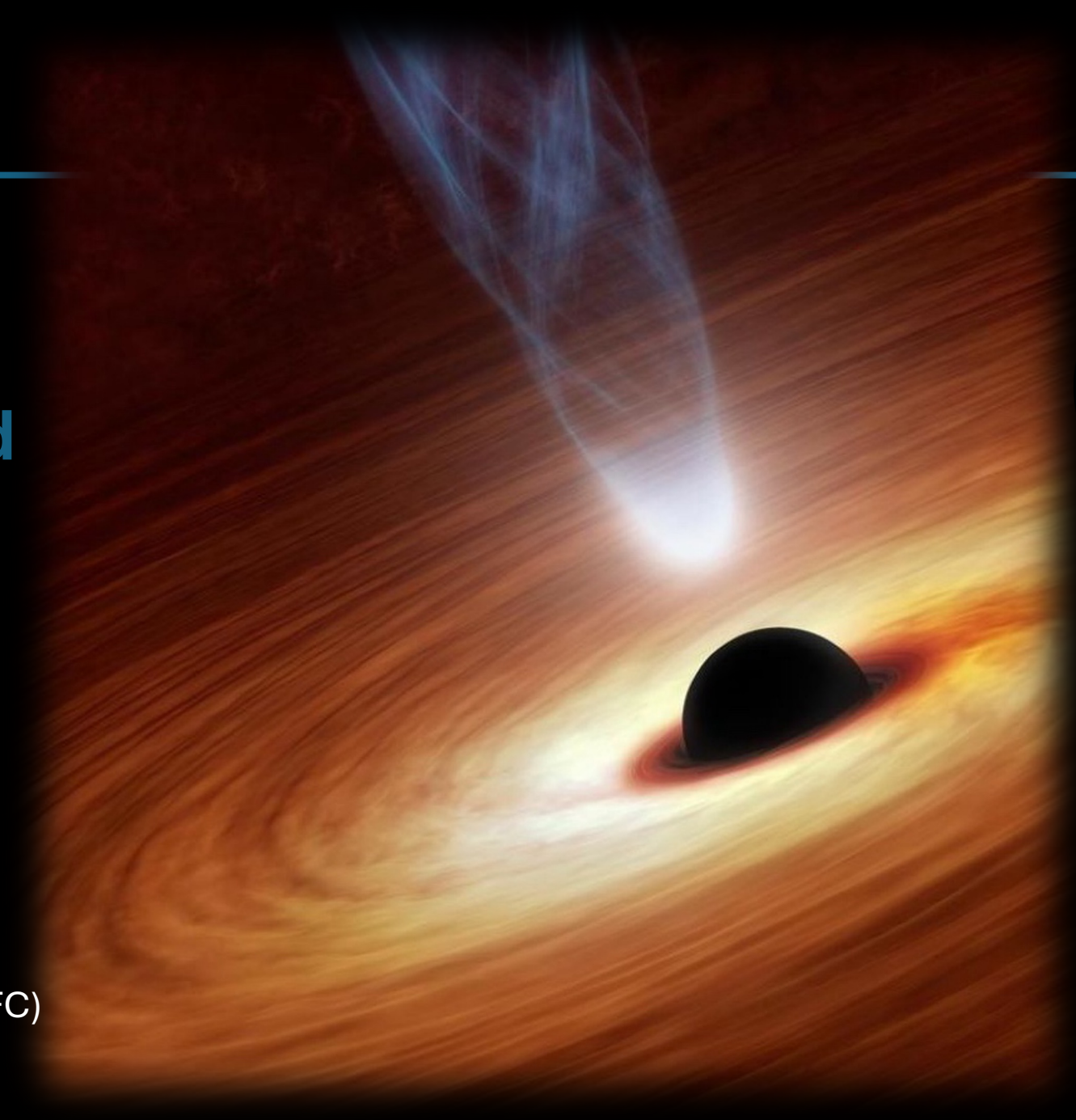
Infrastructure and Governance for Community-Defined Observing Plans



