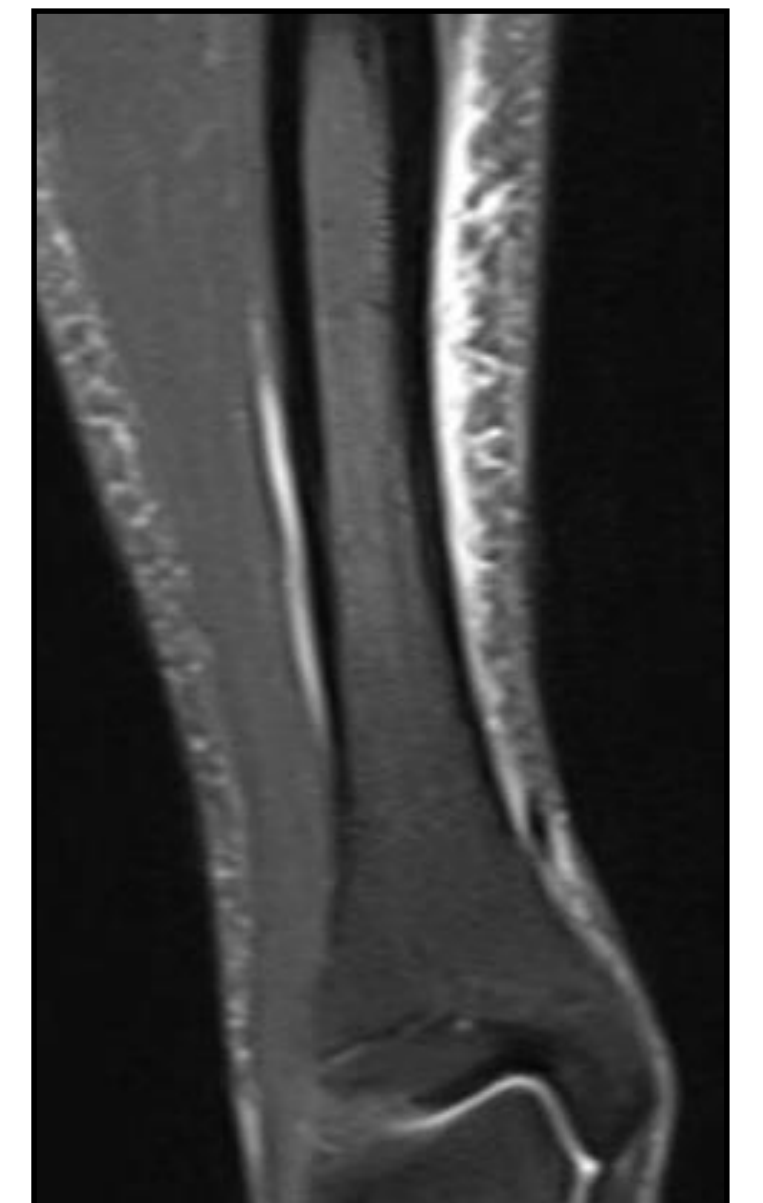
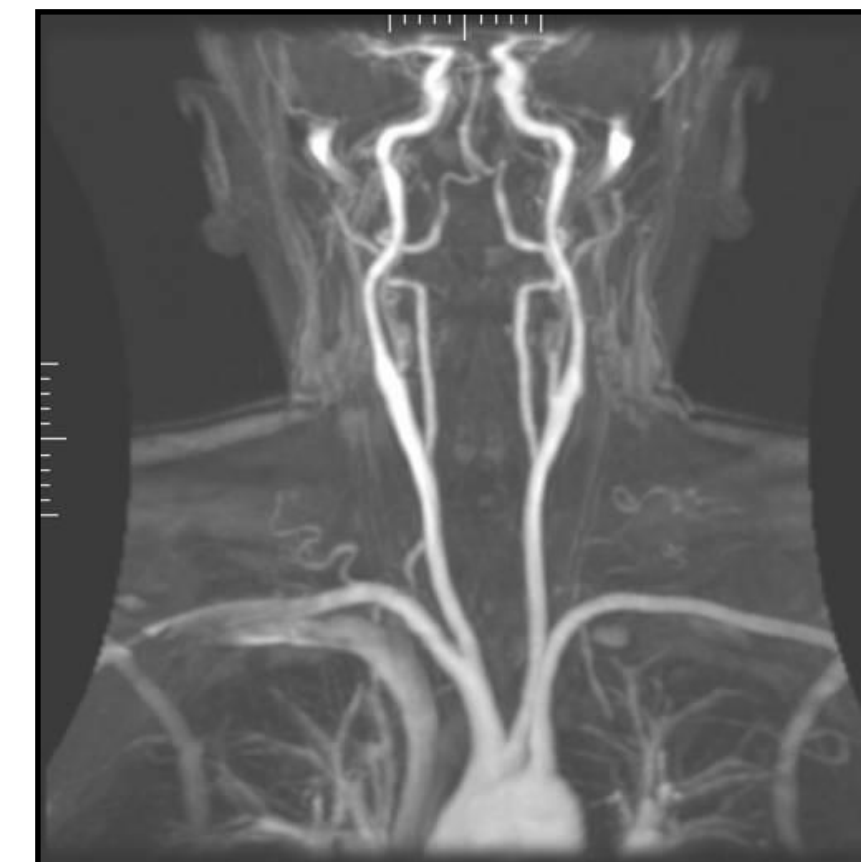
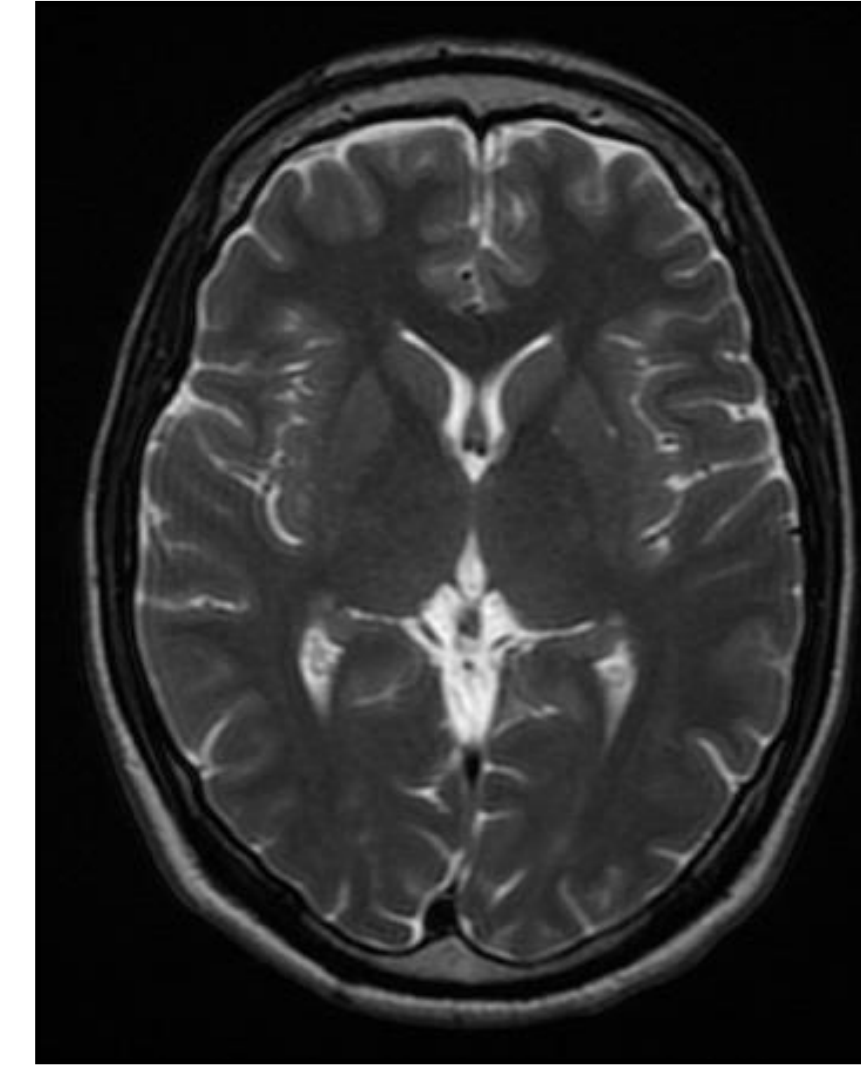


