www.wis-tns.org

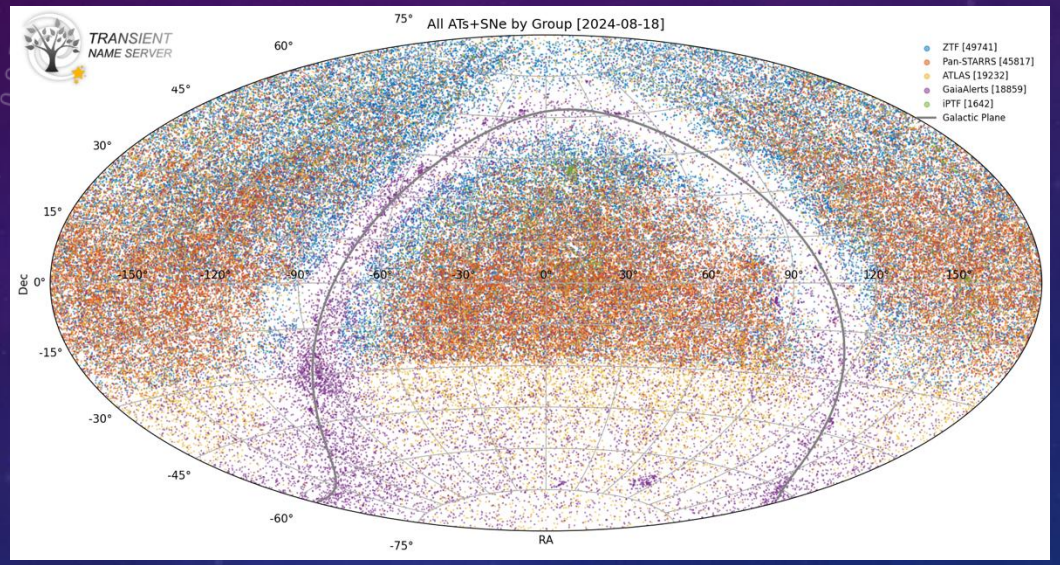
The **Transient Name Server**

in light of the MMA realm

[Overview for the Paris Astro Colibri workshop - Sep 2024]

Ofer Yaron

- Name server
- Fully searchable
- Citable (ADS indexed)



The Official IAU transient reporting mechanism

Alerts on

Transients (AT)

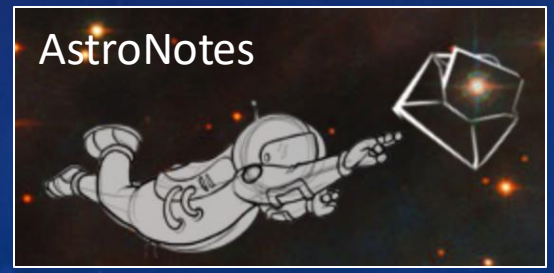
Classifications (SN...)

FRBs

(GRBs, GW events ...)

Reports

- "Manual" [forms] (including amateurs)
- Bulk via APIs [bots] (most surveys)
- Brokers



The team: Avishay Gal-Yam (PI, chair of IAU SN WG),

Avner Sass, Nikola Knezevic

Weizmann Institute for Science

The Transient Name Server - overview

- In operation since Jan 1st, 2016. The official IAU mechanism for reporting new astronomical (extra galactic) transients and specifically for official name designation. (Set up by the IAU in order to provide a modern, automatic mechanism to archive and distribute alerts about transients, replacing the manual CBAT system.)

- [As of Sep 2024] holds: 150k reported transient candidates ("ATs"),
  15k (10%) classified SNe (in addition to the full catalog of all pre-2016 SNe),
  >2k registered users, >150 groups (programs/surveys…)

- The basic TNS object is an Astronomical Transient (AT) with a unique identifier of the form AT YYYYx (x=A..Z, aa..zz, aaa..zzz,…). The prefix "AT" can be later changed to indicate a classification (e.g., "SN") but the unique identifier is always kept.

- Most reports are submitted automatically by "bots" of the major surveys & brokers (PS1, ZTF, Gaia, ATLAS…), but it is also possible to submit reports interactively using forms. Discovery reports are called *AT-reps* whereas classification reports (supported by a spectrum, for the "normal" transients) are called *Class-reps*.

- The system naturally handles multiple reports on the same event (e.g., discoveries of the same object by different surveys) and keeps a (fully searchable) record of "internal names" that are associated with each AT-rep.

- The system supports a citable service for short astronomical announcements - AstroNotes - which is a superior version of the ATEL system (flexibility, searchability; hyperlinked to the specific objects).

The Transient Name Server - overview

- All reports and AstroNotes are indexed by the ADS and are citable.
- Currently all alerts/notifications from the TNS (discoveries/classifications/AstroNotes) are distributed via emails to the registered users, according to their defined preferences. (Additional staging/alerting mechanisms (e.g. Kafka streams) may be added.)
- Some data can be reported as proprietary for a certain period of time; e.g. securing a name designation without official release of the details yet, or not exposing a classification spectrum.
- Groups, Bots and memberships are all self-managed (by the users/group-owners), thus enabling flexible handling of access permissions, controlling the discovery credits etc.
- The system resides on the AWS cloud, increasing its high-availability capacity and scalability.
- On Mar 2020 the Fast Radio Bursts (FRB) community joined the TNS.
    - An additional subsystem was tailored for handling the specific requirements of FRBs – including a separate naming engine (FRB YYYYMMDDx), a separate report form (for the specific FRB properties), and enabling specification of area localizations (*"area transients"*).
- Adaptations for the Gamma-Ray Bursts (GRB) community are now in development.
  (A separate GRB naming engine, and several additional challenges, e.g. the editing of many properties after the initial report…)

Two major requirements/guidelines of the TNS

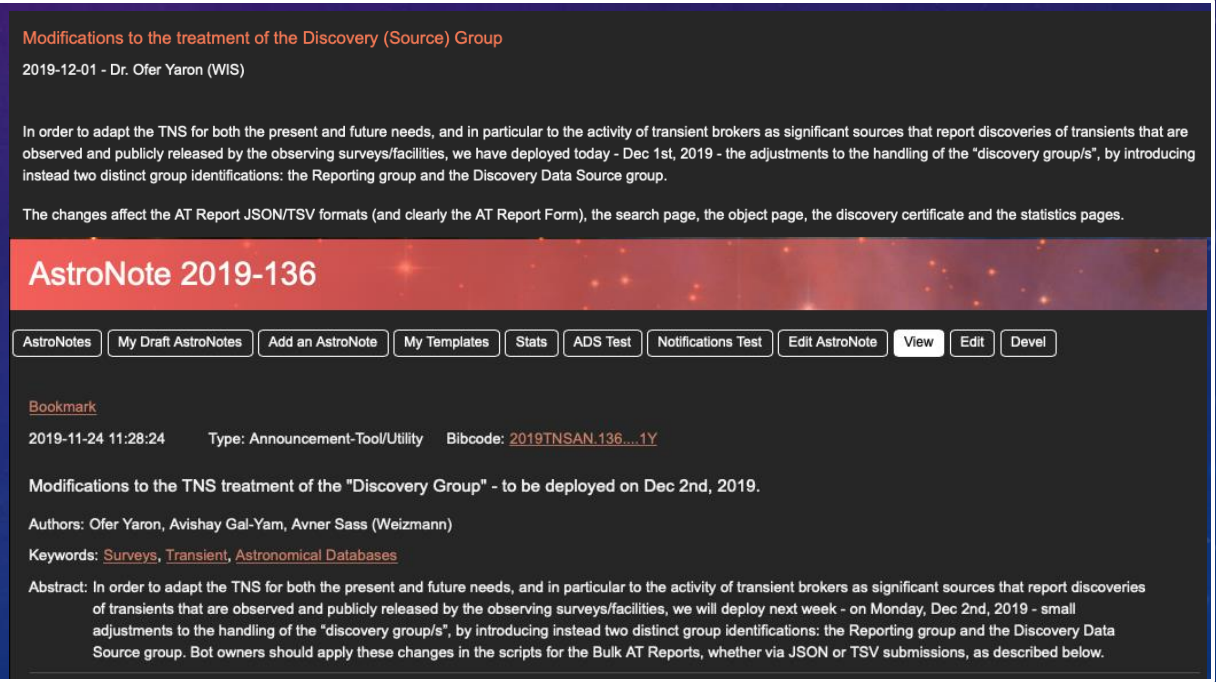
- To provide quick (low-latency) and robust processing of the incoming reports, and in strict order of arrival.
  - No downtime is allowed (downtimes are kept on the level of a few hours per year).
  - A high-availability and scalable system configuration is provided.
- The TNS is dynamic - constantly adapted to meet the needs of the community and its working protocols, as well as the inclusion of new communities and system components.

e.g. with the emergence of “brokers”,
the need to split the “Source group” to the

- Reporting group

and the

- Discovery data source group.



Modifications to the treatment of the Discovery (Source) Group

2019-12-01 - Dr. Ofer Yaron (WIS)

In order to adapt the TNS for both the present and future needs, and in particular to the activity of transient brokers as significant sources that report discoveries of transients that are observed and publicly released by the observing surveys/facilities, we have deployed today - Dec 1st, 2019 - the adjustments to the handling of the “discovery group/s”, by introducing instead two distinct group identifications: the Reporting group and the Discovery Data Source group.

The changes affect the AT Report JSON/TSV formats (and clearly the AT Report Form), the search page, the object page, the discovery certificate and the statistics pages.

AstroNote 2019-136

AstroNotes | My Draft AstroNotes | Add an AstroNote | My Templates | Stats | ADS Test | Notifications Test | Edit AstroNote | View | Edit | Devel

Bookmark

2019-11-24 11:28:24 Type: Announcement-Tool/Utility Bibcode: 2019TNSAN.136....1Y

Modifications to the TNS treatment of the "Discovery Group" - to be deployed on Dec 2nd, 2019.

Authors: Ofer Yaron, Avishay Gal-Yam, Avner Sass (Weizmann)

Keywords: Surveys, Transient, Astronomical Databases

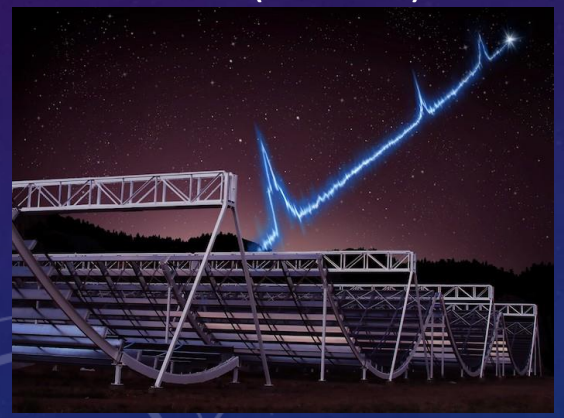
Abstract: In order to adapt the TNS for both the present and future needs, and in particular to the activity of transient brokers as significant sources that report discoveries of transients that are observed and publicly released by the observing surveys/facilities, we will deploy next week - on Monday, Dec 2nd, 2019 - small adjustments to the handling of the “discovery group/s”, by introducing instead two distinct group identifications: the Reporting group and the Discovery Data Source group. Bot owners should apply these changes in the scripts for the Bulk AT Reports, whether via JSON or TSV submissions, as described below.

