### MISSION OBJECTIVES

European polar orbiting radar observatory providing continuity of SAR data for operational applications. These applications include:
- monitoring sea ice zones and the arctic environment
- surveillance of marine environment
- monitoring land surface motion risks
- mapping of land surfaces; forest, water and soil, agriculture
- mapping in support of humanitarian aid in crisis situations

### MISSION PROFILE

- **Sentinel-1A launch date:** 2014
- **Sentinel-1B launch date:** 2015
- **Sentinel-1A launcher:** Soyuz from CSG (Kourou)
- **7 years lifetime (consumables for 12 years)**
- **Sun-synchronous orbit at 693 km altitude**
- **Inclination:** 98.18°
- **Mean LST:** 18:00h at ascending node
- **12-day repeat cycle at Equator with 1 satellite**
- **175 orbit/cycle**
- **96h operative autonomy**
- **Max eclipse duration:** 19 minutes

### SATELLITE PLATFORM

- **3 axis stabilized, yaw/pitch/roll steering (zero Doppler)**
- **0.01° attitude accuracy (each axis)**
- **Right looking flight attitude**
- **10 m orbit knowledge (each axis, 3σ) using GPS**
- **Spacecraft availability:** 0.998
- **Launch mass:** 2300 kg (incl. 130 kg fuel)
- **Solar array power:** 5900 W (End-of-Life)
- **Battery capacity:** 324 Ah
- **Science data storage capability:** 1410 Gbit (End-of-life)
- **Communication links:** X-Band data downlink and Optical data link through EDRS for Payload Data at 520 Mbps; S-Band 64 kbps uplink and 128 kbps/2Mbps downlink for TM/TC

### SATELLITE PAYLOAD

**C-Band SAR**
- **Centre frequency:** 5.405 GHz
- **Polarisation:** VV+VH,HH+HV
- **Incidence angle:** 20° - 45°
- **Radiometric accuracy:** 1 dB (3σ)
- **NESZ:** -22 dB
- **DTAR:** -22 dB
- **PTAR:** -25 dB

Four nominal operational modes designed for inter-operability with other systems:
- **Strip Map Mode** with 80 km swath and 5x5 m (range x azimuth) spatial resolution
- **Interferometric Wide-Swath Mode** with 250 km swath, 5x20 m (range x azimuth) spatial resolution and burst synchronisation for interferometry
- **Extra-Wide-Swath Mode** with 400 km swath and 20x40 m (range x azimuth) spatial resolution
- **Wave Mode** with 5x5 m (range x azimuth) spatial resolution
- Leap-frog sampled images of 20x20 km at 100 km along the orbit, with alternating 23° and 36.5° incidence angles.

---

Last update August 2013