fastMRI

Nafissa Yakubova
Visiting Researcher
FAIR

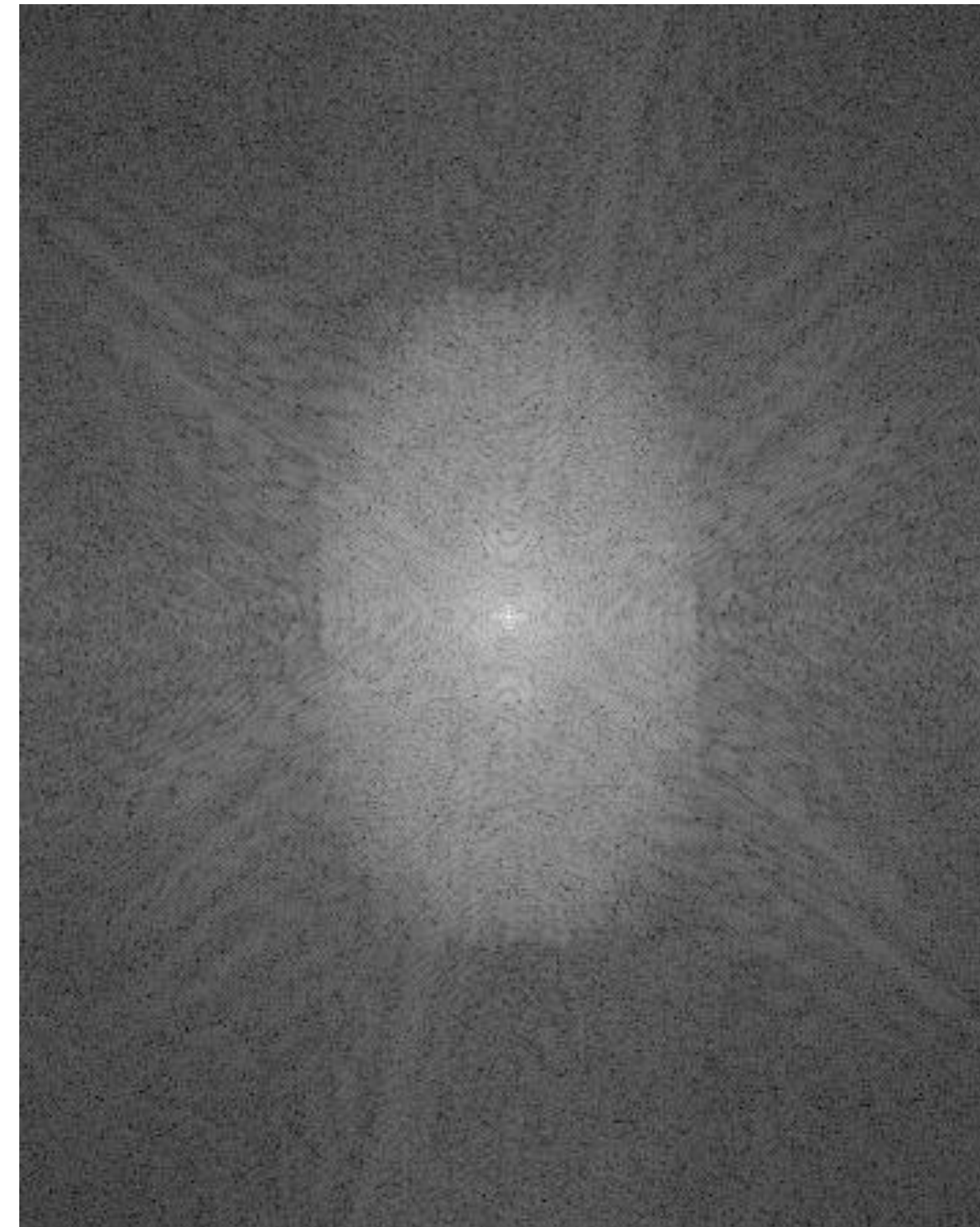
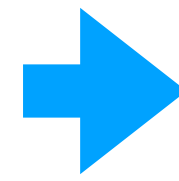
Magnetic Resonance Imaging