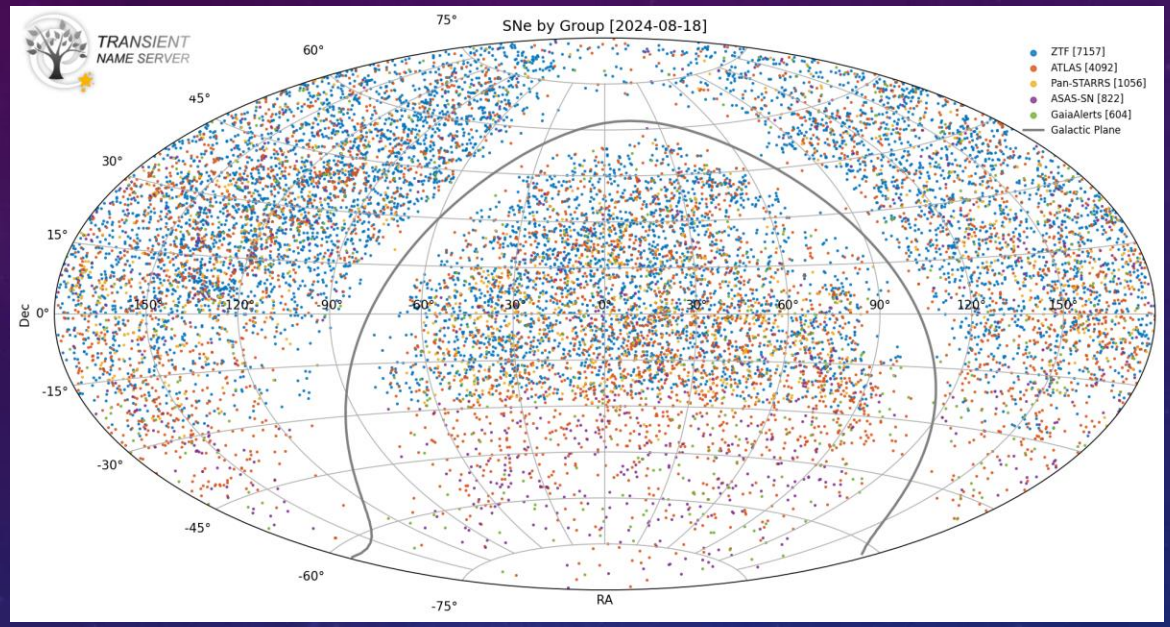
Some of the major surveys reporting to the TNS

Pan-Starrs (Hawaii)

ZTF, iPTF (Palomar, CA)

CHIME-FRB (Canada)

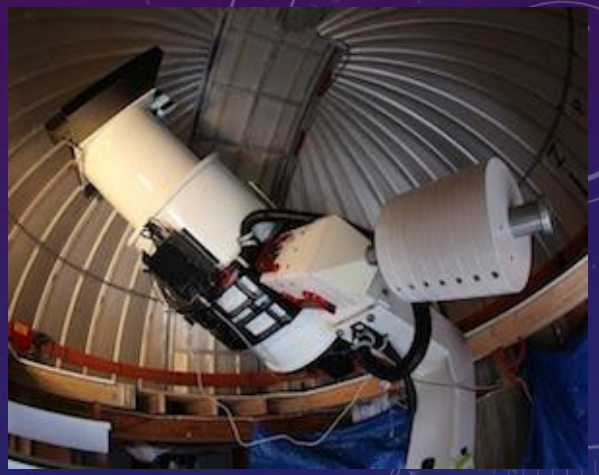




Soon…

- GRBs
- LIGO-Virgo-KAGRA ?

ATLAS (Hawaii)



Gaia (Space)

www.wis-tns.org/stats-maps

TNS Statistics (as of 2024-09-08)

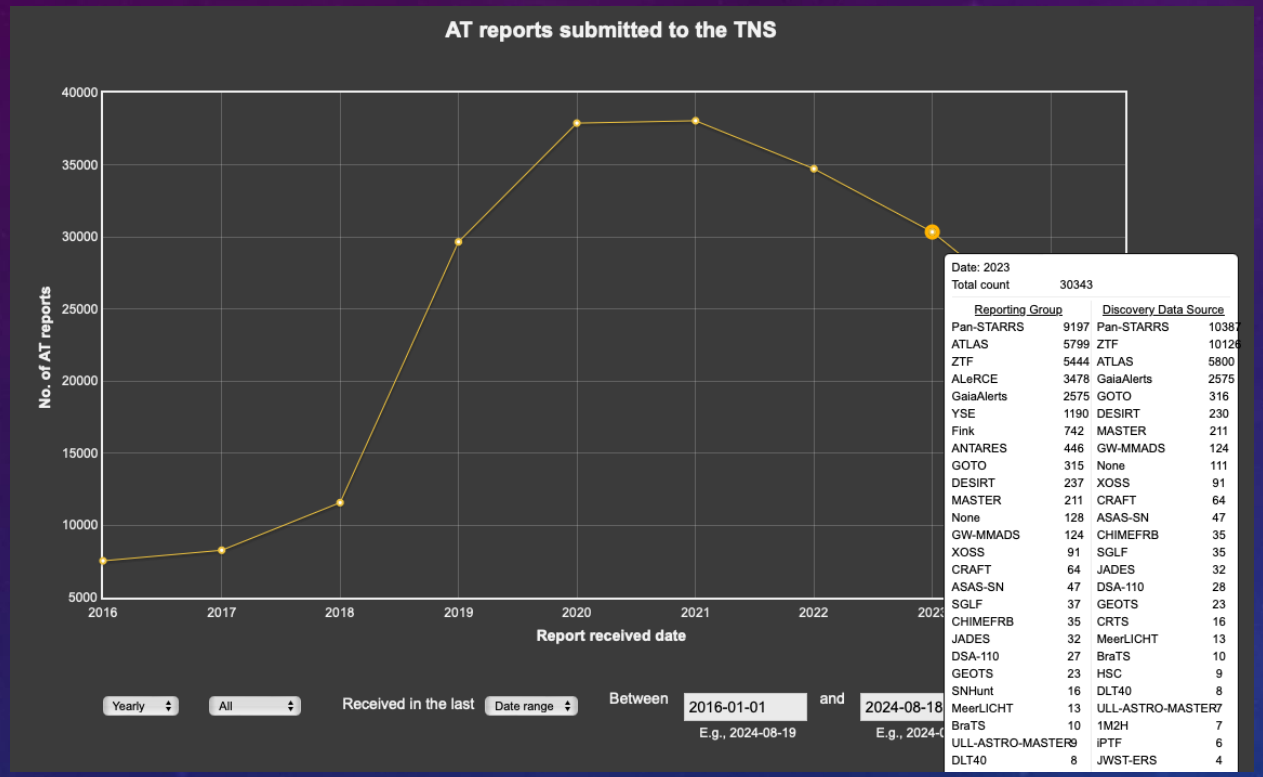
ALL transients reported since Jan 1, 2016	146,128		
PUBLIC transients reported since Jan 1, 2016	146,126		
PUBLIC transients for the top 10 reporting groups	Pan-STARRS	42,944	29.4%
	ZTF	24,020	16.4%
	ALeRCE	22,280	15.2%
	ATLAS	19,391	13.3%
	GaiaAlerts	19,027	13.0%
	YSE	3,359	2.3%
	SGLF	2,029	1.4%
	iPTF	1,640	1.1%
	ASAS-SN	1,345	0.9%
	DESIRT	1,297	0.9%
PUBLIC transients for the top 10 data source groups	ZTF	50,303	34.4%
	Pan-STARRS	46,297	31.7%
	ATLAS	19,391	13.3%
	GaiaAlerts	19,027	13.0%
	iPTF	1,642	1.1%
	ASAS-SN	1,347	0.9%
	DESIRT	1,290	0.9%
	MASTER	1,163	0.8%
	GOTO	994	0.7%
	XOSS	727	0.5%
PUBLIC classified SNe reported since Jan 1, 2016	14,909		
PUBLIC classified SNe for the top 10 reporting groups	ZTF	4,313	28.9%
	ATLAS	4,145	27.8%
	ALeRCE	2,594	17.4%
	Pan-STARRS	840	5.6%
	ASAS-SN	824	5.5%
	GaiaAlerts	605	4.1%

PUBLIC classified SNe by type

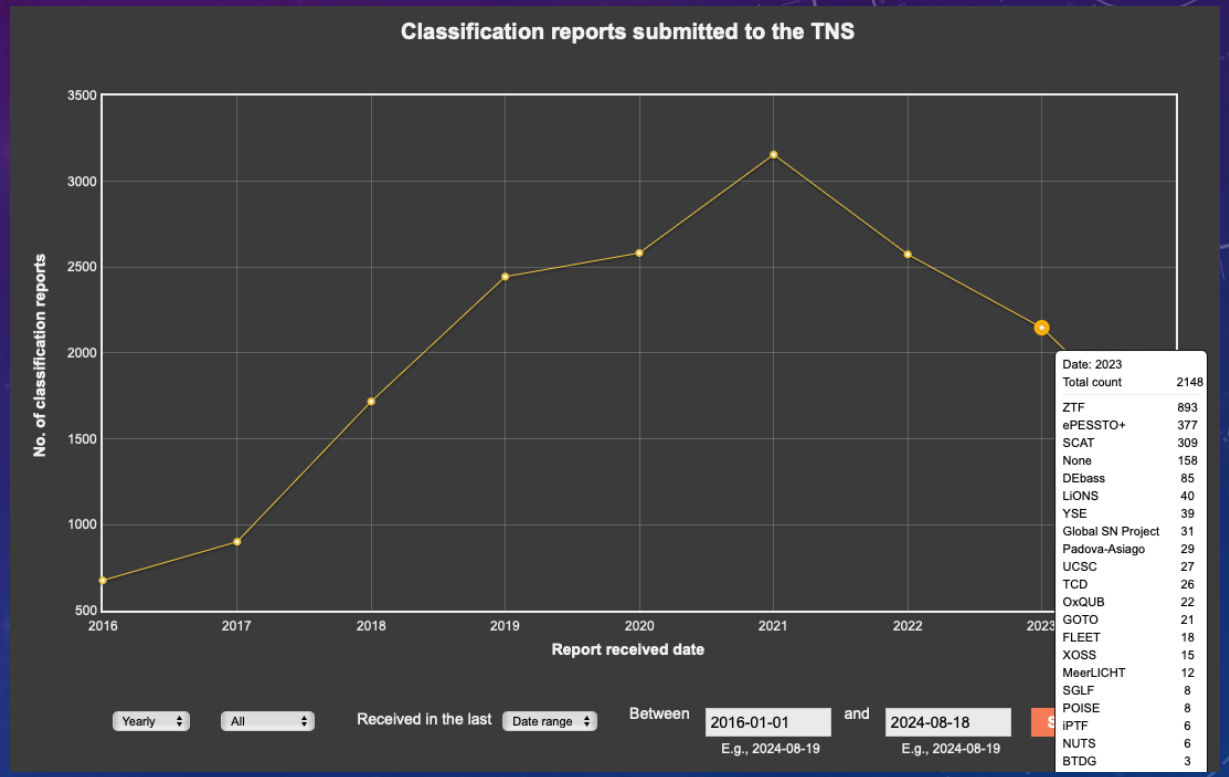
SN Ia	9,813	65.8%
SN II	2,249	15.1%
SN IIn	429	2.9%
SN Ia-91T-like	394	2.6%
SN Ic	314	2.1%
SN Ib	260	1.7%
SN IIP	247	1.7%
SN IIb	218	1.5%
SLSN-I	165	1.1%
SN Ic-BL	137	0.9%
SN Ia-91bg-like	134	0.9%
SN Ia-pec	85	0.6%
SLSN-II	69	0.5%
SN Ib/c	67	0.4%
SN	64	0.4%
SN Ibn	61	0.4%
SN I	55	0.4%
SN Iax[02cx-like]	43	0.3%
SN Ia-CSM	31	0.2%
SN Ib-pec	16	0.1%
SN II-pec	14	0.1%
SN Ia-SC	11	0.1%
SN Ib-Ca-rich	11	0.1%
SN Icn	6	0.0%
SN IIn-pec	5	0.0%
SN IIL	3	0.0%
SN Ic-pec	3	0.0%
SN Ibn/Icn	2	0.0%
SN Ic-Ca-rich	1	0.0%
SN Ia-Ca-rich	1	0.0%
SN Ien	1	0.0%

TNS Reports Yearly Timeline (2024-08-18)

