

# ON THE CONSTRUCTION OF COMPACT RICCI SURFACES

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## ABSTRACT

The starting point of this talk is the intrinsic study of local minimal isometric immersions of a Riemannian surface  $(\Sigma, d\sigma^2)$  into a 3-dimensional space form of curvature  $c$ . Ricci's theorem, generalized by Lawson, states that such immersions exist if the Gaussian curvature  $K$  of  $d\sigma^2$  satisfies  $K < c$  and the equation:

$$(c - K)\Delta K + |\nabla K|^2 + 4K(c - K)^2 = 0.$$

A Riemannian metric  $d\sigma^2$  that satisfies this condition is called a *Ricci metric* of type  $c$ , making  $(\Sigma, d\sigma^2)$  a *Ricci surface* of type  $c$ . In this talk, we explore Ricci metrics of type  $c$  with rotational invariance. We begin by presenting a classification for the case  $c = 0$  and construct new examples of immersed Ricci surfaces in  $\mathbb{R}^3$ . Next, we develop a two-parameter family of non-isometric Ricci metrics of type  $c$  for  $c > 0$ , which can be realized on a torus, and we show how some of these surfaces can be immersed in the 3-sphere.

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