In this thesis we are exploring basic properties of the Kerr solution using several coordinate systems. Later on, we are deriving general metric form of the spacetime foliated by null hypersurfaces. Employing the formalism of optical scalars we shall see, that geometry of a such a spacetime is non-twisting, that is it admits existence of a non-twisting affinely parametrized null geodesic congruence. Subsequently, we are trying to express the Kerr solution in the form of non-twisting coordinates. This form would have many applications e.g. in formalism of weakly isolated horizons (WHIs) for use in more realistic astrophysical models of black holes.