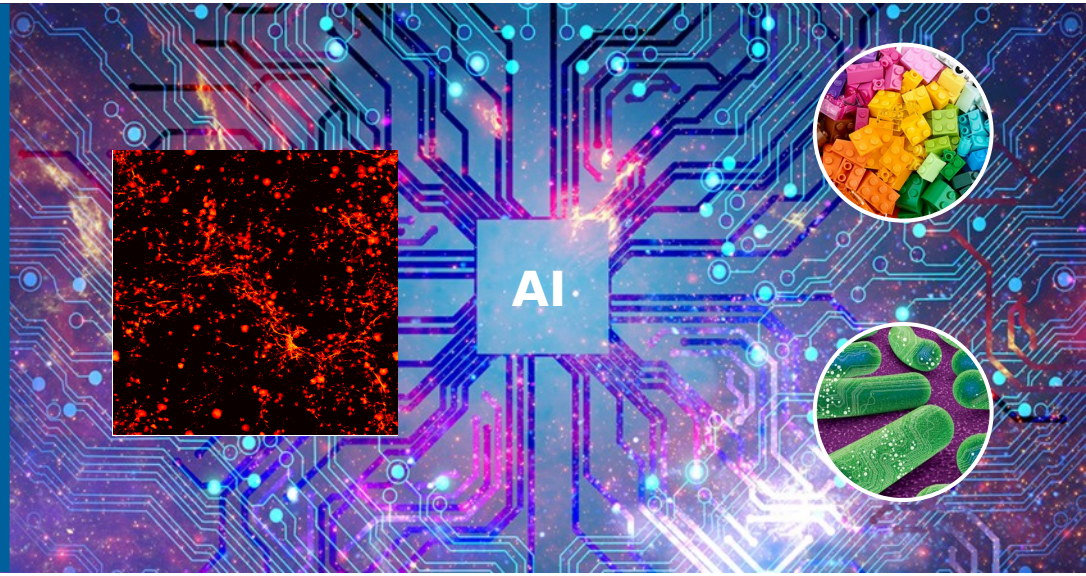
SCALING DEEP LEARNING FOR SCIENTIFIC APPLICATION



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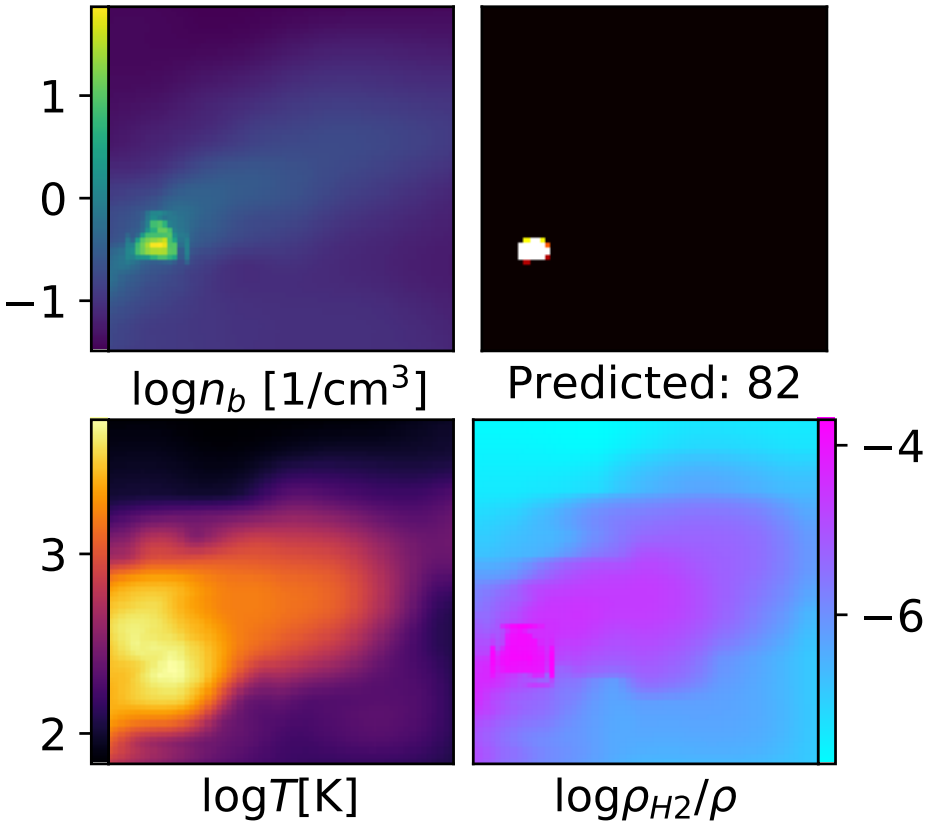
DEEP LEARNING FOR SIMULATIONS AND IN-SITU MODELING

- Astrophysicist by training @ UCSD
- Deep learning specialist by practice
  - DL models to predict formation of first stars
  - Adapted to in-situ models to predict formation and effects of first stars—Accelerated simulation by ~50x
  - GNN models to predict galaxy properties from dark-matter halo merger trees
  - U-Net based models to predict UV absorption in intergalactic gas



CURRENT AND FUTURE WORK

Currently using FSDP for:

- Developing foundation models of genomics
- Developing foundation models for cosmological data; integrating language into cosmological data
- Scaling other architectures; GNN, U-Net, GANs

Future work:

- Scalable DL solutions that are more agnostic to architecture than eg Megatron.
- Finalizing foundation models and extending them to novel areas of genomics and cosmology
- Developing methodology for reliably creating language associations for scientific data