Brian Humensky (NASA GSFC)
TDAMM Study Scientist
4th TDAMM Workshop, Huntsville, AL

ACROSS Core Team:
- Chris Roberts, Samuel Wyatt, Tyler Pritchard, Kirill Vorobyev, Nitzan Frock, Craig Pellegrino (NASA GSFC)
- Jamie Kennea (PSU)
- Dan Kocevski, Michelle Hui (NASA MSFC)

thomas.b.humensky@nasa.gov

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Tyler Pritchard

University of Maryland

NASA-GSFC

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Outline: Questions to Discuss

- Path from White Papers to Adoption and Implementation (after coffee)

- TDAMM Event Workflow
- Triggering Observing Plans and Alerting the Community
- Collecting and Distributing Data
- Publications and Credit
- Updating Observing Plans

- Interaction between Observing Plans and Funding Mechanisms (next talk)

Why this workshop now?

- **Theres a push for observatories to be more responsive to TDAMM needs**
  - Driven by Astro2020, community input, and all the exciting surveys we've been hearing about
  - TDAMM observations can be harder to deal with than other kinds of programs/proposals for observatories (*this should not be the community's problem!*)
  - This means we needed more of a push to get momentum picked up, but we're getting there
- Previous TDAMM Workshops have suggested that events with trigger rates <<1/yr and that require a rapid response time are not well served by the current proposal process
- ACROSS as a NASA program is standing up

Why this workshop now?

- Theres a push for observatories to be more responsive to TDAMM needs in general
- **Previous TDAMM Workshops have suggested that events with trigger rates <<1/yr and that require a rapid response time are not well served by the current proposal process**
  - Key recommendation from workshop #2, Ahumada et al. 2024
    - Expand community access to MMA/TDA data sets. For the most exceptional sources (e.g., next nearby GW counterpart, Galactic supernova), the MMA/TDA community should work with observatory staff to predefine observing programs whose data would become publicly available immediately upon triggering. …
  - Observatories are willing to give time to maximize TDAMM science in this scheme
- ACROSS as a NASA program standing up

Why this workshop now?

- Theres a push for observatories to be more responsive to TDAMM needs
- Previous TDAMM Workshops have suggested that events with trigger rates <<1/yr and that require a rapid response time are not well served by the current proposal process
- **ACROSS as a NASA program is standing up**
  - Developing tools and infrastructure to make multi-mission/wavelength/messenger observations more streamlined
  - Core group of TDAMM aware scientists in an organizational position to assist in the execution and coordination of TDAMM programs across observatories

