

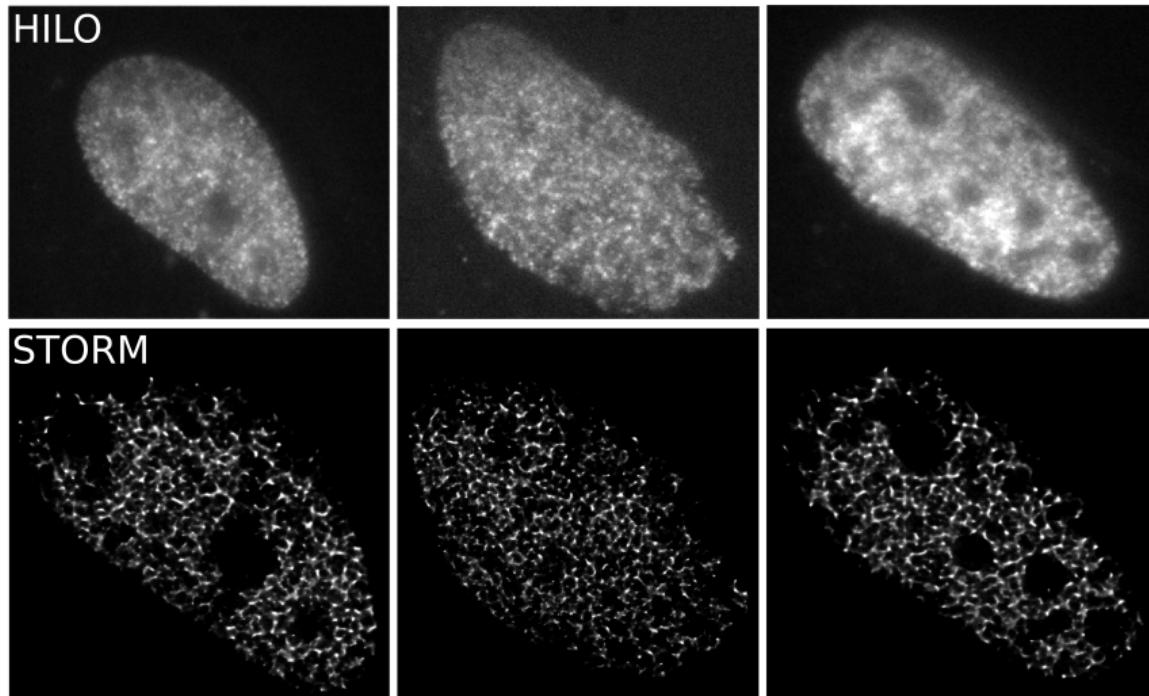
# Deep learning enables fast and dense single-molecule localization with high accuracy

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## Preliminary reconstructions using ThunderSTORM

3000 frames, 10ms exposure (30s). Filtered localizations with  $> 50\text{nm}$  lateral uncertainty, photobleaching correction with exponential fitting



