Minor Planet Center overview

Federica Spoto, Matthew Payne & the MPC team
Center for Astrophysics, Harvard & Smithsonian

55th DPS Meeting - October 4th, 2023
SBN Users Meeting

MPC: staff

Name	FTE	Role
Matthew Payne	1.00	Director
Michael Rudenko	1.00	Software & Sys-Admin; Comets
Peter Veres	1.00	NEOCP operations; Identifications; Pipeline Automation
Dave Bell	1.00	Software & DB-Dev; NEOCP; ADES
Paresh Prema	1.00	Software & Web-Dev; Identifications;
Margaret Pan	0.80	Pipeline Migration; Orbit-Fitting
Federica Spoto	1.00	Project Scientist
Rosemary Pike	0.42	TNOs, Natural Satellites
Mike Alexandersen	1.00	TNOs, Natural Satellites
Chris Moriarty	0.75	Technical Manager
N Casale	0.75	Software Developer
Michael Lackner	1.00	Contractor: Database migration
Ben Gafford	**1.00**	**Software Developer** - starting on Tuesday Oct 11

2022

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Chris Moriarty	1.00	Technical Manager
N Casale	0.75	Software Developer
Michael Lackner	1.00	Contractor: Database migration
Radiy Matveev	**1.00**	**Software Developer** - starting on Tuesday Oct 10

2023

The International Astronomical Union
Minor Planet Center

LEGACY SYSTEM

- **Maintain our current services**
  - Data products (e.g. publications)
  - Flat files of orbits and observations

- **Make our services more easily available**
  - Website improvement
  - Develop new APIs for our more used services

- **Keep a constant validation of all our products**
  - Ensure the quality of the data

The International Astronomical Union
Minor Planet Center

MPC monthly Newsletter

Communicate to our users any recent developments
Solicit feedback from the community
Make our processes as transparent as possible

Where can you find the Newsletters?

We send them at the beginning of the month via email to:
MPC ml - MPC mailing list
MPML
They are always available from our **website**

Visit https://minorplanetcenter.net/mpcops/new/newsletters/

What's New?

Newsletters

Our goal for these newsletters is to communicate to our users any recent developments, to solicit feedback from the community, and make our processes as transparent as possible.

- February 2023:
  In this month's issue: the first newsletter, general information on the new MPC and how to contact us.
- March 2023:
  In this month's issue: the latest impactor 2023 CX1, general introduction on the observations, description of the id
  circular, the processing of a large batch of TESS observations, website improvements.
- April 2023:
  In this month's issue: the new Summary WAMO (SWAMO), the new "data" subdomain, dscription of the MPC code fo
  WAMO, Digital Object Identifiers (DOIs), a new status page, improvements to the digest2 score.
- May 2023:
  In this month's issue: MPC orbits and the new postgres orbit table replicated to SBN, the new Orbit Comparison To
- June 2023:
  In this month's issue: designation of 63 new natural satellites of Saturn, more documentation added to the website
  for Users (e.g. how to properly use keywords, how to report cometary activity).
- July 2023:
  In this month's issue: information on the MPC planned power outage, explanation on how to use the identification
  Comparison Tool, the MPC @ ACM.
- August 2023:
  In this month's issue: the ADES format, high-precision astrometry (occultations), new digest2 population model an
- September 2023:
  In this month's issue: recent problems with the MPC public server, brief overview of the different data sources avai
  objects)

