

# Topology Seminar

**Kirsten Wickelgren**

of Harvard University will be speaking on

## $H_1$ of the Abel-Jacobi Map to the Compactified Jacobian gives Poincaré Duality

on November 26 at 4:30 in  
MIT Room 2-131

The Picard scheme  $\text{Pic}^0$  representing invertible sheaves can be compactified by a moduli space  $J$ -bar of rank 1, torsion-free sheaves called the compactified Jacobian. For a smooth algebraic curve  $X$  over a field  $k$  with boundary  $\partial X$ , applying  $H_1$  to the Abel-Jacobi map  $X \rightarrow \text{Pic}^0(X/\partial X)$  gives the Poincaré duality isomorphism  $H_1(X, \mathbb{Z}/\ell) \rightarrow H_c^1(X, \mathbb{Z}/\ell(1)) = H^1(X, \partial X, \mathbb{Z}/\ell(1))$ . We show the analogous result for the compactified Jacobian that applying  $H_1$  to the Abel-Jacobi map  $X/\partial X \rightarrow J\text{-bar}$  gives the Poincaré duality isomorphism  $H_1(X, \partial X, \mathbb{Z}/\ell) \rightarrow H^1(X, \mathbb{Z}/\ell(1))$ . In particular,  $H_1(X/\partial X \rightarrow J\text{-bar})$  is an isomorphism. This is joint work with Jesse Kass.