

Is there a mystery behind the Ricci curvature?

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The way Gregorio Ricci-Curbastro isolated the part of the curvature that now bears his name in Riemannian Geometry (and generalizes to Metric Geometry, and to the pseudo-Riemannian context in particular) is through an analogy with the second fundamental form in submanifold theory. It is interesting to note that, although completely legitimate from a geometric point of view, this idea has not born much fruit... when studies involving the Ricci curvature have thrived.

There are several other paths that lead to the Ricci curvature, each providing interesting insights. The most penetrating definition of the Ricci curvature may still lie ahead of us.

The lecture proposes a tour of the various definitions and outstanding problems and results connected with them.