Diffusion Equation: $\frac{\partial f}{\partial t} = D\Delta f$

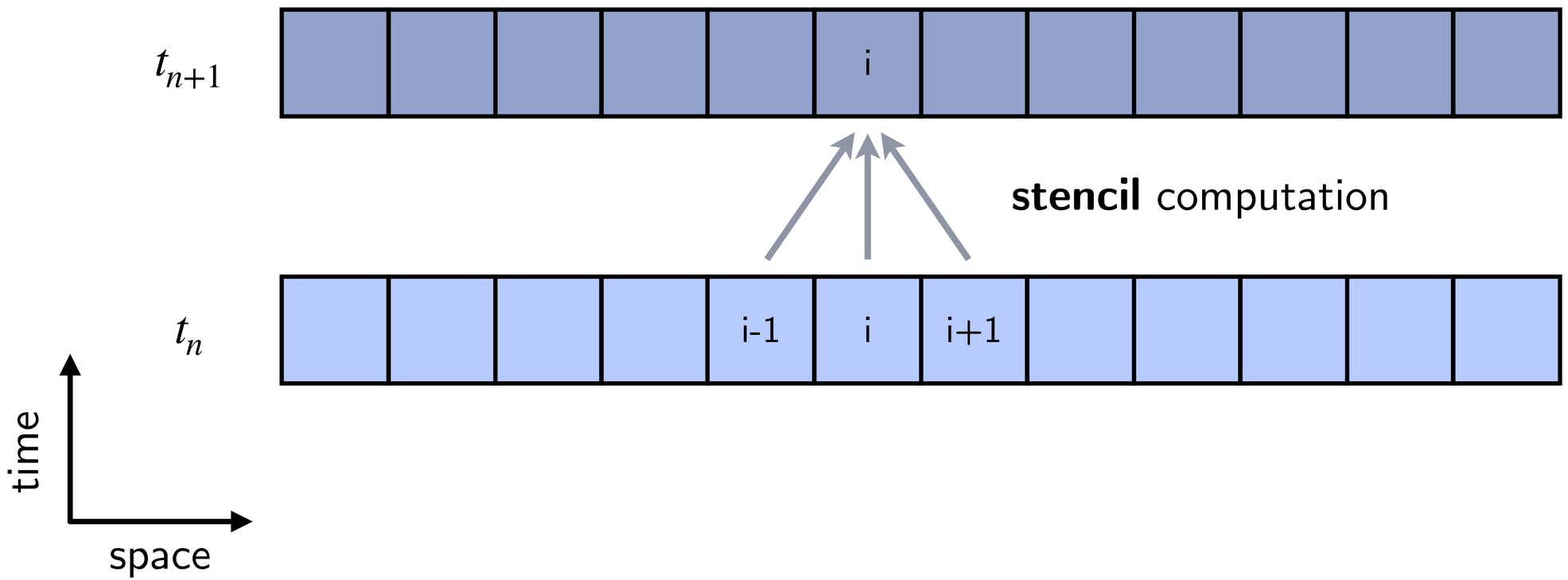
Discretisation in **space** (1D finite differences):

