interior to its hot outer atmosphere. Known as the Solar and Heliospheric Observatory (SOHO), this complex mission carries 12 detectors. Along with Japan's Geotail, launched in 1992, and several other satellites slated for liftoff later this year, SOHO will join a flotilla of craft studying the sun's influence on Earth.

Four months after journeying into space on an Atlas II-AS rocket, SOHO will enter a circular orbit in which the gravitational tugs from the sun and Earth balance. From this orbit, some 1.5 million km from Earth, SOHO will have an uninterrupted view of the sun.

Several of the craft's detectors will explore the processes that generate and heat the sun's outer atmosphere, or corona, and create the stream of charged particles known as the solar wind. Other instruments will attempt to peek inside the sun by studying its sound waves, much as geologists use seismic waves to "see" inside Earth.

A group of SOHO instruments will measure changes in gas motion at the sun's surface, as well as fluctuations in temperature and radiation that provide vital clues to the density and composition of gases in the sun's interior.

NOVEMBER

● Two small platforms, known collectively as the Cosmic Dust Experiment, ride a manned Russian craft to MIR, the Russian space station. Mounted by cosmonauts, the U.S. experiment will use special gels and foams to collect cosmic dust particles over a period of 10 months. A U.S. shuttle crew will return the experiment to Earth so scientists can analyze the composition of the dust.

● ESA launches its Infrared Space Observatory (ISO), only the second satellite devoted entirely to infrared studies. ISO will study the solar system, the birth and death of stars in the Milky Way, and quasars billions of light-years beyond our galaxy. During its 18-month survey, the observatory's helium-cooled instruments will study selected sources over a wide range of infrared wavelengths, from 2.5 to 200 micrometers.

● An ESA-NASA joint venture focuses on planet Earth. Launched by an ESA Ariane 5 rocket, four identical spacecraft collectively known as Cluster will fly in formation to study the ionized gas, or plasma, within Earth's magnetosphere. This is the region surrounding our planet dominated by Earth's magnetic field.

Ground controllers will adjust the distance between the Cluster spacecraft, depending on the size of the plasma structure under study; comparison of measurements from all four craft should yield a three-dimensional picture of the plasma. This mission is expected to last for at least 2 years.

DECEMBER

● Complementing the July launch of FAST and last year's Wind mission, NASA in December sends aloft the Polar satellite, which carries 11 instruments to study the solar wind's interaction with Earth's magnetic field. In particular, the craft will monitor the flow of the solar wind over Earth's magnetic poles. Polar will also photograph the northern aurora, observing the energy exchange between the ionosphere, the region just above Earth's upper atmosphere, and its magnetosphere.

● On the seventh day of December, the Galileo probe released in July will reach its final destination, parachuting deep into Jupiter. The detector-laden probe will beam data to its mother craft for about 75 minutes before meeting its demise, crushed by the pressures deep in the planet's thick atmosphere. Because Galileo's main communications antenna remains stuck, the data will be stored on the craft's tape recorder for transmission to Earth several months later.

● Just as its free-flying probe reaches Jupiter, Galileo will embark on a 2-year grand tour of the giant planet and its moons. Despite Galileo's antenna problem, which will prevent the craft from radioing to Earth as much data as intended, NASA scientists expect Galileo to accomplish about 70 percent of its original mission. □

Health Physics

Radon: Have its risks been overplayed?

In recent years, federal health officials have estimated that as many as 15,000 lung cancer deaths in the United States each year result from radon, a naturally occurring radioactive gas. But the authors of a major new study say they have been unable to demonstrate convincingly any association between exposure to indoor radon and this disease.

Michael C.R. Alavanja of the National Cancer Institute in Bethesda, Md., and his coworkers measured radon for a year in the homes of 1,721 Missouri women, 538 of whom had lung cancer and 1,183 of whom did not. All of the women, who were matched by age, were nonsmokers or former smokers who had given up the habit at least 15 years earlier.

In the Dec. 21, 1994 JOURNAL OF THE NATIONAL CANCER INSTITUTE, the researchers report that average residential radon concentrations were "exactly the same" (1.82 picocuries per liter of air) in both groups of women. However, Alavanja's team did note that among the lung cancer patients whose type of malignancy had been identified, half of those diagnosed with adenocarcinomas showed a slightly increased risk of disease with increased exposure to radon. A study of Swedish women, published earlier last year, reported a similar trend.

While a lifetime of exposure contributes to risk, such contemporary studies measure only exposures at an individual's current address, notes Jonathan M. Samet of Johns Hopkins University in Baltimore. For the statistical significance needed to assess accurately whether low residential exposures constitute no risk — or a risk very different from that posed to underground miners by high radon concentrations — the study would have required many more participants than the number used in this or any other residential-radon study to date, Samet argues in an accompanying editorial. But those numbers may soon become available, he adds, as researchers complete a spate of new studies whose data can be pooled for reanalysis.

Tea: Chernobyl's lingering legacy

Çay (Anatolian tea that rhymes with buy) is to Turks what coffee is to Americans — the caffeinated lifeblood of society. So when cesium-137 fallout from the Chernobyl nuclear accident peppered Turkey's eastern Black Sea coast, a prime tea-growing region, concern about the potential for national exposure to radioactivity mounted quickly. Now, M. Yaşar Ünlü and his coworkers at Çekmece Nuclear Research and Training Center in Istanbul report that drinking tainted tea appears to offer a very effective pathway for picking up nuclear fallout. They describe their findings in the January HEALTH PHYSICS.

The Çekmece team found that new tea shoots forming at the time of the Chernobyl accident — May 1986 — incorporated enough cesium to produce a peak radioactivity of up to 25,000 becquerels per kilogram (Bq/kg) of dry leaves. By 1992, cesium activity in new shoots had dropped to 200 Bq/kg.

What does that mean for the average Turkish tea drinker? Whole-body exposures to cesium from a year's çay drinking in 1986 may have amounted to 0.66 millisieverts, Ünlü's team calculates. That's equivalent to the extra background radiation (from cosmic rays) incurred by living at Denver's altitude for 2.5 years instead of residing at sea level, explains Tom Koval of the National Council on Radiation Protection and Measurements in Bethesda, Md. By 1992, fallout contamination of new Black Sea tea shoots had dropped to levels that would yield an annual cesium dose just one-tenth that delivered by equivalent çay consumption 6 years earlier.