

## Reminder XIV

- The restriction to a subgroup  $G_0$  of  $G$  of a representation of  $G$  gives a representation of  $G_0$ .
- The induced representation is a partial converse: if  $(U, U)$  is a representation of  $G_0$ , one can construct a representation  $(\omega, \mathcal{U})$  of  $G$ .
- If  $G = A \rtimes B$  (semi-direct product) with  $A$  Abelian, then all irreducible representations of  $G$  can be obtained by induced representations. In this case, the subgroups  $G_j = A \rtimes B_j$   $\leftarrow$  a suitable subgroup of  $B$ , called little group, coming from the action of  $B$  on  $A^*$  dual group of  $A$ .
- The Poincaré group is a semi-direct product group  $\mathcal{P} := T(4) \rtimes \mathcal{L}$   $\leftarrow$  Lorentz group, made of 4 disconnected components  $\leftarrow$  identity component.
- The irreducible rep. of  $T(4) \rtimes \mathcal{L}_+$  which are physically important are indexed by 2 quantities: The mass  $M \geq 0$ , the spin  $\in \frac{1}{2} \mathbb{N}$  or the helicity  $\in \frac{1}{2} \mathbb{Z}$  (if  $M=0$ ).