electron density function

The electron probability distribution function, $\rho$, defined as

$$\rho(\mathbf{r}) = n \int \Psi^*[\mathbf{r}(1), \mathbf{r}(2) \ldots \mathbf{r}(n)] \Psi[\mathbf{r}(1), \mathbf{r}(2) \ldots \mathbf{r}(n)] d\mathbf{r}(2) \ldots d\mathbf{r}(n)$$

where $\Psi$ is an electronic wave-function and integration is made over the coordinates of all but the first electron of $n$. The physical interpretation of the electron density function is that $\rho \, d\mathbf{r}$ gives the probability of finding an electron in a volume element $d\mathbf{r}$, i.e., electron density in this volume.

Source:
PAC, 1999, 71, 1919 (Glossary of terms used in theoretical organic chemistry) on page 1937