Discovery reports



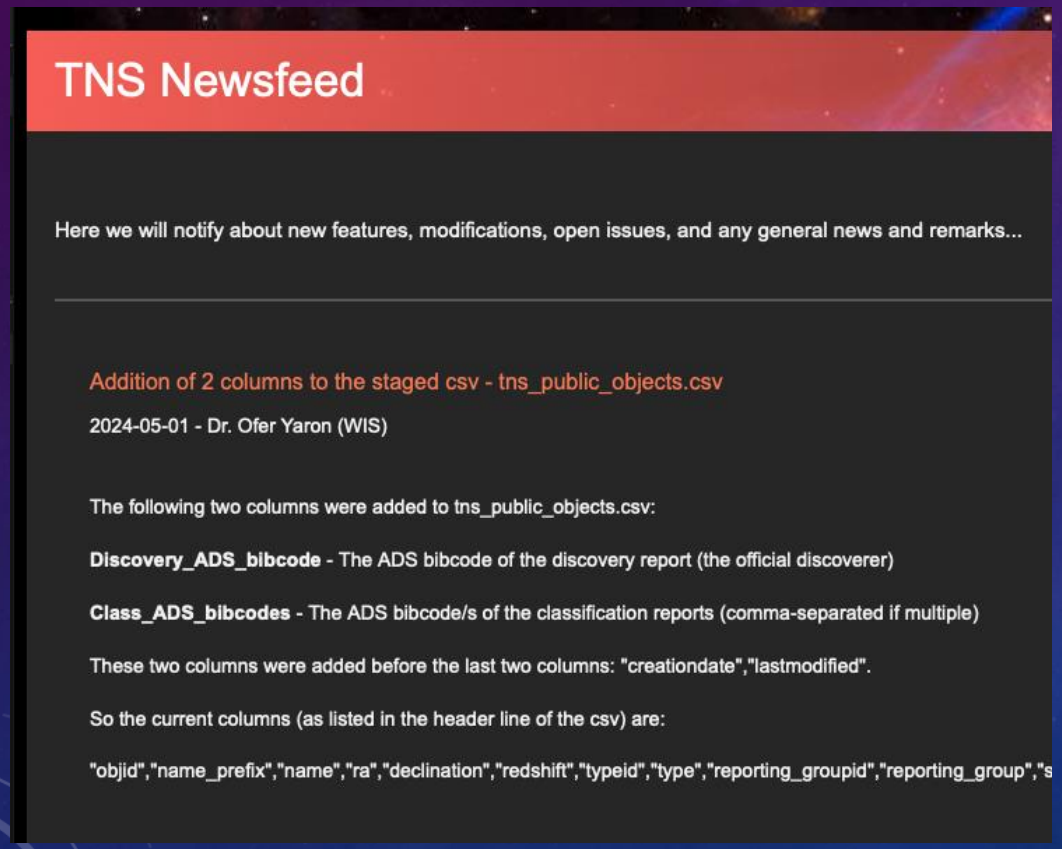
Classification reports



www.wis-tns.org/content/tns-newsfeed
www.wis-tns.org/content/tns-getting-started

TNS NewsFeed + Help Page

- Important updates/revisions are presented on the NewsFeed
- Use the help page, where also sample codes and examples are provided…



TNS Newsfeed

Here we will notify about new features, modifications, open issues, and any general news and remarks...

Addition of 2 columns to the staged csv - tns_public_objects.csv

2024-05-01 - Dr. Ofer Yaron (WIS)

The following two columns were added to tns_public_objects.csv:

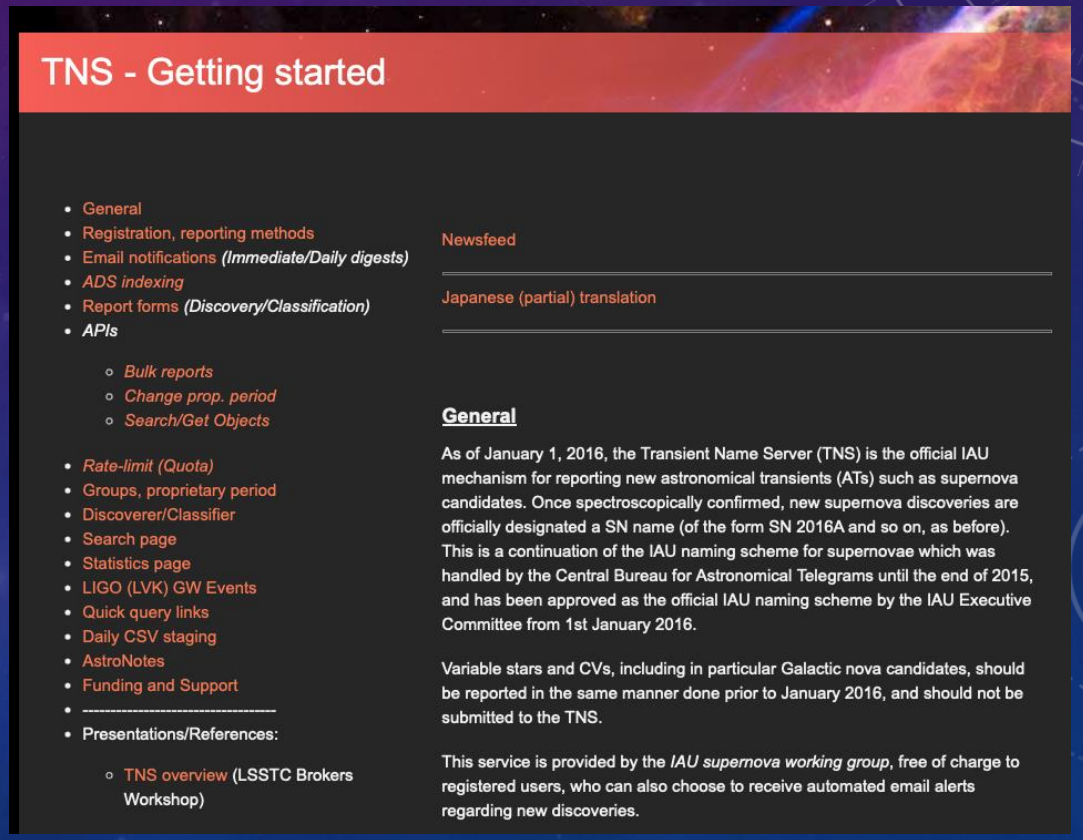
Discovery_ADS_bibcode - The ADS bibcode of the discovery report (the official discoverer)

Class_ADS_bibcodes - The ADS bibcode/s of the classification reports (comma-separated if multiple)

These two columns were added before the last two columns: "creationdate","lastmodified".

So the current columns (as listed in the header line of the csv) are:

"objid","name_prefix","name","ra","declination","redshift","typeid","type","reporting_groupid","reporting_group","s



TNS - Getting started

- General
- Registration, reporting methods
- Email notifications *(Immediate/Daily digests)*
- *ADS indexing*
- Report forms *(Discovery/Classification)*
- *APIs*
  - *Bulk reports*
  - *Change prop. period*
  - *Search/Get Objects*
- *Rate-limit (Quota)*
- Groups, proprietary period
- Discoverer/Classifier
- Search page
- Statistics page
- LIGO (LVK) GW Events
- Quick query links
- Daily CSV staging
- AstroNotes
- Funding and Support
- ----------
- Presentations/References:
  - TNS overview (LSSTC Brokers Workshop)

Newsfeed

Japanese (partial) translation

General

As of January 1, 2016, the Transient Name Server (TNS) is the official IAU mechanism for reporting new astronomical transients (ATs) such as supernova candidates. Once spectroscopically confirmed, new supernova discoveries are officially designated a SN name (of the form SN 2016A and so on, as before). This is a continuation of the IAU naming scheme for supernovae which was handled by the Central Bureau for Astronomical Telegrams until the end of 2015, and has been approved as the official IAU naming scheme by the IAU Executive Committee from 1st January 2016.

Variable stars and CVs, including in particular Galactic nova candidates, should be reported in the same manner done prior to January 2016, and should not be submitted to the TNS.

This service is provided by the *IAU supernova working group*, free of charge to registered users, who can also choose to receive automated email alerts regarding new discoveries.

APIs, Bulk downloads

- A Sandbox environment exists for experimentation with the APIs (both for submission and retrieval of info)

  All API development must be performed against the sandbox!!!

  https://sandbox.wis-tns.org
  https://sandbox.wis-tns.org/api

- APIs are in place for:
  - the submission of Discovery (AT) and Classification reports.
  - Searching of objects (by coords, names – IAU/internal)
  - Retrieving object details

- CSV/TSV downloads are available from the Search page (also in a scriptable way)

e.g. https://www.wis-tns.org/search?&&classified_sne=1&date_start%5Bdate%5D=2021-01-01&format=csv&num_page=100&page=0 ←[0..N]

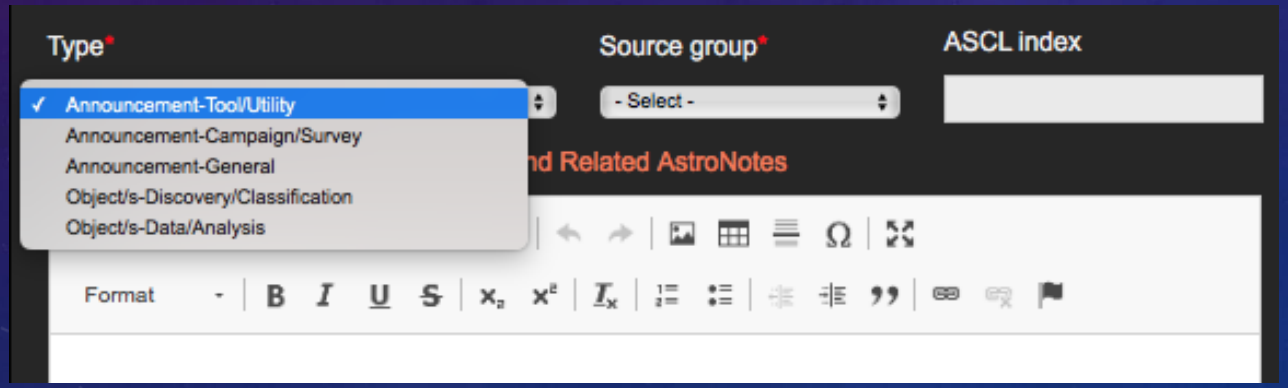
- A CSV of all public objects (as well as daily "delta" lists) are available for download, in order to allow for easy local managing of the TNS data and to perform "heavy" operations locally (such as cross-matching entire catalogs or long object lists)