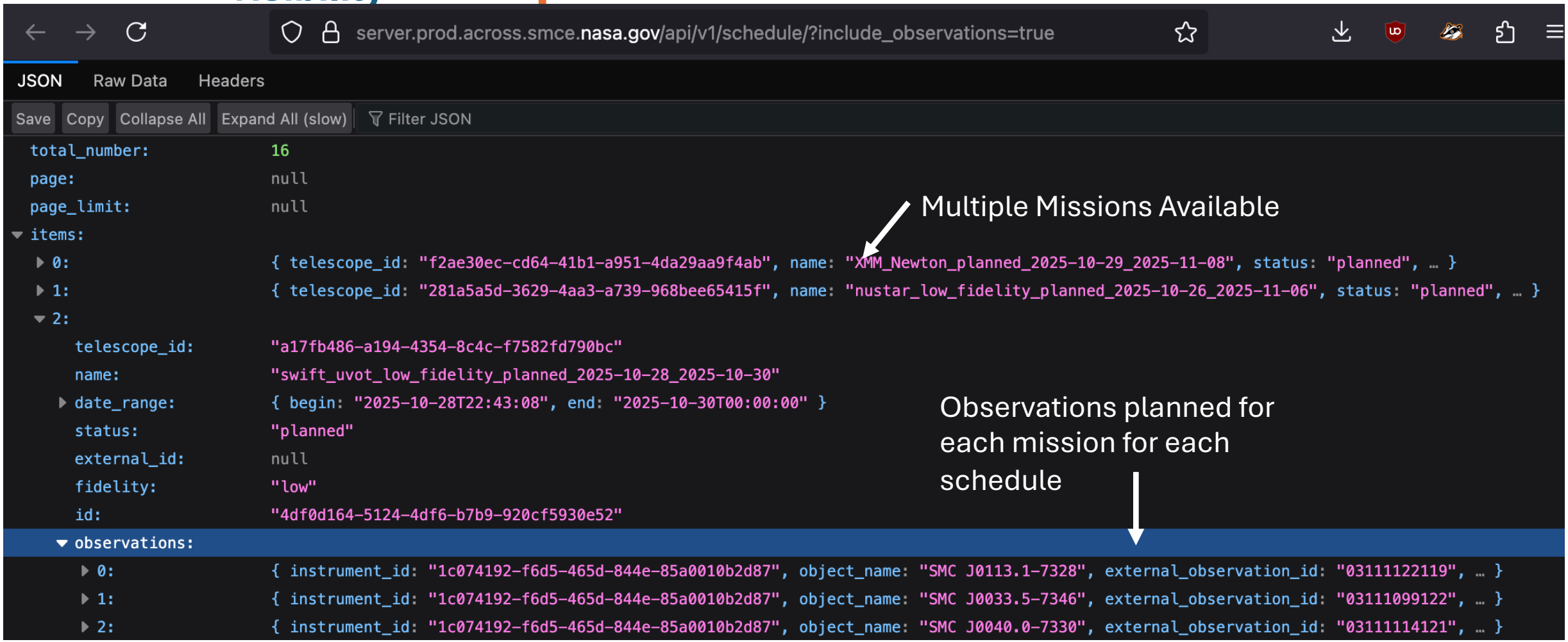
Why this workshop now?

- Previous TDAMM Workshops have suggested that events with trigger rates <<1/yr and that require a rapid response time are not well served by the current proposal process
- ACROSS as a NASA program is standing up
- Theres a push for observatories to be more responsive to TDAMM needs, partially driven by decadal recommendations.

"Can we maximize our science gain for rare transient events for transient events with low observed event-rates using flagship facilities using some form of a recommended community observing plan?"

