

A Timeline of the Labs in Boulder

1946: Central Radio Propagation Lab (CRPL) is created to study the field of radio wave propagation, including investigation of solar and geophysical effects on radio communication, and research on the upper atmosphere.

1950: In only two weeks, the people of Boulder raised \$90,000 to buy the 217 acres of land the Boulder Labs now occupy. This land donation was an important factor in the choice of Boulder for the Labs, along with the varied terrain, freedom from radio interference, and proximity to the University of Colorado and the resources it could provide.

1951: The first CRPL staff were transferred from Washington, D.C., to Boulder.

1954: President Eisenhower, the first incumbent President ever to visit Boulder, dedicates the Boulder Laboratories on September 14th.

1954: The Bureau's first atomic clock, NBS-1, is built in Washington, D.C., and shipped to Boulder. Using the oscillation of cesium atoms, it set a new standard for the second, so accurate it lost only one second every 300 years.

1954-1965: CRPL develops worldwide ionospheric soundings, used to predict usable frequencies for reliable radio communication and navigation, as well as transoceanic and Arctic links.

1956: CRPL's World Data Center-A is established for the International Geophysical Year in 1957; the Center is now part of a NOAA service to collect, archive, and distribute crucial environmental data.

1962: NBS builds a pulsed ruby laser, making possible Apollo 11's famous laser experiment measuring the Moon's distance from Earth.

1965: NOAA forerunner, Environmental Science Services Administration (ESSA), is created, and includes the Weather Bureau, Coast and Geodetic Survey, and CRPL, the research component. President Lyndon Johnson said ESSA would "provide a single national focus for our efforts to describe, understand and predict" the oceans and atmosphere.

1965: Environmental Data Service is formed, including NOAA geophysical data center in Boulder.

1965: NOAA's Space Disturbance Forecast Center begins routine daily forecasting service with U.S. Air Force Air Weather Service, a relationship that continues today.

1967: NOAA's first joint institute, the Cooperative Institute for Research in Environmental Sciences (CIRES), established at the University of Colorado to partner with the local labs in areas of environmental research.

1967: The new Joint Institute for Laboratory Astrophysics (JILA) is dedicated on the University of Colorado campus in Boulder. The cooperative effort between NBS and CU opens up research projects in astrophysics, atomic physics, and aerodynamics.

1967: NBS staff redefine the second, which had been based on the motion of the Earth, as the time it takes a cesium atom to vibrate 9,192,631,770 times.

1967: Research elements of ESSA are collected and reorganized with other Federal research to create laboratories that study environmental sciences, including weather and climate, atmospheric physics and chemistry, air resources, space disturbances, and wave propagation.

1967: The Institute for Telecommunication Sciences (ITS) is created to continue the telecommunications research of the former CRPL.

1968: NIST scientists develop slush hydrogen, a promising and desirable rocket fuel.

1968: NOAA takes over air sampling and analysis of atmospheric carbon dioxide, today the longest modern data record showing increases of this greenhouse gas in the atmosphere.

1970: President Richard Nixon directs a new agency be created to achieve "a more comprehensive understanding of oceanic and atmospheric phenomena, which so greatly affect our lives and activities." Thus NOAA is formed from elements of ESSA, the data service, and agencies involved in fisheries and oceanic services.

1972: The Guinness Book of World Records recognizes NBS scientists for measuring the frequency of laser light, leading to a new definition of the meter 100 times more accurate than before.

1973: ITS designs the Radio Spectrum Measurement System (RSMS), a state-of-the-art computer-controlled measurement system in a mobile van.

1950

1960

1970

Improvements to daily weather forecasts and warnings.

1978: ITS joins the National Telecommunications and Information Administration, NTIA.

1979: NOAA research in Boulder begins collaboration with the National Weather Service to develop forecasting infrastructure to improve the nation's operational weather services.

1980: NBS staff win an Emmy Award for developing the technology for closed captioning on TV.

1981: NOAA's high-energy pulsed Doppler lidar (using optical rather than radio frequencies) for atmospheric wind measurements monitors winds during landing of the second space shuttle flight.

1986: NOAA scientist proposes that the cause of the Antarctic ozone hole is the interaction of human-produced chlorine compounds with ice clouds in the upper atmosphere; scientists from NOAA lead the first National Ozone Expedition to the South Pole that proves the theory correct, propelling international efforts to protect the ozone layer.

1987: NBS's study of superconductivity continues, and research finds more uses for big magnets, such as magnetically levitated trains, and MRI imaging which is widely used in medical science today.

1988: In support of National Weather Service modernization, NOAA scientists develop a meteorological workstation that becomes the prototype for the system now operating in every weather office around the country.

1988: The National Bureau of Standards (NBS) becomes the National Institute of Standards and Technology (NIST).

1989: Staff at NIST build a 10-volt reference standard involving 14,184 Josephson junctions operating simultaneously.

1990: A new species of dinosaur—the only one named after a government agency—*Drinker nistii*, is discovered by NIST and CU scientists.

1991: NIST scientists improve upon NIST-7, the international time standard, with new laser-line narrowing methods. The new methods increased stability and accuracy—this clock will stay within one second of true time for 6 million years!

1994: NOAA's Rapid Update Cycle (RUC) weather forecast model becomes the National Weather Service's first forecast model using isentropic coordinates in the vertical and high frequency data for aviation, severe weather, and general forecasts.

1993: NOAA establishes the first national network to monitor the broad spectrum of solar radiation and Earth's emitted radiation at Earth's surface; the network is used to validate data from environmental satellites and weather forecast models.

1995: Scientists at JILA discover a new form of matter, the Bose-Einstein condensate.

1997: NOAA researchers help predict climate impacts of the 1997-98 El Niño.

1999: NIST F-1, the cesium fountain clock, is unveiled and is currently the most accurate clock in the world. It loses less than one second every 20 million years and "ticks" over 9 billion times per second.

1999: NOAA consolidates Boulder research, data services, and administrative services in the new NOAA building, and moves the Denver Weather Forecast Office to Boulder.

1999: NOAA conducts the first test of a buoy-mounted wind profiler, making possible better observations of conditions over the oceans, and leading to improved models for climate and weather forecasts.

2000: ITS characterizes ultrawideband signals, which may help solve spectrum crowding.

2001: NIST, JILA, and MIT scientists win the 2001 Nobel Prize for Physics for their discovery of the Bose-Einstein condensate.

2003: NOAA wind profiler network helps NASA track debris from space shuttle Columbia accident.

2003: NIST Materials Reliability staff analyze the U.S. Capitol Dome for repairs and lead research on New York's World Trade Center disaster.

2004: NOAA scientist wins the prestigious Blue Planet Prize for her work in identifying the cause of the Antarctic ozone hole.

For more information on the Boulder Labs' Anniversary events, go to www.boulder.nist.gov/BL50

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