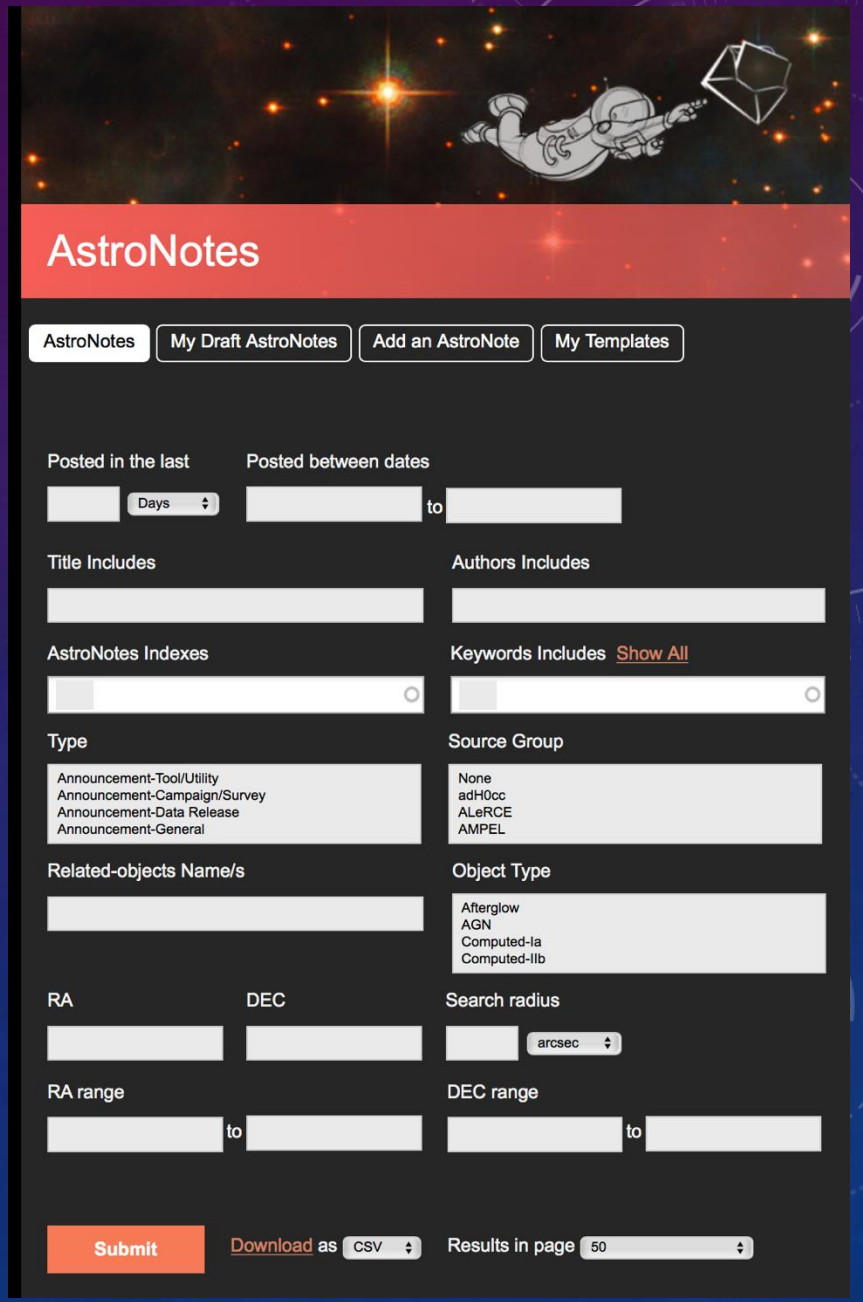
https://www.wis-tns.org/system/files/tns_public_objects/tns_public_objects.csv.zip
Or using curl (with User-Agent and api_key) for a daily csv:

```
curl -X POST -H 'user-agent: tns_marker{"tns_id":YOUR_BOT_ID,"type": "bot", "name":" YOUR_BOT_NAME"}'
-d 'api_key=YOUR_API_KEY' https://www.wis-tns.org/system/files/tns_public_objects/tns_public_objects_20220112.csv.zip > tns_public_objects_20220112.csv.zip
```

AstroNotes!!!

- A sub-system within the TNS (so no need to register to an additional service for creating and receiving these notifications).
- Enabling the distribution of notifications in a very flexible (yet accurate) way, directly coupled to the related objects, searchable and citable.
- Can create either an object-related (discovery, classification, analysis) or an “announcement” notification, without any restrictions, limitations or penalties…





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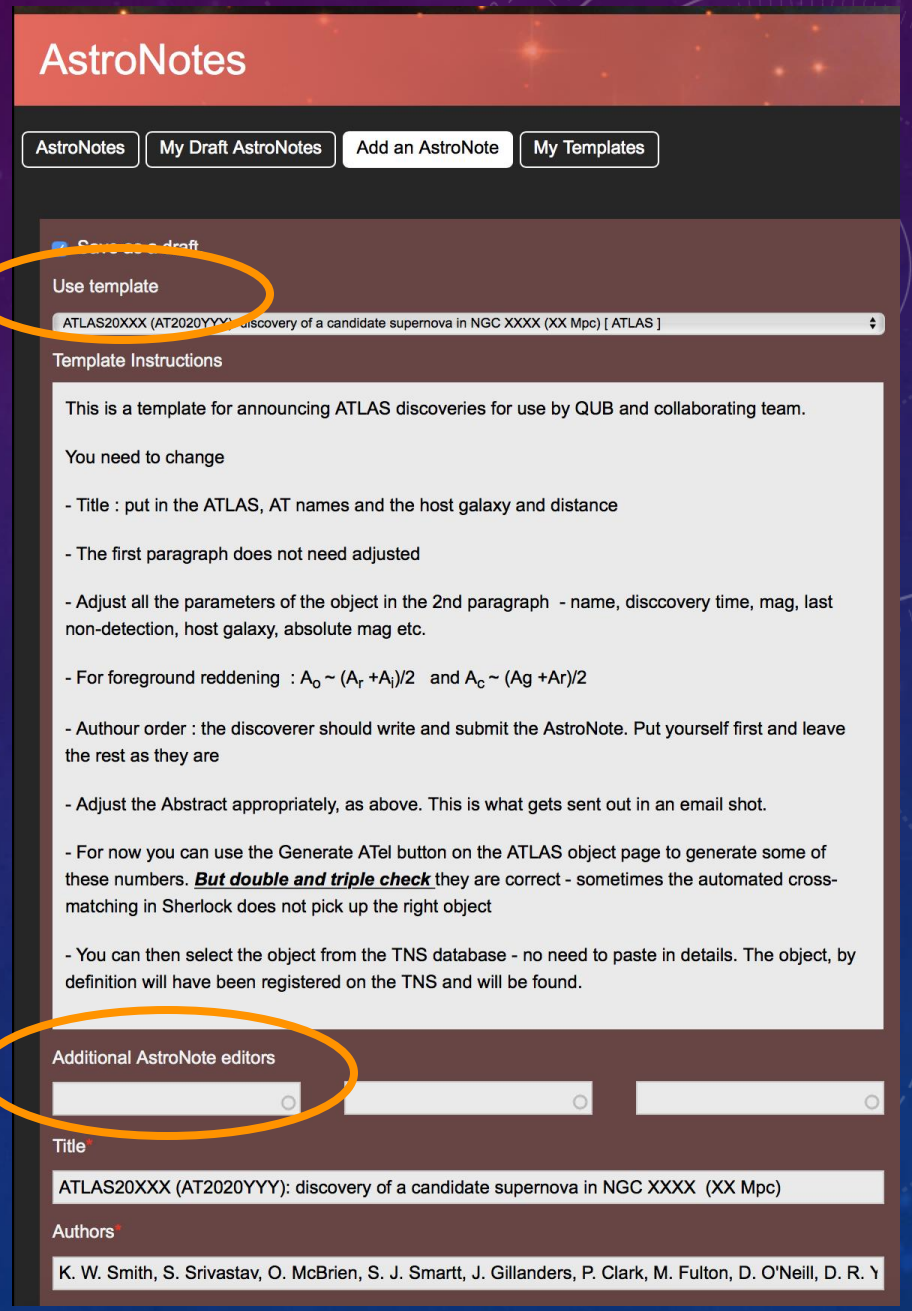
- A “sub-system” within the TNS.
- Enabling the distribution of notifications in a very flexible way, directly coupled to the related objects, searchable and citable.
- Easy managing and use of Templates, for quicker writing of a new AstroNote.
- Easy sharing of Drafts with the colleagues; allowing definition of several editors to continue editing the draft until submission.



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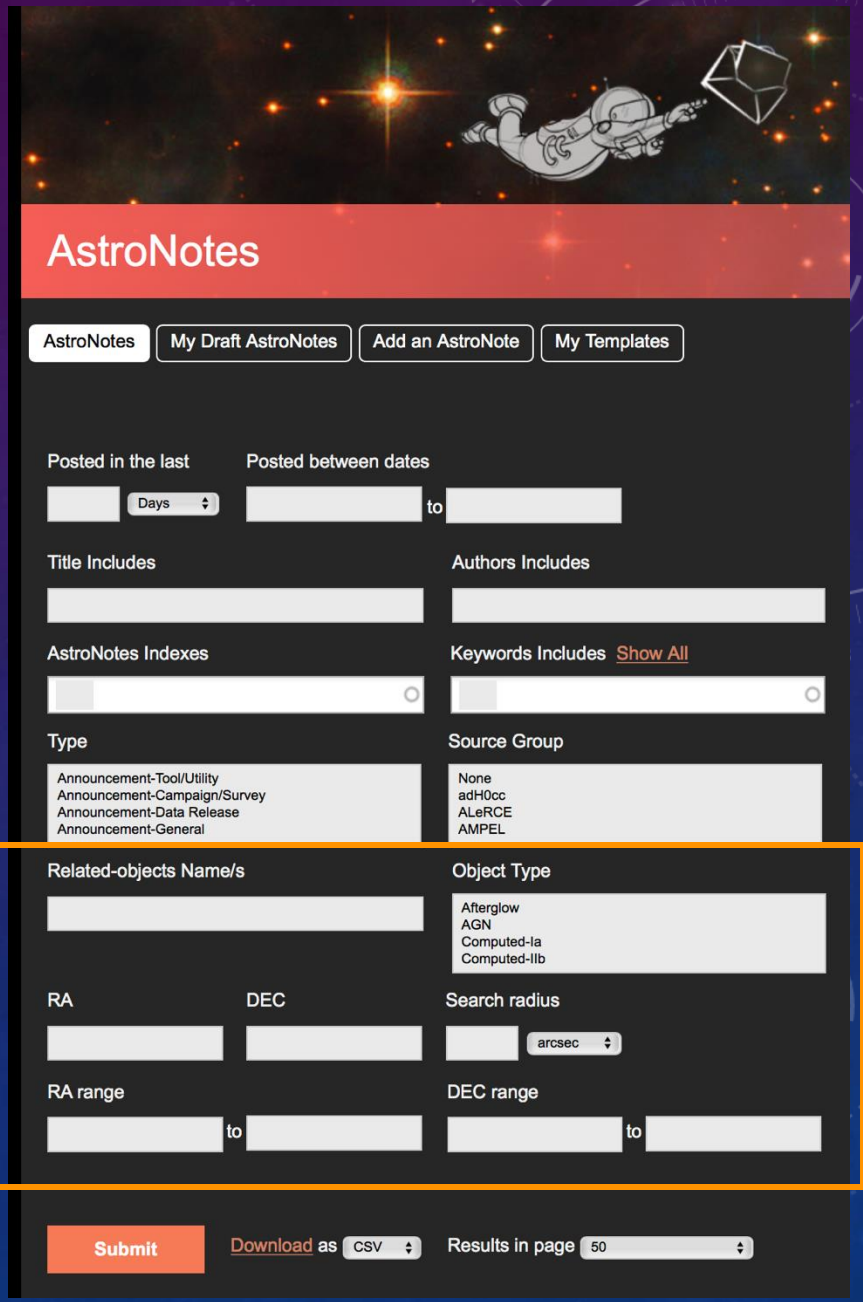

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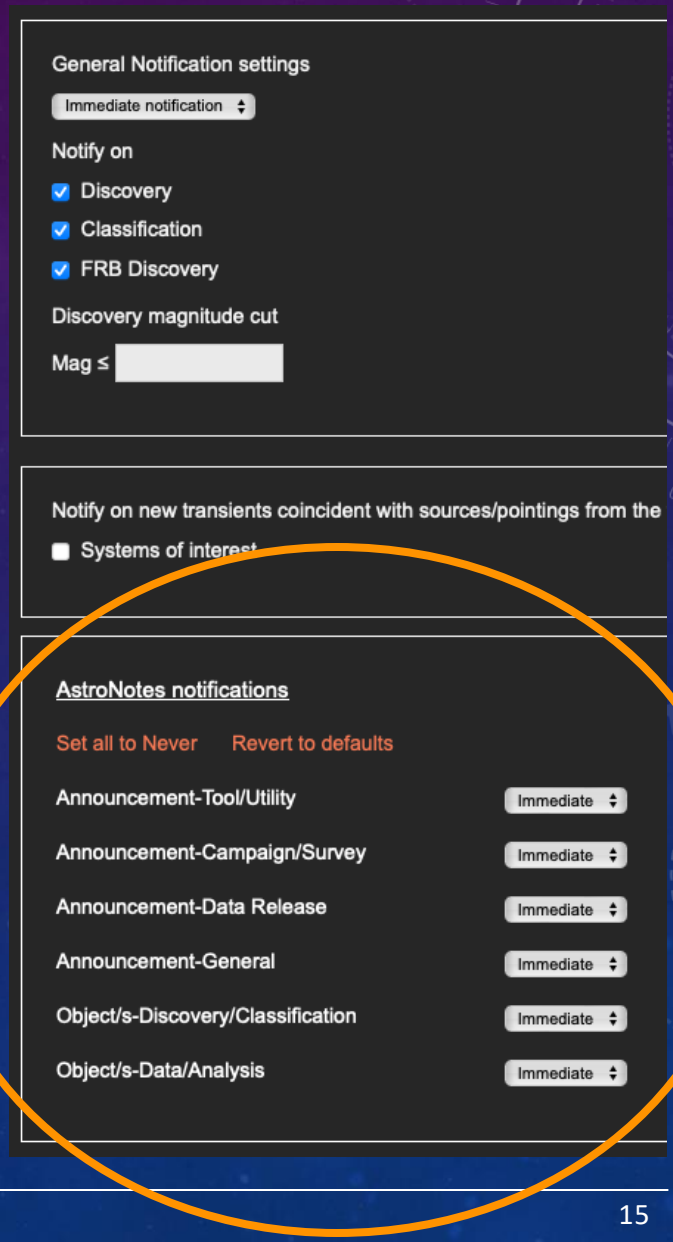
- Many Search options, including by object names, types and coords.
- Possible to define on your My Account page which types of notifications you wish to receive, and in which manner.