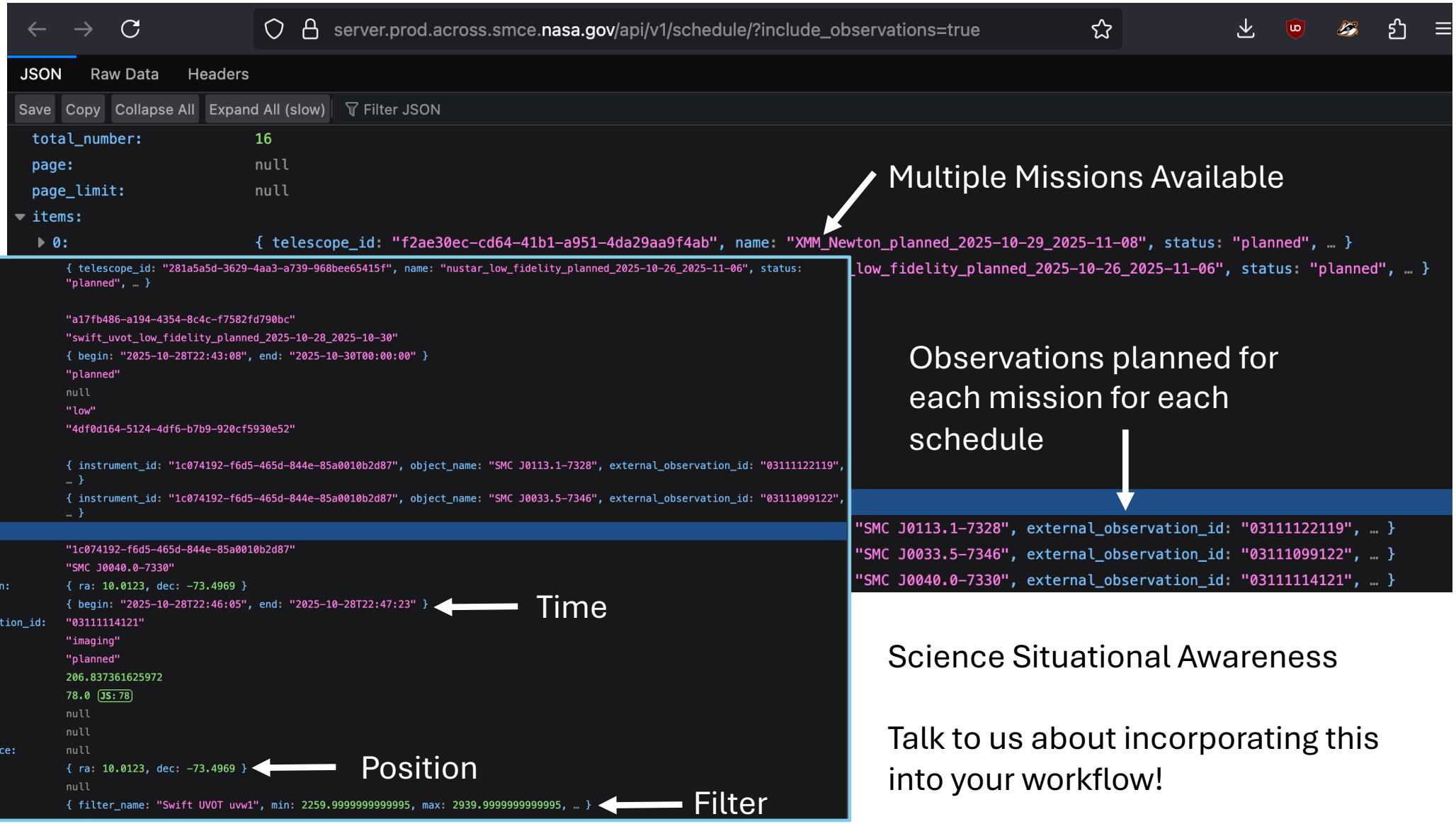
ACROSS – Schedule ingestion & visibility

- As Jamie discussed part of across job is to develop tools and infrastructure for programs such as those talked about here



