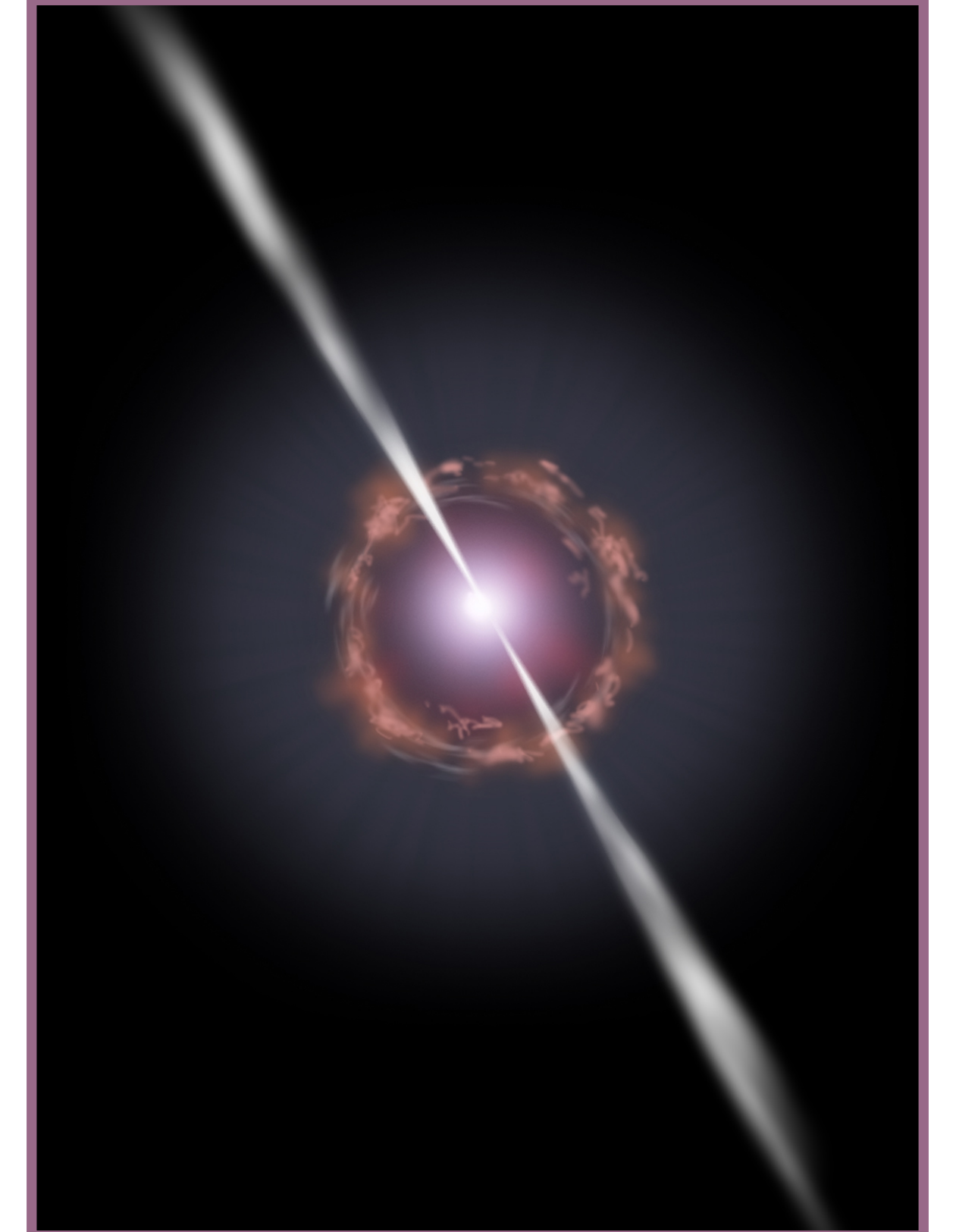


Science Requirements Messaging: Transients



Anna Y. Q. Ho (Assistant Professor, Cornell)

