1114-37-310 **Svetlana Jitomirskaya** (szhitomi@math.uci.edu), University of California, Irvine, Rowland Hall, Room 540D, Irvine, CA 92697-3875, and **Wencai Liu*** (liuwencai1226@gmail.com), 540V,Rowland Hall, Irvine, CA 92697. *Exact asymptotics of the eigenfunctions and transfer matrices for the almost Mathieu operator.*

Almost Mathieu operator is the central quasiperiodic model in both physics and mathematics. It is given by

$$(H_{\lambda,\alpha,\theta}u)(n) = u(n+1) + u(n-1) + 2\lambda\cos 2\pi(\theta + n\alpha)u(n),$$

where λ is the coupling, α is the frequency, and θ is the phase. For fixed parameters α and λ, $\{H_{\lambda,\alpha,\theta}\}_{\theta\in\mathbb{R}}$ is a family of selfadjoint operators on $\ell^2(\mathbb{Z})$. In this talk, we study the almost Mathieu operator $\{H_{\lambda,\alpha,\theta}\}_{\theta\in\mathbb{R}}$ in localization regime, i.e., $|\lambda| > e^{\beta(\alpha)}$, where

$$\beta(\alpha) = \limsup_{n\to\infty} \frac{\ln q_{n+1}}{q_n},$$

and $\frac{p_n}{q_n}$ are the continued fraction approximants of α.

We determine the exact exponential asymptotics of eigenfunctions and of corresponding transfer matrices of the almost Mathieu operators for all frequencies and almost all phases in this regime. This also gives a constructive proof of the arithmetic version of the second transition conjecture proposed in 1994. (Received August 31, 2015)