Workshop dedicated to the memory of Professor Gabriela Kohr
(2nd edition)
Geometric Function Theory in Several Complex Variables and Complex Banach Spaces

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Fixed point theory of holomorphic mappings in complex spaces and applications

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Abstract

This talk is devoted to the recent developments in the fixed point theory of holomorphic and hyperbolically non-expansive mappings in complex spaces.

The results presented here mostly are based on works of Marco Abate, Vladimir Bolotnikov, Filippo Bracci, Clifford Earle, Mark Elin, Lawrence Harris, Kazimemierz Goebel, Ien Graham, Richard S. Hamilton, Gabriela Kohr, Tadeush Kuchzumow, Simeon Reich, David Shoikhet, Adam Stachura, Toshiyuki Sugawa, Lawrence Zalcman and others.

Also, we would like to mentioned a recent great contribution to the theory of fixed points of holomorphic mappings and semigroups in the spirit complex dynamical systems developed by Leonardo Arosio, Manuel D. Contreras and Santiago Diaz-Madrigal.

Actually, the most powerful tool in those studies is the so-called *resolvent family* of a discrete (or continuous) semigroup of holomorphic mappings, which is based particularly on the previous results given by M.Elin, D.Shoikhet and T.Sugawa.

Since the class of nonlinear resolvents consists of univalent functions, it can be studied in the frameworks of classical and modern geometric function theories.

The infinite dimensional theory of holomorphic functions originated in a series of papers by M. Fréchet and R. Gateaux that appeared from 1909 to 1929 and was subsequently developed by many others. We first discuss two definitions of holomorphy. A strong definition is due to Fréchet and a weak definition usually is associated with Gateaux.