



**Donnerstag, den 25. Juni 2026, um 14:30 Uhr, im Hörsaal 2**

**Prof. Dr. Michael Multerer\***

(Università della Svizzera italiana, Lugano)

***Samplets: Construction, Properties and  
Kernel Matrix Compression***

**Zusammenfassung/Abstract:**

We introduce samplets, a multiresolution analysis of discrete signed measures with prescribed vanishing moments. Samplets enable efficient data compression, feature detection and adaptive representations. The decay of samplet coefficients can be employed to quantify pointwise regularity within the framework of microlocal spaces introduced by Jaffard. In the context of reproducing kernel Hilbert spaces, samplets induce bases in subspaces spanned by kernel translates via the Riesz isometry. The corresponding Gramian, that is, the kernel matrix expressed in samplet coordinates, becomes quasi-sparse for quasi-uniform data sites. For asymptotically smooth kernels, the compression error can be controlled by the number of vanishing moments. Furthermore, the compressed representation can be computed efficiently by leveraging H2-matrix techniques. We present the corresponding algorithms and report favorable numerical results.

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