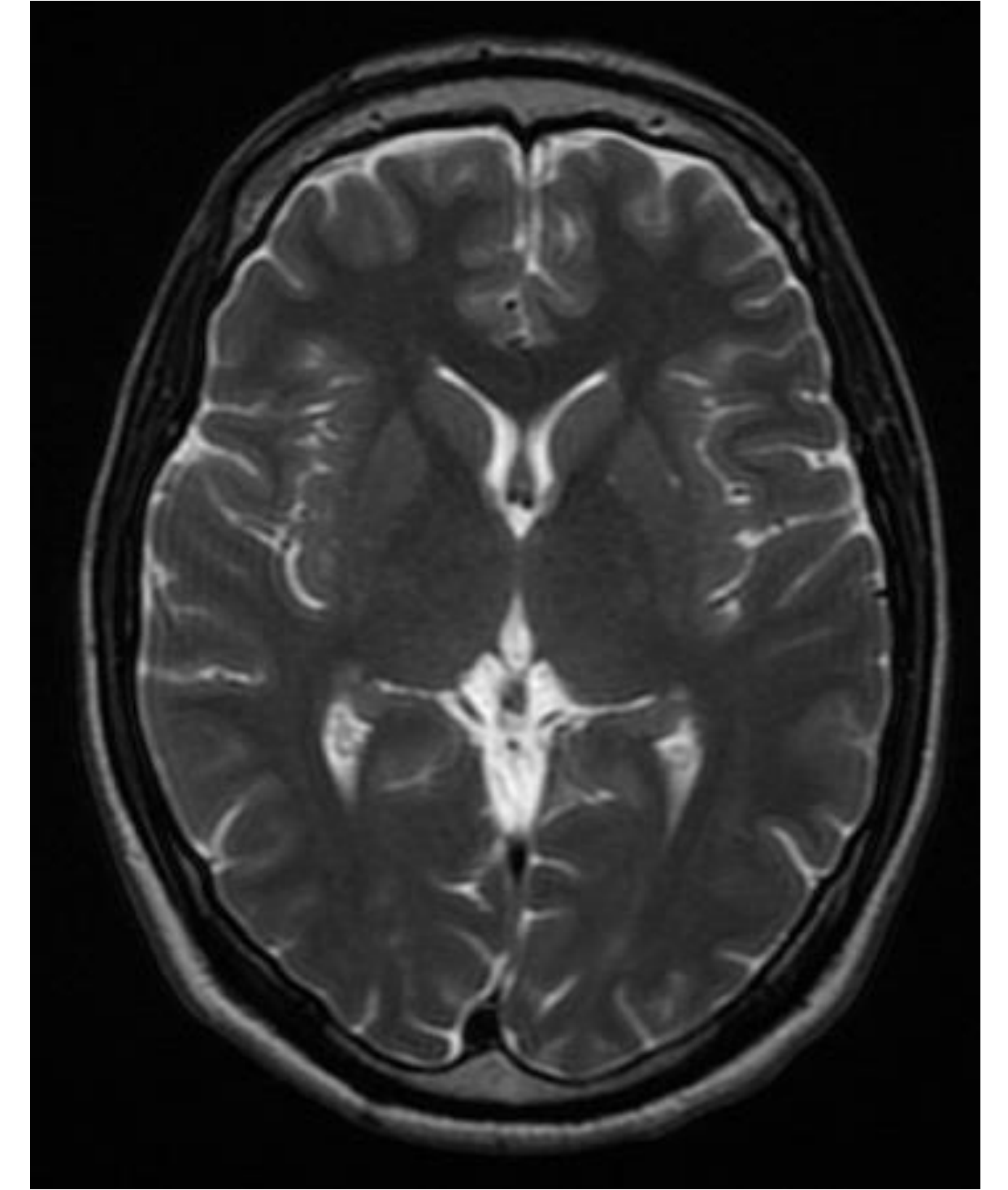
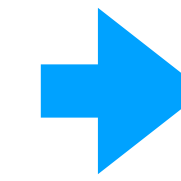
MRI process



MRI scanner



K-space



Final image



THE NEED

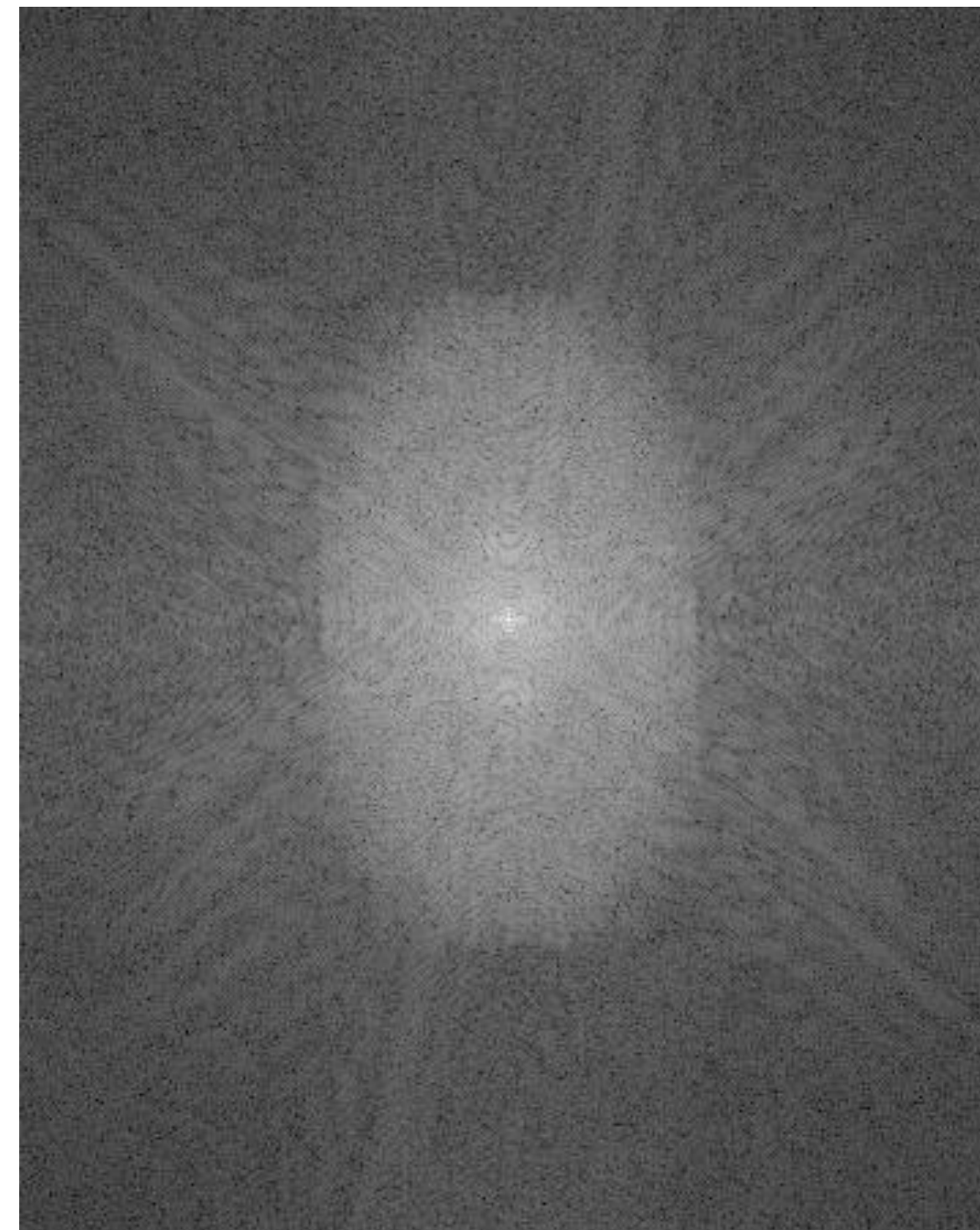
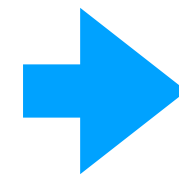
MRIs give a wealth of information...
...but are slow (~20 up to 60 minutes)

- Enhance the experience for patients too sick to stay still
 - Enable imaging of children without the need to anesthetize
 - Reduce radioactive imaging (X-ray, CT)
 - Increase access to MRI across the world

