

# Minimal surfaces in Lorentzian Heisenberg group

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The Weierstrass representation formula for minimal surfaces in  $\mathbb{R}^3$  is a powerful tool to construct examples and to prove general properties of such surfaces, since it gives a parametrization of minimal surfaces by holomorphic data. In [3] the authors described a general Weierstrass representation formula for simply connected immersed minimal surfaces in an arbitrary Riemannian manifold. In this presentation we will use this setting to construct examples of minimal surfaces in the Lorentzian 3-dimensional Heisenberg group  $\mathbb{H}_3$ . Also, we express the first fundamental form, the Gauss map and the Gauss curvature of a minimal surface in  $\mathbb{H}_3$  in terms of its Weierstrass data.

## References

- [1] A. Cintra, F. Mercuri, I.I. Onnis, *Minimal surfaces in Lorentzian Heisenberg group and Damek–Ricci spaces via the Weierstrass representation*, Journal of Geometry and Physics **121** (2017), 396–412.
- [2] B. Daniel, *The Gauss map of minimal surfaces in the Heisenberg group*
- [3] F. Mercuri, S. Montaldo, P. Piu, *Weierstrass representation formula of minimal surfaces in  $\mathbb{H}_3$  and  $\mathbb{H}^2 \times \mathbb{R}$* , Acta Math. Sinica **22** (2006), 1603–1612.