# Astigmatism Calibration

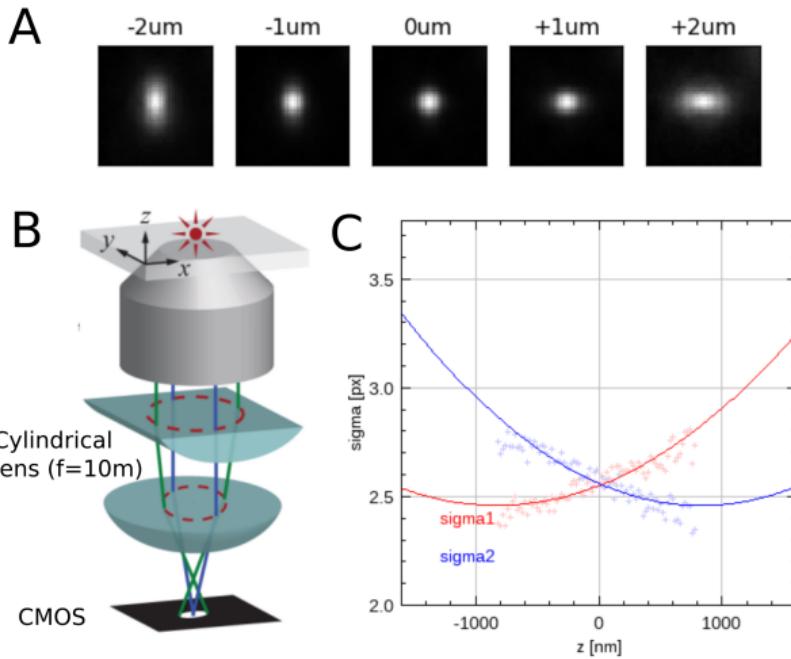
