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Emma Previato* (ep@bu.edu), Department of Mathematics and Statistics, Boston University, Boston, MA 02215-2411. *Weierstrass Semigroups*.

Weierstrass points play a major role in the theory of automorphisms of algebraic curves. We report on the existence of a $\langle 6, 13, 14, 15, 16 \rangle$ Weierstrass semigroup (with J. Komeda and S. Matsutani, *Internat. J. Math.* **24**, 2013). For this class of curves, we give formulas that link algebraic and transcendental moduli, via Klein's higher-genus sigma function. For a trigonal curve, we give an explicit expression of the Riemann theta constant (with Komeda and Matsutani, *Arc. Math.* 2016), not previously known when the Weierstrass semigroup is not symmetric. We then review an application of the Kleinian sigma to hyperelliptic curves, which yields algebraic equations for points of finite order (in a suitable sense) on the Jacobian (with Y. Kodama and S. Matsutani, *Ann. Inst. Fourier* **63**, 2013). The finiteness condition reflects into Poncelet's classical porism, and we report on a generalization to Poncelet's theorem in space. Poncelet's traverses are motions in an algebraically completely integrable system. We propose an interpretation of the Jacobian fibration of integral manifolds analogous to the one devised by N.J. Hitchin in the elliptic case, which corresponds to the monodromy of a particular algebraic class of Painlevé VI equations. (Received August 31, 2016)