LATEST RESULTS FROM THE MARS PATHFINDER ATMOSPHERIC STRUCTURE INVESTIGATION. J.A. Magalhães[1,2], J.T. Schofield[3], A. Seiff[1,2], J.R. Barnes[4], D. Crisp[3], R. Haberle[1,] S. Larsen[5], J. Murphy[1,2], and G. Wilson[1,6], [1]NASA Ames Research Center (Space Science Division, Mail Stop 245-3, Moffett Field, CA 94035, jmagalhaes@mail.arc.nasa.gov), [2]San Jose State University Foundation (San Jose, CA), [3]Jet Propulsion Laboratory (Mail Stop 230-235, 4800 Oak Grove Drive, Pasadena, CA 91109, tim@scn1.jpl.nasa.gov), [4]Oregon State University (College of Oceanic & Atmospheric Sciences, Corvallis, OR), [5]Riso National Laboratory (AMV-125, P.O. Box 49, Roskilde, Denmark DK-4000), [6]Arizona State University (Tempe, AZ.)

The Mars Pathfinder Atmospheric Structure Investigation (ASI) obtained information on Martian atmospheric structure from three science accelerometers, which measured the deceleration of the probe at all levels in the atmosphere, and a pressure sensor, which obtained pressure measurements in the lower atmosphere starting at about 7.4 km altitude. The Pathfinder entry profile represents the first *in situ* measurement of Martian atmospheric structure since the Viking landings in 1976. Entry, descent, and landing occurred at a latitude and longitude close to Viking 1 and somewhat later in northern summer. The early morning entry (~ 3 AM Local Mars Time) has provided the first opportunity to study Mars' nighttime atmospheric structure. To date, our analysis of the ASI data has centered on the derivation of atmospheric structure from deceleration measurements obtained before parachute deployment (9 km altitude).

The accelerometers first sensed the atmosphere at 160 km above the landing site. The measured atmospheric densities from 160 km to 90 km are from 5 to 2.5 times lower than the Viking 1 values. Between 90 and 80 km altitude, an abrubt increase in density brings the densities at lower altitudes to values slightly below those seen by Viking 1, as expected for the lower atmosphere based on the annual variation in atmospheric mass and the late northern summer season of the entry. The temperature profile reveals a middle atmosphere (65 km to 125 km altitude) which is on average 20 K colder than the Viking 1 values. The minimum temperature of the profile (92 K) at 80 km altitude is well below the CO_2 saturation temperature, suggesting the possible formation of nighttime CO_2 clouds in the middle atmosphere. In the lower atmosphere the temperatures are somewhat warmer than or close to the Viking 1 values between 60 km and 16 km altitude, contradicting groundbased microwave observations suggesting a much cooler atmosphere at these altitudes. Between 16 km and 10 km altitude, the temperature profile shows a thermal inversion and deviates notably from the Viking 1 profile. We expect to extend the density and temperature profiles to lower altitudes through further analysis.