup>th</sup>, 2020 @ 1pm Eastern

Join by Zoom:

[https://aiaa.zoom.us/webinar/register/WN\\_nwHE7eLjRviSPN1IGAAAGg](https://aiaa.zoom.us/webinar/register/WN_nwHE7eLjRviSPN1IGAAAGg)

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