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What are anyons

Wavefunction of two identical quantum particles:

$$\Psi(1,2)$$

After one exchange:

$$\Psi(2,1) = e^{i\alpha}\Psi(1,2)$$

After two exchanges:

$$\Psi(2,1) = e^{i\alpha}\Psi(1,2)$$

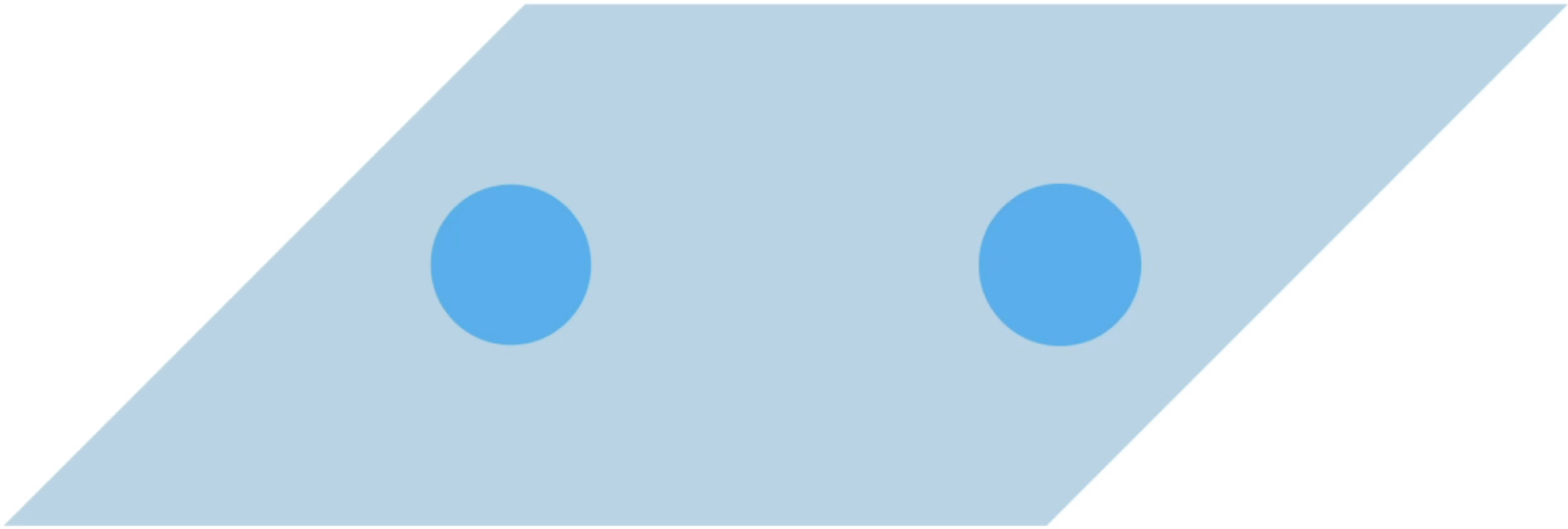
$$\Psi(1,2) = e^{2i\alpha}\Psi(1,2)$$

if $\alpha = 0$, the particles are bosons

if $\alpha = 0$, the particles are bosons

if $\alpha = \pi$, the particles are fermions

Anyons

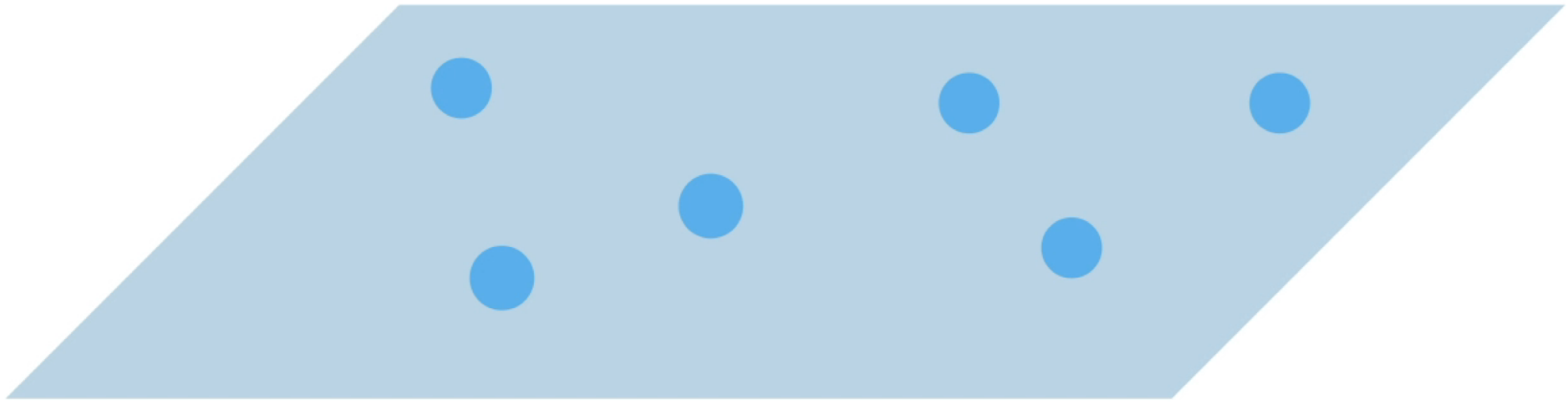


Non-Abelian Anyons

$$\Psi(1,2) = \mathcal{B}_{12}\Psi(2,1)$$

incoherent electron states

multiple, degenerate ground states



incoherent electron states

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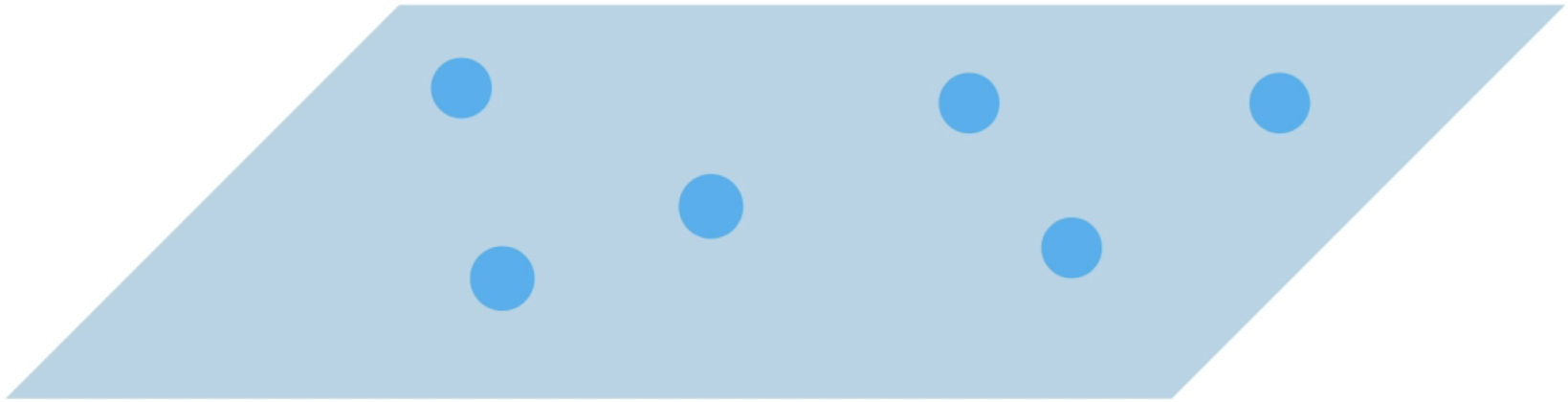

incoherent electron states

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