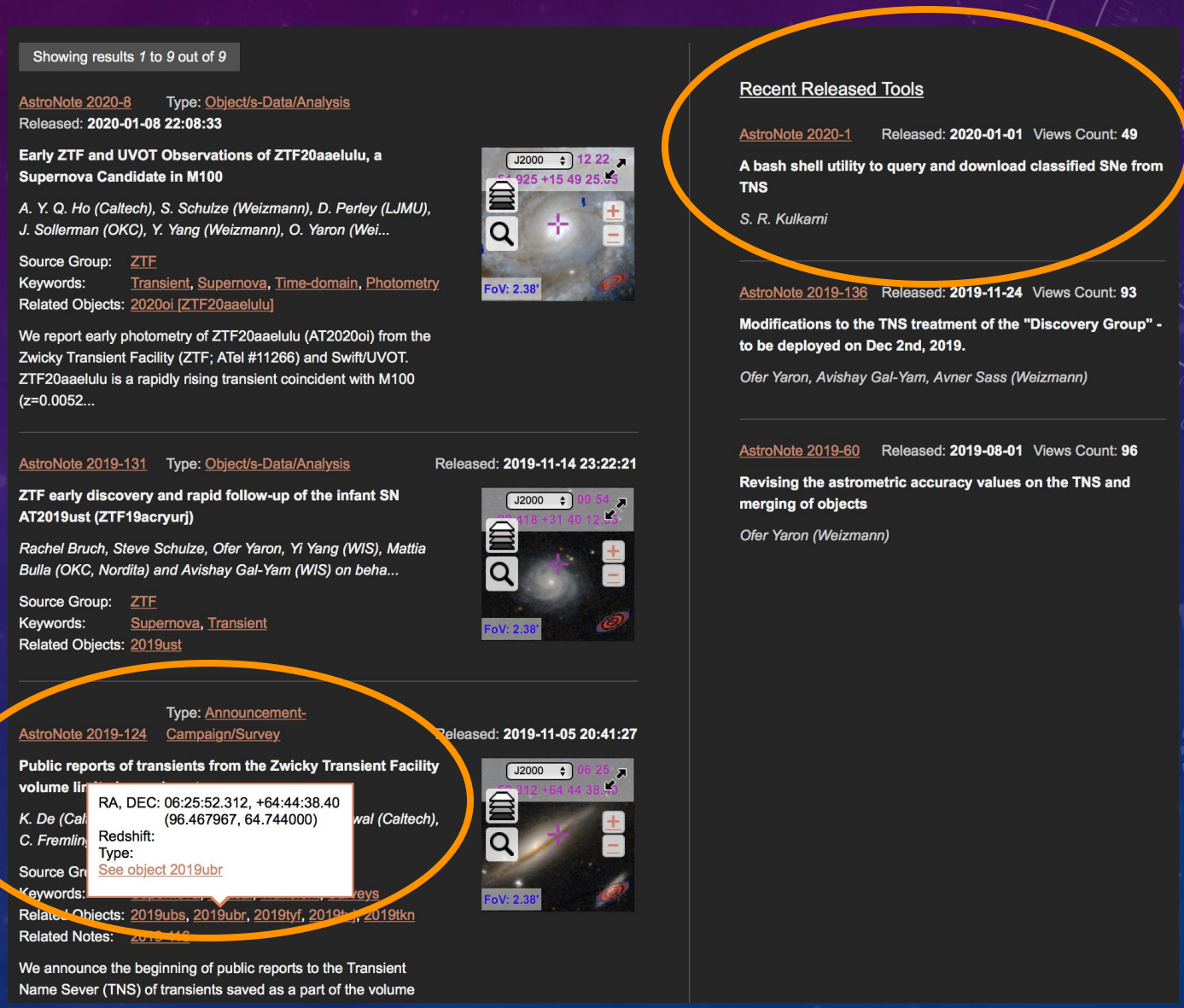


AstroNotes!!!

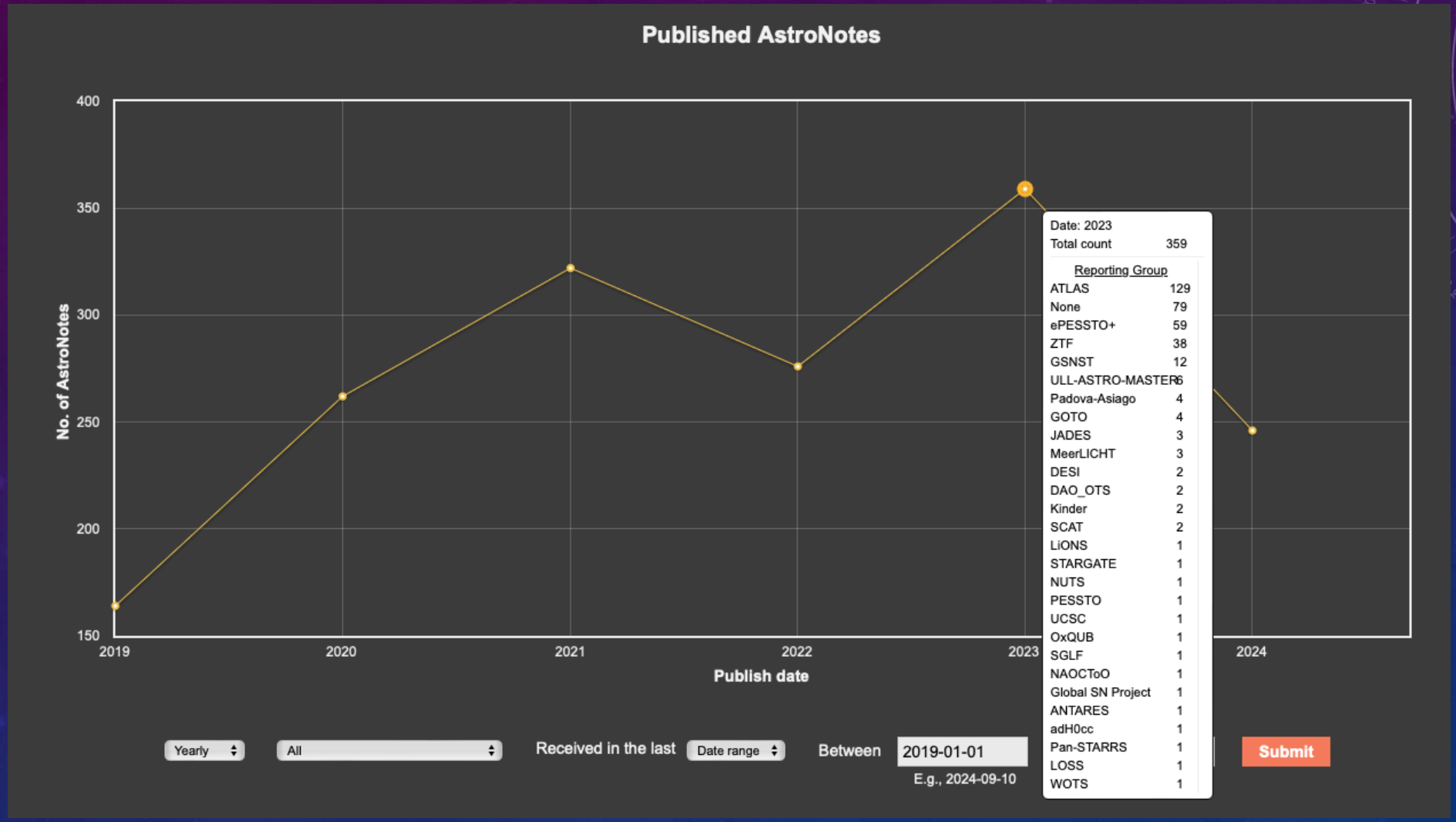
A query for ZTF AstroNotes:

- Major surveys and groups of the Transients community have already moved to using solely AstroNotes – ATLAS, Pan-Starrs, PESSTO, ZTF…

Clicking on an object name overlays its basic details, with a link directly to the object page



