MEP Driving Questions & Research Areas

Domains	Driving Questions		Research Areas‡ (shorthand)	Research Areas‡
Life and Habitability	1. Determine the astrobiological potential of Mars and the processes that govern the preservation of organic and physical biosignatures	1.1	Extant Life	Determine if Mars currently harbors extant life
		1.2	Modern Habitability	Characterize the modern habitability of Martian environments
		1.3	Ancient Life	Search for physical or chemical signatures of ancient life in environments that have a high potential for past habitability and preservation of biosignatures
		1.4	Past Habitability	Constrain the evolution of habitability over geologic timescales
		1.5	Organic Chemistry	Assess the extent of biotic or abiotic organic chemical evolution
Ice, Weather and Climate	2. Characterize the past and present state of the Martian atmosphere, its interactions with the surface and processes controlling weather, climate, distribution of volatiles, and radiation environment	2.1	Modern Ices and Volatiles	Identify and characterize the emplacement, exchange and evolution of present-day water ice and other volatiles at or near the Martian surface
		2.2	Modern Weather	Characterize the state and controlling processes of the present-day weather, climate, and radiation environment
		2.3	Relict Ice	Understand the emplacement and evolution of past ice reservoirs at the Martian surface and within the crust over geologic time
		2.4	Climate Evolution	Find evidence for the state of Mars' early climate, the factors that controlled it, and how it evolved from the past to the present
Geology	3. Determine the nature, origin, structure, composition, and evolution of the crust and the interior of Mars and its moons	3.1	Modern Surface Processes	Identify and characterize the processes that are actively shaping the present-day surface of Mars
		3.2	Crustal Geology	Study the key processes that have modified the Martian crust over geologic time
		3.3	Geochronology	Determine the timing of construction and modification of the crust
		3.4	Martian Interior	Understand how Mars' interior structure, composition, and dynamics relate to Mars' formation and subsequent evolution
		3.5	Martian Moons	Understand the formation and evolution of the Martian planetary system

‡All research areas are aligned with the sustained, decade-long exploration program in understanding of the history and evolution of Mars, while those in orange indicate research areas with greatest overlap with agency priorities of advancing human exploration and/or planetary protection.