Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **295** Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Ab initio nuclear theory for neutrino physics

Tuesday, 8 June 2021 11:00 (20 minutes)

As science probes ever more extreme facets of the universe, the role of nuclear theory in confronting fundamental questions in nature continues to deepen. Long considered a phenomenological field, breakthroughs in our understanding of nuclear and electroweak forces in nuclei are rapidly transforming modern nuclear theory into a true first-principles, or ab initio, discipline.
In particular this allows us to attack some of the most exciting questions in physics beyond the standard model such as the nature of dark matter and the nature of neutrino masses through a hypothetical process called neutrinoless double beta decay. We first address the gA quenching puzzle which has challenged the field for over 50 years, then discuss rapid advances which now allow for converged calculations of neutrinoless double beta decay nuclear matrix elements for all major players in ongoing searches 76Ge, 130Te, and 136Xe.

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Session Classification: TS4-1 Neutrino-related questions in nuclear and astro-particle physics (PPD Neutrino Physics and Beyond Symposium) / Questions liées aux neutrinos en physique nucléaire et d'astro-particules (Symposium PPD sur la physique des neutrinos et au delà)

Track Classification: Symposia Day (PPD) - Neutrino Physics and Beyond