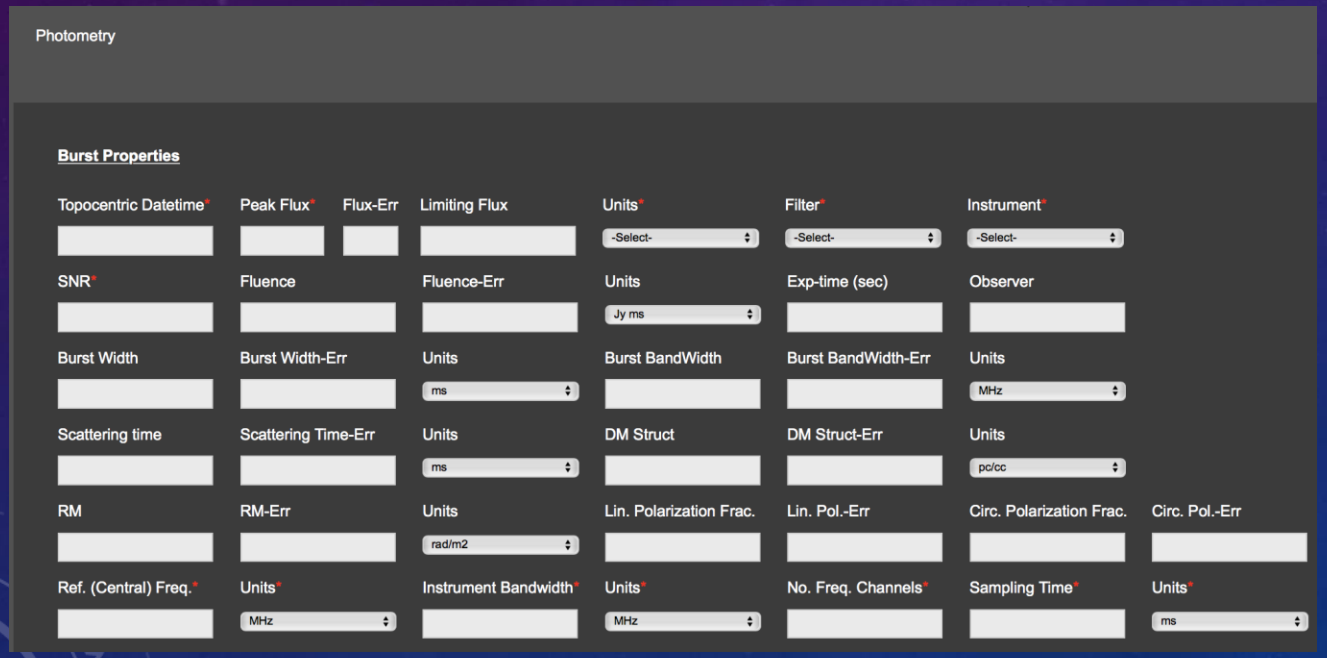
AstroNotes - Stats

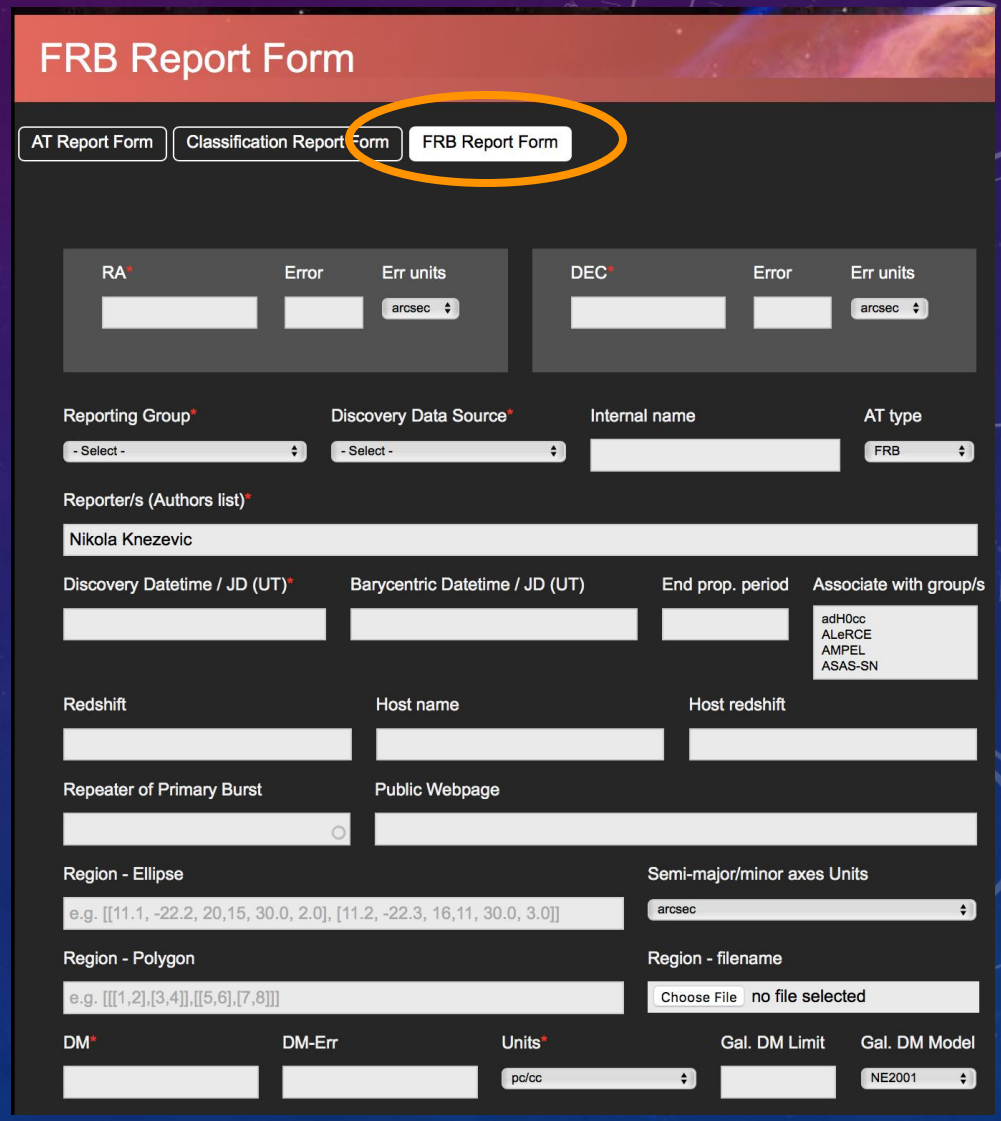


(Almost) monotonic increase since 2019, currently dominated by ATLAS, ePESSTO+ and ZTF

Area Transients - The new guys in town (well, already since Mar 2020)... FRBs

- Main coordination with CHIME and representatives of the FRB community
- A separate engine for designation of names: (FRB)YYYYMMDDabc, coexisting next to the AT/SN names
- FRB-Catalog fully ingested to the TNS





Fast Radio Bursts

FRB Advanced Search

Repeater: Repeater | Repeater of | FRB with measured redshift

DM Range: to

RM Range: to

SNR Range: to

Flux Range: to

Show main query | Explain main query

Submit | Download as CSV | Download as TSV | Results in page 50

Columns to display

Showing results 1 to 2 out of 2

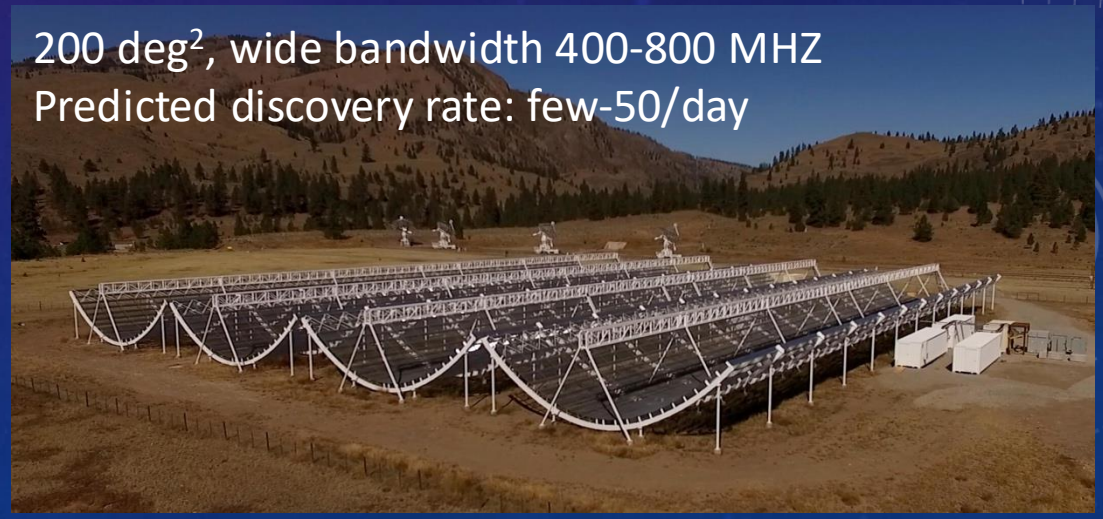
ID	Name	Reps	Class	RA	DEC	Obj. Type	Repeater of Primary Burst	DM (Err)	Galactic DM Limit	Barycentric Datetime
51465	FRB 20191202A	1		02:15:60.000	+33:00:00.00	FRB	FRB 20191202A	680 (68) pc/cc	24 (NE2001)	
51466	FRB 20190807A	1		00:08:00.000	+02:00:00.00	FRB	FRB 20191202A	430 (43) pc/cc	23 (YMW16)	

- Repeaters are distinct objects on the TNS, allowing flexible associations of multiple bursts with the Primary Burst.

CHIME/FRB Discovery of Eight New Repeating Fast Radio Burst Sources

The CHIME/FRB Collaboration, B. C. Andersen,[1,2] K. Bandura,[3,4] M. Bhardwaj,[1,2] P. Boubel,[1,2] M. M. Boyce,[5] P. J. Boyle,[1,2] C. Brar,[1,2] T. Cassanelli,[6,7] P. Chawla,[1,2]

The discovery of the first repeating FRB source, FRB 121102, at a dispersion measure DM $\simeq$ 560 pc cm^{-3} (Spitler et al. 2014, 2016), eliminated cataclysmic models as the only means for producing FRB emission. The repetitive nature of FRB 121102 enabled sub-arcsecond localization of the source via radio interferometry and subsequent optical identification of the low-metallicity host galaxy



LVK (LIGO/Virgo/KAGRA) service on the TNS

See AstroNote 2024-79

- Following the past O1-O3 observing runs, we now follow the O4 incoming LVK GW public alerts.
- We provide a list of both the high & low significance events with their basic info.
- For every newly released real alert, we create Aitoff-projection skymaps showing the localizations, with all known public TNS transients that lie within the 50/90/99% credibility regions, over-plotted.
- We show and provide downloadable tables of the existing TNS transients that have existed BEFORE the exact time of event and the transients that stream in AFTER the time of the GW; updated on an hourly basis during two weeks from the event time.

LVK GW

O4 events | O1-3 events

Significance: High

Showing 67 events out of 714

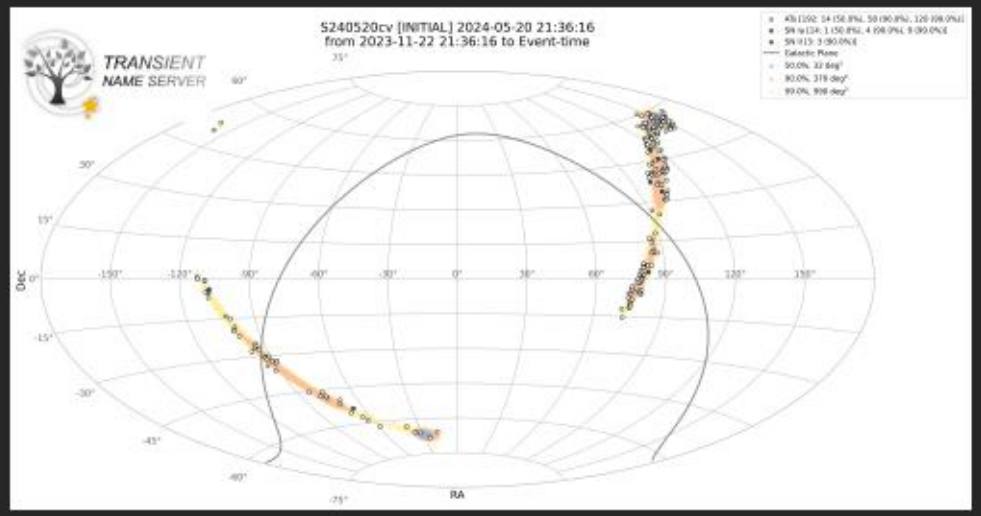
Event Date	Event ID	Last Alert Type	Significance	GraceDB URL	Instruments	Classification	Distance [Mpc] (Err)	FAR [Hz]
2024-08-13 04:39:13	S240813d	UPDATE	High	To GraceDB event page	L1, V1	BNS: (0%) NSBH: (0%) BBH: (100%) Terrestrial: (0%)	2079.268 (482.80)	1.806e-18
2024-08-13 03:45:48	S240813c	UPDATE	High	To GraceDB event page	L1, V1	BNS: (0%) NSBH: (0.01%) BBH: (99.78%) Mass-Gap: (2.76%) Terrestrial: (0.22%)	1129.800 (337.97)	2.614e-09
2024-08-07 21:45:59	S240807h	UPDATE	High	To GraceDB event page	L1, V1	BNS: (0%) NSBH: (0.01%) BBH: (99.99%) Mass-Gap: (28.33%) Terrestrial: (0%)	1018.123 (295.00)	2.012e-11
2024-07-16 03:49:00	S240716b	UPDATE	High	To GraceDB event page	L1, V1	BNS: (0%) NSBH: (0%) BBH: (100%) Terrestrial: (0%)	1820.897 (685.99)	7.862e-16
2024-07-05 05:32:15	S240705at	UPDATE	High	To GraceDB event page	H1, L1, V1	BBH: (100%) Terrestrial: (0%)	3693.616 (879.91)	7.080e-16
2024-07-03 19:13:55	S240703ad	UPDATE	High	To GraceDB event page	L1, V1	BNS: (0%) NSBH: (0%) BBH: (100%) Terrestrial: (0%)	1894.381 (678.69)	1.185e-13
2024-06-30 10:17:03	S240630t	UPDATE	High	To GraceDB event page	H1, L1, V1	BNS: (0%) NSBH: (0%) BBH: (100%) Terrestrial: (0%)	3161.399 (841.15)	1.893e-12
2024-06-29 14:52:56	S240629by	UPDATE	High	To GraceDB event page	H1, L1, V1	NSBH: (8.38%) BBH: (91.47%) Terrestrial: (0.15%)	1173.017 (244.86)	3.168e-10
2024-06-27 13:16:22	S240627by	UPDATE	High	To GraceDB event page	H1, L1, V1	BNS: (0%) NSBH: (0.01%) BBH: (99.15%) Mass-Gap: (1.49%) Terrestrial: (0.84%)	1248.933 (344.80)	1.207e-08
2024-06-24 21:37:16	S240624cd	RETRACTION	High	To GraceDB event page	H1, L1	Retracted		8.042e-09
2024-06-23 23:18:47	S240623dg	RETRACTION	High	To GraceDB event page	H1, L1	Retracted	55.253 (16.72)	9.514e-08