New extended packed provID

New definition of extended packed provisional designation
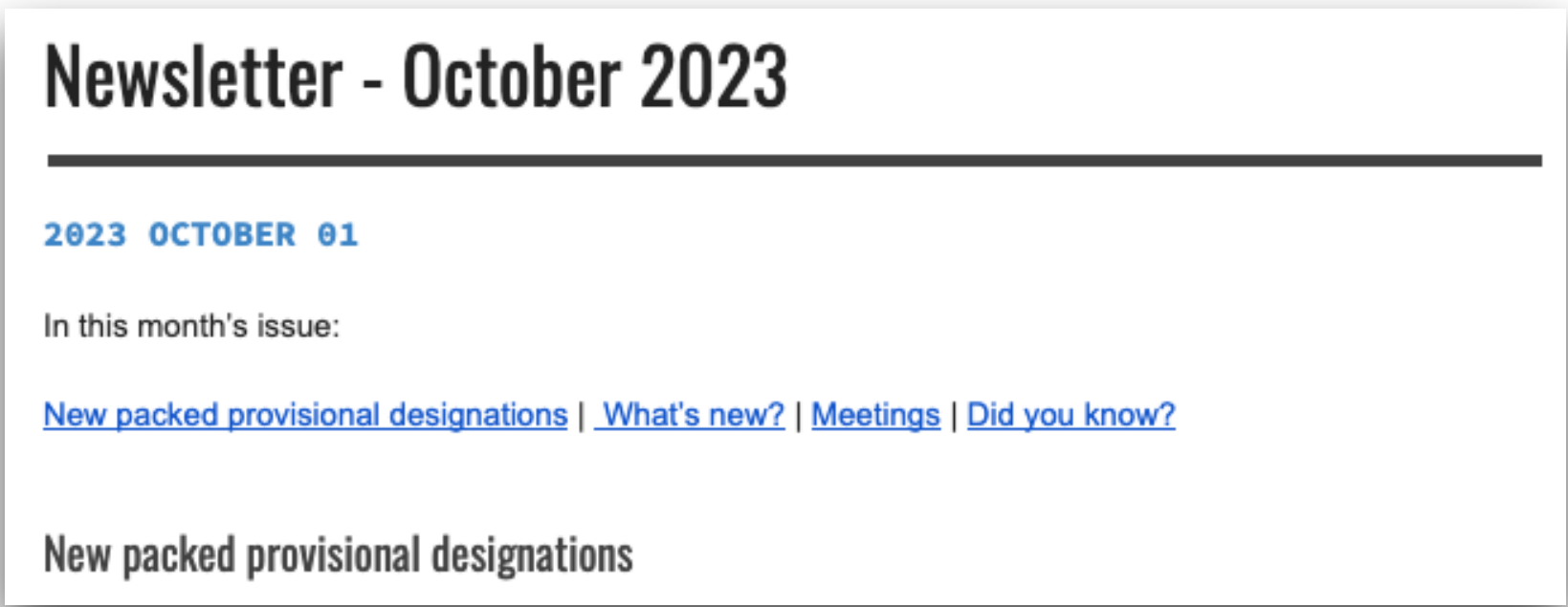
The first column MUST contain an underscore '_'

The character in the second column must be a capital letter, indicating the last two digits of the year of discovery (e.g. P=25, Q=26, …)

The third character is the capital letter for the half month

Columns from four to seven will contain four alphanumeric character [0-9A-Za-z] used as base62 representation of the order of designation after 15,500

The new extended packed provisional designation WILL NOT be used before June 2024.

Year	Half month	Order of designation within half month	Unpacked provisional designation	Packed provisional designation
2023	B	0	2023 BA	K23B00A
2025	D	15500	2025 DZ619	K25Dz9Z
2025	D	15501	2025 DA620	_PD0000
2026	D	15524	2026 DY620	_QD000N

Newsletter - October 2023

2023 OCTOBER 01

In this month's issue:

New packed provisional designations | What's new? | Meetings | Did you know?

New packed provisional designations

https://minorplanetcenter.net/media/newsletters/MPC_Newsletter_Oct2023.pdf

What's new since the last meeting?

MPC new services

- Where Are My Observations (WAMO) API

- Documentation and query examples to be used for the replicated table (e.g. obs_sbn)

- Orbit comparison Tool: comparing orbits among the largest orbit computing centers (e.g. MPC/JPL/…)

- SWAMO tool: observation statistics

Visit https://minorplanetcenter.net/mpcops/new/developments/

| OBSERVERS | DATA | **NEW** | CONTACT | **STATUS** |

Developments
Existing Upgrades
Newsletters

What's New?

