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Juno's Exploration of Jupiter and the Impact for Future Missions

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Juno arrived at Jupiter on July 4, 2016 and provided a view of Jupiter's polar regions in both visible (JunoCam) and infrared (JIRAM) wavelengths. These images show a surprising complex organization of polar cyclones. They also revealed unexpected distributions of high-altitude hazes, widespread fine-scale discrete clouds and waves. Juno's microwave radiometers (MWR) measure brightness temperatures at a range of wavelengths between approximately 1 and 50 cm. At these wavelengths, the microwave opacity is dominated by ammonia and water vapor, allowing the MWR to reveal structure and composition in Jupiter's deep atmosphere. The results are paradigm shifting in their indication of unexpected variability in both latitude and depth. Additionally, the MWR has been discovered to be a very sensitive lightning detector. An overview of the most surprising Juno results from MWR, JIRAM and JunoCam will be presented and the impact of these discoveries on future direction for planetary exploration will be discussed.