LVK (LIGO/Virgo/KAGRA) service on the TNS

See AstroNote 2024-79

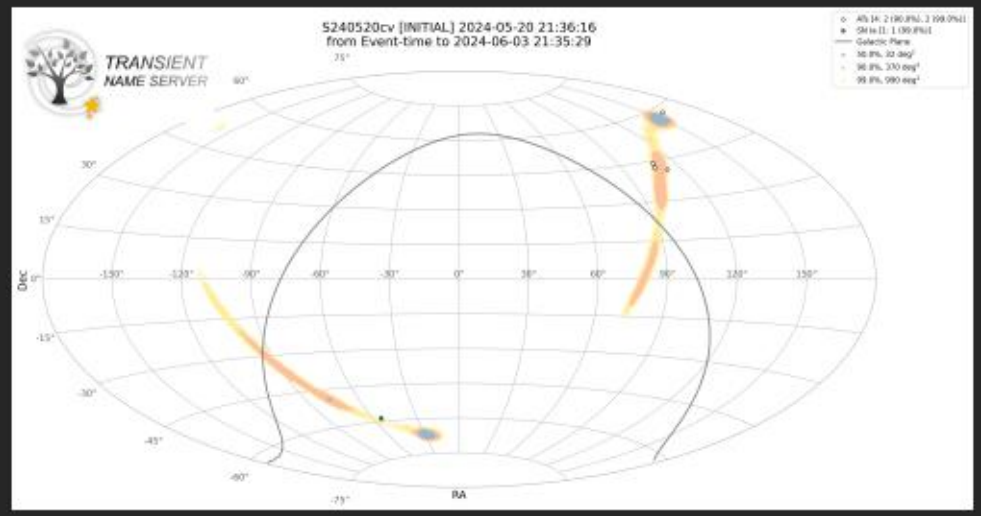
e.g., for S240520cv:

TNS Transients discovered BEFORE the GW event
(within date range 2023-11-22 - 2024-05-20)



Skymap before JSON format transient list before TSV format transient list before

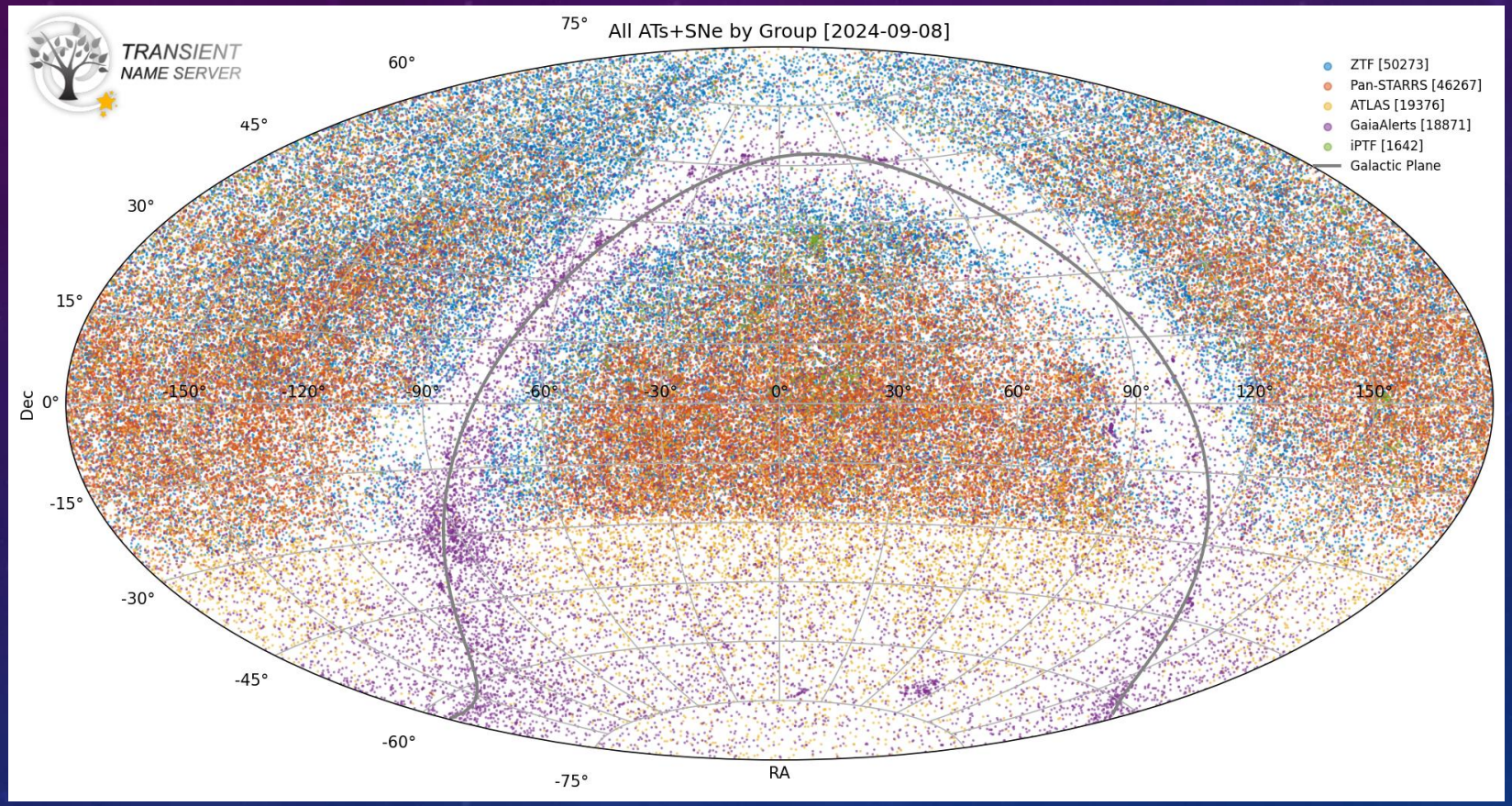
TNS Transients discovered AFTER the GW event
(within date range 2024-05-20 - 2024-06-03)



Skymap after JSON format transient list after TSV format transient list after

Skymaps & Plots

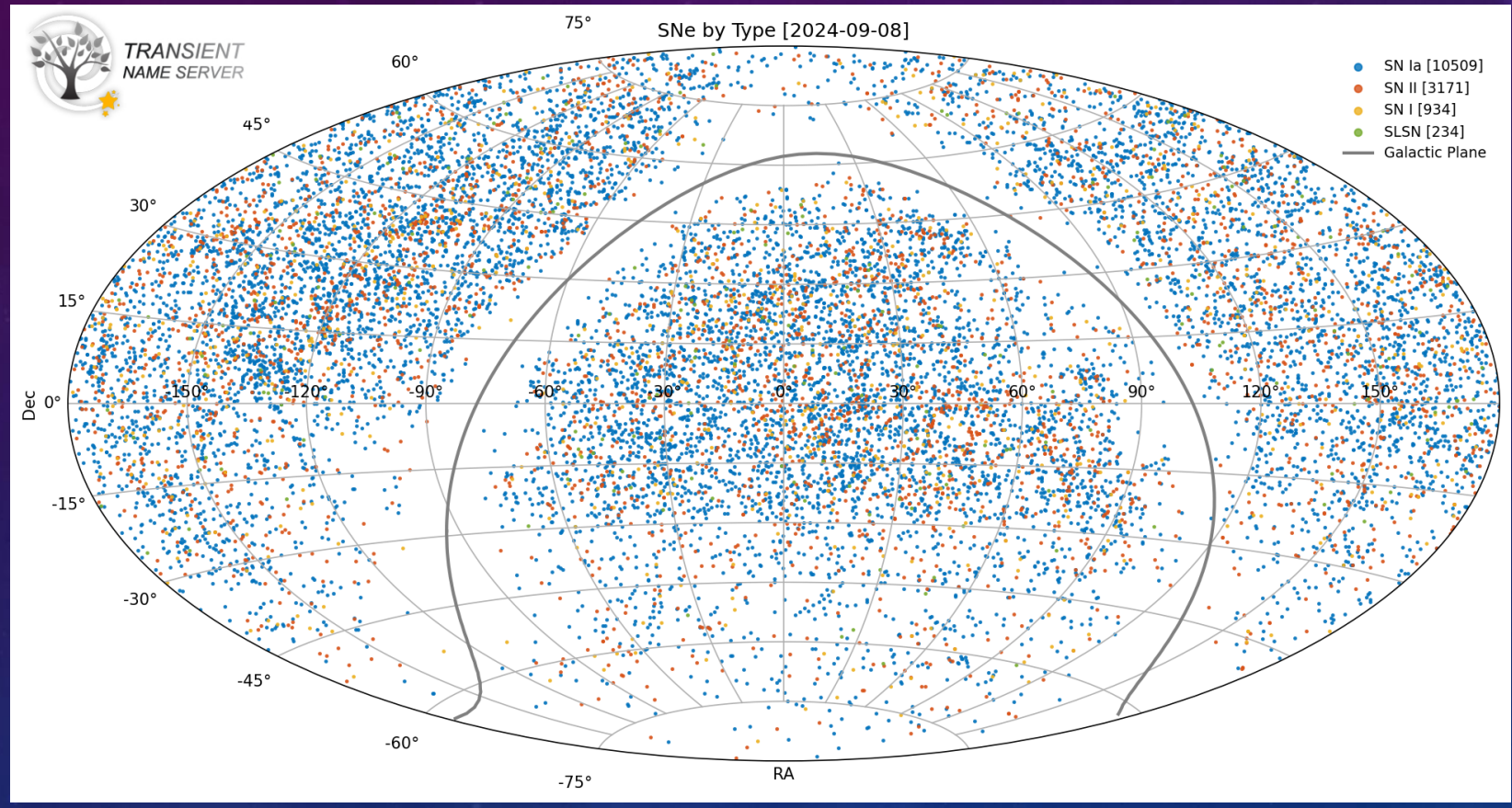
Aitoff-projection skymaps of all TNS objects by various cuts & groupings, updated weekly.



Can see the various regions covered by the top contributing surveys

Skymaps & Plots

Aitoff-projection skymaps of all TNS objects by various cuts & groupings, updated weekly.