On behalf of the CMB-S4 Sources & Transients Working Group

Transient & variable mm-wave phenomena

1/3

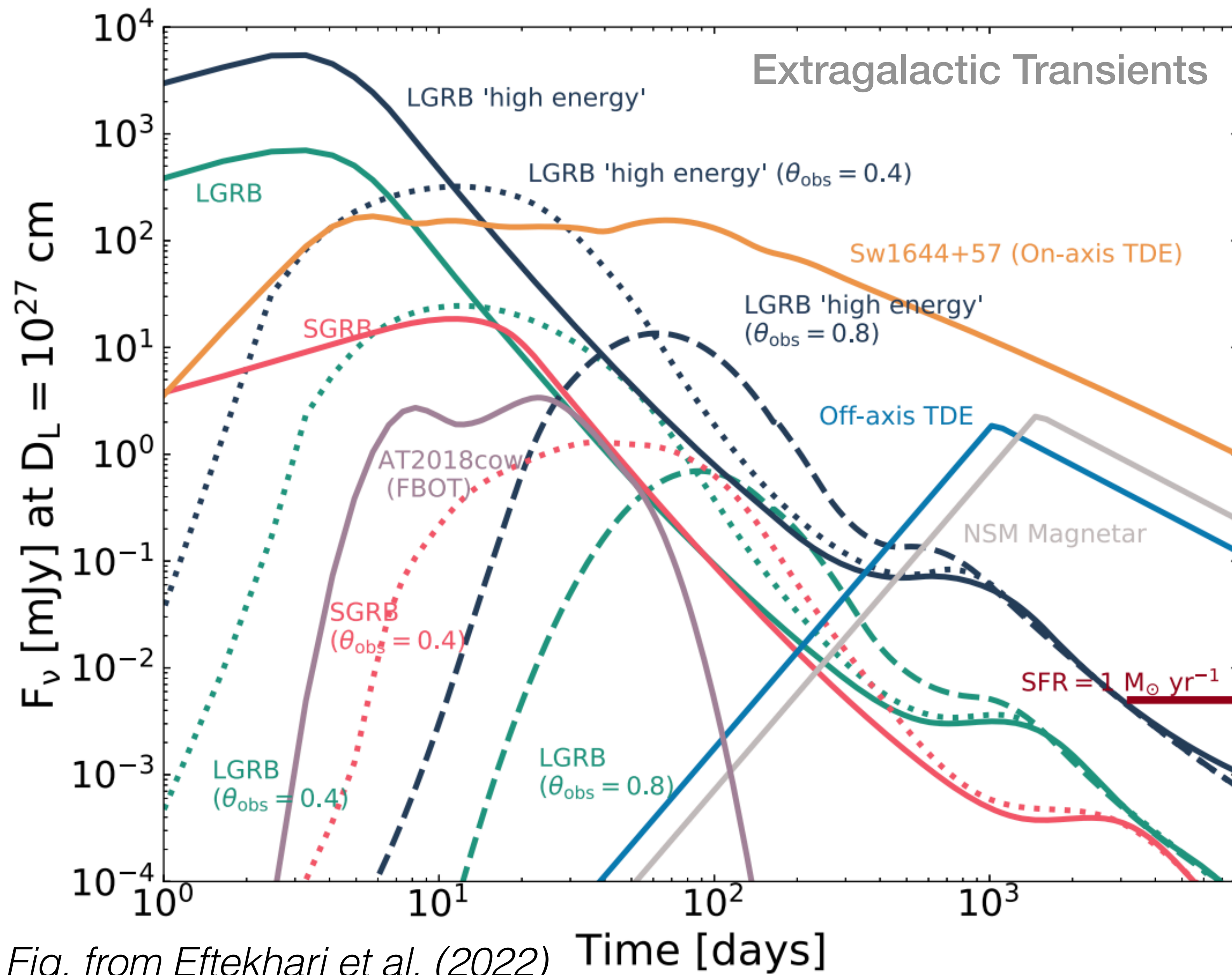


Fig. from Eftekhari et al. (2022)

Extragalactic Variables
(AGN, ...)

Galactic Variables (stellar
flares, X-ray binaries, ...)