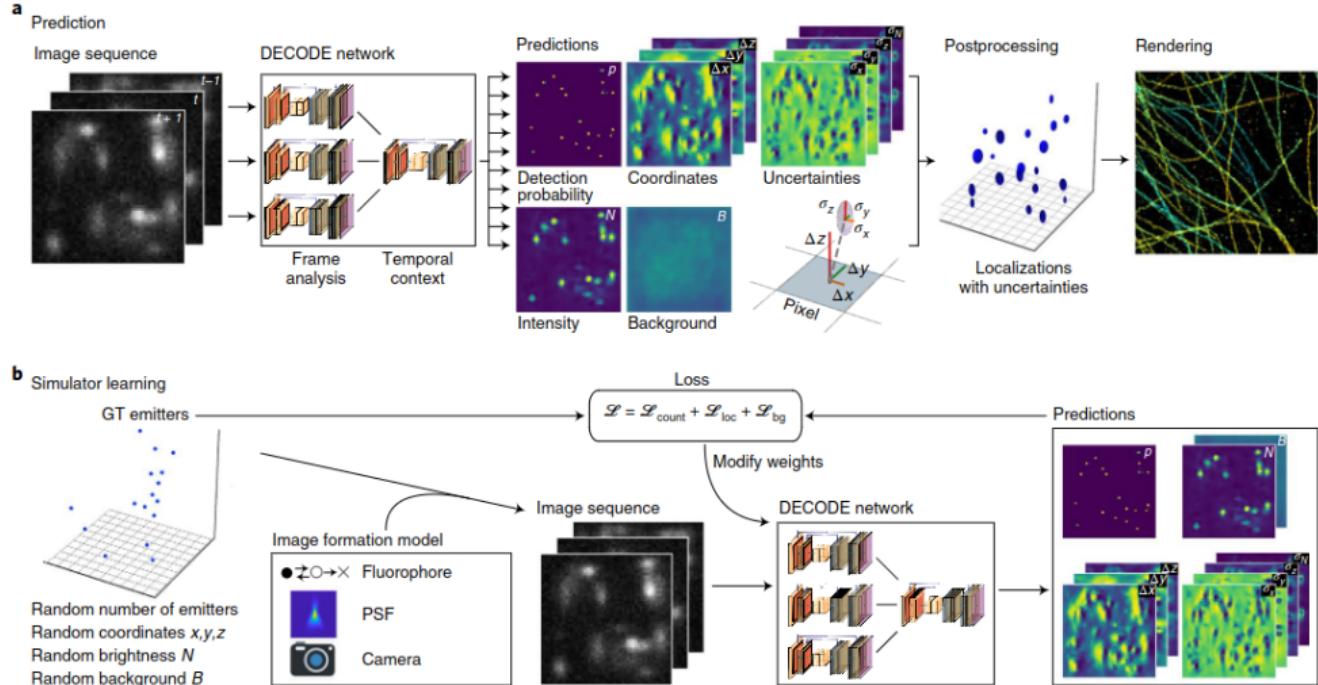
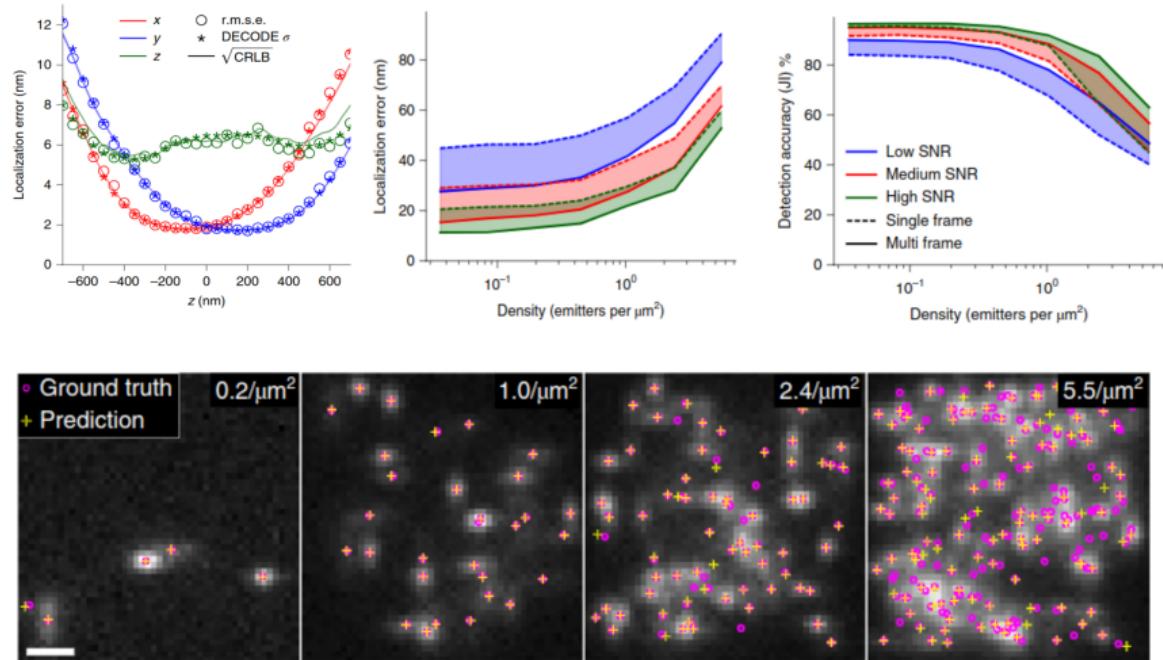


