The first half of the talk will be a review of how to solve, following Conway, Pell’s equations such as $x^2 - 2y^2 = 1$ over the integers. Roughly speaking, one enters a number (value of the form) in a few complementary components of the $SL(2, \mathbb{Z})$ spine (= topograph) in the hyperbolic plane, and the solutions appear. Positive and negative values are separated by a line (= river), which is the axis of the symmetry group. The second half of the talk will sketch a generalization of this to hyperbolic 3-space, corresponding to integral binary hermitian forms. The topograph becomes the spine of the suitable Bianchi group, and the river becomes an ocean (a copy of hyperbolic plane).

This is joint work with Gordan Savin.