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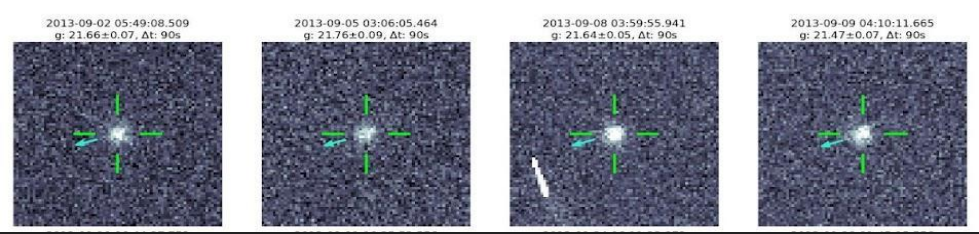
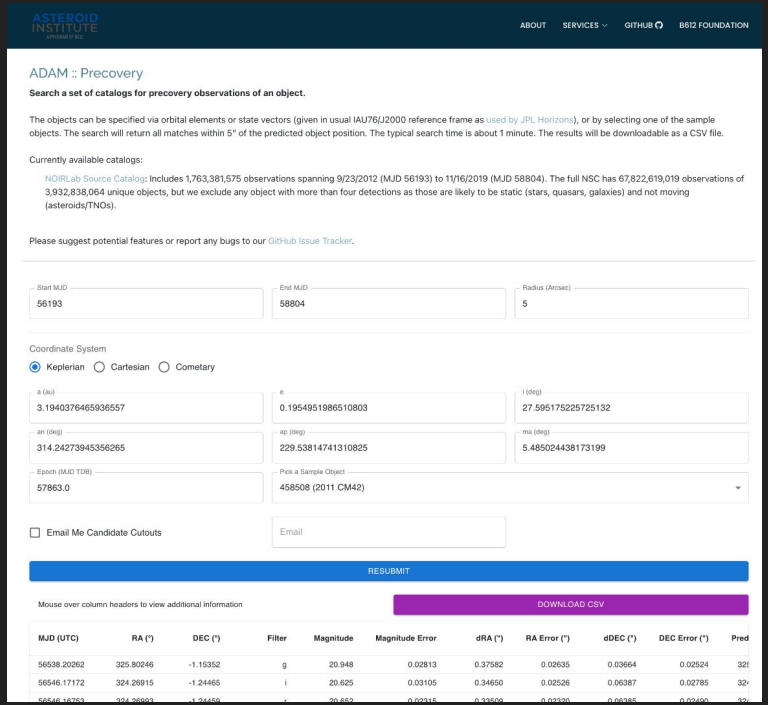
Poster Lightning Talks

Kathleen Kiker: The Asteroid Discovery, Analysis, and Mapping (ADAM) Precovery Service

- Working service at: https://adam.b612.ai/
- New algorithm improves speed over traditional/brute force precovery methods
- Searches entire NSC DR2 in ~35 seconds
- Precovery searches can extend the arcs of newly discovered objects, recover lost objects, and refine orbits