New Developments

This page lists new services that are in development at the MPC (alpha, beta) that are in the testing phase.

(Beta) Where Are My Observations (WAMO) API

The WAMO API extends the functionality of the WAMO page, while preserving the original service. This page describes how to use the new API.

Last Updated 2023-10-01

(Beta) MPC Database Tables Schema

- Further guidance on the MPC database tables

Last Updated 2023-05-31

(Beta) Orbit Comparison Tool for NEOs

This tool allows you to compare the orbital parameters that are present in MPC's MPCORB.DAT files with JPL's values for the same objects.

Last Updated 2023-04-28

(Beta) Summary of Where Are My Observations - SWAMO

SWAMO lets you explore the outcomes of all submissions over the MPC's history at a month-level granularity, and the SWAMO-R dashboard lets you explore the outcomes of the past six months worth of submissions at a day-level granularity.
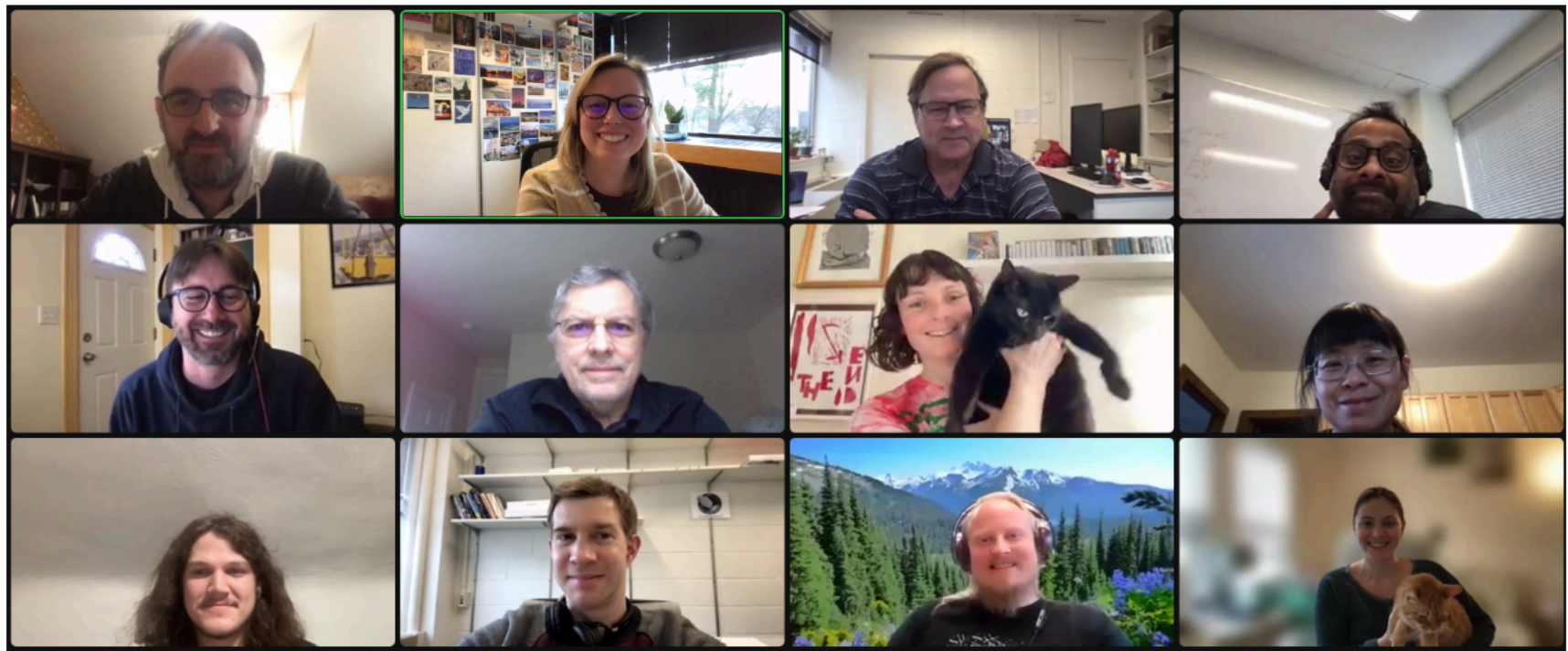
Restructuring the website

localhost:8000/mpcops/mpc_guide/

Implemented locally

Welcome!

