Szymon Peszat (IMUJ), random motions on spheres.

The talk is based on a joint work with Zdzisław Brzeźniak (York, UK). First I am going to introduce some classes of diffusions (in the Stratonovich form)

$$dX = \pi(X) d_S W \tag{1}$$

on $\mathbb{R}^{d+1}$, preserving the unit sphere $\mathbb{S}^d$; that is $X(0) \in \mathbb{S}^d$ implies $X(t) \in \mathbb{S}^d$ for all $t \geq 0$. Thus (1) defines a Markov process on $\mathbb{S}^d$. We are interested in the case where the generator of X is the Laplace-Beltrami operator $\Delta_{\mathbb{S}^d}$. Such X we call a Brownian Motion on $\mathbb{S}^d$.

Next we are interesting in jump diffusions on $\mathbb{S}^d$. In this case we should consider the equation in the so-called Markus canonical form

$$dY = \pi(Y) \diamond dL.$$

The most interested case is where the generator of Y is the fractional power $-(-\Delta_{\mathbb{S}^d})^\alpha$ of the Laplace-Beltrami operator.