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B会場：9/26 AM1 (9:00-10:30)
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Mercury's dynamic magnetosphere: updates from the BepiColombo cruise observations

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Mercury is the innermost planet in the Solar System and has a unique space environment. Mercury possesses a weak global magnetic field and is subject to the intense solar wind due to its proximity to the Sun (0.31-0.47 AU). In such conditions, Mercury formed a small but highly dynamic magnetosphere. Because of its small size and its proximity to the Sun, Mercury was unable to retain the bulk of its atmosphere and ionosphere. These conditions make Mercury's space environment unique and an excellent science target for comparative study with Earth. The first Mercury orbiter, MESSENGER (MERcury Surface, Space ENVIRONMENT, GEOchemistry, and RANGing), explored this innermost region of the Solar System during 2011 – 2015 and provided a number of new findings. For example, Mercury's magnetosphere is much more dynamic than had been predicted. Magnetic field measurements indicated Dungey cycles on Mercury with a period of a few minutes. MESSENGER detected many energetic electron events with periodicities of a few minutes and electron precipitations at the nightside. These outstanding discoveries still remain as open issues due to some limitations of instruments onboard MESSENGER and its extended elliptical orbit with apherm in southern hemisphere. The ESA-JAXA joint mission BepiColombo is now on the track to Mercury. After the successful launch of the two spacecraft for BepiColombo, Mio (Mercury Magnetospheric Orbiter: MMO) and Mercury Planetary Orbiter (MPO), commissioning operations of the spacecraft and their science payloads were completed. BepiColombo will arrive at Mercury in the end of 2025, and it has 7-years cruise with the heliocentric distance range of 0.3-1.2 AU. Even before arrival, we already obtained fruitful science data from Mercury during three Mercury flybys completed on 1 October 2021, 23 June 2022, and 19 June 2023. We performed science observations with almost all the instruments onboard Mio and successfully obtained comprehensive data of Mercury's magnetosphere such as magnetic fields, plasma particles, and waves. Here we present the updated status of BepiColombo mission, initial results of the science observations during the Mercury flybys, and the upcoming observation plans.