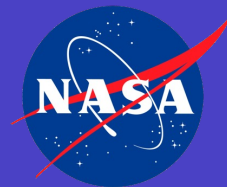


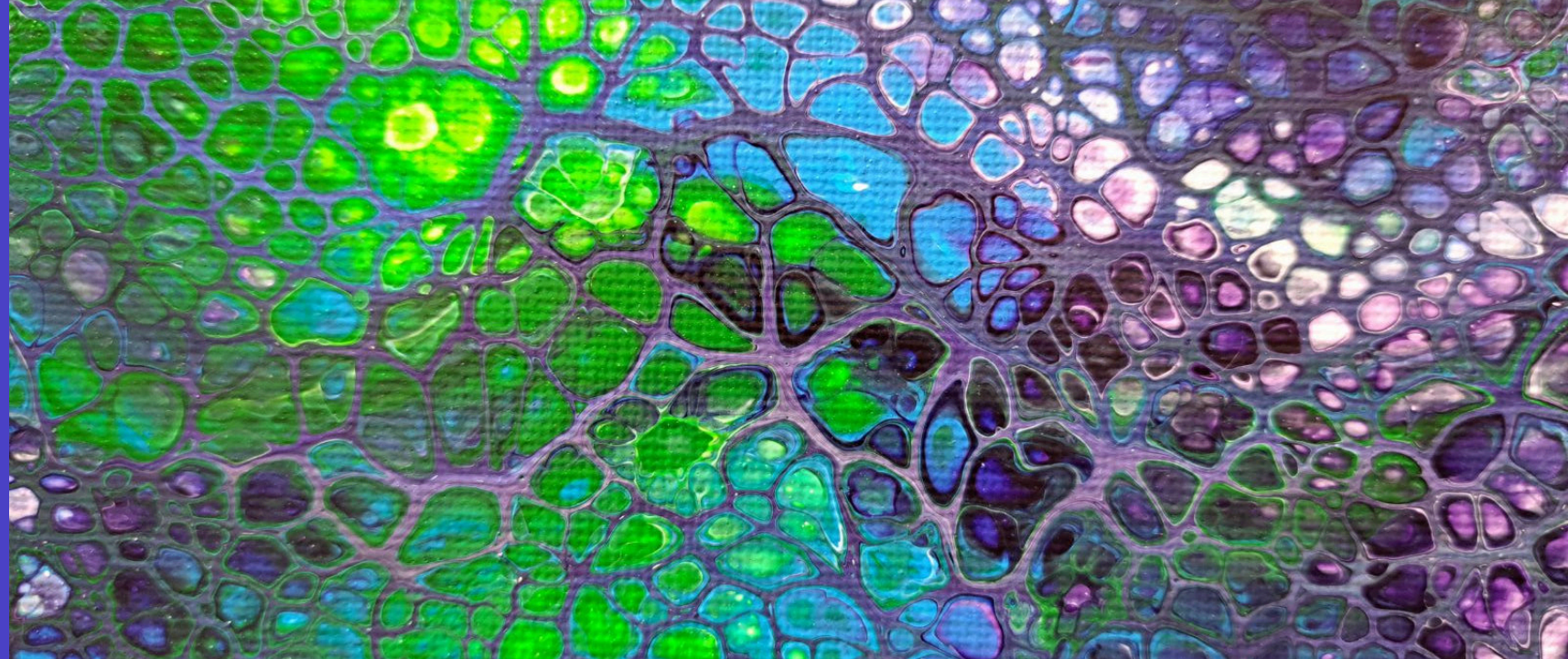
NEOfixer Update

for IAWN

Alex R. Gibbs
Catalina Sky Survey
University of Arizona



Topics



- Features
- How CSS uses it
- Usage statistics
- Coming soon

Targets (500)

Filters: Showing 1 to 50 of 33,423 entries

Telescope:

500

Column visibility CSV Print PDF

Previous 1 2 3 4 5 ... 669 Next

Show 50 entries

Search:

