

MICROINSTRUMENTS FOR A LOW POWER, LOW MASS WEATHER STATION,
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Advances in electronics and instrument technology over the past thirty years have enabled a new concept for NASA missions, an evolution from large Voyager-class spacecraft to smaller, less costly Discovery and Explorer missions. By taking advantage of micromachining and micro-instrumentation, this reduction in size can be accomplished without requiring a sacrifice in performance. In some cases, the small payload will enable new types of missions which would be otherwise inconceivable.

A microweather station is envisioned as an enabling technology for a network of weather stations on Mars for measuring wind, temperature, pressure, humidity, and aerosol concentration in the Martian planetary boundary layer. A similar instrument is being developed for deployment in the Earth's upper atmosphere. Micromachined hot-wire anemometers, capacitive manometers and thermal conductivity gauges are being developed for the pressure and wind measurements. A humidity sensor will measure the dewpoint to determine the humidity in the arid environments of Mars and the troposphere. Recent results on the microweather station sensors will be discussed.