

## INVITATION TO THE LECTURE

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ROOM 213

# PRECONDITIONER CONSTRUCTION FOR MIXED HODGE LAPLACIAN ON A HILBERT COMPLEX

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The focus of this talk is an application of a norm fitting framework by Hong et al. to the mixed formulation of the Hodge Laplace operator on a Hilbert complex. It will be shown that the Hilbert complex structure provides very useful properties in the Hodge decomposition and the related Poincaré inequality. Using these, we interpret the mixed Hodge Laplacian as a perturbed saddle point problem and apply the norm fitting approach to obtain two operator preconditioners. Finally, it will be shown that both of these operators can be simplified to the same norm-equivalent preconditioner with the expected structure that is easy to implement and numerical experiments confirm its robustness.