Seminar on Geometric Function Theory
Meeting 29, 19th October 2009
lecture: **Some open problems in Geometric Function Theory**
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(1) Is a bounded smooth pseudoconvex domain $D \subset \mathbb{C}^n$ k_D-complete or c_D-complete?
(2) Let $D \subset \mathbb{C}^n$ be a bounded smooth pseudoconvex domain.
   (a) Does for any $\varepsilon > 0$ and $z_0 \in \partial D$ exist a constant $c > 0$ such that $\kappa_D(z; n(z_0)) \geqslant \frac{c}{(d_D(z))^{1-\varepsilon}}$ for any $z \in (z_0 - n(z_0)) \cap D$, where $n(z_0)$ is a normal vector at z_0?
   (b) Does for $n = 2$ and $z_0 \in \partial D$ exist a constant $c > 0$ such that $\kappa_D(z; n(z_0)) \geqslant \frac{c}{d_D(z)}$ for any $z \in (z_0 - n(z_0)) \cap D$, where $n(z_0)$ is a normal vector at z_0?
(3) Is any bounded pseudoconvex balanced domain $D \subset \mathbb{C}^2$ with a continuous Minkowski functional k_D-complete?
(4) Is any bounded pseudoconvex balanced domain $D \subset \mathbb{C}^n$ with a smooth Minkowski functional k_D-complete?
(5) Is any bouded domain with continuous boundary hyperconvex?
(6) Is any psuedoconvex Hartogs domain D with b_G-complete basis G b_D-complete?
(7) Is the Lempert theorem valid for $\mathbb{C}$-convex domains?
(8) Can any $\mathbb{C}$-convex domain be exhausted by smooth $\mathbb{C}$-convex domains?
(9) Can $\mathbb{G}_2$ be exhausted by smooth $\mathbb{C}$-convex domains?
(10) Is the Lempert theorem valid for the tetrablock?
(11) Is the Green function continuous for pseudoconvex Reinhardt domains?
(12) Can $\{(z, w) \in \mathbb{C}^2 : (\operatorname{Re} z^2)^2 + |z|^2 + |w|^2 < 1\}$ be exhausted by domains biholomorphic to convex ones?
(13) Does for any pseudoconvex domain exist N such that the infimum in the definition of the Kobayashi pseudodistance for D is taken only over N discs?
(14) Is the infimum in the Poletsky's definition of the Green function of hyperconvex domains always attained?
(15) Does the Green function of a hyperconvex domain converge to zero as the pole tends to the boundary?
(16) Is the Green function of a strictly pseudoconvex domain with smooth boundary of class $\mathcal{C}^2$?