5005-C1-25 **Gabriel Peyre*** (gabriel.peyre@ceremade.dauphine.fr), Ceremade, Universite Paris Dauphine, Place de Lattre de Tassigny, 75775 Paris Cedex 16, France. *Adaptive Sparse Representation of Geometric Textures.*

I will show how adapted dictionaries can be trained to approximate and generate geometric texture patterns. I restrict myself to two different approaches: bandlets dictionaries and dictionaries learned from data.

Bandlets dictionaries are well suited to approximate locally parallel textures. Each basis is parameterized by a geometric flow that follows closely the texture patterns. The resulting basis vectors generate a tight frame of elongated atoms that can sparsify turbulent textures. Sparse modeling over a well chosen bandlet dictionary can be used for various tasks such as texture synthesis, compressed sensing decoding or morphological component separation.

Rather that using had-oc geometrical constraints for textures, one can infer the model from exemplar input textures. This model imposes a sparsity assumption on the set of patches extracted from the texture. This sparsity can be optimized by learning a dictionary to optimally represent the input patches. The resulting model can smoothly interpolate between aggressive compression routinely used in computational harmonic analysis and realistic texture synthesis required by computer graphics applications. This texture model also finds applications in problems such as structure+texture decomposition or image inpainting. (Received May 05, 2007)