

# Paper Submission Form - SAIP2025 Proceedings

Sections A, C, D, and E must be completed by all authors (including students) who submit papers. Section B is compulsory for students who submit manuscript(s).

## Section A: Paper Submission Information

Paper/Abstract ID	141
Paper title	Investigation of Poly(2,5)-benzimidazole (ABPBI)-Carbon Nanotube Composites for LEO Applications: An Integrated Computational and Experimental Study
Corresponding Author Name & Surname:	Luwy Swanepoel
Corresponding Author Email Address:	luwyswanepoel@gmail.com or 34200894@mynwu.ac.za

## Section B: For Students & Supervisors

Supervisor Name & Surname:	Lynndle Square
Supervisor Email Address:	lynndle.square@nwu.ac.za

For this paper, the supervisor must agree/disagree with the following statements.

	Yes	No
1. I am aware that the above-mentioned paper is being submitted for possible publication in the Proceedings of the SAIP Conference. I am satisfied that the presented work is that of the listed authors. I hereby give consent to the submission	✓	
2. I have proof-read the manuscript	✓	
3. I am satisfied that the manuscript is written in appropriate English and is sufficiently free of grammatical and spelling errors	✓	
4. I am familiar with the required manuscript format ("House Style"), and I am satisfied that this manuscript meets the criteria. I am aware that manuscripts not conforming with House Style may be desk rejected	✓	
5. I am satisfied that the scientific content of this manuscript is of sufficient standard for it to be considered for publication in the Proceedings of the South African Institute of Physics Conference Proceedings	✓	

Student Name & Surname: Luwy Swanepoel .....

Signature: .....

Date: 29 July 2025

Supervisor Name & Surname: Lynndle Square .....

Signature: .....

Date: 30 July 2025

## Section C: Suggested Reviewers

Obtaining the two referee reports necessary for DHET subsidy is an onerous task.

Please provide the names and contact details of three qualified South African and/or international referees. Referees should have a PhD and expertise in the relevant area of Physics. Do not recommend referees who have co-authored a work with any of the authors on the manuscript within the past five (5) years. Manuscripts without three recommended referees may be subject to desk rejection.

### Suggested Reviewers in your Research Field (Both local & international)

	Reviewer Names & Surname	Reviewer's Email Address(es)
Suggested reviewer #1	Edwin Mapasha	Edwin.mapasha@up.ac.za
Suggested reviewer #2	Aniekan Ukpong	UkpongA@ukzn.ac.za
Suggested reviewer #3	Regina Maphanga	Regina.maphanga@nithecs.ac.za

## Section D: Declaration of Novelty and Use of AI

### How is this submitted manuscript scientifically novel?

This study presents a novel integration of experimental and computational methodologies to investigate the suitability of ABPBI–carbon nanotube (CNT) composites for Low Earth Orbit (LEO) applications. The scientific novelty lies in the following:

1. Dual Approach: The simultaneous use of multi-walled carbon nanotubes (MWCNTs) in experimental synthesis and single-walled CNTs (SWCNTs) in DFT simulations offers a unique framework for cross-validating material behaviour across scales and modalities.
2. Electronic Property Tuning: The manuscript demonstrates that CNT incorporation significantly alters ABPBI's electronic structure, reducing the band gap and enhancing UV absorption.
3. Expanded Structure–Property Understanding: The work advances the field by linking structural changes observed in XRD (e.g., semi-crystallinity, internal strain) to electronic behaviour changes detected in both experimental and theoretical spectra. This offers a more integrated understanding of how nanoscale structure influences macroscopic performance in space-relevant environments.

Please see the [Author Guidelines for the AI use policy](#).

### How was AI used in the generation of this manuscript?

AI tools were used in this manuscript to improve language, grammar, and sentence construction. They were not used to generate new information, scientific content, or references.

## Section E: Plagiarism

	Yes
I am aware that plagiarism detection software may be used on my manuscript.	<input checked="" type="checkbox"/>