



**MATERIALS SCIENCE  
& ENGINEERING**  
TEXAS A&M UNIVERSITY

# Introduction to Materials Science & Engineering

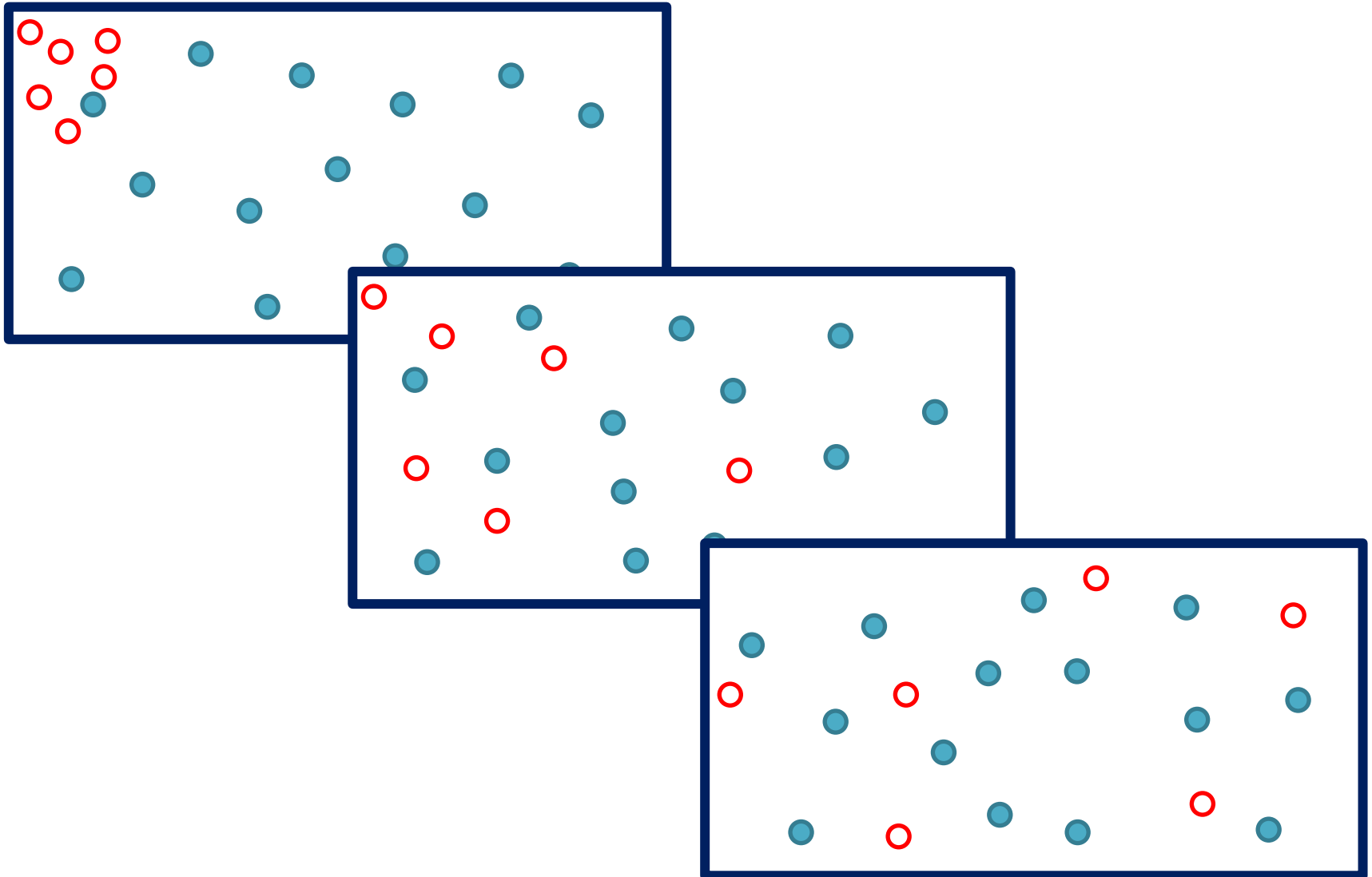
## Diffusion Ficks First Law

**Dr. Patrick Shamberger**

