Transients Proposals

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November 30, 2023
Target of Opportunity (ToO) Proposals

• Why ToOs?
  • “Known unknowns”. Expected phenomena.
  • Reasonable likelihood of an interesting event occurring (e.g. a supernova)
  • Time and location unknown at the time of proposing.

• Advantages of main cycle vs DD:
  • Faster turnarounds are possible.
  • Judged against other main cycle proposals.
Mid-Cycles and Director’s Discretionary (DD) Proposals

- **Mid-Cycles:**
  - Scientific reason why observations couldn’t be proposed at the last main cycle (e.g. data received/object discovered after deadline).
  - Compelling scientific urgency to observe this cycle.
  - Transients ok but not primary route.

- **DDs:**
  - “Unknown unknowns”. Unexpected phenomena or unexpected developments since last call.
  - Time critical.
  - **Response time is from acceptance.** Review has to happen first.
Flavours of ToO activations

- **Non-disruptive:**
  - >21 days response time (no limit on these)

- **Disruptive:**
  - 2-21 days response time (limited to 8 per cycle)

- **Ultra-disruptive:**
  - <2 days response time (limited to 1 per cycle)

- **Flexible Thursdays (FlexDays):**
  - 1 FlexDay per month of the cycle, 2 activations per month (limited to 20 activations in Cy30, but will be 24 in Cy31 onwards)
Execution time for DD programs from submission.

Actual versus requested ToO response times since 2020.

DD programs: 2021-23
Lots of ToOs, and lots of triggers expected

• Numbers of HST ToO proposals are increasing:
  • Cycle 29: 45 / 1051 = 4.3%
  • Cycle 30: 45 / 1003 = 4.5%
  • Cycle 31: 57 / 902 = 6.3%

• Lots of facilities online now or coming online soon!
  • Rubin/LSST, Rubin, Roman, Zwicky, LIGO, Kamioka, Virgo, LISA, IceCube Gen2, Super Kamiokande, Hyper Kamiokande, ...
Flexible Thursday ToOs — New in Cycle 31!

• Expect a large pool of events requiring rapid turnaround.
  • Can (scientifically) pick events to match certain observing days.
• 1 Flexible Thursday per month, 2 activations per Flexible Thursday.
  • Triggers submitted by 10:00 UT on the preceding Tuesday.
  • Flexible Thursday schedules are filled with “easy”-to-move observations.

• Cycle 31:
  • 3 FlexDay proposals submitted
  • 1 FlexDay proposals accepted
  • Success rate: 1 in 3 — well above overall average (1 in 7).
  • All were competitively ranked: in top third of proposals in panel.
Current Review Process

• ToOs are reviewed in their science panel:
  • All ToOs are reviewed by Discussion panels regardless of size (no external review).

• Pros:
  • Reviewed against other proposals in the broad science area.

• Cons:
  • Panelists worry that non-ToO science is not competitive with the “urgency” of ToO science.
    • This isn’t true, but panelists will worry regardless of the facts!
  • Ultra-disruptive and Disruptive activations are limited each cycle. Requires a lot of cross-panel discussions to manage.
Proposal: A new High-Energy Transients panel

- What will go here: supernovae, kilonovae, gravitational waves, fast radio bursts (FRBs), gamma ray bursts (GRBs), tidal disruption events (TDEs).
- What won’t: Solar System ToOs (Solar System), Microlensing ToOs (Stellar Pops), AGN ToOs (SMBH).
- Discussion panel only (no external). Panel chair will join the Executive Committee.
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• Pros:
  • Most ToOs, especially Ultra-Disruptive and Disruptive are evaluated against each other. Easier to assess relative rankings and adjudicate limits.
  • Feedback from various ToO communities (including Stellar Physics panel): they feel more expert in TDAMM topics in other science areas than other topics in their science area.
• Cons:
  • Proposals aren’t compared against other proposals in their science area.