weather station will be different from a satellite launched to send television signals across Canada. Below, the classification into nine different types of satellites is given as well as a prominent representative of each of it:

- Astronomy satellites, for example, Hubble Space Telescope
- Atmospheric studies satellites, for example, Polar
- Communications satellites, for example, Anik E
- Navigation satellites, for example, Navstar
- Reconnaissance satellites, for example, Kennan, Big Bird, Lacrosse
- Remote sensing satellites, for example, Radarsat
- Search and rescue satellites, for example, Cospas-Sarsat
- Space exploration satellites, for example, Galileo
- Weather satellites, for example, Meteosat (see Figure 17.31)

17.2.5.1 The international space station ISS

The International Space Station is the largest and most complex international scientific project in history (Figure 17.32). When it is complete the station will represent a move of unprecedented scale off the home planet. Led by the United States, the International Space Station draws upon the scientific and technological resources of 16 nations: Canada, Japan, Russia, 11 nations of the European Space Agency and Brazil. More than four times as large as the Russian Mir space station, the completed International Space Station will have a mass of about 502 000 kg. It will measure 120 m across and 95 m long. Assembly is planned to be completed by 2004. Most of the 256-kW solar arrays will be delivered by United States; only Russia will provide a science power platform that can supply about 20 kW of electrical power. This PV generator – worth about 450 million US$ – will be the largest object ever transported by human being into space. Each of the 6560 solar modules consists of 40 8*8 cm^2 mono-crystalline silicon cells. Cell efficiency will be around 14.5%, which seems to be not very outstanding; however, when the production of the cells started in 1988, the technology of the much more efficient GaAs cells – up to 26% is now possible – was not yet available.

17.2.5.2 The unmanned airplanes "Pathfinder" and "Helios"

The Pathfinder is one of several unpiloted prototypes under study by NASA's ERAST (Environmental Research Aircraft and Sensor Technology) program, a NASA-industry alliance that is helping develop advanced technologies that will enable aircraft to study the Earth's environment during extremely long flights at altitudes in excess of 30 km. The Pathfinder is a remotely controlled, solar-powered flying wing, designed and built as a proof of concept vehicle for a much larger aircraft capable of flying at extremely high altitudes for weeks at a time. Pathfinder is constructed of advanced composites, plastics and foam, and despite a wingspan of nearly 30 m, it weighs only about 300 kg. Current from solar arrays provides power during daylight, while stored energy allows flight after dark. The batteries allow an endurance of about 2 h in darkness.