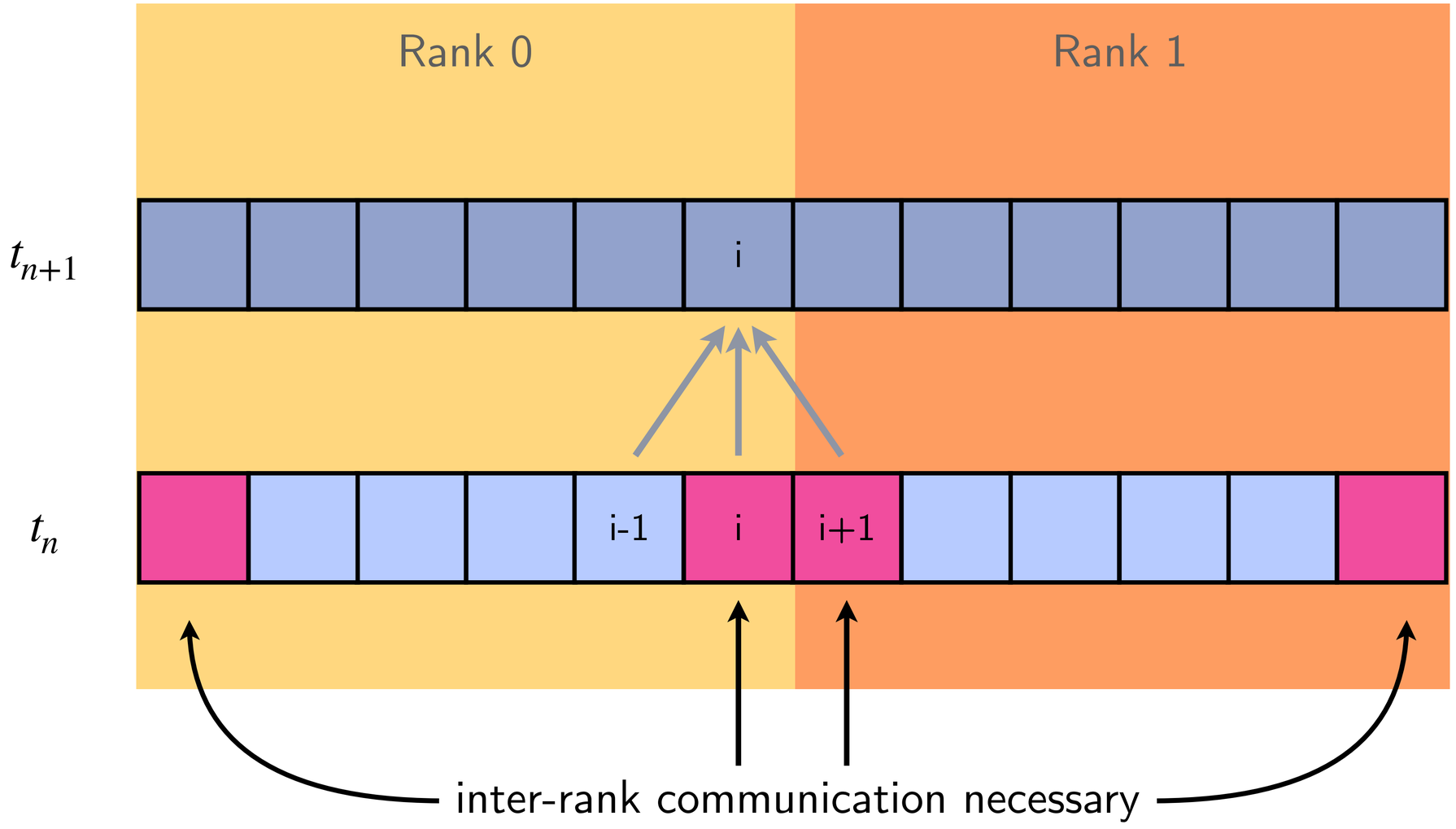
$$\frac{\partial f(x_i)}{\partial t} \approx \frac{D}{h^2}\left[f(x_{i-1}) - 2f(x_i) + f(x_{i+1})\right]$$

Discretisation in **time** (Euler):

$$f(x_i, t_{n+1}) \approx f(x_i, t_n) + \frac{D\Delta t}{h^2}\left[f(x_{i-1}) - 2f(x_i) + f(x_{i+1})\right]$$

$$f(x_i, t_{n+1}) \approx f(x_i, t_n) + \frac{D\Delta t}{h^2} \left[f(x_{i-1}) - 2f(x_i) + f(x_{i+1}) \right]$$

