VIRTUAL EAST-WEST SCV SEMINAR

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THE RANGE OF THE KILLING OPERATOR

The Killing operator on a Riemannian manifold takes a vector field to the symmetrised part of its covariant derivative. Its kernel consists of Killing fields, the infinitesimal Riemannian symmetries. Its range in flat space was identified in three dimensions by Saint-Venant in 1864 as the kernel of a certain second order operator. These second operator compatibility conditions were extended to constant curvature metrics (in all dimensions) by Calabi in 1961. What about the Fubini-Study metric on complex projective space? What about locally symmetric spaces in general? I'll explain the background to these constructions and exactly what happens on Riemannian locally symmetric spaces (joint work with Federico Costanza, Thomas Leistner, and Ben McMillan). I'll mainly concentrate on complex projective space, where several natural features come together.