Student Geometry Seminar

國立清華大學數學系 學生幾何研討會

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講題 Ancient solutions to curve shortening flow with finite entropy

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Abstract

Recently, asymptotic analysis on ancient solutions to mean curvature flow under certain convexity and low-entropy conditions has led to significant progress in the regularity theory in mean curvature flow in low dimensions. In the 1-dimensional case, convex ancient solutions are classified by Daskalopoulos—Hamilton—Sesum and Bourni—Langford—Tinaglia. In this talk, I will explain our recent progress towards the classification problem of ancient solutions to curve shortening flow under a much weaker assumption—finite entropy, which only places constraints on curves near space-time infinity. Specifically, we show that ancient solutions with entropy less than 3 must be convex; hence they are completely classified by applying the convex result. Moreover, we demonstrate that ancient solutions with finite entropy admit unique tangent flows at infinity, given by lines with multiplicity. Additionally, there are finitely many 'tip points' near which the curves resemble the translating 'Grim Reaper'. This talk is based on joint work with Kyeongsu Choi, Donghwi Seo, and Kai-Wei Zhao.

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