Selected in 2016 NASA Heliophysics Explorer Mission of Opportunity ($55M standalone mission) for Phase A concept study
– Phase A Concept Study Report delivered in summer 2018
– February 25, 2019 – Selected into an Extended Phase A to address value of launching a year later, validate cost and benefit of extending Phase E from 6 months to one year
– Launch no earlier than March 2023, one year prime mission

Six small spacecraft fly in loose formation, 10 km diameter, above geosynchronous orbit 25 hour period orbit

Each spacecraft has 4m crossed dipole antennas and a 0.1-20 MHz dual polarization receiver

Deployed from back of a communications satellite

Simultaneous recording of 0.1-20 MHz radio emission from sky and Global Navigation Satellite System recorded for navigation and timing
SunRISE Science Objectives

Sun Radio Interferometer
Space Experiment

PRINCIPAL INVESTIGATOR: Justin C. Kasper (University of Michigan)
SHP-3. Determine how magnetic energy is stored and explosively released and how the resultant disturbances propagate through the heliosphere.
Coherent solar radio bursts

\[ f_p = 8.98 \text{ kHz} \sqrt{n_e/(1 \text{ cm}^{-3})}, \quad f_{obs} = (f_p, 2f_p) \]
Measure the location and distribution of Type II radio emission relative to expanding CMEs 2–20 Rs from the Sun, where the most intense acceleration occurs.

SunRISE Objective 1
• All major solar energetic particle ion events (NOAA classification based on proton > 10 Mev flux) are proceeded by a decametric-hectametric (DH, < 10 MHz) Type II burst

• When timing is possible arrival time of SEPs at Earth vs speed can be solved for SEP release time and height above Sun

• Generally SEP release occurs 10-20 minutes after DH Type II burst starts
Emission is from a small region of the CME