THE HEISENBERG PICTURE

THIS ENTIRE TIME...

WE HAVE BEEN WORKING IN THE HEISENBERG PICTURE.

DRAWING #2: HEISENBERG PICTURE 2

IN THE HEISENBERG PICTURE:

OPERATORS CORRESPONDING TO OBSERVABLES EVOLVE RELATIVE TO THE TIME AXIS:

$$A(t)$$

STATE OPERATORS, HOWEVER, REMAIN FIXED RELATIVE TO THE TIME AXIS:

$$\rho(t) = \rho(t_0)$$

DRAWING #3: HEISENBERG PICTURE 3

THIS GIVES RISE TO THE TIME DEPENDENCE OF THE AVERAGE VALUE OF THE OBSERVABLE $\mathbb{A}(t)$:

$$\langle \mathbb{A} \rangle (t) = \mathrm{Tr}\left(\rho(t_0)\, A(t)\right)$$

$$= \mathrm{Tr}\left(\rho(t_0)\, \mathcal{U} A(t_0) \mathcal{U}^{+}\right) \qquad \text{WHERE: } \mathcal{U} = \mathcal{U}(t, t_0)$$

... (AS WAS SEEN BEFORE).