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Overview of Reactor Neutrino Experiments

Thursday, October 2, 2025 11:30 AM (25 minutes)

Reactor neutrinos have played a central role in shaping our understanding of neutrino properties, from their discovery in 1956 to today's precision measurements of oscillation parameters. This presentation will provide an overview of the field, beginning with landmark historical milestones and moving toward the current generation of precision experiments. I will highlight recent results on oscillation parameters, reactor flux and spectrum anomalies, searches for sterile neutrinos at short baselines, and the first observation of coherent elastic neutrino–nucleus scattering with reactor antineutrinos by the CONUS+ collaboration. Particular attention will be given to next-generation flagship experiments, including JUNO, with its expected sensitivity to the neutrino mass ordering and sub-percent precision on oscillation parameters, and TAO, which will deliver unprecedented accuracy in reactor spectrum characterization. Beyond fundamental physics, I will briefly discuss applications to reactor monitoring and safeguards. The talk will conclude with a personal perspective on current and future contributions from South America.

Submitter Email

pietro.chimenti@uel.br

Submitter Name

Pietro Chimenti

Submitter Institution

Universidade Estadual de Londrina

Primary author: CHIMENTI, Pietro (Universidade Estadual de Londrina (UEL))

Presenter: CHIMENTI, Pietro (Universidade Estadual de Londrina (UEL))

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