



**S N BOSE NATIONAL CENTRE  
FOR BASIC SCIENCES**

*Block JD, Sector III, Salt Lake, Kolkata 700 106*

## **DEPARTMENTAL SEMINAR**

# **Department of Astrophysics and High Energy Physics**

**8<sup>th</sup> July, 2024**

**4.00 PM**

**ONLINE / FERMION**

### **SPEAKER**

**Dr. Subhronel Chakrabarti,  
Postdoctoral Researcher,  
The Institute of Physics of the Czech Academy of Sciences.**

### **TITLE OF THE TALK**

## **An Ode to Action**

### **ABSTRACT**

The action principle has been a cornerstone in the evolution of theoretical physics over the last century, guiding the development of myriad theoretical frameworks. However, recent research has ventured into a domain "beyond the action principle," probing quantum field theories (QFTs) independent of conventional action-based approaches. In this talk, we will highlight two specific instances where the absence of action principles was widely presupposed, yet subsequent careful investigations revealed the emergence of an action.

The first instance involves the famous case of chiral bosons, for which a novel action-based formulation has been recently identified, contingent upon an expanded notion of constructing an action. The second pertains to the innovative third-way consistent gauge theories, which describes self-interacting p-form fields without seemingly relying on an action principle. I will show how our recent examination of these third-way gauge theories brings us back to an action-based description. I will conclude with a discussion of the class of QFTs that genuinely elude action principles, advocating for a deeper comprehension of the family of QFTs that do accommodate action-based descriptions.

### **HOST FACULTY**

**Dr. Parijat Dey, Assistant Professor,**

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