1026-11-112   **Cormac O'Sullivan***, cormac12@juno.com, and **Ozlem Imamoglu** and **Jay Jorgenson**.
     Higher-order automorphic forms and a conjectural inner product. Preliminary report.

Automorphic forms of order 2 and higher generalize the classical space $S_k(\Gamma_0(N))$, for example, by allowing a more flexible automorphy property. They arose in work of Goldfeld on the ABC conjecture and a connection with percolation theory was established by Kleban and Zagier. In joint work with O. Imamoglu we give a conjectural inner product for the space of automorphic cusp forms of order n. We show the conjecture is true for $n = 1, 2$. If there is time I will outline related results in work with J. Jorgenson where we find a new type of Dedekind sum related to 3rd-order forms. (Received February 21, 2007)