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Poster
Space-based coronagraphs have observed the solar corona since 1971, with the launch of the OSO-7 mission that recorded the first image of a coronal mass ejection (CME) on Dec 14, 1971. Since then, a variety of missions carried white light coronagraphs, including LASCO which has provided nearly continuous white light coronal observations since 1995. More recent missions furnished new views of the corona away from the Sun-Earth line and at distances to the Sun much closer than 1 AU (i.e. STEREO, Parker Solar Probe, and Solar Orbiter). PUNCH will deliver the first observations of polarized brightness of the outer corona and heliosphere over a nearly full field-of-view from the base of the outer corona through the heliosphere to nearly 1 AU.

The past decades have also seen ground-based solar observations increase in number, quality, and variety. Ground-based coronal observations in the visible, near IR and radio provide critical information on the coronal plasma and magnetic field in the low and middle corona, where CMEs originate. Ground-based magnetic field measurements of the photosphere and chromosphere, coupled with helioseismology observations of far-side active regions provide improved magnetic boundary conditions for models of the coronal field. We discuss how these ground-based observations are complementary to PUNCH NFI and other space-based coronagraph data and how they can be used to connect properties of the ambient structures in the low and middle corona with the outer corona and solar wind. These observations also provide crucial information on the formation and early dynamics of CMEs and related solar activity that is important for scientific research and for space weather forecasting. We also highlight future ground-based missions that can greatly expand these capabilities.
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