Contribution ID: **65** Type: **not specified**

First steps towards understanding neutrinos. A tribute to Enrico Fermi on the 90th anniversary of the β decay model

Wednesday, 6 September 2023 16:55 (20 minutes)

We retrace the first steps towards understanding neutrinos, particles predicted by Pauli in 1930 to avoid a supposed violation of time-translation symmetry. Although there is a tendency to reduce the whole story to his intuition and the skill of Reines and Cowan, according to history great strides were made thanks to precious intellectual tools that combined ideas and mathematics. I refer to the contribution of Fermi, who proposed in 1933 a particular theory in which matter particles can appear and disappear, prototypical of those at the basis of today's particle physics. Fermi's theory, despite the limitations of the formalism available at the time, led physicists towards the observation of neutrinos, paved the way for further fruitful developments - for example, it anticipated the characteristic of crossing symmetry - and has an impressive scientific legacy. We reconstruct the chain of arguments in the most accessible terms for a modern reader, emphasising the role of theoretical physics and reflecting on some alternative assessments of Fermi's contribution.

Primary author: VISSANI, Francesco (INFN, Laboratori Nazionali del Gran Sasso)

Presenter: VISSANI, Francesco (INFN, Laboratori Nazionali del Gran Sasso)

Session Classification: Da Poleni a B. Rossi e oltre / From Poleni to B. Rossi, and Beyond: 20th Century

Track Classification: SISFA 2023