

# H2 Z: Sun-Solar System Connection Roadmap

## Targeted Outcome to Capabilities to Implementation

*Targeted Outcome: Phase 2015-2025, Our home in space*  
**Identify Precursors of Important Solar Disturbances**

### **Targeted Understanding**

Buildup of energy & helicity  
in coronal magnetic fields

Evolution of global  
solar magnetic field

Relationship between  
CME shocks, flare/  
CME current sheets  
and Solar Energetic  
Particles (SEPs)

Relationship  
between eruptive  
filaments, active  
regions, CMEs,  
and SEPs

CME magnetic  
field orientation

Relationship between global  
field and solar disturbances

### **Enabling Capabilities & Measurements**

Coronal vector magnetic  
field evolution and  
subsurface field evolution

Near-Sun in situ measurements of  
charged particle distribution,  
composition, waves & fields;  
neutrons, hard X-rays & gamma  
rays

UV Spectroscopic determination of  
Pre/Post-shock density, speed,  
compression; ion/electron velocity  
distributions, charge states,  
abundances; Alfvén speed, magnetic  
field, reconnection rates in CME  
shocks, flares, current sheets

On-Disk UV/EUV  
Spectrographic imaging  
for flow velocities,  
energy release signatures;  
Disk Magnetograph for  
magnetic field topology  
and evolution

Radio burst  
measurements  
of near-Sun  
CME shocks

CME magnetic  
field evolution  
behind the disk

Visible light Coronagraph/  
Polarimeter for electron density  
structure and evolution

### **Implementation Phase 2: 2015-2025**

SDO for global  
magnetic field and  
active region  
measurements

Solar Probe/  
Solar Orbiter for  
near-Sun in situ  
observations

SEPP to fully characterize  
coronal sources of SEPs, CME  
shocks and current sheets

DOPPLER, RAM to  
identify disk signatures of  
CME, flare, SEP initiation

SIRA to  
characterize CME  
shocks

SHIELDS  
for tracking disk  
features behind the  
limb