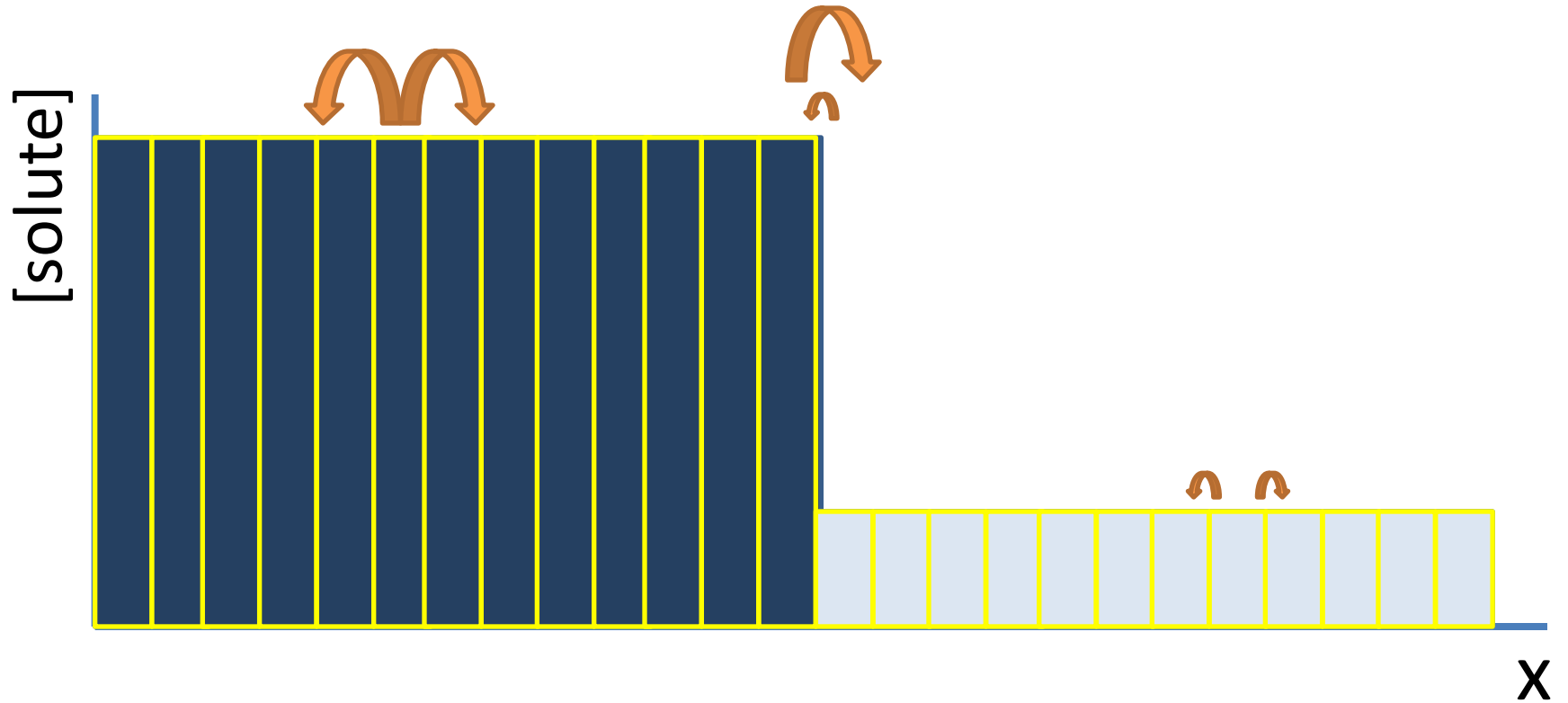
Dept. of Materials Science and Engineering  
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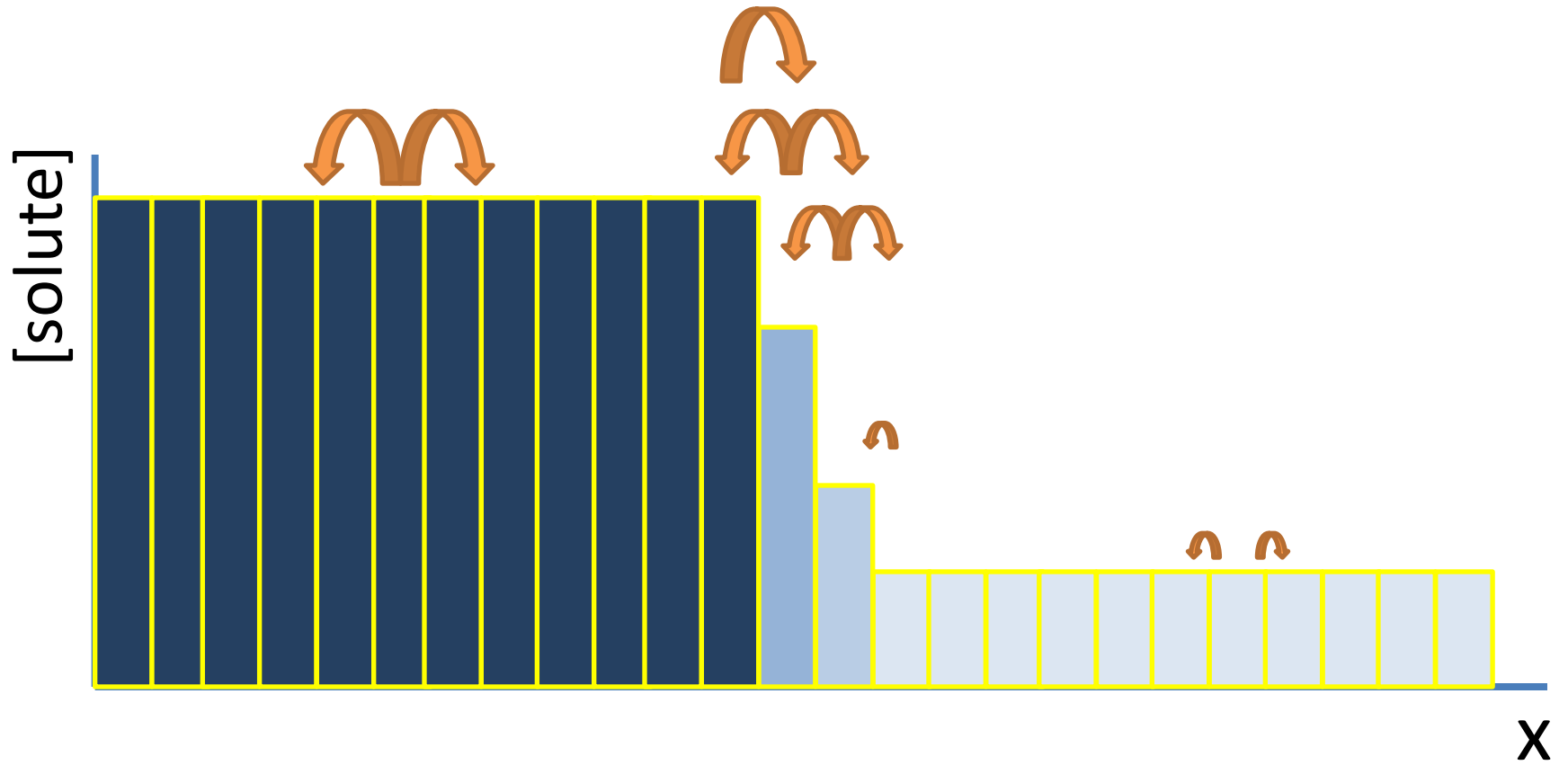
# Diffusion: Origin of Fick's Law



