



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Aspects of Inflationary Magnetogenesis  
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This thesis investigates how inflation can generate primordial large-scale magnetic fields and imprint quantum signatures on them and on gravitational waves. It develops: (i) an EFT framework that breaks conformal invariance while avoiding strong coupling and backreaction, with reheating-driven amplification; (ii) an anisotropic (Bianchi I) mechanism yielding viable present-day fields; and (iii) quantum-information tools using squeezed states and Stokes operators to test the quantum origin of these primordial fields.