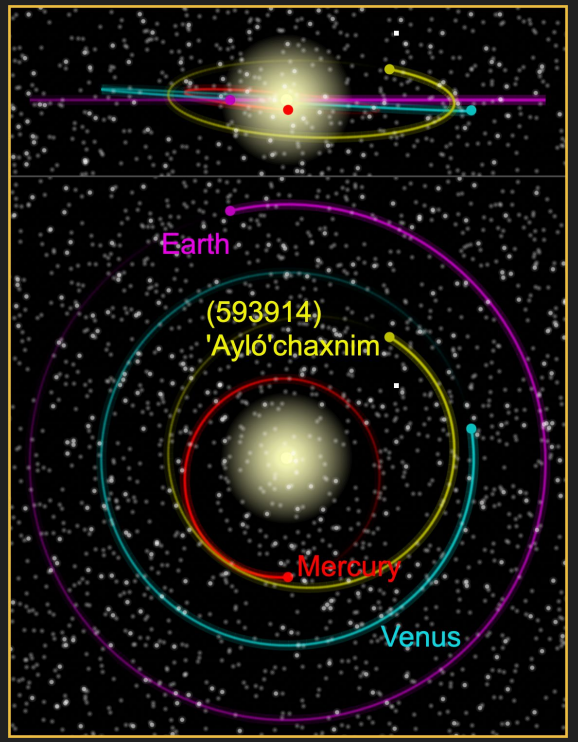




Find the complete talk at: https://ls.st/lssteu4youtube

Bryce Bolin: (594913) 'Ayló'chaxnim, a kilometer-scale asteroid inside Venus' orbit

- (594913) 'Ayló'chaxnim is the first known asteroid confined within the orbit of Venus
- Max Solar distance 0.65 au, ~2 km size
- ~10 Myr lifetime, likely to hit Venus
- Possibly 10 x more 'Ayló'chaxnim asteroids compared to NEO models
- May hint of an additional source of asteroids inside the orbit of Mercury



Scan QR code for manuscript:
Bolin et al. 2022, MNRAS:L, 517, 1, L49-L54

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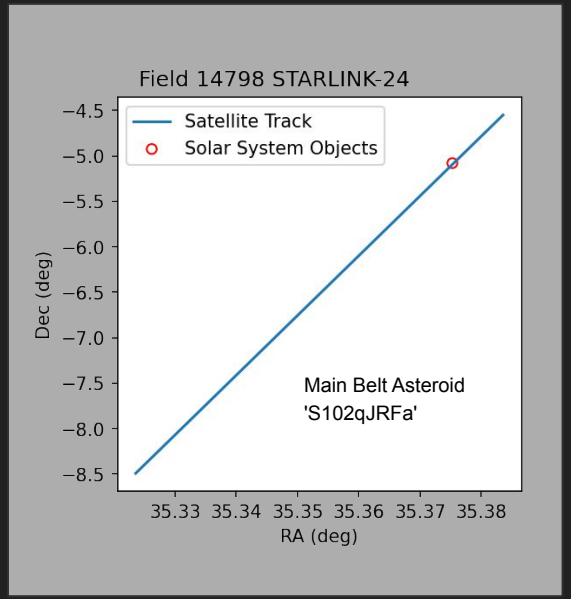
Siegfried Eggl: The Impact of Mega Constellations on Solar System Science with LSST

- Mega constellations of Artificial Satellites are a reality for LSST
- Even with considerable efforts by operators to darken satellites they are still bright ~7-8 mag
- An impact analysis on static sources and cosmology has been attempted (e.g. Tyson et al. 2020)
- We are studying the impact of mega constellations on moving sources such as Solar System Objects (SSOs) via higher fidelity, direct simulations.
- Our preliminary results regarding suggest a loss of SSO detections in the few % range due to Starlink satellites alone.
- Through the current “6 detection” requirement for discoveries even small percentages lost can have undesirable consequences.
- Nothing to panic about but keep an eye out for.



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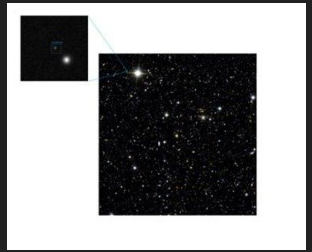
Detection of slow-moving solar system objects using 3D convolutional neural networks

Scientific Goal

Detecting long-period comets in support of the ESA F mission Comet Interceptor.
Develop and test a Machine Learning-based algorithm to detect slow-moving objects in LSST images.