Packed	Object	Priority	Score	Cost (min)	Interest	Mag. (V)	Uncert. (°)	Rate ("/min)	Last Obs.	Arc Length	U	H	MOID (AU)	NEO	Impact
P21MFJF	P21MFJF	critical	9.02	43	0.00	20.8	0.9040	14.7	1.1d	1.0h	12.5	22.8	0.049	100	-
P11MpBr	P11MpBr	very high	8.80	75	-	21.2	0.3738	0.7	4.0d	1.0h	11.4	20.0	0.005	87	-
C9RKE32	C9RKE32	high	7.72	20	1.00	20.9	0.0299	2.2	1.2h	1.7h	12.1	20.5	0.155	81	1
C9RJZN2	C9RJZN2	high	7.69	34	0.00	21.5	0.0467	8.1	1.9h	1.4h	11.3	27.4	0.004	100	-
P11MKAF	P11MKAF	high	7.52	16	-	21.6	0.0053	1.4	1.0h	3.1h	11.8	22.8	0.000	100	-
K20F06M	2020 FM6	high	7.51	6	-	17.8	0.9049	31.9	3.5y	29d	6.2	21.9	0.007	100	-
C3Z3J31	C3Z3J31	high	7.50	4	1.00	19.8	0.0448	12.6	3.1h	3.6h	10.1	26.4	0.006	100	-
K16GM2K	2016 GK222	high	7.29	242	-	22.0	0.8006	1.7	7.5y	26d	6.7	21.0	0.248	100	-
C3Z61H1	C3Z61H1	high	7.27	2	1.00	18.0	0.0252	29.9	3.4h	1.7h	9.9	23.9	0.039	100	-
K23G02	2023 GZ2	high	7.27	249	-	22.8	0.1341	1.9	164d	27d	8.0	21.7	0.107	100	-
P21MKwz	P21MKwz	high	7.22	77	0.00	21.8	0.1250	0.9	4.3h	0.5h	11.7	18.6	0.808	34	-
C0LJRR5	C0LJRR5	high	7.21	549	0.70	22.2	1.3522	3.0	5.1d	1.7h	11.7	25.6	0.100	99	-
K19U13U	2019 UU13	high	7.16	43	-	21.6	0.1628	2.1	3.9y	38d	5.9	19.1	0.674	100	-
K23H06J	2023 HJ6	high	7.02	315	-	22.4	0.1974	2.5	164d	24d	7.8	22.9	0.077	100	-
NEOfixer Update	2023 JG2	med-high	6.97	27	1.00	21.3	0.0672	7.4	4.1h	3.4h	10.8	24.6	IAWN 2023-10-26	100	3
A10XDtL	A10XDtL	med-high	6.96	78	-	19.9	4.1691	5.3	1.3d	0.5h	11.9	23.3	0.001	100	-

Target List

Targets (500)

Filters: Showing 1 to 50 of 33,422 entries

Show

- NEOCP
- Unnumbered NEOs
- Single-opp, current
- Single-opp, previous
- Multi-opp
- Numbered NEOs

- Potential Impactors
- Radar Targets
- Yarkovsky Candidates
- NHATS Objects
- All Other Objects

NEOfixer
Score

Min

0 - none

Max

Units

Cost

0

999999

min

V magnitude

0

99

Uncertainty

0

999999

degrees

Rate

0

999999

arcsec/min

Elongation

0

degrees

H

0

99

MOID

0

99

AU

RA

0

999

hr

Dec.

-90

90

degrees

Galactic
Confusion

0

100

Submit

Reset

Filtered Targets API Link

All Targets API Link

Target List: Filters API Links

Targets (500)

Filters: Showing 1 to 50 of 33,422 entries

Column visibility ▾ CSV Print PDF

Packed	Dec. (°)	RMS (")	Cost	Interest
Object	Mag. (V)	U	(min) ↑↓	↑↓
Priority	Uncert. (°)	H		
Priority Now	Rate ("/min)	q	43	0.00
Score	Elong. (°)	MOID (AU)	42	0.50
Score Now	GC	NEO	70	-
Cost	Num. Obs.	Geo	2	1.00
Import	Obs. Used	Impact	16	0.80
Urgency	Last Obs.	NHATS	9	0.00
Interest	Arc Length	Radar	51	-
RA	Arc Used	Yarkov.	3	1.00
K2010001	2020 TRU	high	7.51	-
K16GM2K	2016 GK222	high	7.29	242

Target List: Columns Export

gibbs Log out Register Search site

Telescope: 152

Previous 1 Next

Search: 2023 U

↑↓	Arc Length	↑↓	NEO	↑↓	Impact	↑↓	Status	↑↓	
	1.3d		1.9d		100		-7.43		-
	1.1d		2.0d		100		-7.06		-
	2.0d		5.1d		100		-6.98		-
	1.2d		1.8d		100		-6.37		-
	1.3d		1.9d		100		-5.98		-
	2.1d		6.0d		100		-5.84		-
	2.0d		1.0d		100		-5.84		-
	5.4d		1.8d		100		-		-

