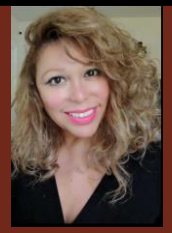
IAA-PDC-25-253 - Poster and Manuscript 2025 – Capetown, South Africa

NON-GOVERNMENTAL NEO DISCOVERY INTERNATIONAL PROGRAMS INCLUDING THE ASTROMETRICA SOFTWARE



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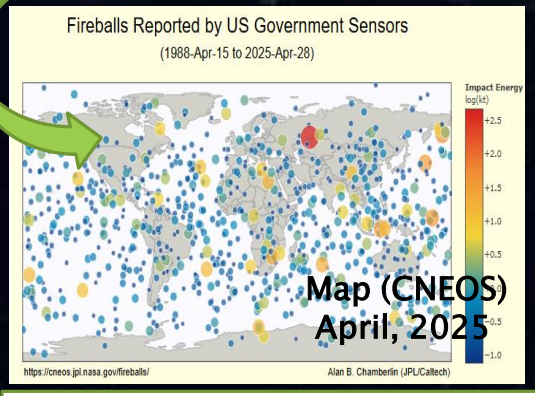
*It is the PD experts' responsibility to create new PD initiatives to expand PD and NEO capabilities

The NSS ISDC PD-Beyond Program aims to support the work of NASA, ESA, and JAXA, and to foster other professional audiences involvement in planetary defense and NEO

1.Asteroid Foundation – UN Sanctioned Asteroid Day.
2. The IAF E10 Planetary Defense Symposium
3. The Planetary Society
4. The IAA Far Side Moon Committee
5. B12 Fundation
6. The NSS ISDC Planetary Defense and Beyond Program
7. The IAA Planetary Defense Conference (PDC)

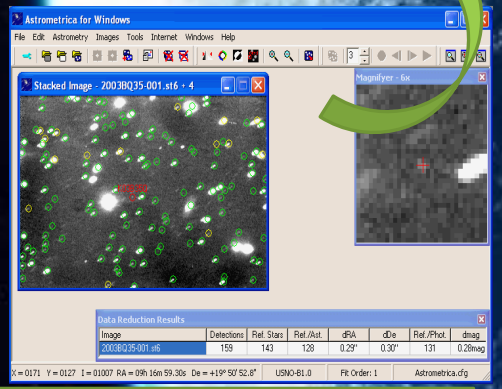
Our NSS ISDC PD-Beyond Program Hopes to Foster NOGs Collaboration with IWAN, SMPAG, UNOOSA and FEMA

An asteroid impact is a real threat – ASTROMETRICA Software for NEO Discovery is an accessible tool



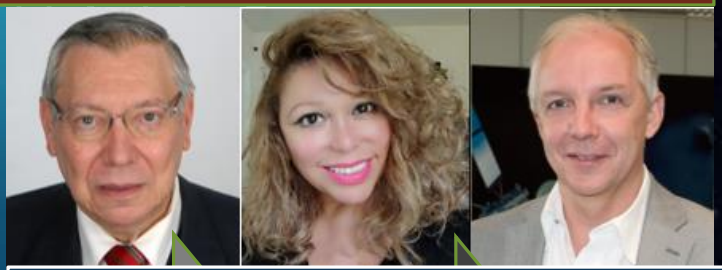
Map (CNEOS) April, 2025

Current detection efforts have cataloged only a fraction of the estimated NEO population, with a tracking rate of less than 0.1%. Therefore exploring accessible tools and expanding our NEO observation capabilities to NGOs is a must



Astrometrica

Reads FITS (8, 16 and 32 bit integer files) and SBIG image files. The size of the images is only limited by the available memory.
Automatic image calibration (Dark Frame and Flat Field correction).
Blinking with automatic image alignment.
Zoom and 'Magnifying Glass' for closeup image inspection.
Automatic reference star identification.
Automatic moving object detection and identification.
'Track and Stack' function to follow fast or very faint moving objects.
Access to the complete MPC database of orbital elements (MPCOrb).
Access to new-generation star catalogs (Gaia DR3, ATLAS REFCAT, PPMXL, UCAC 4, and CMC-15).
Includes Internet access (Send e-mail to the MPC, download the MPCOrb databse or query reference star catalogs at VizieR).



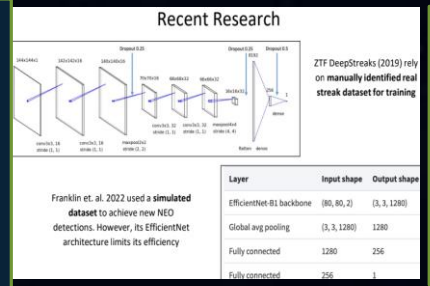
PD TRACK CO-CHAIRS: Claudio Maccone Nancy C. Wolfson Stephan Ulamec

NSS ISDC 2024 Planetary Defense NextGen Best Paper

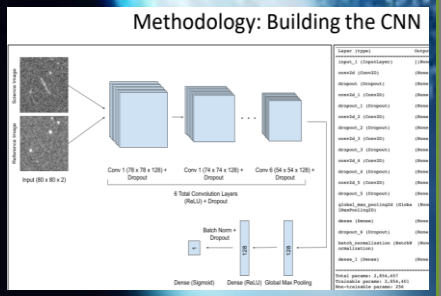
Minghao Zou:

High School Junior, Valley Christian High School

Presentation Title: *Next-Generation Space Science: Young Professionals* Developing CNN-Based Detection of Near-Earth Objects



➢ Most are fainter and move faster than the average NEO – This verifies capability of our model & pipeline and its improvement over other existing algorithms ❖ The small size of our model and the refined post-processing pipeline allows us to filter through full nights of data much quicker than existing pipelines



❖ We only used a 2080 TI GPU and a 3090 GPU to process all nights of data, while current softwares use multiple high-end CPUs
➢ Our method is directly scalable with more abundant compute resources
*Our model can theoretically detect 230 novel NEOs in just 150 nights of data