The complex Monge-Ampère equation is one of the most important equations in complex differential geometry. The solution, of this equation, for smooth data obtained by S. T. Yau, allows to find metrics with prescribed Ricci curvature on compact Kähler manifolds with definite Chern class, in particular Kähler-Einstein metrics - important in theoretical physics. Nowadays this type of constructions can be made under weaker assumptions. Potentials of those metrics are the weak solutions of the complex Monge-Ampère equation. Moreover those metrics are also the limits of the Kähler-Ricci flow, under which a given metric evolves to some canonical metric on the same space.

We shall consider the following problems:

1. Stability of the complex Monge-Ampére equation when the right hand side moves in some classical function spaces.

2. The question when the existence of a subsolution implies the existence of the solution.

3. The application of the above to the better description of the limits of the Kähler-Ricci flow or limits of Calabi-Yau spaces.

4. The Calabi conjecture (on existence of canonical metrics) in quaternionic geometry.