

**The University of Queensland
Centre for Mathematical Physics
SEMINAR**

Speaker: Peter Jarvis, School of Mathematics and Physics,
University of Tasmania

Title: Worldline quantisation of a reciprocally invariant system

11am, Thursday 17th May, 2007

Priestley Building, room 641.

Abstract

We present the worldline quantisation of a system invariant under the symmetries of reciprocal relativity (pseudo-unitary transformations on ‘phase space coordinates’ $x^\mu(\tau)$, $p^\mu(\tau)$ together with an additional phase $\theta(\tau)$, which preserve the Minkowski metric and the symplectic form, together with global translations). Imposition of the first class constraint on physical states enforces the condition that the cosmological constant term (which is allowed by the reparametrisation-invariant coupling of the system to the metric on the worldline) must be identified with a fixed eigenvalue of the Casimir invariant of the full quaplectic symmetry group $Q(3, 1) \cong U(3, 1) \ltimes H(3, 1)$, the semidirect product of the pseudounitary group with the Weyl-Heisenberg group (which is a central extension of the global translation group, with central charge \hbar). The decomposition of such unitary irreducible representations of the quaplectic group with respect to the Poincaré group is constructed. We speculate on the particle spectrum implied by this implementation of Born-Green reciprocity.

Joint work with Jan Govaerts (U.C. Louvain), Stephen Low (U.T. Austin) and Stuart Morgan (U. Tasmania).

All interested are invited to attend.

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