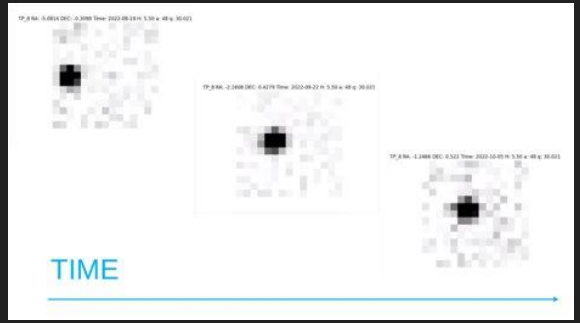
Input: frames sequence

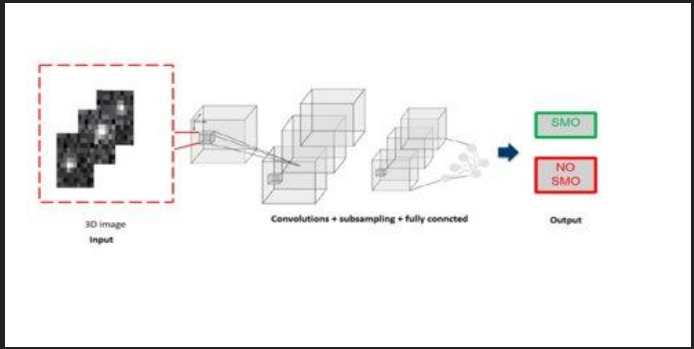
Slow-moving object



Data augmentation

- Luminosity
- Orientation
- speed





Output: binary classification: include a SMO or not.

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Hybrid Solar System Catalogue

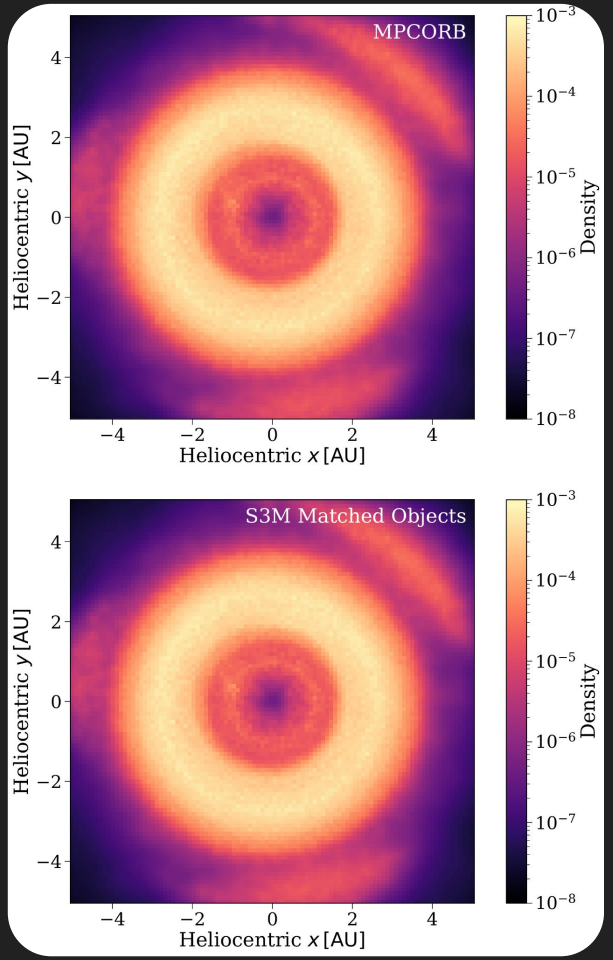
Tom Wagg

Motivation: Make predictions for LSST that **account for prior detections** - let's not predict the (re)discovery of Ceres!

We combined simulated objects from S3M (Grav+2011) with detections from MPCORB without changing underlying distributions

Hybrid catalogue can be used for mock LSST observations in the same way as S3M, allowing for **more accurate predictions**

Creation is **fast**, can be updated for every night of LSST detections



Full talk available here

https://youtu.be/WXLAvV4dzuM • tomwagg@uw.edu • https://github.com/dirac-institute/hybrid_sso_catalogue