1068-43-28 **Susanna Dann*** (sdann@math.lsu.edu) and **Gestur Olafsson**. *Paley-Wiener Theorems on $\mathbb{R}^n$ as a Gelfand Pair.*

One of the important questions related to any integral transform on a manifold $\mathcal{M}$ or on a homogeneous space G/K is the description of the image of a given space of functions. If $\mathcal{M} = G/K$, where (G, K) is a Gelfand pair, then the harmonic analysis is closely related to the representations of G and the direct integral decomposition of $L^2(\mathcal{M})$ into irreducible representations of G. $\mathbb{R}^n$ can be realized as the quotient $\mathbb{R}^n \simeq G/\mathrm{SO}(n)$, where G is the orientation preserving Euclidean motion group $\mathbb{R}^n \rtimes \mathrm{SO}(n)$. The pair $(G, \mathrm{SO}(n))$ is a Gelfand pair. Hence this realization of $\mathbb{R}^n$ comes with its own natural Fourier transform derived from the representation theory of G. The representations of G that are in the support of the Plancherel measure for $L^2(\mathbb{R}^n)$ are parameterized by $\mathbb{R}^+$. After recalling the Fourier transform on Gelfand pairs, we describe the image of smooth compactly supported functions under the Fourier transform with respect to the spectral parameter. Then we discuss projective limits of these spaces. (Received January 19, 2011)