

Viewing a Cosmic Habitat

By Barry M. Olson for the Sun Times

You may have heard of the International Space Station, but have you ever see it? Chances are that you have, perhaps without even realising it! The station can often be spotted during the twilight hours of dawn or dusk, when the station is at the right angle with the sun to reflect light back to Earth. So, what exactly is the International Space Station (ISS)? The ISS is a large, artificial satellite in Earth orbit for the purpose of providing a facility where astronauts can live and work for long periods of time conducting experiments and learning about the space environment. The space station is an international project, and the partners include Canada, United States, Russia, Japan, the European Space Agency, and Brazil. The station orbits about 350 kilometers above Earth's surface. The orbit is inclined 51.6 degrees to the equator, and the orbital period (the time for the station to go around Earth once) is 90 minutes. The ISS is currently 73 by 44.5 by 27.5 meters in size, has a mass of 183 tonnes, and has a habitable volume of 425 cubic metres. Assembly of the station began in November 1998 when the first module was launched into orbit by Russia. Seven years and 50 rocket launches later, the station is the largest human-built object in space. The assembly of the station is not yet complete and it will continue to increase in size during the next few years. Expedition crews of two to three people have continuously occupied the ISS since November 2000. The population onboard the station periodically increases by three to seven people when one of the American space shuttles or a Russian Soyuz spacecraft pays a visit for a few days.

Enough facts and figures. How does one actually see the station when it is 350 kilometres overhead? On any clear night you can see a multitude of stars and perhaps one or more of the bright planets. As you observe, the sky seems fairly static. However, you may see a few meteors, which will appear for a split second as streaks of light caused by space dust entering the atmosphere and incinerating. The other main action in the night sky is the movement of many artificial satellites in orbit. They appear as faint, star-like objects moving across the starry background. Most are faint and we can only see them by the sunlight they reflect. They can remain visible from a few seconds to a few minutes, depending on when you first spot a given satellite. Do not mistake airplane lights as satellites. Airplane lights often flash and are coloured. Because the ISS is the largest satellite in a relatively low orbit, it appears nearly as brilliant as the brightest stars.

The easiest way to find out when you can see the space station from your location is to visit web pages that provide sighting information, such as the following two sites: From NASA-<http://spaceflight.nasa.gov/realdata/sightings/SSapplications/Post/SightingData/Calgary.html> Heavens-Above website: <http://www.heavens-above.com/>

The NASA site is actually for Calgary, but the sighting opportunities are suitable for the Lethbridge area. At the second web site, you can customize the input information and generate sighting predictions for your exact location. Plus this site can provide sighting opportunities for other satellites. The information includes the date, time and direction of appearance, time and direction of disappearance, degrees above the horizon (90 degrees is overhead), and duration of appearance. The NASA site indicates the ISS will be visible over Lethbridge on December 7 (6:52 a.m.), 8 (7:18 a.m.), 9 (6:11 and 7:43 a.m.), and 10 (6:36 a.m.), 2005.

Once you have obtained a date and time for a sighting, go outside and look towards the western sky. The ISS travels in a west-to-east direction. Sometimes it can appear due west, pass directly overhead, and disappear in the east and be visible for three to four minutes. Other times it can appear low in the southwest and disappear in the south and be visible for less than a minute. Because of its bright, star-like appearance the station is hard to miss. No fancy binoculars or telescopes are needed.

So take the opportunity to view this cosmic habitat in Earth orbit, and while you are at it, perhaps give an earthly wave to the high-riding occupants.

Barry M. Olson is a member of the Lethbridge Astronomy Society, which holds a monthly public observing session at 7:30 PM on the last Saturday of the month (from September to April) at the Oldman River Observatory at Popson Park. See <http://www.lethbridgeastronomysociety.ca> for more details.



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Photo caption: A full view of the International Space Station as seen from the space shuttle Discovery on August 6, 2005. Photo credit: National Aeronautics and Space Administration (NASA).