# COMPLEX ANALYSIS SEMINAR

## RANGE OF BEREZIN TRANSFORM

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**ABSTRACT**: Let $dA = \frac{dxdy}{\pi}$ denote the normalized Lebesgue area measure on the unit disk $\mathbb{D}$ and $u$, a summable function on $\mathbb{D}$. The Berezin transform of $u$ is defined as $B(u)(z) = \int_{\mathbb{D}} u(\xi)\frac{(1-|z|^2)^2}{|1-\xi\overline{z}|^4}dA(\xi)$. Ahern described all the possible functions of the form $B(u)$ for which $B(u)(z) = f(z)\overline{g(z)}$ where both $f, g$ are holomorphic in $\mathbb{D}$. The natural next question was to describe all functions in the range of Berezin Transform which are of the form $\sum_{j=1}^{N} f_j\overline{g_j}$ where $f_j, g_j$ are all holomorphic in $\mathbb{D}$. We shall describe all $u$ for which $B(u) = \sum_{j=1}^{N} f_j\overline{g_j}$ where $f_j, g_j$ are all holomorphic in $\mathbb{D}$. Further we give very simple proof of the result of Ahern.

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**Date:** Thursday, January 21, 2010

**Time:** 4pm-5pm

**Place:** UH 4010

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**Webpage:** `http://math.utoledo.edu/~sonmez/complexseminar.html`