



NASA Conjunction Assessment Risk Analysis (CARA) Program

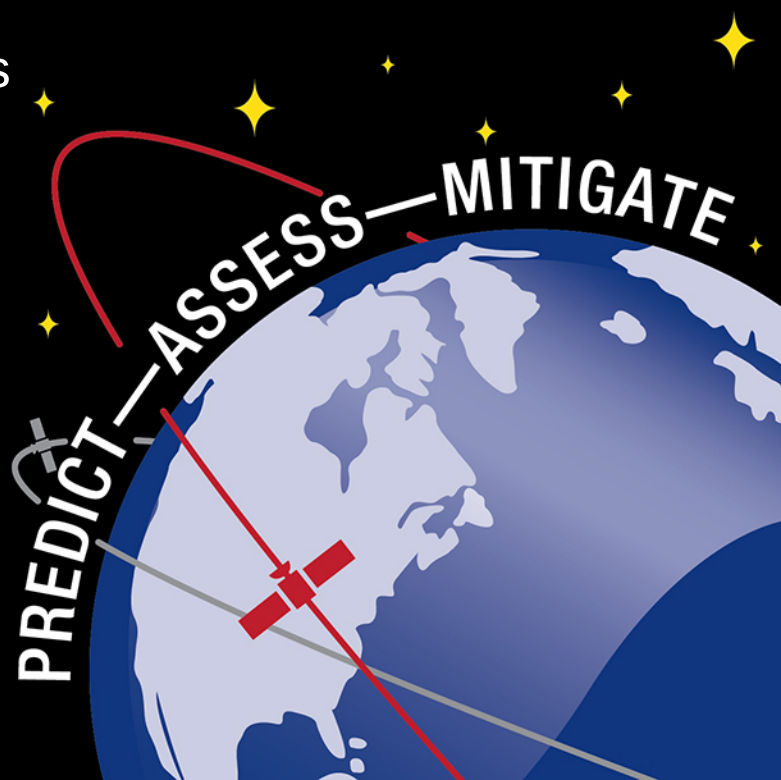
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NASA CARA

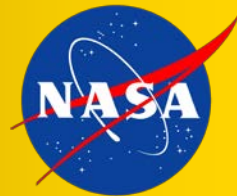
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NASA Conjunction Assessment

- NASA performs conjunction assessment risk analysis for safety of flight of all of its operational assets
 - Performed at NASA Johnson Space Center for human spaceflight
 - Performed by CARA at NASA Goddard Space Flight Center for all Agency uncrewed assets
- The Conjunction Assessment Risk Analysis (CARA) team currently provides service to ~65 operational satellites
 - NASA uncrewed assets
 - Foreign partner assets
 - Commercial assets



NASA Conjunction Assessment

- CARA receives Conjunction Data Message (CDM) alert messages from Orbital Safety Analysts at the 18th Space Control Squadron
 - 3x/day for low earth orbit, 2x/day for Geosynchronous
 - CARA analyzes each CDM to determine the risk posed to NASA assets
 - CARA recommends mitigation action to spacecraft operators if a threat exists
- Conjunctions are ranked by Pc thresholds into red/yellow/green categories
 - Red conjunctions are analyzed further to determine risk level and potential mitigation options
 - Yellow conjunctions are monitored until the time of closest approach
 - Green conjunctions are ignored unless they have an active secondary
 - CARA contacts owner/operator of active secondary to coordinate mitigation plans
- 0.2% of CDM alerts result in maneuver planning, 14% of planned maneuvers result in maneuver execution