

$$\partial_\mu T^{\mu\nu} = 0$$

$$P^\mu \left(\frac{\partial}{\partial x^\mu} - g \operatorname{tr} \left(\mathcal{Q} G_{\mu\nu} \right) \frac{\partial}{\partial p_\nu} - ig \left[\mathcal{Q}, \frac{\partial}{\partial \mathcal{Q}} \right] \right) f(x, p, \mathcal{Q}) = 0$$

INDIA-JINR WORKSHOP ON PARTICLE, NUCLEAR, NEUTRINO PHYSICS AND ASTROPHYSICS

National Institute of Science Education and Research (NISER), Bhubaneswar, India

$$R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

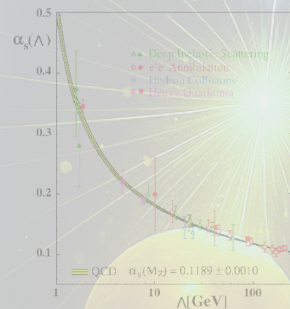
10-12 NOV, 2025

Local Organiser:

Amaresh Jaiswal (NISER)

Najmul Haque (NISER)

Narayan Rana (NISER)



Scientific Secretaries:

Aniruddha Dey, JINR

Deeptak Biswas, NISER

$$L = -\frac{1}{4} G_{\mu\nu}^a G^{a\mu\nu} + \bar{q} \left(i\gamma^\mu D_\mu - m \right) q; a = 1, \dots, 8$$

$$\sigma = \int |\mathcal{M}|^2 d\Omega$$

Webpage:

<https://indico.niser.ac.in/event/3/>

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FUNDAMENTAL PHYSICS OF ELEMENTARY PARTICLES AND ASTROPHYSICS, ATOMIC NUCLEUS, CONDENSED MATTER, APPLIED RESEARCH IN ACCELERATOR AND DETECTOR TECHNOLOGIES, MATERIALS, LIFE AND ENVIRONMENTAL SCIENCES

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7 laboratories, 5000+ employees from 30+ countries
budget 234 M\$ (2025)



2025:



Major Research Facilities

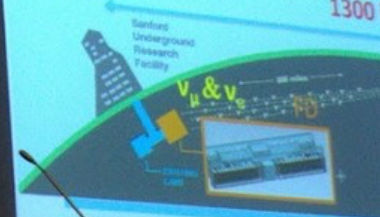
- ✓ Nuclear Physics: Accelerators (Mumbai, Delhi & Kolkata) & reactors
- ✓ Neutrino Physics: Reactors (Mumbai, Kakrapar), International collaboration
- ✓ Astrophysics: Radio Telescopes (Ooty and GMRT-Pune), Optical-IR (Nainital, HCT-Ladakh, VBT & KSO-Tamilnadu, MAIRO-Gurushik (ASTROSAT), Gamma ray (MACE & HAGAR-Hanley, TACTIC-N Ooty)
- ✓ Particle Physics: Developing Indigenous Detectors for experiments at international facilities



- ### Neutrino E
- Muon neutrinos/antineutrinos from high-power
✓ 1.2 MW from day one; upgradeable to 2.4
 - A Massive Liquid Argon TPC Far Detector in South
underground in a former gold mine.
✓ 4 modules, 70 kton of liquid Argon.
 - A Near detector complex with multiple detectors
the neutrino source at Fermi Lab
✓ Characterize the beam with 100s of meters

South Dakota

1300'



Soumitra Bhattacharya | India-JINR Workshop, NISER



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