

# TALLER: APLICACIONES INTERDISCIPLINARIAS DE DETECTORES DE PARTÍCULAS



Contribution ID: 37

Type: Student Talk

## Detection of thermal neutrons and its applications

*Friday, 12 June 2026 16:00 (30 minutes)*

Thermal neutron detection plays a key role in fields such as medical physics, materials science, and nuclear engineering. This work presents a simulation-based study of a thermal neutron detection system using the Geant4 toolkit alongside a proposed experimental setup. The system consists of an Americium-Beryllium (AmBe) source, a paraffin block for neutron thermalization, and a boron-doped graphene film as the neutron converter. Detection relies on measuring the characteristic gamma produced by neutron capture in boron-10, using a BGO scintillator crystal coupled with a SiPM sensor. Monte Carlo simulations focus on system efficiency, paraffin geometry optimization, and signal-to-noise ratio. This design explores boron-doped graphene as a lightweight and efficient converter, offering a promising alternative for the development of compact thermal neutron detectors.

**Primary authors:** BELTRAN GARCIA, Luis Ricardo (Universidad Antonio Nariño); MORENO, Deywis (Universidad Antonio Nariño)

**Presenter:** BELTRAN GARCIA, Luis Ricardo (Universidad Antonio Nariño)

**Session Classification:** Day #3: Afternoon Lectures - Session 2