Target List: Site Search Sort

Object Page: Tabs

NEOfixer

CATALINA Sky Survey | LPL Lunar & Planetary Laboratory | NASA

Targets Status FAQ API Contact

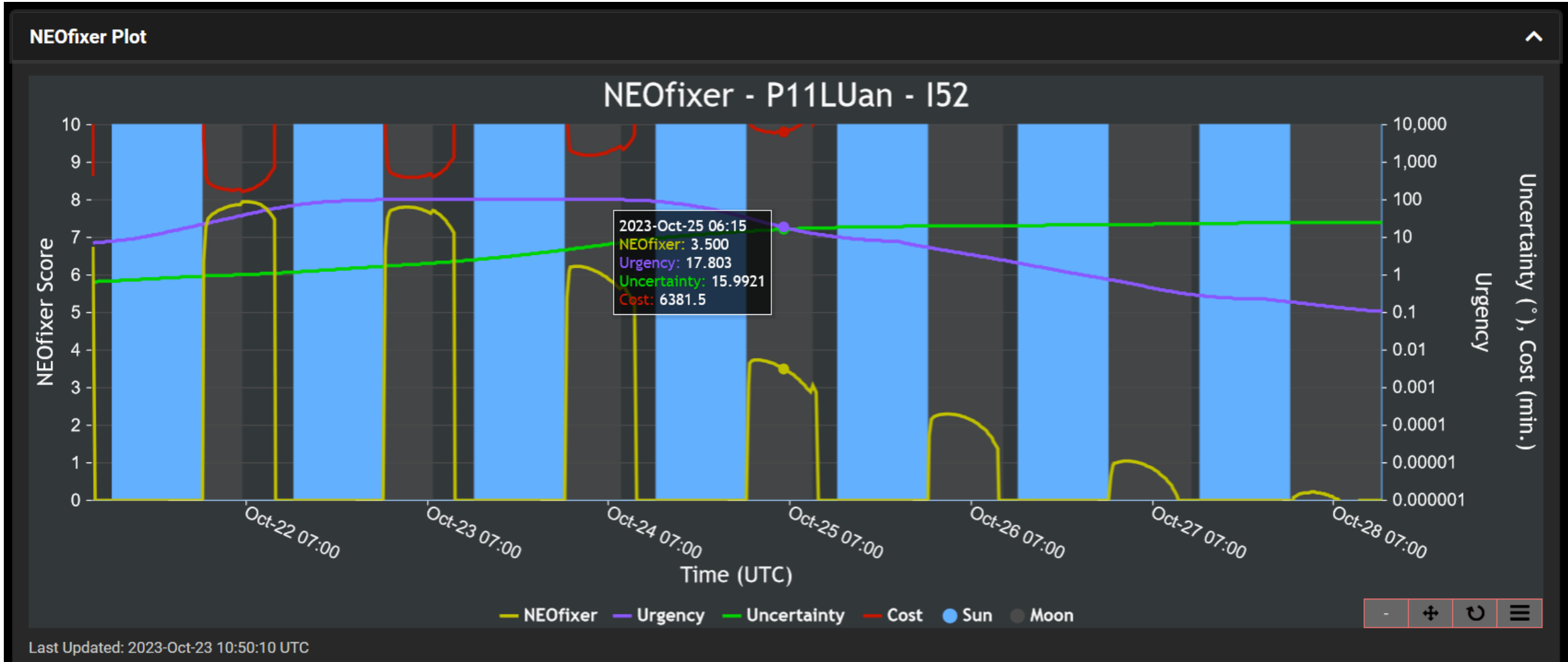
gibbs Log out Register Search site

P11LUan (I52)

Telescope: I52

- NEOfixer Plot
- Orbital Elements
- Scores and Interest
- Ephemeris
- Benefit Plot
- Observations
- Residuals
- Orbit View

Object Page: Scores Over Time



Object Page: Score Breakdown

NEOfixer Score for P11LUan at I52			
Quantity	Value	ΔScore	
Importance	35.665	1.55	
Benefit	36.801	1.57	
Urgency	98.926	2.00	
Cost	1436.473	-3.16	
Confidence	0.071	-1.15	
Interest	1.000	0.00	
Time of max tonight (t_{max})	2023-10-23 04:15:00 UT		
NEOfixer (at t_{max})	6.4442	high 7.81	

Importance			
Quantity	Basis	Value	ΔScore
S_H	$H = 22.88$	20.155	1.30
S_{MOID}	$MOID_{\oplus} = 0.011952 \text{ AU}$	1.923	0.28
$P(\text{NEO})$	$\text{find_orb } p_{\text{NEO}} = 92.0\%$	0.920	-0.04
S_{Scout}	$\text{Scout rating} = 0$	1.000	0.00
Base Importance (target table)		38.748	--
Importance		35.665	1.55