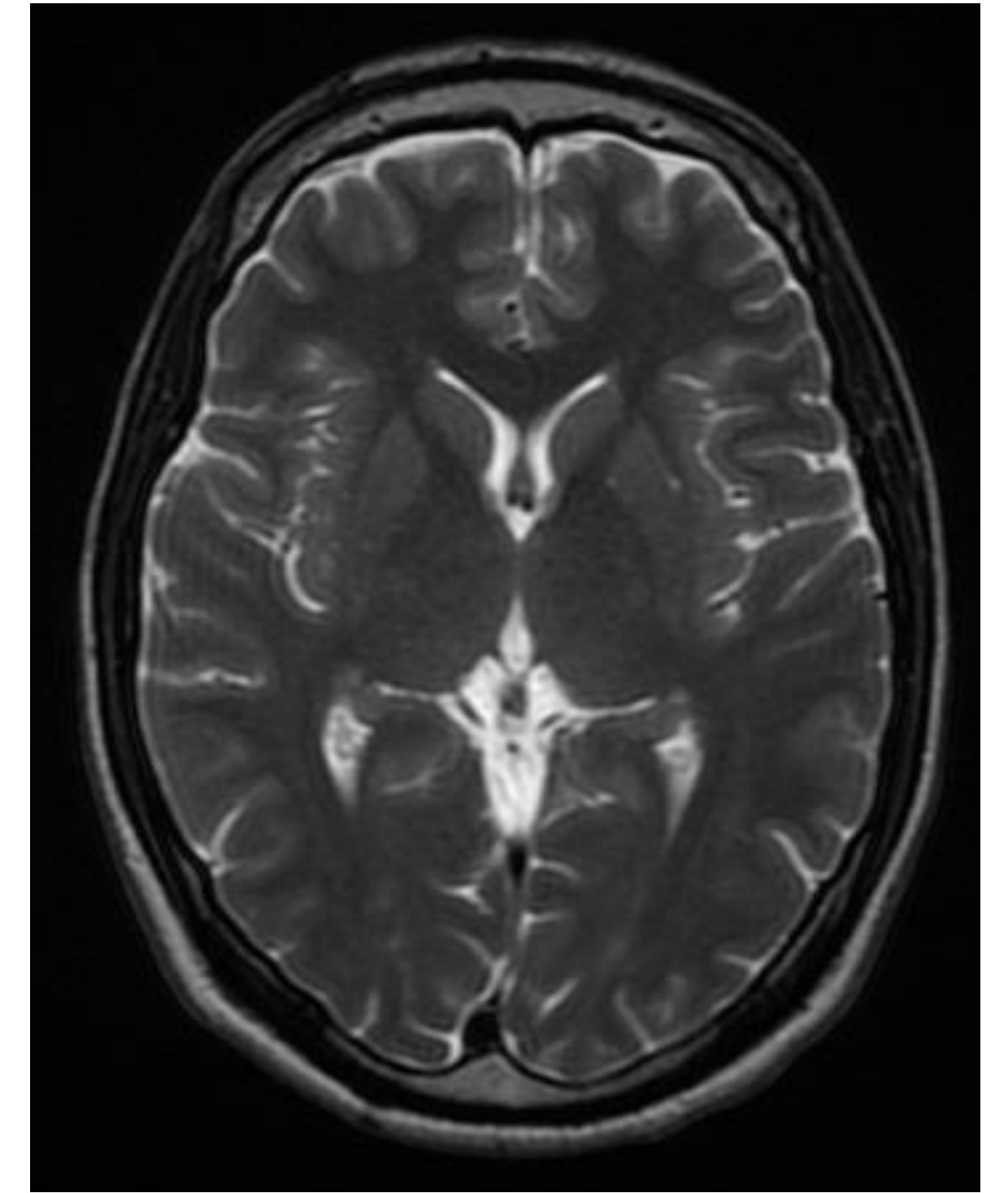
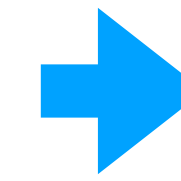
MRI process



MRI scanner



K-space

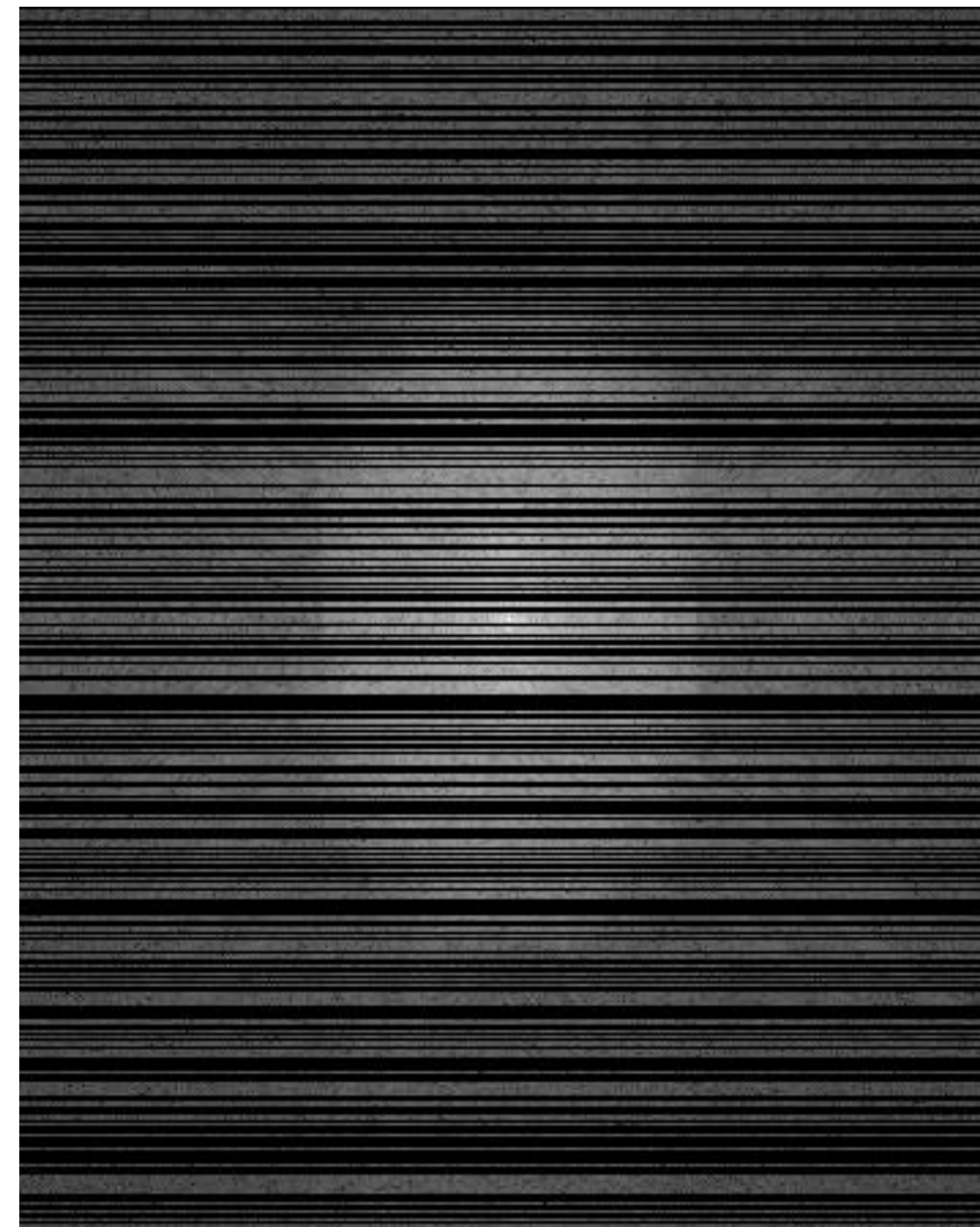
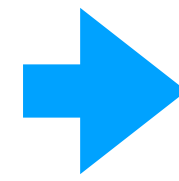