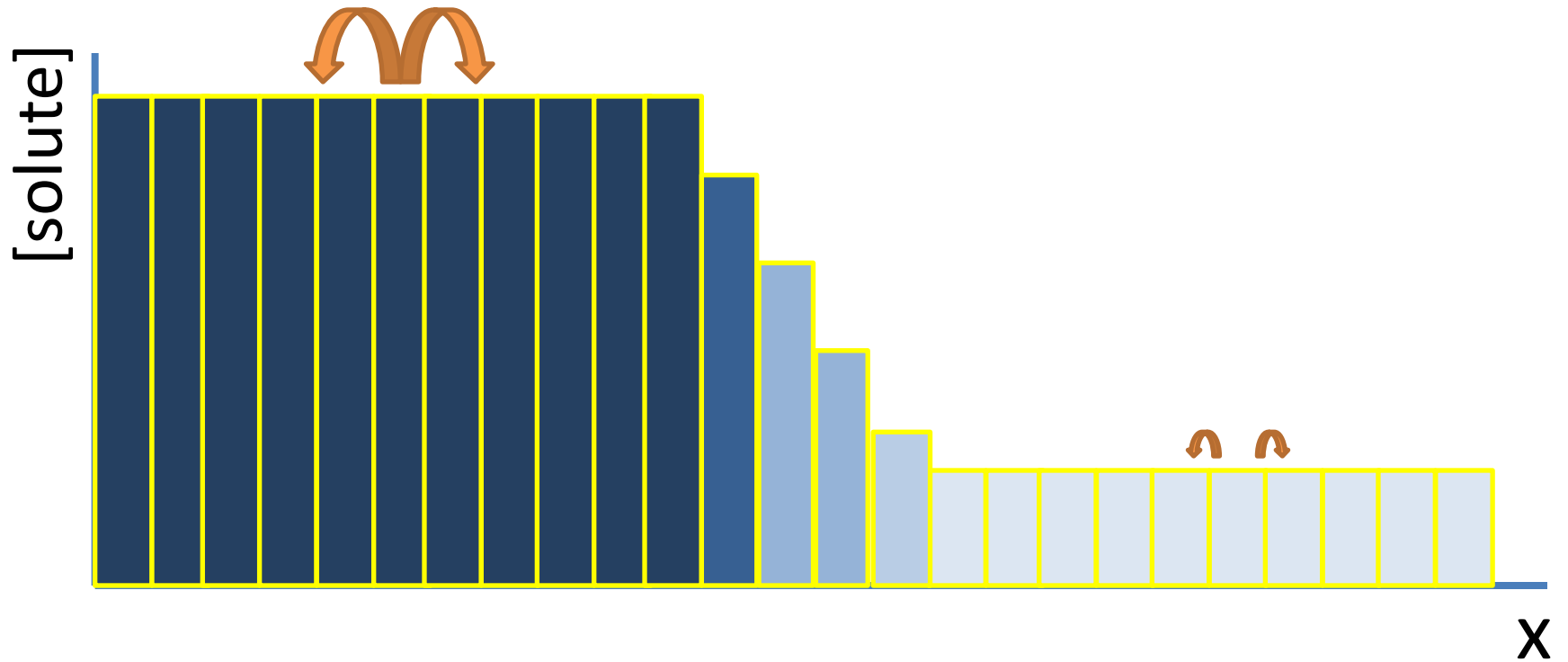
# Diffusion Flux



# Diffusion Flux

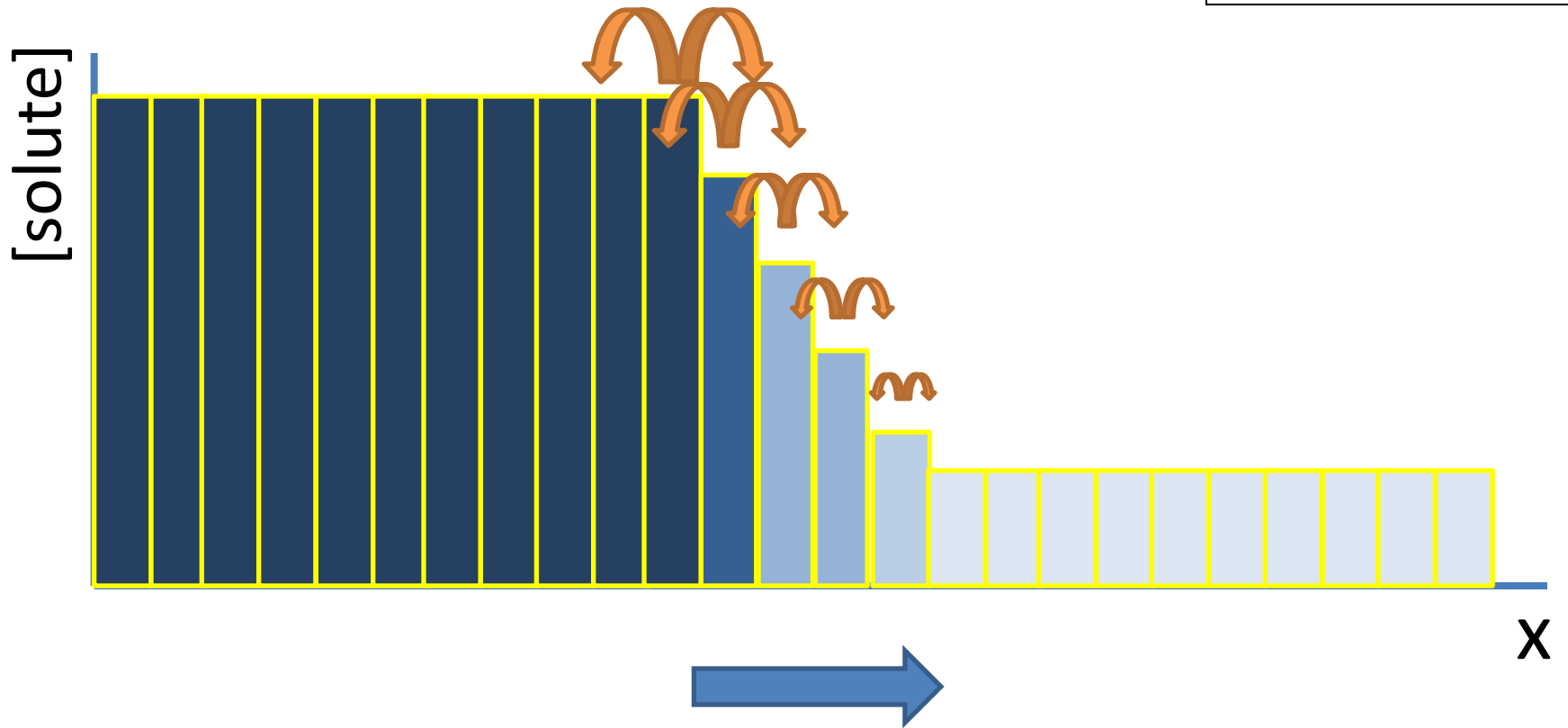


# Diffusion Flux



# Diffusion Flux

$$J = -D \frac{dC}{dx}$$



# Summary:

- Origin of Fick's First law of diffusion
- Atoms are ALWAYS moving
- Flux (mass/area/time) is proportional to concentration gradient