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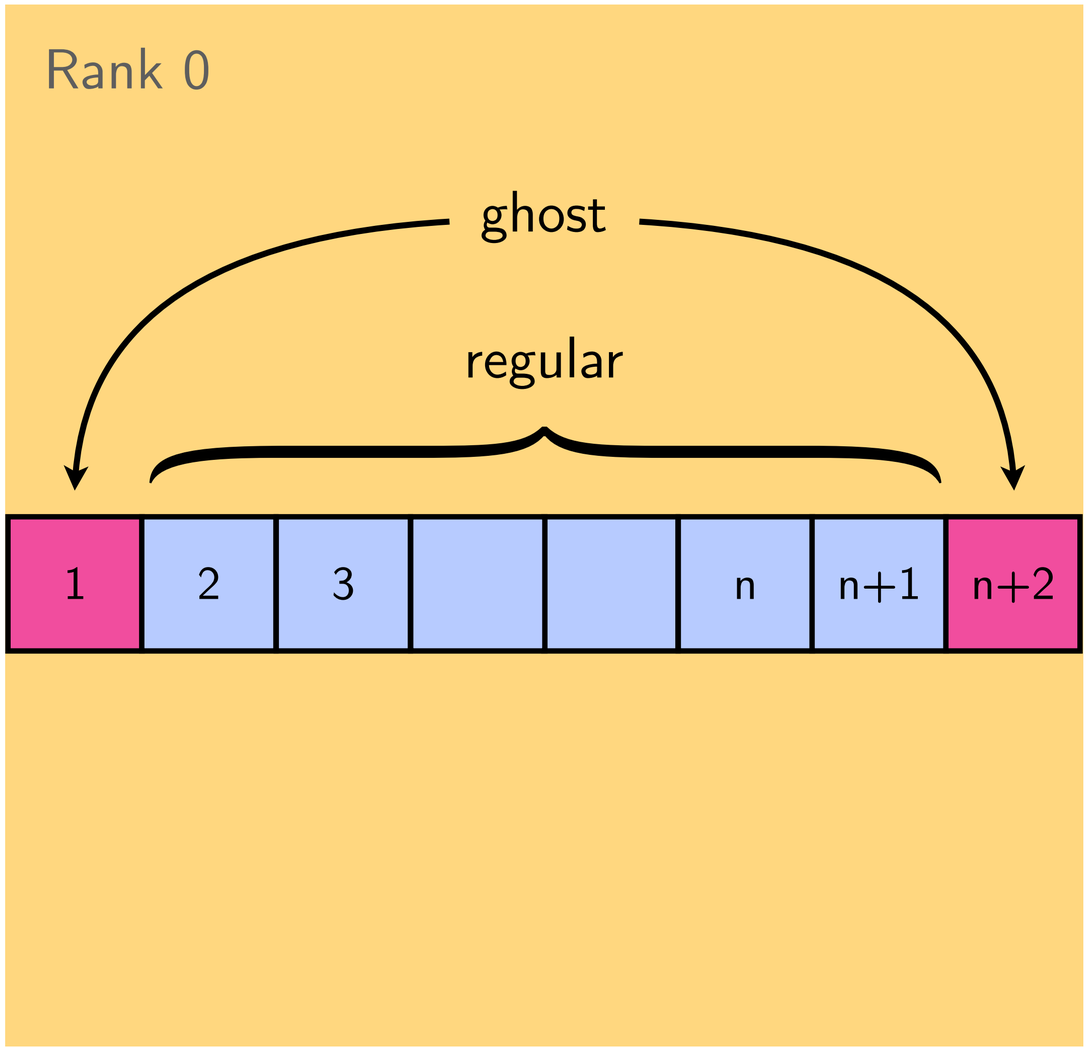
inter-rank communication necessary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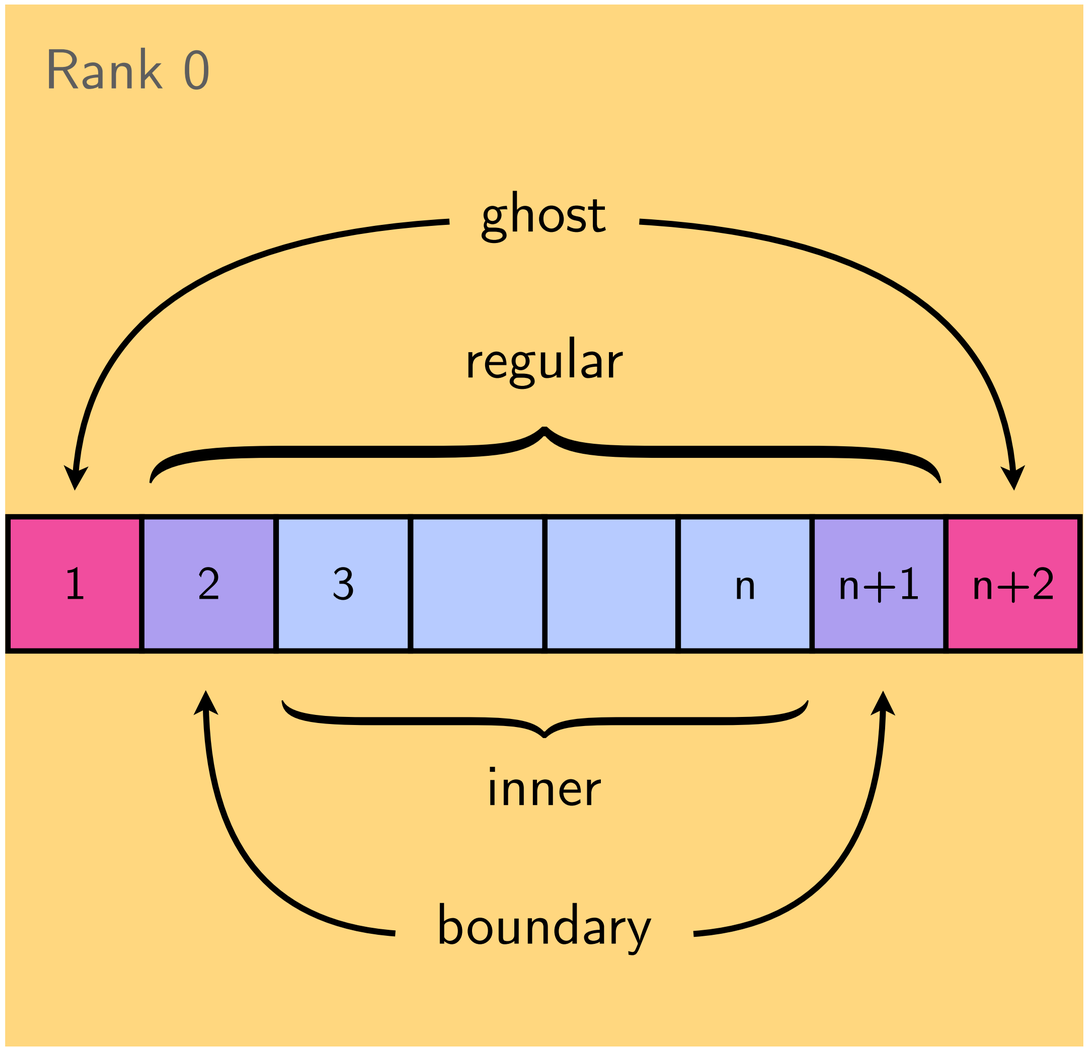
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