Final image

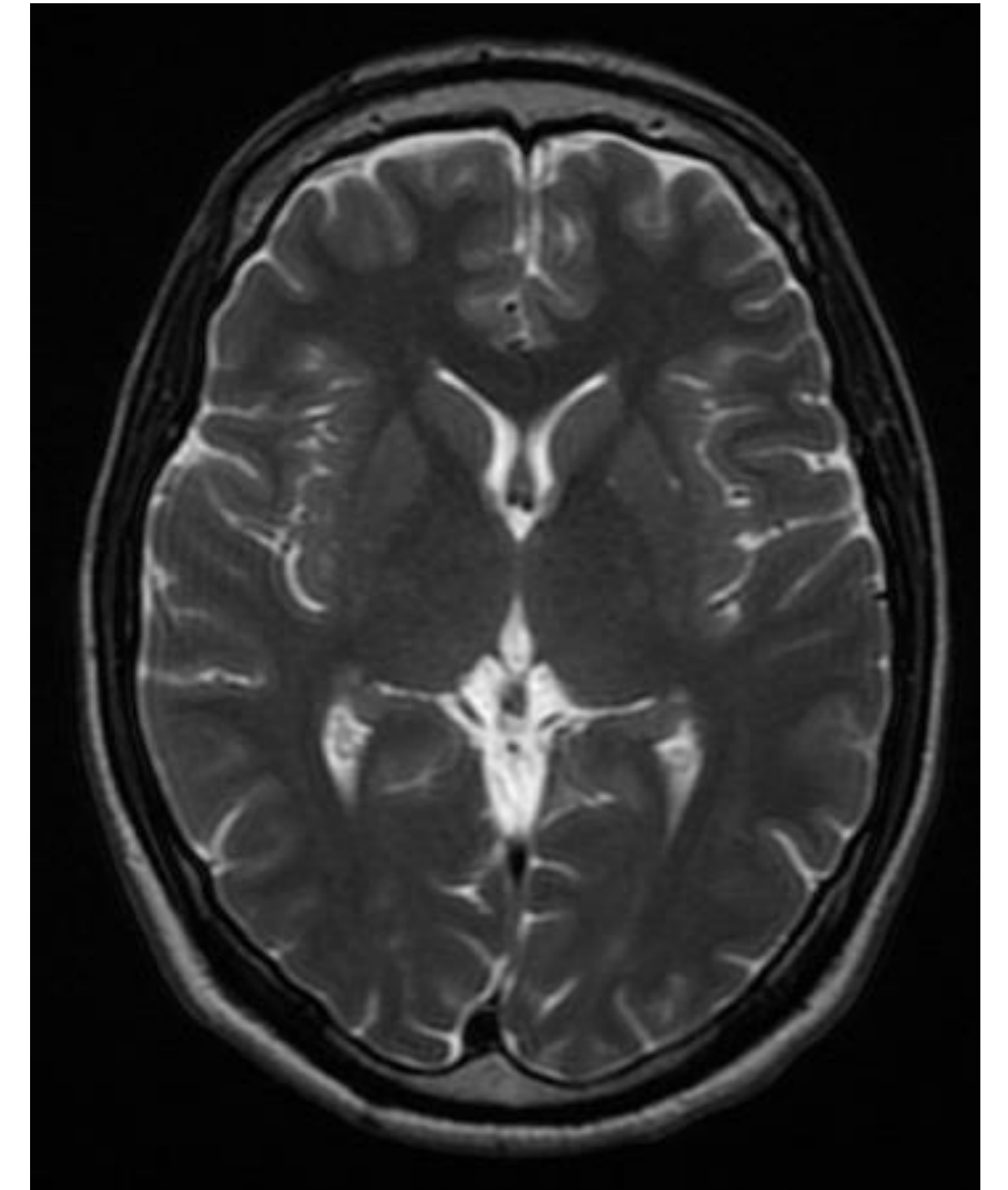
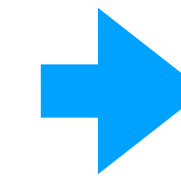
FastMRI goal



MRI scanner

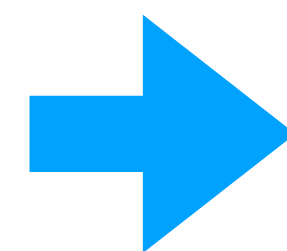
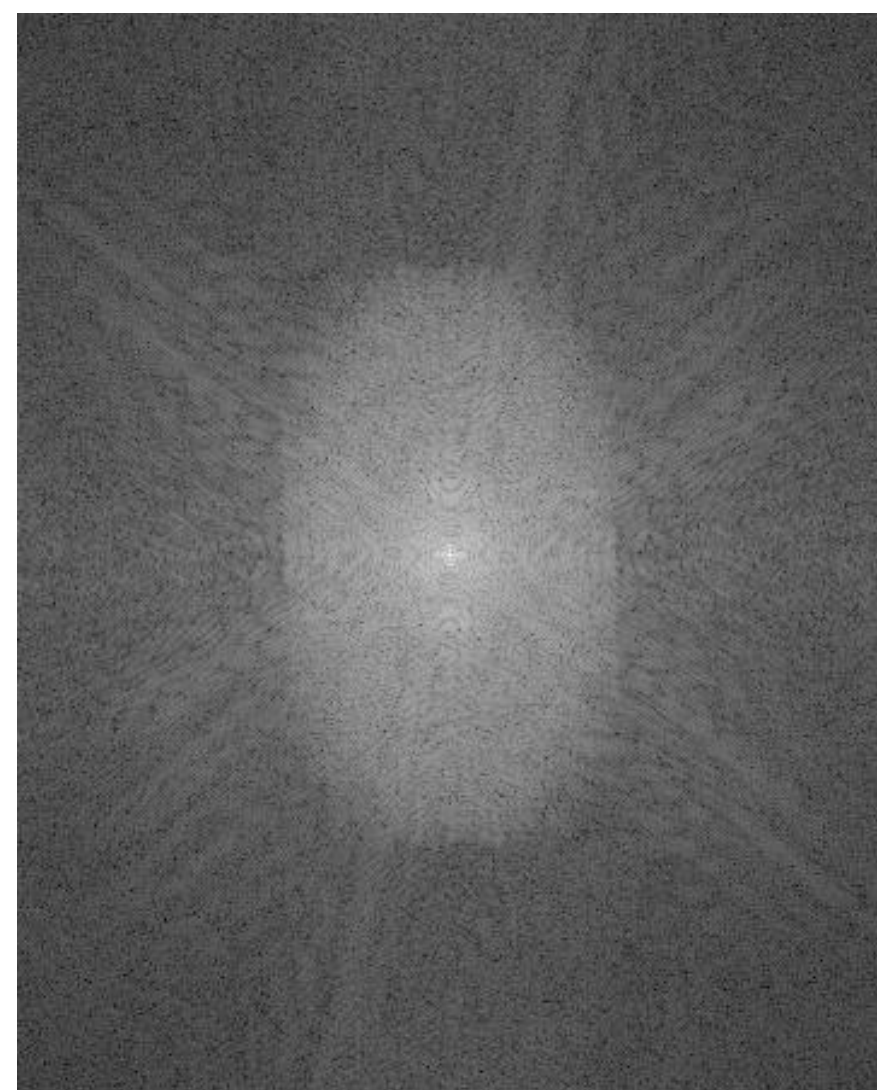


