Bandlimited approximations to integral transforms

Consider

$$f(x) = \int_0^\infty k(x,t)d\nu(t)$$

where ν is a Borel measure and $k(x,t) = e^{-|x|t}$ or $k(x,t) = e^{-x^2t}$. (For example, $f(x) = \log \frac{x^2+a^2}{x^2+b^2}$ is of this form.) This talk considers the problem of bandlimited approximation to such functions and explains how these extremal functions are used in attempts to bound the Zeta function and Dirichlet L functions in their critical strips assuming the Riemann hypothesis.