

ACADEMIC REGISTRY
Abstract of Thesis Form



Candidate

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School/PGI:	MACS	Degree Sought:	PhD
Title of Thesis: (complete in upper and lower case)	TIME DEPENDENT NONCOMMUTATIVE GEOMETRY AND FIELD THEORY ON THE NAPPI-WITTEN SPACETIME		
	time dependent noncommutative geometry and field theory on the nappi-witten spacetime		
Signature:		Date:	

Abstract

We characterise the worldvolume theories on symmetric and non-symmetric D-branes in the six-dimensional Nappi-Witten spacetime. We find classes of Euclidean and Lorentzian noncommutative D3-branes, the physical origins of which are described through the interplay between isometric embeddings of branes in the spacetime and the Penrose-Güven limit of $AdS_3 \times S^3$. A non-symmetric spacetime-filling D-brane is constructed to give a spatially varying noncommutativity, analogous to that of the Dolan-Nappi model.

We then describe an algebraic approach to the time-dependent noncommutative geometry of the Nappi-Witten spacetime and develop a formalism to construct and analyse field theories defined thereon. Various star-products are derived in closed explicit form and the Hopf algebra of twisted isometries is constructed. Scalar field theories are defined using explicit forms of derivative operators, traces and noncommutative frame fields. Noncommutative worldvolume field theories of the aforementioned D-branes are also constructed.

All techniques throughout are presented in such a manner that they may be applied to generic homogeneous pp-waves supported by a constant Neveu-Schwarz flux.