Benefit			
Quantity	Basis	Value	ΔScore
S_{uncert}	$1\sigma \text{ uncert.} = 1.805488^\circ = 6499.76''$	3.680	0.57
S_U	$U = 11.78$	10.000	1.00
Benefit		36.801	1.57

Urgency			
Quantity	Basis	Value	ΔScore
$Cost_1$	Optimal cost score in near future	97067.054	--
$Cost_0$	Optimal cost score tonight	1016.261	--
Ratio (r)		95.514	--
Urgency		98.926	2.00

Cost			
Quantity	Basis	Value	ΔScore
ω_{slew}	Max slew rate (°/minute)	60.000	--
$t_{acquire}$	Target acquisition time (minutes)	--	--
$t_{overhead}$	One visit overhead time (minutes)	0.167	--
$t_{integrate}$	One visit integration time (minutes)	10.562	--
N_{fields}	$1\sigma \text{ uncert.} = 1.805488^\circ = 6499.767''$	10.222	--
C_{fields}	$1\sigma \text{ unconf.} = 1.805488^\circ = 6499.767''$	10.222	--
$C_{confusion}$	Galactic confusion	10.222	--
Base cost in minutes (target table)		382.059	--
Cost		1436.473	-3.16

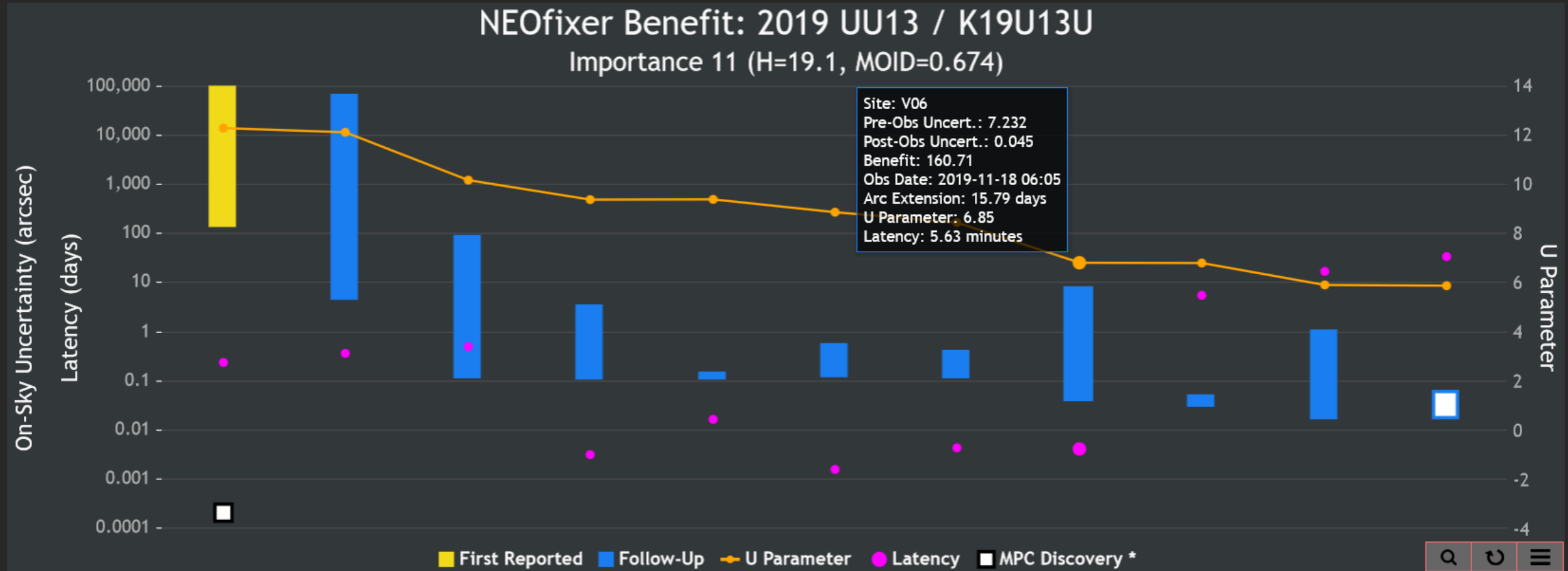
Confidence			
Quantity	Basis	Value	ΔScore
P	Raw confidence	0.885	--
Confidence		0.071	-1.15