K-space

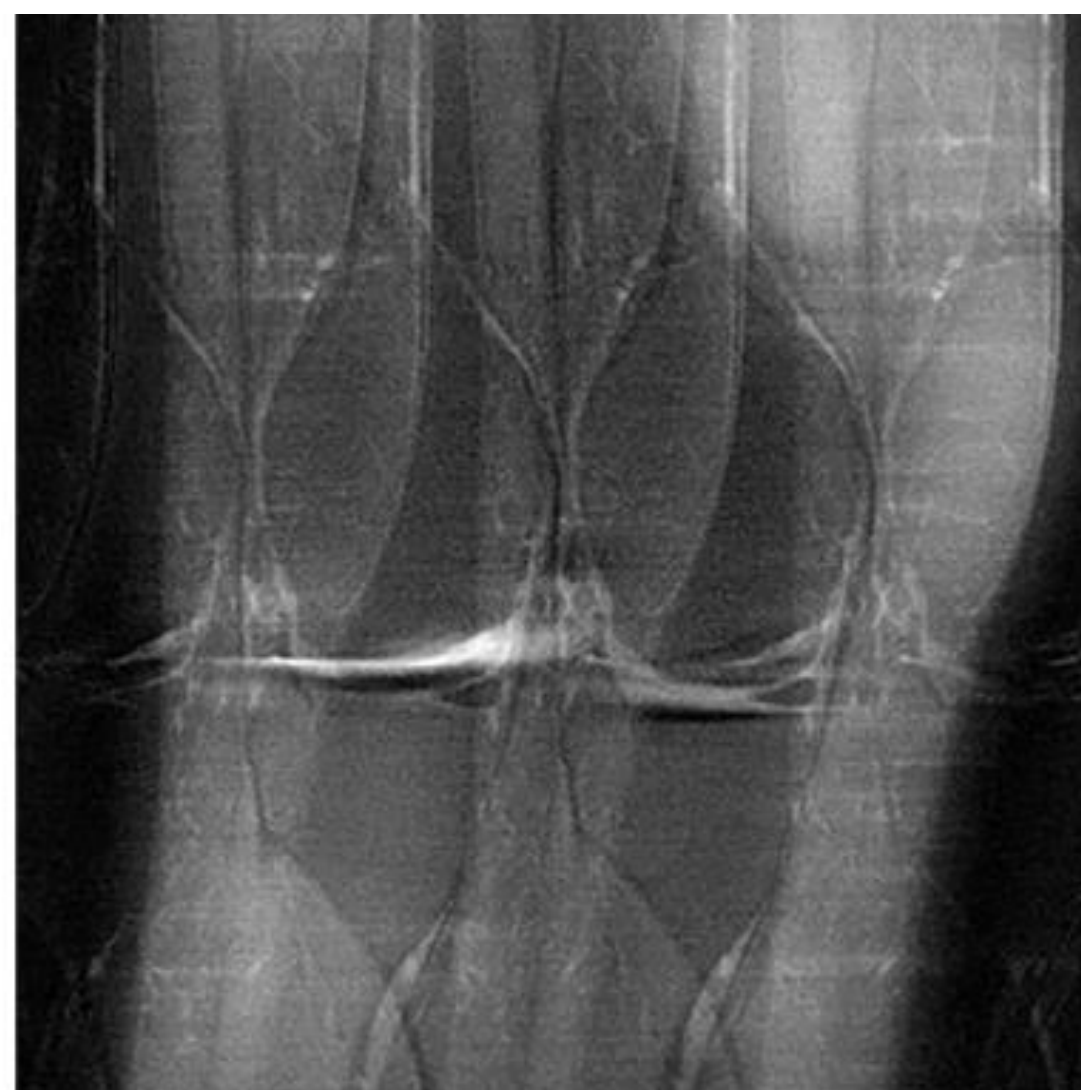
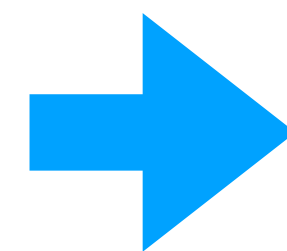
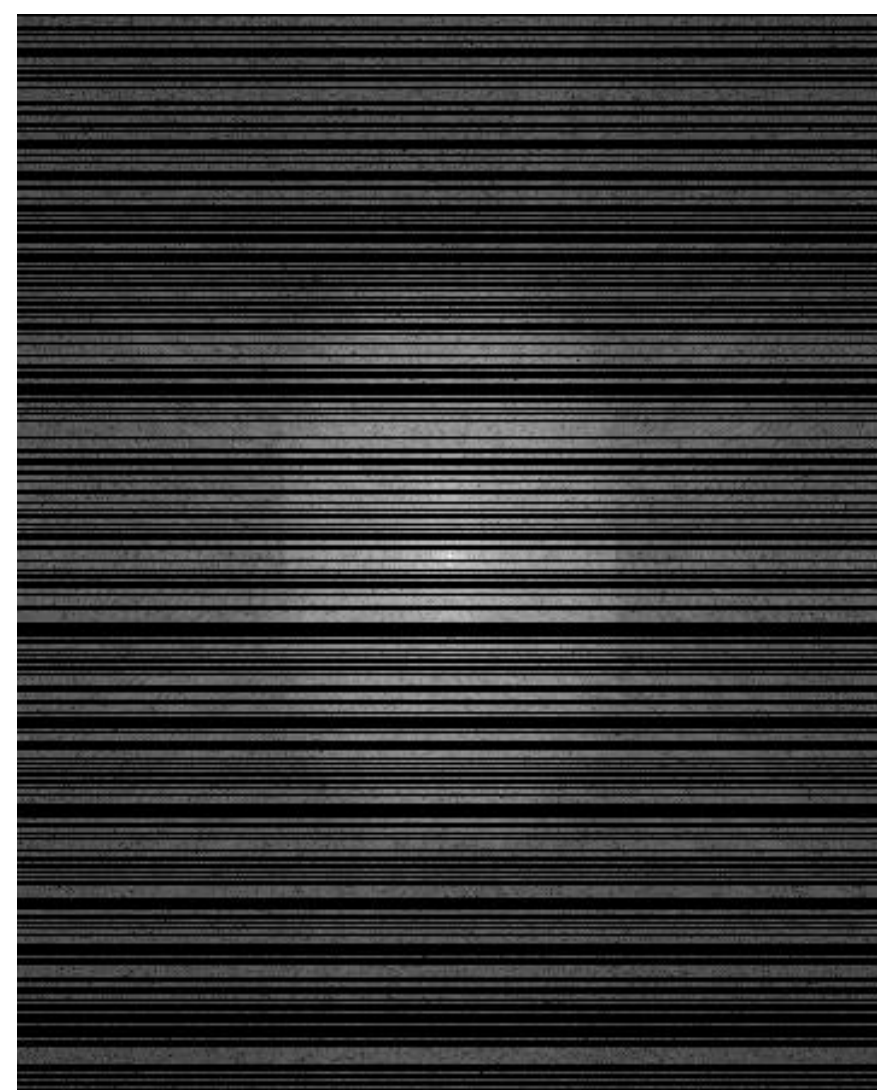


