

# Remote Sensing Satellite Development and Earth Observation Applications from Taiwan Space Agency, NSPO

*Tuesday, 22 March 2022 11:30 (30 minutes)*

National Space Organization (NSPO) which is the Taiwan Space Agency. There are fifteen satellites have been developed and launched successfully since 1991. In 1999, FORMOSAT-1 was deployed with three scientific experimental missions: (1) Ionosphere Plasma and Electrodynamics Instrument for measuring the effects of ionospheric plasma and electrodynamics, (2) Ocean Color Imager for taking the images of visible and near-infrared light radiometric measurement on the ocean surface, and (3) Experimental Communication Payload for transmitting and receiving Ka-band signal from the ground stations. In 2004, FORMOSAT-2 was deployed as Taiwan's first optical Remote Sensing Instrument (RSI) satellite. Real-time images were taken daily with 2-m black & white and 8-m color images. The earth observation (EO) satellite images were applied on territorial planning, natural resource exploration, environmental protection, disaster prevention and relief, and other earth observation applications. In 2006, FORMOSAT-3 constellation (with six satellites) has deployed for observing global atmosphere and ionosphere. The global radio occultation (RO) data was applied on the weather forecast updates, long-term climate change research, dynamic monitoring of the ionosphere, earth gravity research and other related scientific research. These satellite programs were accomplished their missions and decommissioned.

In 2017, FORMOSAT-5 was deployed. It's the first self-developed optical RSI satellite by Taiwan, according to the experience of FORMOSAT-2. The optical RSI with 2-m black & white and 4-m color images continues to serve the global imagery users' community of FORMOSAT-2. In 2019, FORMOSAT-7 was deployed. It's a follow-on program to the successful FORMOSAT-3 with upgraded performance for spacecraft bus and mission payload. FORMOSAT-7 with six-satellites were forming a constellation to increase meteorological data collection in low-latitude regions (between 50 degrees north and south latitudes). An average of 4,000 points of RO data were received every day, and the accuracy of weather forecast, climate observation, and space weather monitoring are expected to be improved. Currently, FORMOSAT-5 and FORMOSAT-7 are on the orbit and serving the needs for Taiwan, as well as for the global society.

Nowadays, a couple of satellite programs are in the progress. Triton, also called as Wind-Hunter Satellite, is the self-derived meteorological satellite which carries Global Navigation Satellite System-Reflectometry (GNSS-R) to collect GNSS signals reflected from the Earth surface in low Earth orbit and conduct researches on soil characteristics, air-sea interaction, and typhoon intensity prediction. FORMOSAT-8 is the self-derived optical RSI constellation which is planned to develop six satellites with 1-m black & white and 2-m color images continues the mission of FORMOSAT-5. Beyond 5G is planned to develop low earth orbit communication satellite to experiment the broadband internet service, video conference and internet of thing.

**Presenters:** Dr CHEN, Bo (NSPO); Dr HWANG, Feng-Tai (NSPO); Dr CHOU, Jill (NSPO)

**Session Classification:** Earth & Environmental Sciences & Biodiversity Applications