



الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
جامعة قسنطينة 1 – الإخوة منتوري
كلية العلوم الدقيقة



PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
Constantine 1 University – Frères Mentouri
Faculty of Exact Sciences

ANNONCE DE SOUTENANCE



Conformément à la décision n° 29D3C/2026 datée du 05 Mars 2026 autorisant la soutenance d'une thèse de doctorat, le Vice-doyennat chargé de la post-graduation, de la recherche scientifique et des relations extérieures, a n n o n c e la soutenance publique d'une thèse de doctorat le :

Jeu di 16 Avril 2026 à 16H00

**Lieu : A la salle de conférences sise au Campus Chaab Erssas
Constantine 1 – Frères Mentouri -**

Filière : P H Y S I Q U E

Spécialité : Physique Fondamentale et applications

Doctorant : **ABDELMOUMENE Mohamed Adib**

Sur le thème : « Théorie des cordes dans le formalisme de la paraquantification et géométrie non commutative ».

Devant le jury d'examen :

	Nom et prénoms	Grade	Etablissement d'appartenance
Président	BENSLAMA Achour	Professeur	Université Constantine1, Frères Mentouri
Directeur de thèse	BELALOUI Nadir	Professeur	Université Constantine1, Frères Mentouri
Examineurs	MOUMNI Mustapha	Professeur	Université Hadj Lakhdar – Batna 1
	ZAIM Slimane	Professeur	Université Hadj Lakhdar – Batna 1
	AISSAOUI Habib	Professeur	Université Constantine1, Frères Mentouri
	GHITI Mohamed Farouk	M.C.A	Ecole Nationale Supérieure Assia Djebbar – Constantine -

A b s t r a c t

This thesis presents a comprehensive study of the effects of non-commutativity and paraquantization within the framework of string theory. The main objective is to investigate how these two approaches modify the mathematical structure and physical properties of the theory. In the first part, the analysis focuses on open and closed bosonic and fermionic strings interacting with an antisymmetric background field $B_{\mu\nu}$, which gives rise to non-commutativity. This interaction alters the boundary conditions and commutation relations, leading to corrections in the mass spectrum and a reformulation of the fundamental symmetries of the theory. The second part is devoted to the study of open fermionic strings in a non-commutative phase space. By redefining the fundamental relations between coordinates and momenta, modified forms of the Virasoro and Lorentz algebras were obtained while maintaining the consistency of the physical spectrum through the GSO projection. Finally, the introduction of the paraquantization formalism allowed for a generalization of the standard quantization procedure.

Its application to open strings led to the formulation of a new para-Virasoro algebra and revealed a modification of the critical space-time dimension. Overall, this work highlights the coherence and richness of the non-commutative and paraquantized formulations of string theory and demonstrates how these extensions affect its geometric structure and physical content.