To the new MPC guide. We need your feedback to ensure that this is a useful and welcoming resource. Please use Jira Helpdesk ⧉ to send us your feedback and suggestions. If you want to contact the MPC, please follow these instructions.
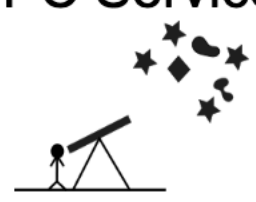

The Minor Planet Center (MPC) is the single worldwide location for receipt and distribution of positional measurements of minor planets, comets and outer irregular natural satellites of the major planets. The MPC is responsible for the identification, designation and orbit computation for all of these objects. This involves maintaining the master files of observations and orbits, keeping track of the discoverer of each object, and announcing discoveries to the rest of the world via electronic circulars and an extensive website. The MPC operates at the Smithsonian Astrophysical Observatory ⧉, under the auspices of Division F of the International Astronomical Union (IAU) ⧉. All of the MPC's operating funds come from a NASA Near-Earth Object Observations program grant.

Featured guides:

Data/Publications	MPC Services	Jira Helpdesk

Documentation and latest MPC news:

Documentation	Newsletter	Contact Us

Restructuring the website

localhost:8000/mpcops/mpc_guide/

Implemented locally

MPC Services and Tools

The MPC develops and maintains a variety of different services and tools that should help amateur astronomers and more expert users to plan their observations or to retrieve the data they need.

Main MPC Services:

NEO Confirmation Page (NEOCP) - Ephemerides for newly-discovered possible new objects	+
Possible Comet Confirmation Page (PCCP) - Ephemerides for newly-discovered possible comets	+
Search in the MPC database (DB search) - Observations and orbits for a single object	+
Ephemeris Service (MPES) - Ephemerides for asteroids and comets	+
Minor Planet Checker (MPChecker) - List of known objects in a specified region	+
Recovery Page - Recovery Page for NEOs and TNOs	+

MUG findings

Appreciation for our newsletter
and for the new services

1. Communication. The MPC has made substantial progress regarding communications with its user base. The monthly newsletter provides the community with visibility of the latest developments and guidance on how to correctly collect and report observations. Frequent and timely usage of the mpc-ml mailing list has been helpful to notify the community of possible data product and operational problems and their resolutions. The MPC has been responsive in addressing issues reported to the Jira Help Desk. The MUG is pleased to see significant progress in many areas of new development, e.g., SWAMO, the orbit comparison tool, updated digest score, APIs, Git and software infrastructure, and the handling of packed designations for numbered objects past (620000), which serves as a test for a forthcoming rule update regarding packing obs80 designations.

Although the MPC has made great strides in providing documentation for its services, database and data products, documentation remains incomplete, in particular for database table column descriptions. Moreover, finding services and information on the MPC website remains challenging. This may be partially addressed by a careful redesign of the website dropdown menus, but a consolidated tools/documentation page and a site map should also be valuable.

New suggestions / WIP

Internal developments

SOFTWARE

- **Migrating towards a database-centric system**

- **Migrate towards the use of new systems, such as AWS, Docker, RabbitMQ, NGINX, …**
  - Both for receipt and processing

- **All the new software is under version control** (GitHub)
  - Continuous integration tests
  - We are importing the legacy code under GitHub as well

- **Keep a constant validation and quality control of all our products**

HARDWARE

- **Moving towards Virtualization**

  - Efficient resource use

  - Automated IT management

  - ★ **Faster disaster recovery**