Faculti Summary
https://staging.faculti.net/diameter-rigidity-for-kahler-manifolds-with-positive-bisectional-curvature/

The speaker discusses their work in differential geometry, focusing on the study of geometric structures on smooth manifolds, particularly Kähler manifolds with positive bi-sectional curvature. They explain a general principle in geometry that objects with large positive curvature are relatively small compared to model spaces, and this leads to concepts of rigidity results in comparison geometry, where geometric objects are analyzed against model spaces like spheres or Euclidean space.

They elaborate on the importance of understanding curvature from intrinsic properties rather than just relying on external observations, giving examples like the Earth's curvature and the sum of angles in triangles on curved surfaces. The speaker introduces the concept of Riemannian manifolds, which possess additional structures allowing for the measurement of angles and lengths via dot products in tangent spaces.

The speaker then explains classical results regarding the diameter of Kähler manifolds and introduces diagnostic tools like Ricci curvature and the Riemann curvature tensor, emphasizing the complexity of higher-dimensional geometries and the challenges of deriving meaningful results using different curvature properties.

They highlight prior work by Myers and Chang establishing bounds on diameters and congruencies related to curvature, and discuss their contributions concerning conditions under which certain diameter rigidity results hold for Kähler manifolds. Notably, they mention that while analogous results for Kähler manifolds exist, there are limitations and uncertainties when establishing strict analogs, particularly relating to the use of bi-sectional curvature as opposed to Ricci curvature.

The conversation concludes with an open question centered on whether a specific construction of products of complex projective spaces yields the maximum diameter for Kähler manifolds given certain curvature conditions, with the speaker expressing curiosity about the outcome.