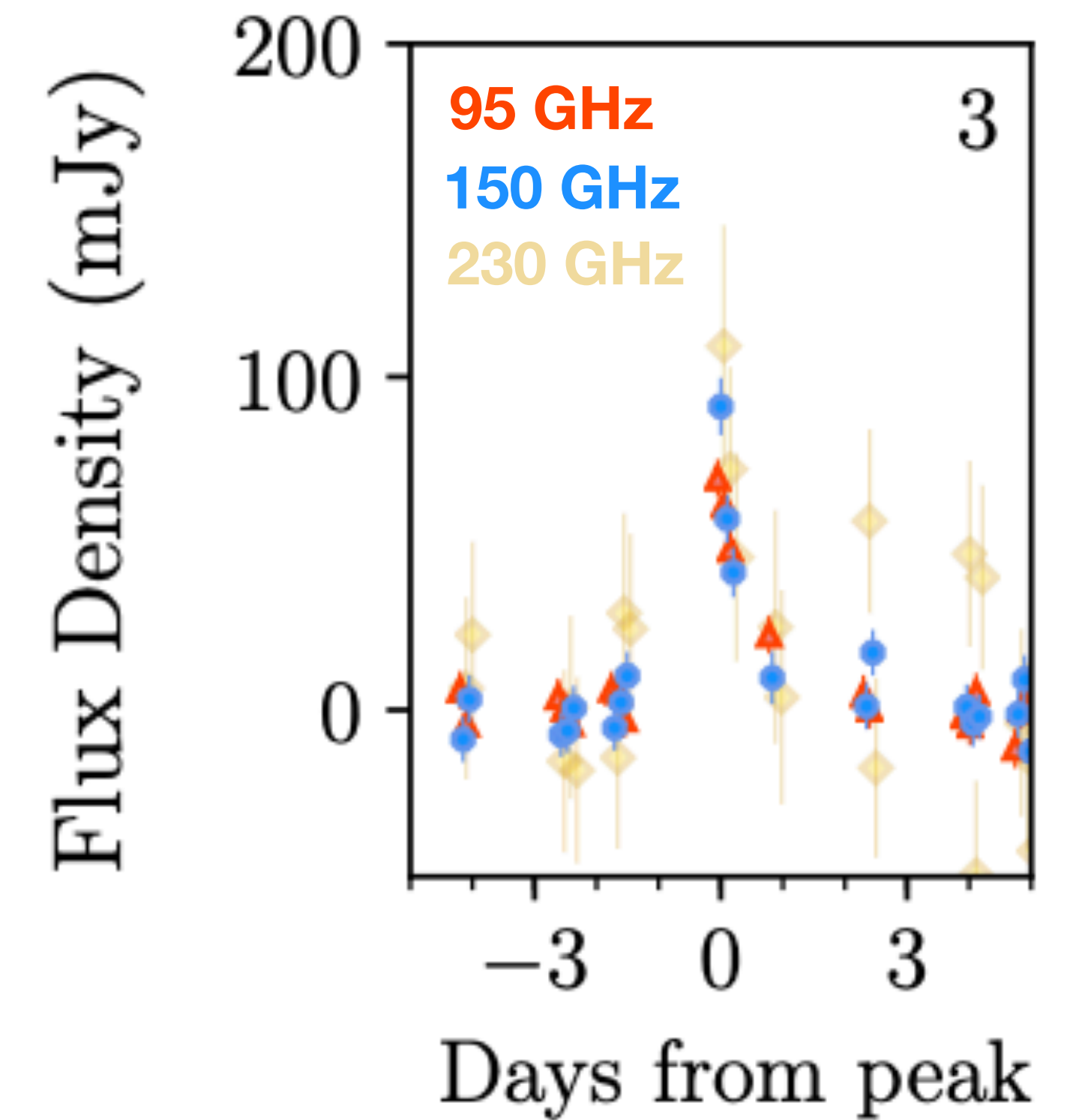
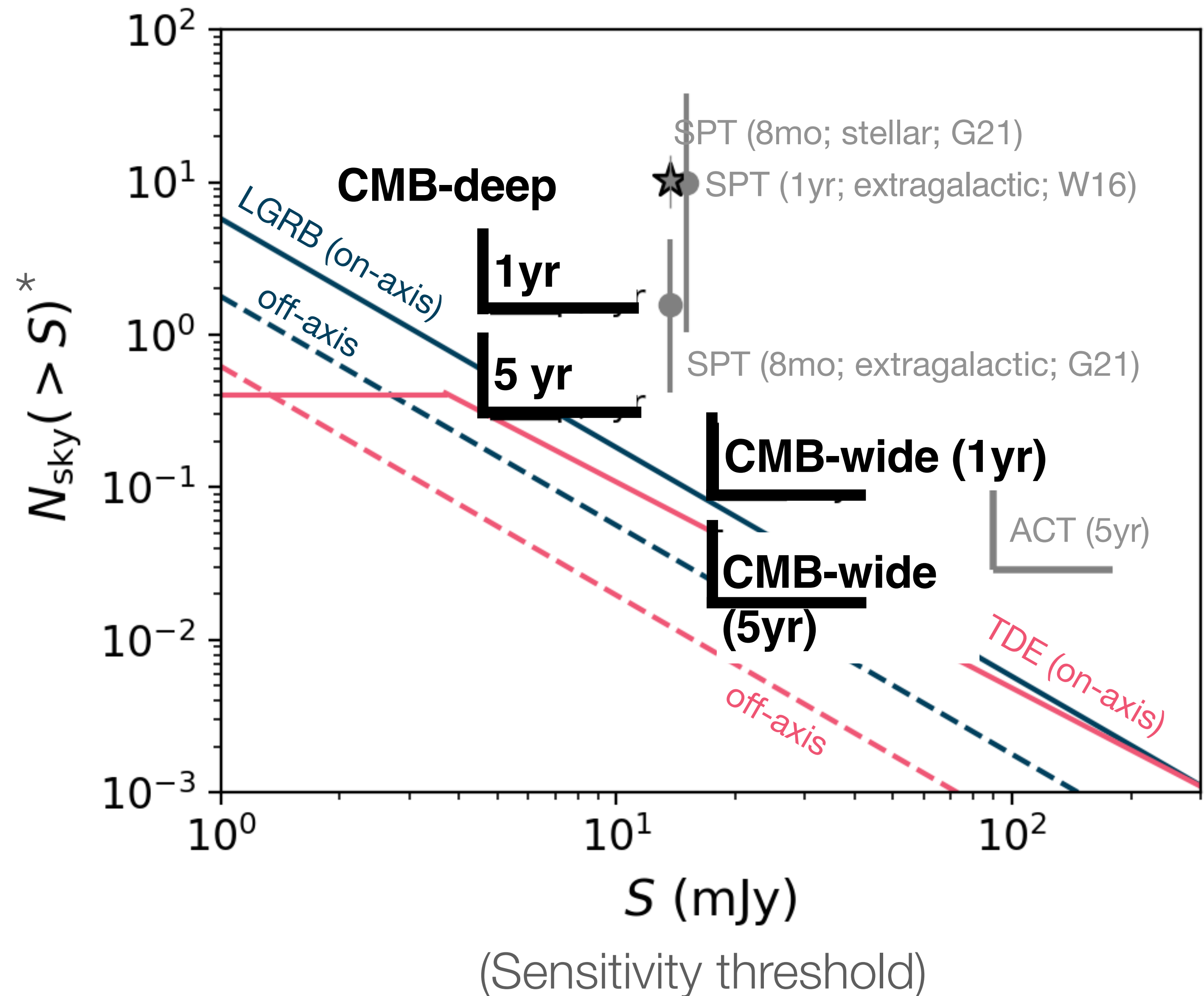


Fig. from Guns et al. (2021)

The most sensitive wide-field high-cadence mm-band survey ^{2/3}

- First mm survey expected to routinely detect classes of galactic and extragalactic transients/variables



*Number of sources in the sky brighter than the threshold

Scientific return

- **Radio/mm:** synchrotron (shocks)
 - **mm:** physical regime, modeling
 - **CMB-S4:** population statistics, long-term high-cadence monitoring
- Questions that require untargeted survey:
 - Mechanism behind stellar flares
 - Final years of massive star's life (binary interaction, burning phases)
 - Particle acceleration mechanism
 - Jets: launch, structure, composition
 - Discovery space

