1) What previously made measurements expanded in time and space domains would hold potential to answer critical science questions and/or contribute to community or system science? (Outline science questions, measurements, and rideshare opportunity).

- Science Question (Time): What are the solar irradiance effects on climate?
  - Measurements: Continuity is key, gaps don't allow cross-calibration
    - SORCE ending soon (UV-IR), multiple EUV gaps
  - Opportunity: Soft X-ray (MinXSS), Visible (CSOL) and TSI (CTIM) on CubeSats; Soft X-ray (DAXSS) on international ride-share (INSPIRESAT-1)
- Science Question (Space): Multi-vantage points allow quantification of planetary space weather and climate drivers
  - Measurements: MAVEN has quantified the current influence of SEPs, solar wind, CMEs, and solar EUV irradiance on atmospheric loss, and is extrapolating back in time
    - Simplified instrument+modeling needed for Heliospheric/Planetary mission
    - EUVM is currently the most cited paper of the MAVEN instruments
  - Opportunity: Large planetary mission
- SPACE/TIME: Space Weather now-casting and forecasting

2) What novel measurements would hold potential for resolving key open science questions or lead to discoveries? (Outline science question/discovery, measurement, and rideshare opportunity)

- **Science Question:** What are the solar energy drivers of everything in the heliosphere? *Also key to space weather forecasting and human presence in interplanetary space and on Mars
  - **Measurement (1):** Use small subset of proxy–based solar irradiance measurements located on CubeSats throughout the heliosphere to recreate the solar irradiance everywhere
    - With solar irradiance, you can also estimate SEPs (soft X-ray spectra) and CMEs (coronal dimming)
    - **Opportunity:** Prime: Any Earth-escape rideshare; Backups: planetary missions; Artemis or L1 (gravity assist + propulsion); GTO/GSO disposal orbit (propulsion)
- **Science Question:** What is the initiation mechanism that triggers CMEs? And under what conditions?
  - **Measurement (1):** Fill the gap from 1.5-2.5R_{Sun} with 24/7 observations using an EUV wide field imager (on disk out to >3.5R_{Sun})
    - **Opportunity:** Prime: Dawn/Dusk Sun-sync orbit; Backups: 2 in LEO or 1 at L1
  - **Measurement (2):** Multi-vantage point observations in the Heliosphere (L1, L4, L5, out-of-the-ecliptic)
    - **Opportunity:** Prime: Planetary mission; Backups: ARTEMIS, L1 (gravity assist + propulsion)

3) What high-risk, high-reward science questions could take advantage of this opportunity? (Outline science question and rideshare opportunity)

- **Science Question:** What is the initiation mechanism that triggers CMEs? And under what conditions? – High Risk/High Reward version
  - **Measurement (1)**: Fill the gap from 1.5-2.5R_{Sun} with 24/7 observations using formation flying white-light coronagraph (e.g. 1.05-5R_{Sun})
    - This is soon to be done on PROBA-3/ASPIICS, but can also be done with a formation flying CubeSat coronagraph
    - **Opportunity:** Prime: Artemis, L1, GTO/GSO disposal (with propulsion); Backups: Planetary mission
- **Science Question:** What is the global solar surface magnetic field
  - **Measurement (1)**: Measure the line-of-sight solar surface magnetic field at L4, L5, or out-of-the-ecliptic
    - Likely be able to reconstruct vector B-field in overlap region
    - Be able to combine surface B-field measurements with limb CME observations and Solar Orbiter/Parker Solar Probe
    - **Opportunity:** Prime: L1, Planetary Mission; Backups: Planetary mission, Artemis?