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Capillary Christoffel-Minkowski problems

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The classical Minkowski problem asks for the existence and uniqueness of a convex body with prescribed Gauss curvature, while the family of Christoffel-Minkowski problems generalize this question to find convex bodies with prescribed elementary symmetric polynomial of the principal radii. The full resolution of the Minkowski problem was given by works of Minkowski, Aleksandrov, Pogorelov, Nirenberg, Cheng-Yau, while sufficient conditions for the resolution of the Christoffel-Minkowski problem were given by Guan-Ma and Sheng-Trudinger-Wang. In this talk we discuss recent work with Yingxiang Hu and Mohammad Ivaki, which gives an analogous set of sufficient conditions to solve the Christoffel-Minkowski problem in the class of capillary surfaces in a half spaces with angle less than 90 degrees.

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