1106-11-19 **Henri Darmon*** (darmon@math.mcgill.ca), McGill University,805 Sherbrooke St W, Montreal QC Canada. *Elliptic curves and explicit class field theory.* Preliminary report.

The values of the exponential function $e^{2\pi iz}$ and of the modular function $j(z)$ (at rational and quadratic imaginary arguments, respectively) give explicit generators for essentially all abelian extensions of the field of rational numbers and of quadratic imaginary fields. The associated theories of cyclotomic fields and of complex multiplication are quite rich and were actively pursued throughout the 19th century. Kronecker's "Jugendtraum", raised again by Hilbert as the twelfth in his celebrated list of open problems for the 20th century, seeks to extend these theories to base fields other than the rationals or quadratic imaginary fields. More than a hundred years later, Hilbert's 12th problem is still largely open. This lecture shall describe this question and its possible connections to the construction of rational points on elliptic curves, tying in with another fundamental open problem in number theory: the celebrated Birch and Swinnerton-Dyer conjecture. (Received November 3, 2014)