This new Hubble Space Telescope view of Jupiter reveals the giant planet’s trademark Great Red Spot, and a more intense color palette in the clouds swirling in Jupiter’s turbulent atmosphere than seen in previous years. The colors, and their changes, provide important clues to ongoing processes in Jupiter’s atmosphere.

Among the most striking features in the image are the rich colors of the clouds moving toward the Great Red Spot, a storm rolling counterclockwise between two bands of clouds. These two cloud bands, above and below the Great Red Spot, are moving in opposite directions. The red band above and to the right (northeast) of the Great Red Spot contains clouds moving westward and around the north of the giant tempest. The white clouds to the left (southwest) of the storm are moving eastward to the south of the spot.

All of Jupiter’s colorful cloud bands in this image are confined to the north and south by jet streams that remain constant, even when the bands change color. The bands are all separated by winds that can reach speeds of up to ~650 km/hour.

The bands are created by differences in the thickness and height of the ammonia ice clouds. The colorful bands, which flow in opposite directions at various latitudes, result from different atmospheric pressures. Lighter bands rise higher and have thicker clouds than the darker bands.