Web front-end awaiting the government to reopen but the API is live

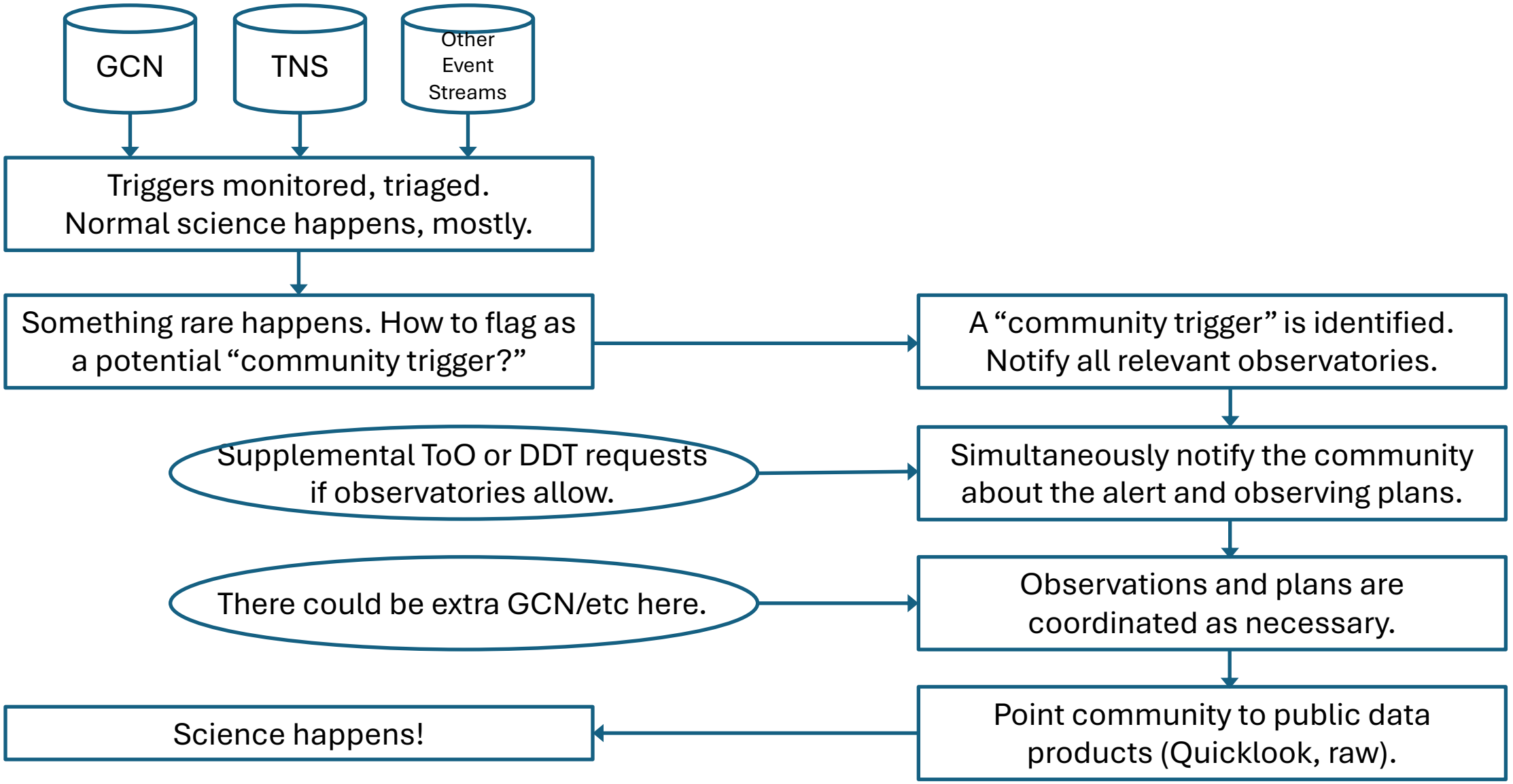
ACROSS – Schedule ingestion & visibility



Science Situational Awareness

Talk to us about incorporating this into your workflow!

TDAMM Event Workflow



Triggering Observing Plans and Alerting the Community

- **Trigger criteria are set by the community-defined observing plans**
- Who decides whether trigger conditions are satisfied?
- Who is monitoring for events that may meet trigger criteria?
- How is the community alerted to the triggering of an observing plan?

Triggering Observing Plans and Alerting the Community

- Trigger criteria are set by the community-defined observing plans
- **Who decides whether trigger conditions are satisfied?**
  - Trigger Advocate Committee
    - Large enough to have requisite expertise / redundancy, small enough to be nimble – must be available / reachable! And/or not require all to make decision
    - Terms of few years, expect 1-2 triggers/yr – so a low rate of work
  - Role for AAAC, NAC, and other advisory committees and agencies in selection / ratification?
- Who is monitoring for events that may meet trigger criteria?
- How is the community alerted to the triggering of an observing plan?

Triggering Observing Plans and Alerting the Community

- Trigger criteria are set by the community-defined observing plans
- Who decides whether trigger conditions are satisfied?
- **Who is monitoring for events that may meet trigger criteria?**
  - Community at large
    - Then reaching out to ACROSS team and/or decision-making body
  - ACROSS-funded community duty scientists or team (see next talk)
  - ACROSS team
- Who is monitoring for events that may meet trigger criteria?
- How is the community alerted to the triggering of an observing plan?