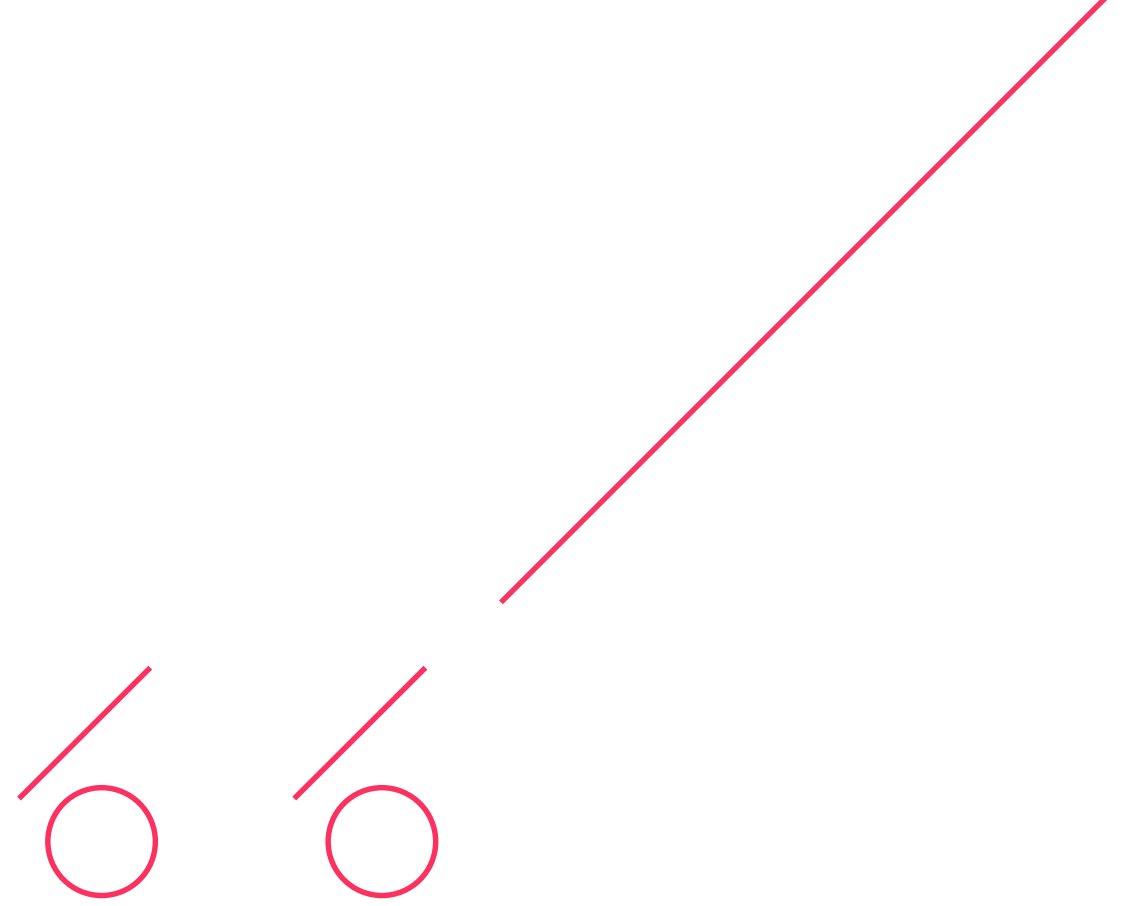
Final image

Fully Sampled



Under Sampled



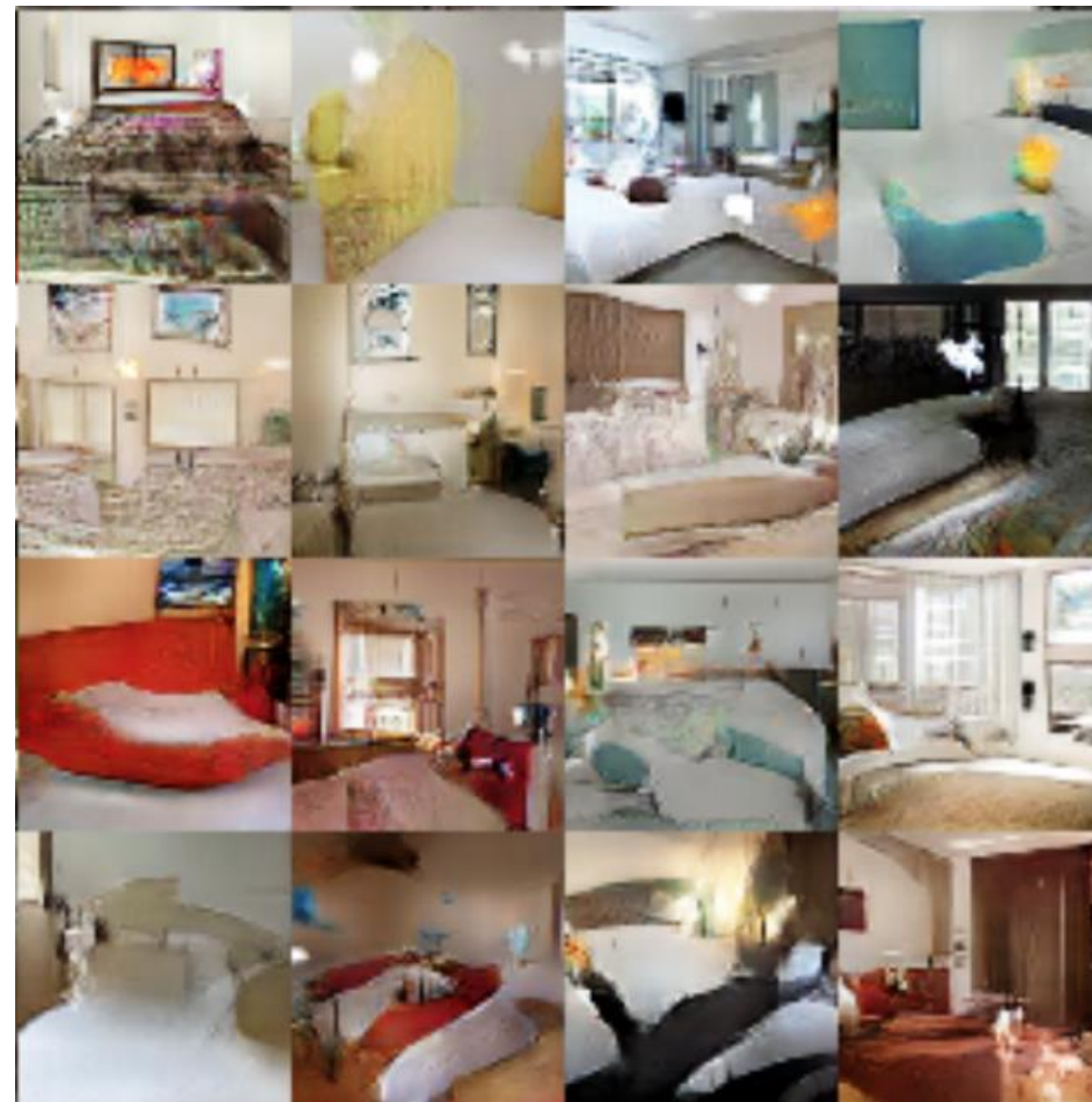


Why is this an interesting AI problem?

GANs, U-nets, etc.



Goodfellow et al., 2014



Radford et al., 2016



Karras et al., 2018

Facebook AI Research Mission



Advancing the science of artificial intelligence



COLLABORATION



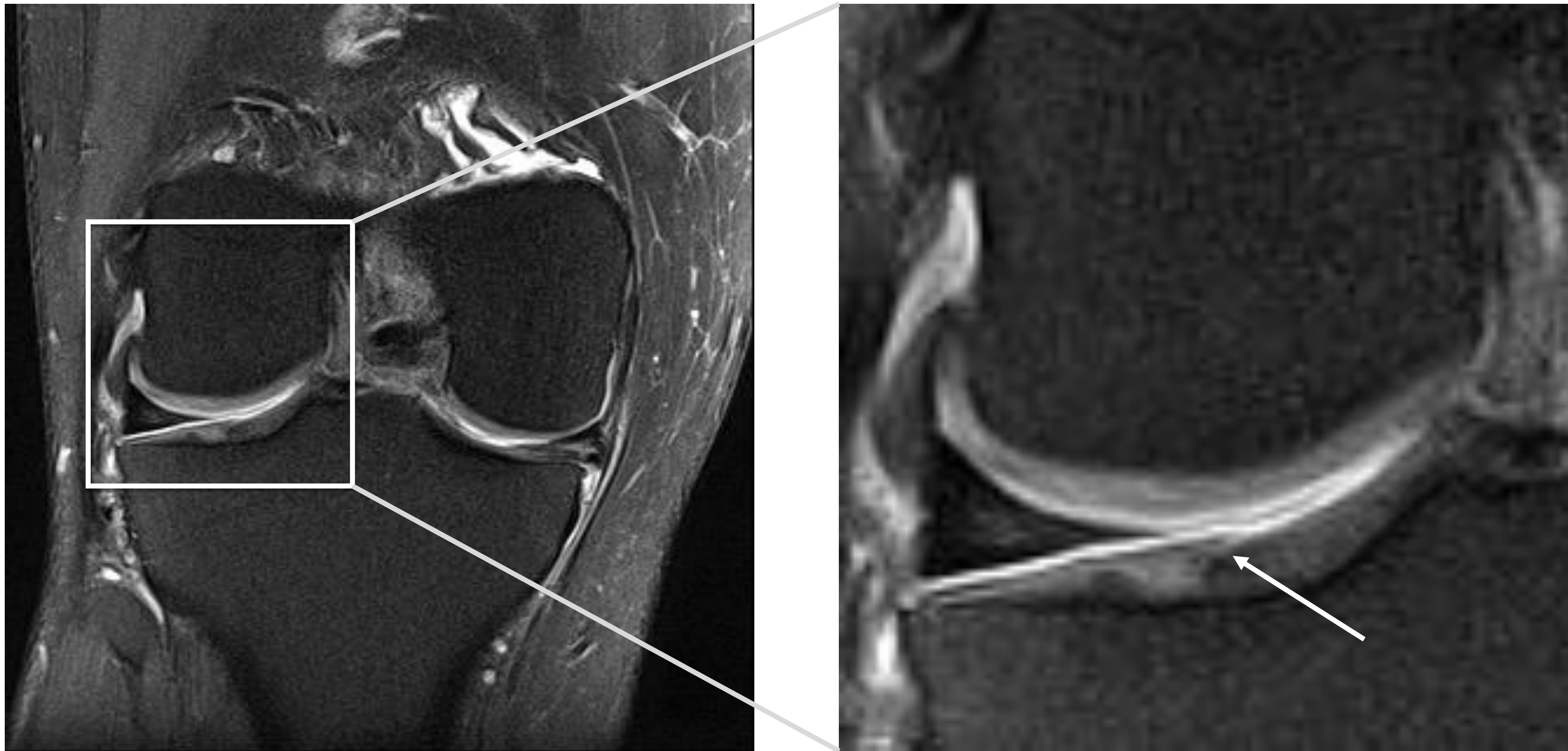
- Leading Medical Research Institution
- Dedicated Imaging Research Center
- Lead by Dr. Daniel Sodickson, Dr. Michael Recht, Dr. Yvonne Lui.
- Access to real-world, diverse data set
- IRB, Ethics Committee
- Open Scientific Research



- Algorithms
- Evaluation
- Data

CHALLENGES

Evaluation?





- Dataset size
- Standard dataset
- Multi-coil raw data
- Single-coil reconstructions

DATA

DATA PRIVACY



- IRB approved
- HIPAA compliant
- Fully de-identified images



Empower the medical and AI communities

- provide large gold-standard data set
- evaluation metrics
- open source models

Thank You

