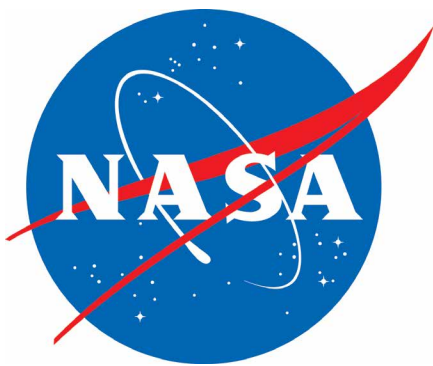
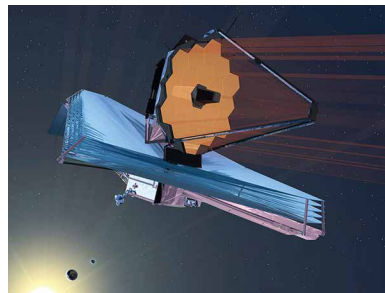
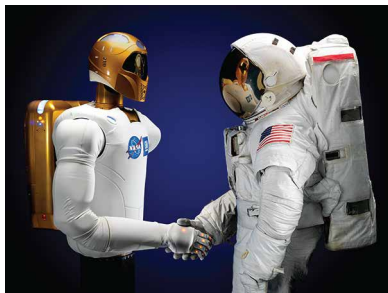
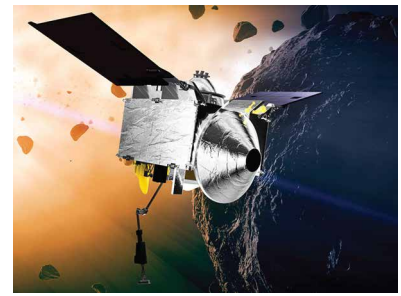


NASA's Independent Verification and Validation Program SYSTEM & SOFTWARE ASSURANCE

<https://www.nasa.gov/centers/ivv>



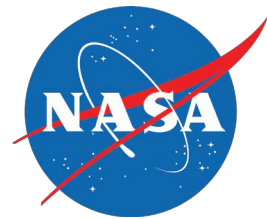
**Ensuring Safe, Reliable,
Secure Operation
of Safety & Mission
Critical Software**

The IV&V Program is an integral part of NASA's strategy for providing the highest achievable levels of safety, security, reliability and cost effectiveness in critical software systems.

NASA's IV&V Program

SYSTEM & SOFTWARE ASSURANCE

<https://www.nasa.gov/centers/ivv>



NASA's IV&V Program provides full lifecycle independent verification and validation and independent assessments for NASA's highest profile missions. IV&V leads to higher quality products, reduced risk, greater insight, reduced cost, and knowledge transfer. Metrics, customer surveys, and customer quotes consistently indicate high value.

What is IV&V?

Verification answers the question, "Are we building the product right?" Verification is the process of determining whether or not the software products of a given phase of the systems development lifecycle (SDLC) fulfill the established requirements for that phase.

Validation evaluates the software products throughout the SDLC to ensure those products meet the mission and customer's needs. Validation answers the question, "Are we building the right product?"

Independence in IV&V has three parameters: technical independence, managerial independence and financial independence.

IV&V Benefits

- Higher confidence that delivered products are error free and meet the user's needs.
- An increased likelihood of uncovering high-risk errors early in the development lifecycle.
- Delivery of ongoing status indicators and performance reporting to decision makers (e.g. program managers).
- Reduction of the need for rework from the developing contractor thereby reducing total costs to programs and projects.
- Facilitation of the transfer of system and software engineering best practices.

Current & Past IV&V Projects

CASSINI

COMMERCIAL CREW PROGRAM (CCP)

EUROPA

GROUND SYSTEMS DEVELOPMENT AND OPERATIONS (GSDO)

HUBBLE SPACE TELESCOPE

INSIGHT

ICE, CLOUD, AND LAND EVALUATION SATELLITE-2 (ICESAT-2)

INTERNATIONAL SPACE STATION (ISS)

JAMES WEBB SPACE TELESCOPE (JWST)

JOINT POLAR SATELLITE SYSTEM (JPSS)

LANDSAT 9

MARS 2020

MULTI-PURPOSE CREW VEHICLE (ORION MPCV)

PARKER SOLAR PROBE (PSP)

SPACE LAUNCH SYSTEM (SLS)

WIDE FIELD INFRARED SURVEY TELESCOPE (WFIRST)