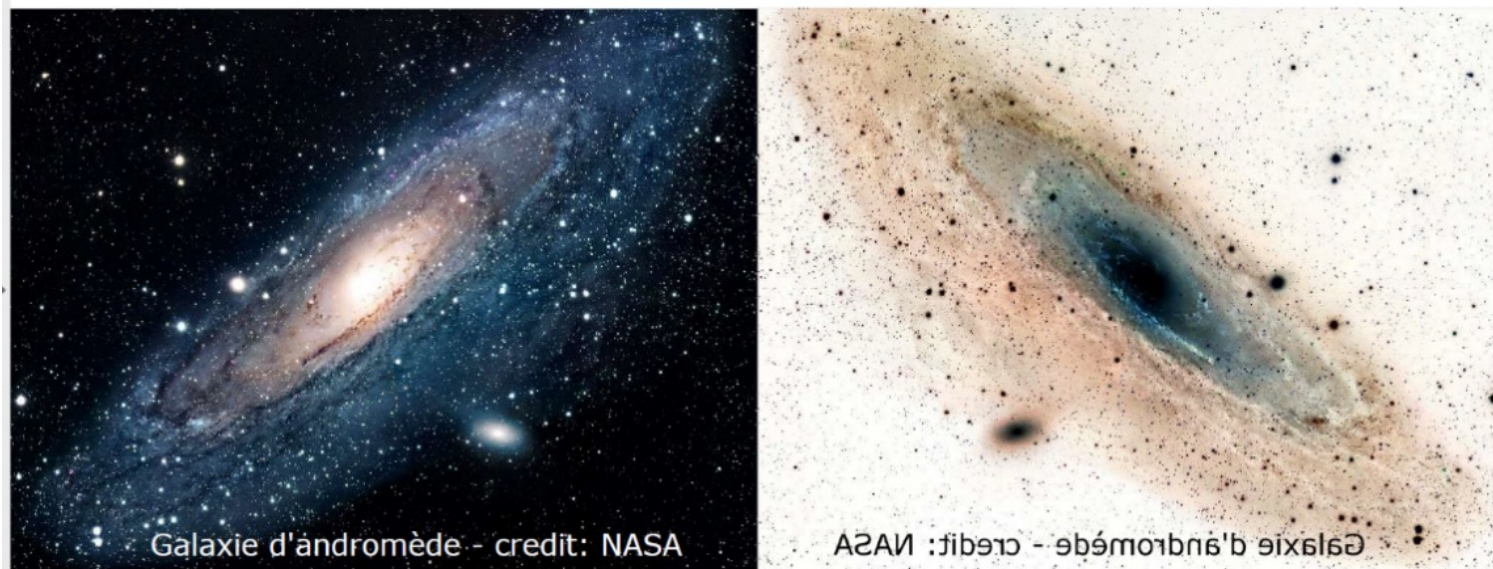


Fundamental interactions and symmetries

Conclusions



Sum-up of presentations

- Leendert: **general interest in nuclear beta decay challenging the Standard Model**
 - BSM searches with sensitivity beyond the TeV level
 - Introduction to different searches: V_{ud} for CKM, search for exotic currents, CP violation
 - Novel way of probing the recoil spectrum with quantum sensor « SALER »
- Bertram: **V_{ud} via Ft value measurements**
 - Corrective radiations $\Delta_R, \delta_C, \delta_{NS}$ needs to be controlled. A larger set of nuclei to test CVC / nuclear structure dependant corrections. Unique perspectives at S3.
 - Ongoing theoretical efforts have to be pursued with ab-initio theories
- Maud: **search for scalar currents in the decay of ^{32}Ar in the WISArD experiment**
 - Proof-of-principle has been achieved at ISOLDE. A precision of 10^{-3} within reach.
 - Constraining measurement thanks to constraints on the fierz + beta neutrino angular correlation

Sum-up of presentations

- Serge: **radioactive molecules for P, T tests**
 - Orders of magnitude enhancement factors for the sensitivity to CP violation in parity doublets of deformed nuclei embedded in polar molecules (diamagnetic/paramagnetic)
 - Molecular spectroscopy measurement at ISOLDE as preliminary investigation.
 - Future spectroscopy at S3-LEB and Orsay for an eventual measurement
 - Nuclear theory input needed
- Sacha: **Search for CP violation in the decay of $^{23}\text{Mg}/^{39}\text{Ca}$ with MORA**
 - Commissioning of the experiment in Jyväskylä
 - Attempt of in-trap polarization partly hindered by the beam purity $^{23}\text{Na}:^{23}\text{Mg}$. R&D is ongoing.
 - Experiment at DESIR: HRS will be an asset
- Marius: **Search for a dark neutron decay of ^6He**
 - A way to solve the discrepancy between the neutron « bottle » and « beam » half-life measurements
 - An upper limit of $4 \cdot 10^{-10}$ on the BR is obtained (95%CL) which is a 5 orders of magnitude improvement
- Mohamad: **Search for scalar interactions in the beta spectrum shape of ^6He with bSTILED**
 - ^6He half life improved!
 - After correction of background due to bremsstrahlung a statistical error on b of $3 \cdot 10^{-3}$ is being achieved

NuPECC Long Range Plan

- **Nuclear theory input is needed for**
 - Radiative corrections
 - V_{ud} + correlations
 - Radioactive molecules – nuclear moments
 - Neutrinoless double beta decay
- **Facilities**
 - DESIR will be a very important facility for fundamental interactions/symmetries
 - Unique facility to be equipped with an HRS + PIPERADE +MR-TOF-MS
 - Long/repeated period of beam time is required for these experiments to make an impact
 - SPIRAL1
 - Mirror nuclei for CP and correlation measurements @ MORA
 - Prospects for SALER with recoil spectrum measurements
 - S3
 - Prospects for radioactive molecules
 - Ft value related measurements (Q_{β} , $T_{1/2}$, BR)
- **Emerging technologies to be followed**
 - Radioactive molecules for P, T tests
 - Quantum sensors for recoil energy spectrum measurement