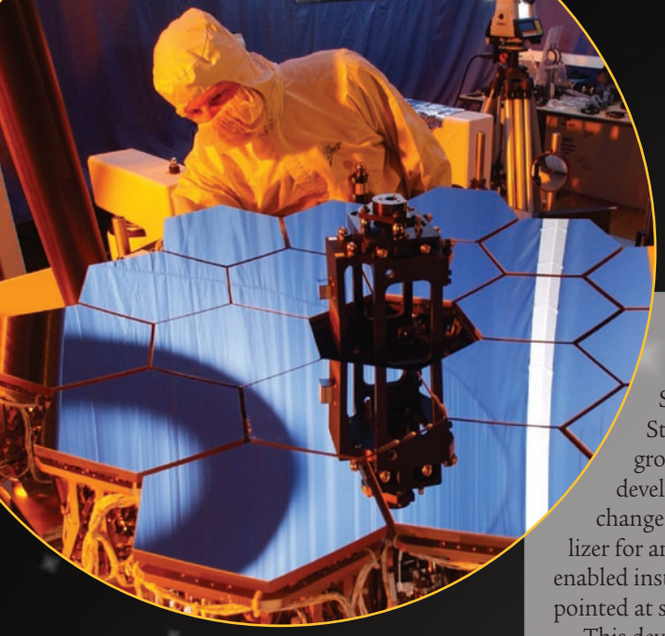
From jars to the stars

By Robert Arentz



Above, Tim Towell, a Ball Aerospace engineer, inspects part of the James Webb Telescope, scheduled to be launched in 2013. The Webb will orbit about one million miles above Earth and is designed to examine every phase of space history, supplanting the Hubble. Below, engineers inspect solar panels of the CloudSat satellite in a Ball Aerospace clean room prior to its April 2006 launch.

Some of Ball Aerospace's first scientists began as students at CU. Here a team gathers outside Hale Sciences around 1951 with a rocket nose cone that contains the spectrograph and pointing control device they designed. David Stacey (PhDPhys'54) is squatting to the left of the rocket. Jim Jackson (PhDPhys ex'54) is standing with a pipe to the left of W.B. Pietenpol, head of CU's physics department.

A year before *Sputnik* kicked off the Space Race in 1956, David Stacey (PhDPhys'54) and a group of CU physics colleagues developed a device that would change rocket science — a stabilizer for an optical spectrograph that enabled instruments to be accurately pointed at something "fixed" in the sky.

This development caught the attention of Edmund Ball, a son of one of the five Ball Brothers who ran the family's canning jar company. He was in Boulder investigating a private company to possibly diversify his glass manufacturing business when he met Stacey. The two drank beer at Stacey's home near Chautauqua Park and discussed CU's pointing-control device as well as the scientists and engineers in CU's Upper Air Laboratory.

"Stacey and Jim Jackson (PhDPhys ex'54) were working on an optical spectrograph for the nose cone of a rocket," explains Al Bartlett, professor emeritus of physics who joined the faculty in 1950. "Very complex systems would allow the spectrograph to point at the sun, independent of how the rest of the rocket might be turning or twisting. Even today this sounds to me like an incredible task. But they were doing it."

Ball was so interested in the device he bought the rights to it from CU. He also hired his first three employees from the Upper Air Lab for a new company — the Ball Brothers Research Corp., which was essentially a startup before the term was even coined.

The initial employees included Stacey, Jackson and Pete Bartoe (Mech Engr'49, MS'54). More followed from the Upper Air Lab, which CU reorganized as the Laboratory for Atmospheric and Space Physics.

That was 50 years ago. Now, with 3,000 employees, Ball Aerospace & Technologies Corp. is a leader in the development of spacecraft, sensors, systems and components for government and commercial programs. It's one of 300 space-related companies in Colorado.

"We started out with about six or seven people," recalls Ruel "Merc" Mercure Jr. (Phys'51, MS'55, PhD'57), former Ball Aerospace president who joined the company in 1957. "We didn't grow rapidly. Most of us had our roots in the University of Colorado, so it was a marvelous environment because everybody knew each other."

"Ball and CU were involved in the U.S. space program even before NASA was formed in 1957," says David Taylor (ExecMBA'88), current Ball Aerospace president and CEO. "We are proud many of our top engineers are university graduates and brag that we have more than 40 PhDs who hail from CU."

Over the decades, Ball Aerospace and CU have collaborated on hundreds of space-related missions, including the Solar Mesospheric Explorer, built by Ball for LASP in 1981. The 1999 QuikSCAT mission and 2003 ICESat are being flown out of the operations center located at LASP to enhance global climate change research.

A recent space success was the July 2005 Deep Impact encounter with Comet Tempel 1. A Ball-built spacecraft deliberately crashed into the quiescent comet while a nearby second spacecraft took high resolution images of the impact. The results were watched around the world, including by the standing-room-only crowd at CU's Fiske Planetarium.

"Having the campus nearby elevates our company because advanced training in an academic setting is so accessible," says Alice Phinney (EPOBio'80, MechEngr'85), a lead engineer for the Deep Impact mission. Ball sponsors three experiments each year for CU's senior mechanical engineering design class, which Phinney says results in having many "fabulous" graduates working at the company.

Before the Ball Aerospace campus on Arapahoe Avenue was built, scientists Bill Frank and Rob Hathaway (ElEngr'56) examine a pointing control device in the parking lot of Ideal Market in this 1959 photo.

Other Ball bragging rights include the optical correction system that fixed the Hubble Space Telescope's instruments, restoring its ability to view clearly and share its spectacular images of the distant heavens with those on Earth. A CU-designed and Ball-built spectrograph is scheduled to be added to Hubble in 2008.

"I grew up in Boulder and being in a university town lends a forward-thinking, scientific view to everything we do at Ball Aerospace," says Dave Murrow (Aero'84) of the business development office. "Boulder's culture has always been about seeking knowledge, from NCAR to NOAA to NIST. CU is the anchor of that high-technology team, with Ball Aerospace as one of the earliest members."

Robert Arentz works for Ball Aerospace's business development group and is the company's unofficial historian.