Figure B: Huang et al. Science 2008

# DECODE for high-density single-molecule localization

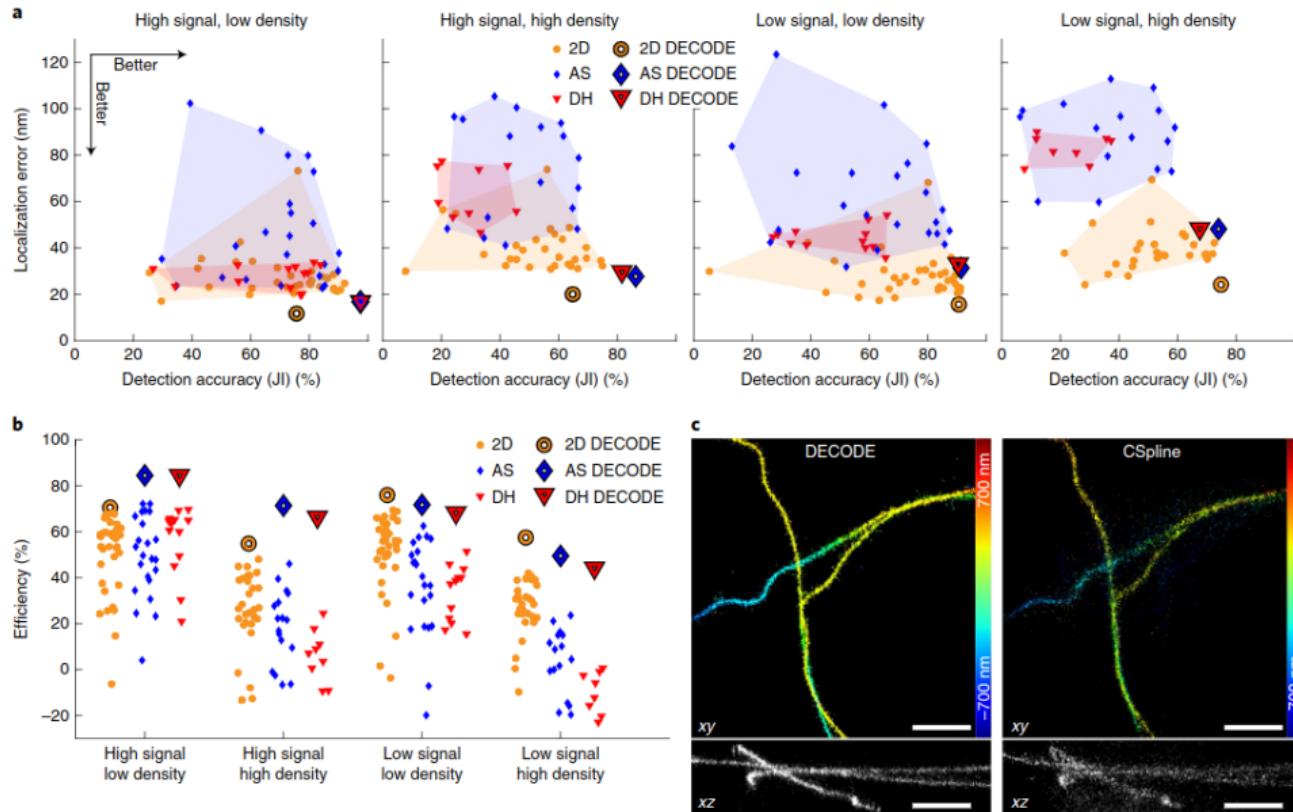


# Performance of DECODE on simulated astigmatism data

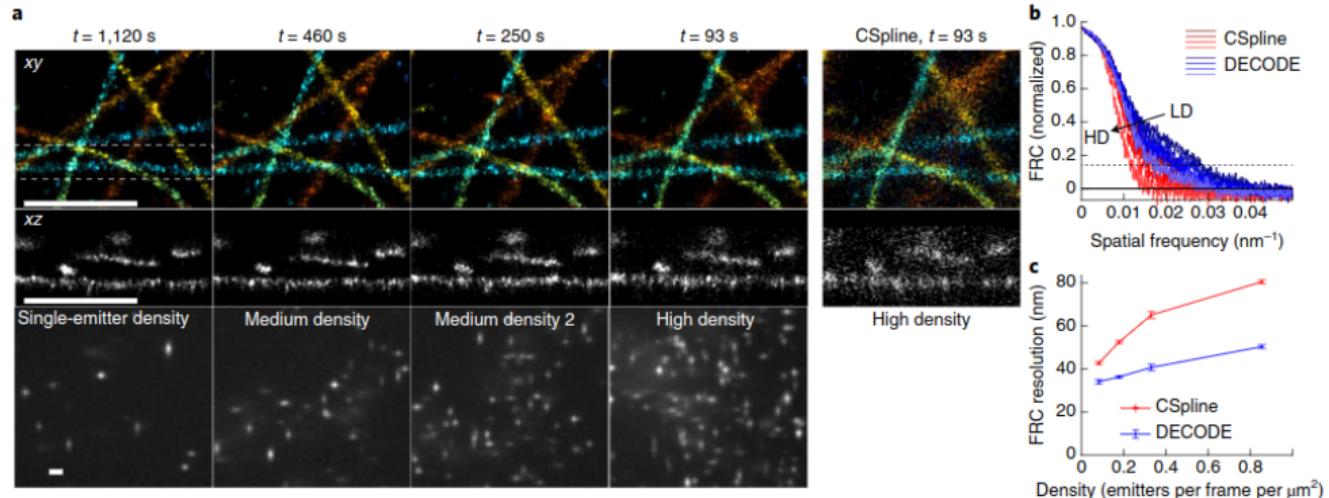


Multi-frame includes 'temporal context' into localization process

# DECODE for high-density single-molecule localization

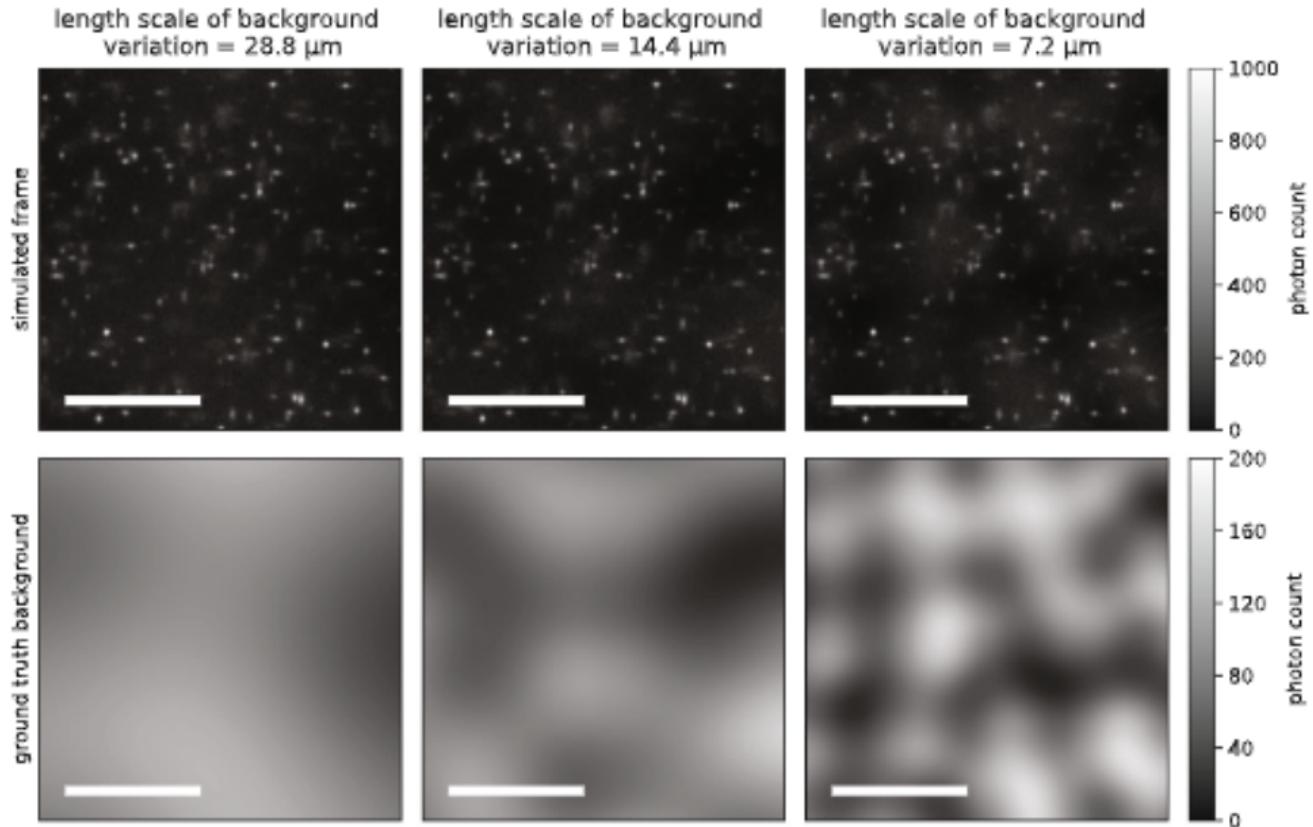


# DECODE can reduce acquisition times by one order of magnitude



Microtubules labeled with anti- $\alpha$ -tubulin primary and AF647 secondary antibodies. Low quality with CSpline after 93s

# DECODE for estimating background and photon counts



# DECODE for estimating background and photon counts