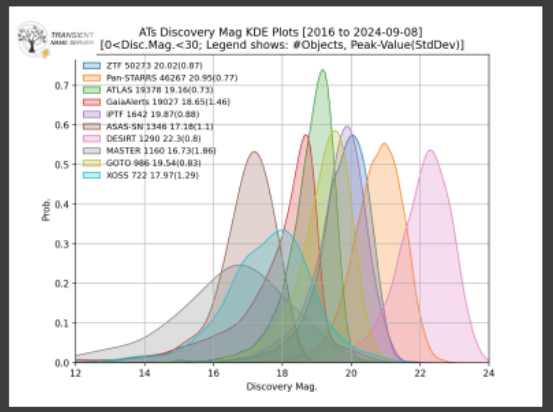


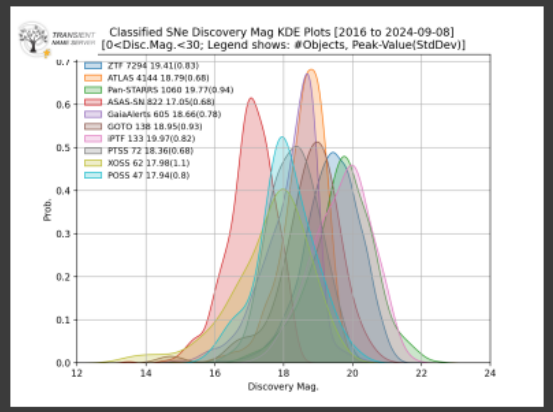
Hardly any SNe around the galactic plane

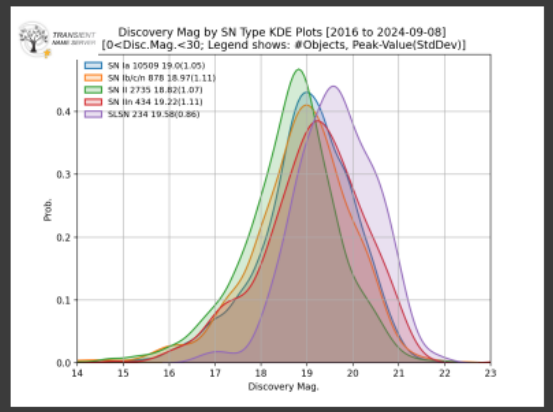
Skymaps & Plots

Discovery magnitude distributions plots by various cuts & groupings, also the evolution over the past 6 years.

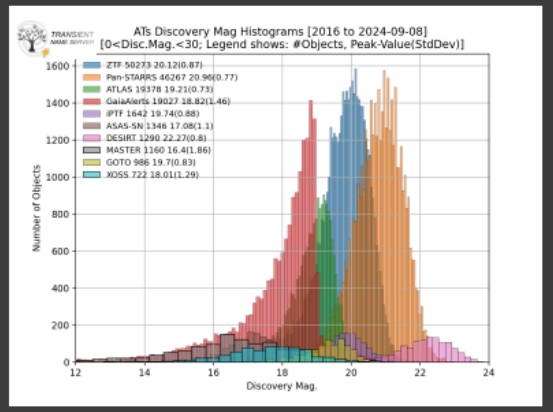
Discovery Magnitude Distributions - KDE Plots

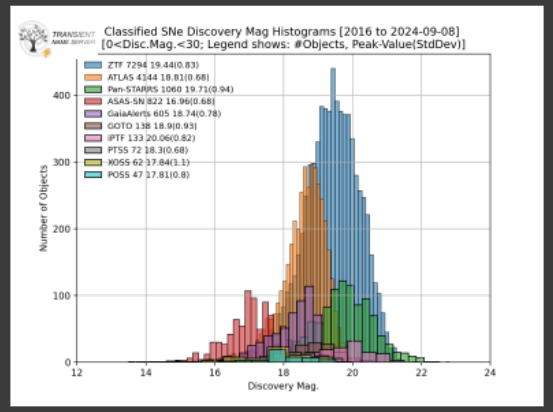


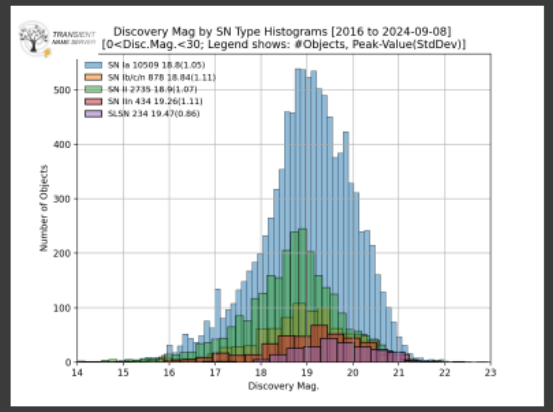




Discovery Magnitude Distributions - Histogram Plots







Upcoming TNS Ver 2.0

- A new version - TNS 2.0 - will be deployed soon, which includes mainly upgrades of the various infrastructure components and rewriting of modules and software components, but also several new features; for instance:
- An option to provide Automatic Classification info as part of the AT (Discovery) report
- An option to indicate that an object (candidate transient) was found to be unreal (bogus)
- Introduction of new naming wheels, to accommodate for the potential coming addition of the GRB community, and preparing the grounds for additional multi-messenger naming needs, e.g. for the GW events
- Additional API capabilities, e.g. to include all possible search criteria
- An official prefix for TDEs
- Automatic provision of forced-photometry info
- And more…

Clarifications / to summarize

- The TNS manages discovery & classification information (data), NOT extended LCs, spectral sequences etc...
  For this, data repositories such as WISeREP are relevant (https://www.wiserep.org).

- Initiated mainly for SN candidates, the TNS also handles other extra-galactic transients, including novae (CVs), AGN flares, TDEs, Kilonovae… BUT NOT variable stars, asteroids or other such galactic/local variable/moving sources.

PLEASE DO NOT submit varstars/moving objects but only "clean" extra-galactic transient candidates!!!

- "Area Transients" are also officially joining the TNS: FRBs have joined, in the near future likely GRBs.
  (In future more sophisticated cross-matching and association capabilities should be implemented – both on the TNS, and hopefully also by the additional utilities being developed.)

- Classifications must be supported by a spectrum (not relevant for the area transients), and currently the TNS only switches the prefixes from AT to SN and soon TDE (Kilonovae… remain AT until an official decision will be made).

- API sample codes are available for download on the help page.

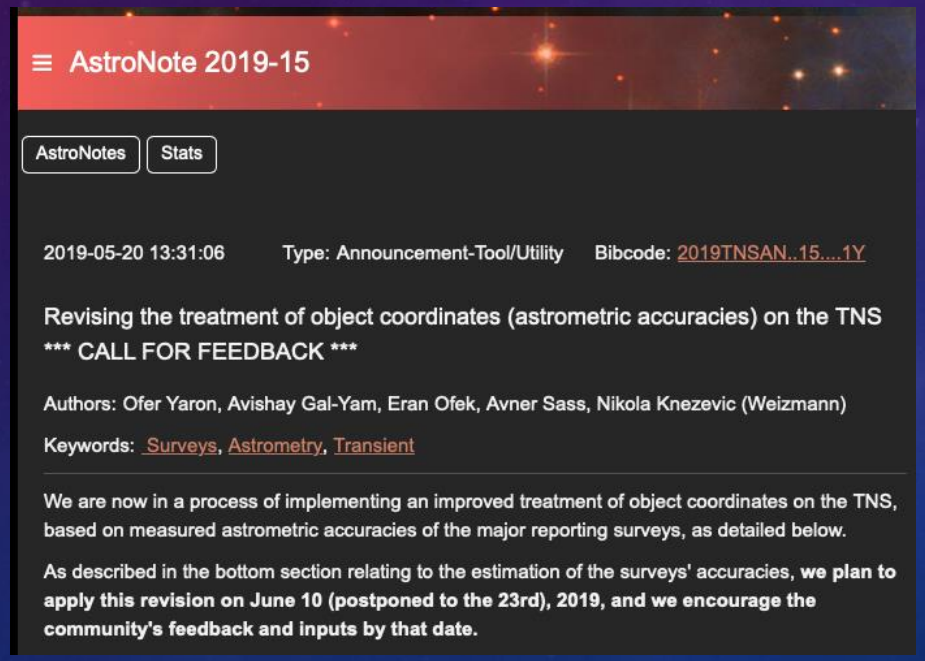
Clarifications / to summarize

- Prospects for the Rubin LSST:
  - The TNS will accommodate receipt of up to several thousands of transient candidates per day, also potential duplicate reports (for the same event) from the various brokers; however…
  - We expect “clean” streams of transient candidates, with minimal ”contamination” such as variable stars, moving objects, bogus detections etc…
  - One should also note that with the depth of LSST, only a small fraction of the transients will get a spectroscopic classification.

- For any questions/feedback/suggestions related to the use of the TNS, its APIs and AstroNotes, please do not hesitate to contact us: www.wis-tns.org/content/contact-us (or me in person)

Astrometric accuracies of surveys on the TNS

- Several reporting groups/surveys have a defined astrometric accuracy that is significantly better than the default threshold of 5 arcsec.
- This affects the setting of an object's "principal" coordinates (in case of multiple reports from several groups), and also the decision on the creation of a new object vs association with an existing one.
- See AstroNotes 2019-15 and 2019-37 for detailed descriptions, and do let us know if the astrometric accuracy of certain groups need to be considered/revised.



≡ AstroNote 2019-15

AstroNotes | Stats

2019-05-20 13:31:06 Type: Announcement-Tool/Utility Bibcode: 2019TNSAN..15....1Y

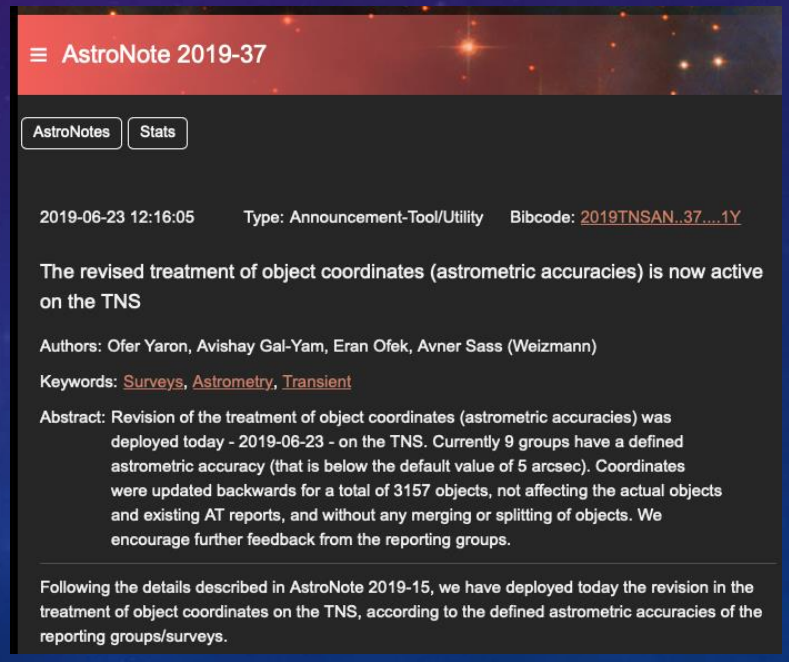
Revising the treatment of object coordinates (astrometric accuracies) on the TNS *** CALL FOR FEEDBACK ***

Authors: Ofer Yaron, Avishay Gal-Yam, Eran Ofek, Avner Sass, Nikola Knezevic (Weizmann)

Keywords: Surveys, Astrometry, Transient

We are now in a process of implementing an improved treatment of object coordinates on the TNS, based on measured astrometric accuracies of the major reporting surveys, as detailed below.

As described in the bottom section relating to the estimation of the surveys' accuracies, **we plan to apply this revision on June 10 (postponed to the 23rd), 2019, and we encourage the community's feedback and inputs by that date.**



≡ AstroNote 2019-37

AstroNotes | Stats

2019-06-23 12:16:05 Type: Announcement-Tool/Utility Bibcode: 2019TNSAN..37....1Y

The revised treatment of object coordinates (astrometric accuracies) is now active on the TNS

Authors: Ofer Yaron, Avishay Gal-Yam, Eran Ofek, Avner Sass (Weizmann)

Keywords: Surveys, Astrometry, Transient

Abstract: Revision of the treatment of object coordinates (astrometric accuracies) was deployed today - 2019-06-23 - on the TNS. Currently 9 groups have a defined astrometric accuracy (that is below the default value of 5 arcsec). Coordinates were updated backwards for a total of 3157 objects, not affecting the actual objects and existing AT reports, and without any merging or splitting of objects. We encourage further feedback from the reporting groups.

Following the details described in AstroNote 2019-15, we have deployed today the revision in the treatment of object coordinates on the TNS, according to the defined astrometric accuracies of the reporting groups/surveys.

Astrometric accuracies of surveys on the TNS