



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

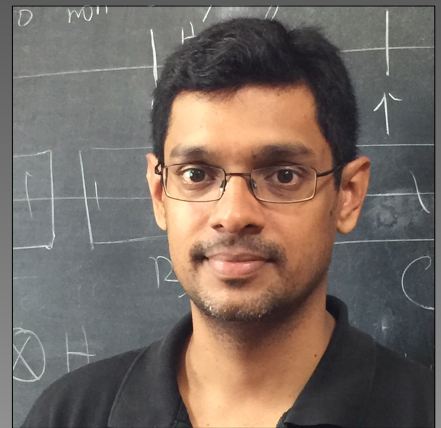
S-duality, triangle groups and modular anomalies in $N=2$ SQCD

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Time: 11.30 am

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(Duration and Location are subject to irreducible jitter)

We study $N=2$ superconformal theories with gauge group $SU(N)$ and $2N$ fundamental flavours in a locus of the Coulomb branch with a Z_N symmetry. In this special vacuum, we calculate the prepotential, the dual periods, and the period matrix using equivariant localization. In the conformal limit, we find that the period matrix is completely specified by $[N/2]$ effective couplings on which the S-duality group acts as a generalized triangle group. In addition, we propose a non-perturbatively exact map between each effective coupling and the bare coupling in terms of the hauptmodul of the corresponding triangle group. For $N=2, 3, 4$ and 6 , all the S-duality groups are arithmetic Hecke groups which contain a subgroup that is also a congruence subgroup of the modular group $PSL(2, Z)$. For these theories, we introduce mass deformations that respect the symmetries of the special vacuum and show that the constraints arising from S-duality allow one to resum instanton contributions to these observables in terms of meromorphic modular functions which solve modular anomaly equations.