Time-domain astrophysics

Introduction: Douglas Scott
Example (protostars): Doug Johnstone
Lessons from ACT: Cody Duell
Science programme: Greg Sivakoff
Tracking the time-variable Millimeter-wave sky with CMB experiments

Thematic Areas:
- Planetary Systems
- Formation and Evolution of Compact Objects
- Stars and Stellar Evolution
- Galaxy Evolution
- Multi-Messenger Astronomy and Astrophysics
- Star and Planet Formation
- Cosmology and Fundamental Physics
- Resolved Stellar Populations and their Environments

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Co-authors: Edo Berger (Harvard University); Lindsey Bleem (Argonne National Laboratory); Thomas M. Crawford (University of Chicago); Douglas Scott (University of British Columbia); Nathan Whitehorn (University of California - Los Angeles)

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Transient, variable, moving
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• Solar system (moving) objects
• Stars and protostars
• Novae, tidal-disruption events
• AGN (and other jets)
• GRBs, supernovae
• FRBs?
• GW events + neutrinos
• The unexpected
Kulkarni (2012) – phase space for optical transients
Can we fill in this figure for the submm?
CCAT (2022) – phase space for submm transients

\[ \text{Terra incognita} \]
\[ \text{Hic sunt dracones} \]

Peak Luminosity \([M_V]\) vs. Characteristic Timescale \([\text{day}]\)
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• Follow-up capability (CCAT niche)?