Triggering Observing Plans and Alerting the Community

- Who decides whether trigger conditions are satisfied?
- Who is monitoring for events that may meet trigger criteria?
- How is the community alerted to the triggering of an observing plan?
  - GCN Circular? Other channels – TNS, SCiMMA, …?
  - ACROSS Web Portal
    - News item / update on Community-defined plan page
    - Mission / observatory observing plans will begin to update to reflect trigger

Collecting and Distributing Data

- All data taken as part of community-defined plans should become public as quickly as possible
  - Quicklook / real-time pipeline results (light curves, photometry, spectra) that are needed for decision-making need to be shared as fast as reasonably achievable
- NASA observatories:
  - Raw data will go out through the mission science centers and to the archives as usual – (e.g. Fermi-LAT/BAT data available via FSSC after ~6-12 hrs and via HEASARC after ~2 weeks after observation)
- NSF observatories:
  - NOIRLab coordination of data products from NSF-funded observatories?
- Independent observatories:
  - Perhaps can learn from highly successful Exoplanet Follow-up Program (ExoFOP) model
    - Data contributed to central repository in return for promise of shared credit
    - Who would manage that central repository?

Publications and Credit

- Anyone who contributes to taking data should receive credit in papers initially reporting those data
- 3rd TDAMM Workshop WP Finding: "*The AAS and APS journals should work with the NASA ADS system to implement the technical tracking of these various authorship options.*"
  - Referring to tracking multiple contact authors
- DOI's for data?
  - MAST/Zenodo can offer this currently
  - could work with AAS/APS journals to require appropriate citations when using public community data?

Updating Observing Plans

- We anticipate this series of TDAMM workshops will continue regularly (every ½ years?)
- While future workshops may focus on other themes, can reserve some time to revisit and update community-defined observing plans
  - To reflect lessons learned, new results, and new capabilities
- Maybe only need to revisit a given plan every 2-4 years
- Also need to provide an opportunity to nominate and vet new science cases

Summary

- We're eager to work with you to define infrastructure needs to implement the RHITE observing plans
- This discussion was a good start; let's continue it as we write up the white papers
- Future workshops can help to define the infrastructure needs in more details – much as the 1st (Science) and 2nd (Infrastructure) workshops built on each other

Backup / Notes

Why can TDAMM Programs Be Hard?

Joint Programs require manpower overhead (but ACROSS is helping here)

- Every satellite is its own unique and beautiful snowflake
  - Different ConOps (Concept of Operations – ask Jamie)
    - Planning/response timescales, priority schemes, software systems
  - Nobody's systems talk to each-other
  - Coordinated programs often require lots of back-and-forth checks and person-to-person interactions to validate
  - Outside of flagship facilities many of these facilities are run on very constrained budgets, and lack manpower and expertise to make them more responsive

Joint proposals add overhead to a process which for non-flagships Is typically run on a shoestring budget (ACROSS will \help here in the future)

- Agreements need to be made across each mission individually, on a yearly basis as NRA's change
- Have to get TR from partner observatories for each joint proposal
- Have to make sure that any warded proposals don't duplicate efforts from awarded proposals at other missions (aka double dipping)

Exciting + Rare-Transient events raise their own problems (Maybe this workshop is helping here?)

- Money needs to be spent on certain timescales.
  - Risk of stochastic over/under-flow with lots of events triggering at once (or never)
  - Book-keeping across years or balancing reserve budgets is difficult and imprecise
    - Don't want to tell people they aren't getting their money, have to be very conservative, lowers efficiency
- Getting a dozen DDT's can be time-consuming to wade through – what's the 'communal' request, how to prioritize?
- Multiple similar proposals can also be tricky – how do you choose the "best" one to fund/ensure fairness?

Notes from prior discussions, to be deleted

- On an infrastructure session – my input would be that we need to have some kind of “observing plan infrastructure” session to discuss issues like (some or all of these): how they get ratified (by community and by missions), how they get updated (at annual workshops?), who makes the decision to trigger and what process is put in place to govern that, how the triggers get announced to community, how the data get released to the community, where the data gets collected (for the non-NASA, non-NSF data, which will be available through their respective archives).
- Governance: who has authority to trigger? Which observatories are willing to sign onto which observing plans? Process to get from draft plans / WP to final agreement and going live. Timeline to go live - 9 mo? Year?
- Across will run to ground what is implementable and agreed to, get the agreements made. Do need to figure out who will decide on triggering.
- Starting a long-term process, will take a while, but start with the easiest cases
- Roles of ACROSS, community, agencies, observatories / mission science teams