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Domingo Toledo* (toledo@math.utah.edu). *Complex hyperbolic manifolds and their totally geodesic sub-manifolds.*

This will be a survey of various constructions of compact (or complete and finite volume) complex hyperbolic manifolds. There are very general arithmetic constructions that work in all dimensions, and geometric constructions that work in low dimensions. The latter are based on monodromy of families of algebraic varieties. The earliest example is Picard's use of part of the period matrix of a family of curves of genus 3 to give an example of a complete, finite volume quotient of the complex hyperbolic plane.

Picard's example has been extended in many ways to construct other complex hyperbolic manifolds, for example, the ones of Deligne and Mostow, using different families of curves. One example using higher-dimensional varieties is the uniformization of the moduli space of cubic surfaces by complex hyperbolic 4-space (Allcock-Carlson-Toledo).

A special feature of these geometric constructions is that they contain totally geodesic complex sub-manifolds. Their geometry can be used to get some understanding of the geometry of the ambient manifold. (Received March 16, 2017)