Algebra and Geometry Seminar

Speaker: Yvan Saint-Aubin (Université de Montréal)

Title: Spin chains as a module over the affine Temperley-Lieb algebra.

Abstract: Let $V = (\mathbb{C}^2)^{\otimes N}$ be the tensor product of N copies of the two-dimensional simple $U_q(sl_2)$-module. It is also a $U_q(sl_2)$-module (through the coproduct on $U_q(sl_2)$). The algebra of endomorphisms $\mathrm{End}_{U_q(sl_2)}V$ is known to define a representation of the (original) Temperley-Lieb algebra TL_N on V (Jimbo (1985, 1986), Martin (1992)). This is known as the (q-)Schur-Weyl duality. The TL_N-action on V was extended to one of the affine Temperley-Lieb algebra aTL_N by two physicists in their study of spin chains (Pasquier and Saleur (1990)). While this extended action fails to commute with that of $U_q(sl_2)$, the interplay between both actions can be used to reveal the structure of V as a aTL_N-module.
This is joint work with Théo Pinet (arXiv:2205.02649).