Surprise is one of six emotions having a specific and universally recognized facial expression. Functional imaging and neuropsychologic studies have uncovered partly separable neural substrates for perceiving different facial expressions; however, the functional neuroanatomy of perceiving surprised faces has not yet been investigated. Using functional magnetic resonance imaging (fMRI), we aimed to identify the neural substrate of surprise perception from facial expressions. Based on the assumption of unexpectedness and novelty as elicitors of facial surprise reactions, we hypothesized recruitment of medial temporal lobe structures implicated in novelty detection during the perception of surprise in others. Healthy subjects were scanned while they were presented with surprised faces. As a control, they viewed faces depicting neutral or disgust expressions. Activations during the emotional conditions were contrasted with each other and with the neutral face condition. Compared to both control conditions, perception of surprised facial expressions yielded consistently increased signals in the parahippocampal region, an area associated previously with novelty detection. Our findings therefore suggest a close relation between perceiving surprise in others and the response to novel events. Additionally, we confirmed activation of the insula during perception of disgust expressions.