الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
جامعة قسنطينة 1 – الإخوة منتوري
كليـــــــــة العلوم الد قيـقة

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 DE THESE

Monsieur **SAIDANI Lyamine**

Soutiendra sa thèse de Doctorat en Sciences en Physique

Spécialité : « Physique Energétique ».

Intitulée : «**Contribution à l'étude numérique de la convection naturelle thermosolutale dans un espace annulaire rempli de nanofluides** »

D a t e : le Samedi 07 Décembre 2024 à 16 H00.

L i e u : A la salle de documentation du département de Physique – Bloc des Sciences Université Constantine 1 Frères Mentouri.

Devant le jury :

	Nom et prénoms	Grade	Etablissement d'appartenance
Président	BOUFENDI Toufik	Professeur	Université Constantine 1 Frères Mentouri
Directeur de thèse	DJEZZAR Mahfoud	Professeur	Université Constantine 1 Frères Mentouri
Co-directeur de thèse	TAYEBI Tahar	Professeur	Université Mohamed El-Bachir el Ibrahimi .Bordj Bou Arreridj -
Examinateurs	LAOUAR Salah	Professeur	Université Larbi Ben M'hidi – Oum el Bouaghi
	MEZAACHE El-hacène	Professeur	Université 20 aout 1955 – Skikda -
	TOUAHRI Sofiane	M.C.A	Université Constantine 1 Frères Mentouri

A b s t r a c t :

The present work is a contribution to the study of thermosolutal magnetohydrodynamic natural convection and entropy generation in a horizontal annular space between two concentric circular cylinders filled with nanofluids and subjected to a uniform vertical magnetic field. The inner wall is maintained at a high

temperature and concentration, while the outer wall is kept cold and at a low concentration. With in the scope of the Boussinesq approximation, the governing equations (continuity, momentum, energy and concentration) are numerically solved using the finite volume method and applying the SIMPLE algorithm for Pressure-Velocity coupling, based on the commercial software FLUENT.

The study focuses on the combined effect of control parameters expressed as dimensionless numbers, such as Rayleigh number (10 2 <Ra<105), buoyancy ratio (-4<N<4), Lewis number (0.01<Le<10), Hartmann number (0<Ha<50) and nanoparticles volume fraction (ϕ=0, 0.02 and 0.04) for two conductive nanofluids. The acquired results are presented as streamlines, isotherms, isoconcentrations and isentropics, along with profiles of heat and mass transfer rates,all discussed in detail in accordance with the control parameters. Furthermore, a thermal and mass performance criterion, representing the interaction between irreversibility and heat and mass transfer within the system, is also introduced and discussed.