

SwRI's integrated avionics control NASA's WISE spacecraft

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NASA's latest spacecraft, the Wide-field Infrared Survey Explorer (WISE), launched Dec. 14, carries an ultra-sensitive infrared instrument that will take nearly 1.5 million images of the sky at four wavelengths and provide key scientific data identifying the most luminous galaxies in the universe and the closest stars to the sun. WISE will also measure the diameters of more than 100,000 asteroids, including hundreds of near-Earth objects (NEOs). The spacecraft, built by Ball Aerospace and Technologies Corp. and Space Dynamics Laboratory, uses a cryogenically cooled detector that provides hundreds to hundreds of thousands of times greater sensitivity than has been achievable on previous survey missions.

Southwest Research Institute's SC-11 spacecraft control avionics unit is the brain of the [WISE spacecraft](#). The SC-11 is an integrated system providing complete command and control over spacecraft operations. The SC-11 interfaces with and controls all major spacecraft subsystems, including spacecraft command and data handling, payload data processing, closed-loop thermal control, power distribution, and attitude determination and propulsion. Additionally, the SC-11 provides a backup "safe mode" processor to ensure sun-safe orientation of the spacecraft in the event that the main processor should go offline.

"The ability of the SwRI avionics to provide a scalable and easily adaptable solution supporting both single string and redundant missions allows our customers to minimize their overall costs and maintain a common core architecture," says Buddy Walls, manager of Avionics

Systems in the SwRI Space Science and Engineering Division. "The SC-11 for the WISE mission is a great example of that process, which directly built upon the flight success of the DARPA Orbital Express program and provided a high degree of reuse for WISE."

In addition to offering spacecraft avionics and computers, Southwest Research Institute has extensive expertise in spacecraft instrument development and in both observational and theoretical space and planetary science. SwRI serves as the principal investigator institution for NASA's Interstellar Boundary Explorer (IBEX) Small Explorer mission and for the New Horizons and Juno New Frontiers missions. In addition, SwRI leads the science investigation for NASA's four-spacecraft Magnetospheric Multiscale mission.

Source: Southwest Research Institute ([news](#) : [web](#))

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