



Geometry Webinar AmSur/AmSul

Non-Kähler Calabi-Yau geometry and pluriclosed flow

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Resumo: In this talk I will overview joint work with J. Jordan and J. Streets, in arXiv:2106.13716, about Hermitian, pluriclosed metrics with vanishing Bismut-Ricci form. These metrics give a natural extension of Calabi-Yau metrics to the setting of complex, non-Kähler manifolds, and arise independently in mathematical physics. We reinterpret this condition in terms of the Hermitian-Einstein equation on an associated holomorphic Courant algebroid, and thus refer to solutions as Bismut Hermitian-Einstein. This implies Mumford-Takemoto slope stability obstructions, and using these we exhibit infinitely many topologically distinct complex manifolds in every dimension with vanishing first Chern class which do not admit Bismut Hermitian-Einstein metrics. This reformulation also leads to a new description of pluriclosed flow, as introduced by Streets and Tian, implying new global existence results. In particular, on all complex non-Kähler surfaces of nonnegative Kodaira dimension. On complex manifolds which admit Bismut-flat metrics we show global existence and convergence of pluriclosed flow to a Bismut-flat metric.