Interest				
Site	Time (UTC)	Status	Value	ΔScore
No observing interest reported				
All interest (target table)			0.0	--
Others' interest (besides I52)			0.0	--
Interest			1.000	0.00

$$Base \text{ Cost} = \frac{45^\circ}{\omega_{slew}} + t_{acquire} + 3N_{fields} C_{confusion} (t_{integrate} + t_{overhead})$$

Object Page: History

Benefit Plot



API: HTTPS Curl JSON Text RESTful

NEOfixer

Targets Status FAQ API Contact

API

Contents

- Overview
- Parameters
- Reply Format
- **Methods**
 - Get Ephemeris (ephem)
 - Get Observations (obs)
 - Get Orbit (orbit)
 - Report Observing Status (report)
 - **Get Targets (target)**
 - Get Uncertainty Offsets (uncert)
- Example Code
 - curl and jq
 - Python 3
 - Tcl
- Sample Programs

```
{
  "jsonrpc": "2.0",
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    "generated": {
      "jd": 2460241.286111,
      "time": "2023-10-23T18:52:00Z"
    },
    "num": 10,
    "ids": [
      "P11MLeA",
      "P21MFJF",
      "K20F06M",
      "C0LJRR5",
      "C3Z3J31",
      "C9RJZN2",
      "C9RA6J2",
      "P21MKwZ",
      "C9REGZ2",
      "P11MKAF"
    ],
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        "number": null,
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        "score": 9.68,
        "cost": 7.9,
        "importance": 52,
        "urgency": 100,
        "interest": null,
        "status": null,
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        "time": "2023-10-24T11:45:00Z",
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        "ra deg": 77.53771,
        "dec": "-13:16:58",
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        "elong": 125.2,
        "gc": 0.633,
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        "arc used": 0.04,
        "residual": 0.1,
        "u": 12.08,
        "h": 19.19,
        "q": 0.288,
        "moid": 0.1406,
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        "neo": 99,
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        "nhats": null,
        "radar": null,
        "yarkov": null
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        "provisional": null,
        "number": null,
        "priority": "critical",
        "score": 9.53,
        "cost": 17.8,

```

Example: How CSS Uses NEOfixer

At our follow-up telescopes:

Interfaces	Get Targets	Queue	Auto Update	Report Status
Mostly API Some web page	API client: Filter target list Use exposure time	Vet targets Observing conditions	Targets on queue automatically updated via API: Priorities Ephemerides	Queue manager Validation

Example API code and clients on website.

NEOfixer Stats: Visitors

150 Accounts

120 Telescopes

3,400 Visitors/Month

110 Visitors/Day

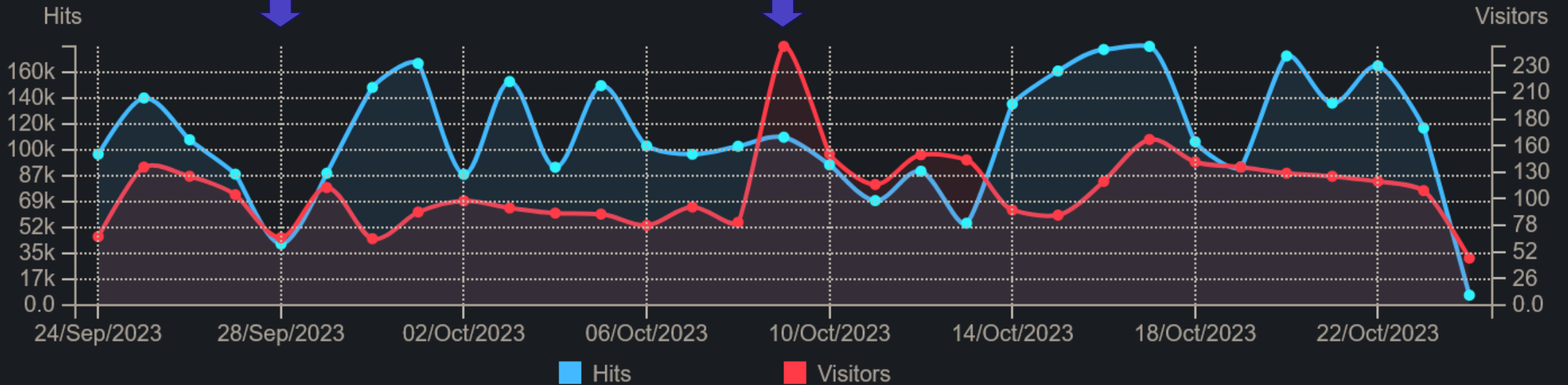
UNIQUE VISITORS PER DAY

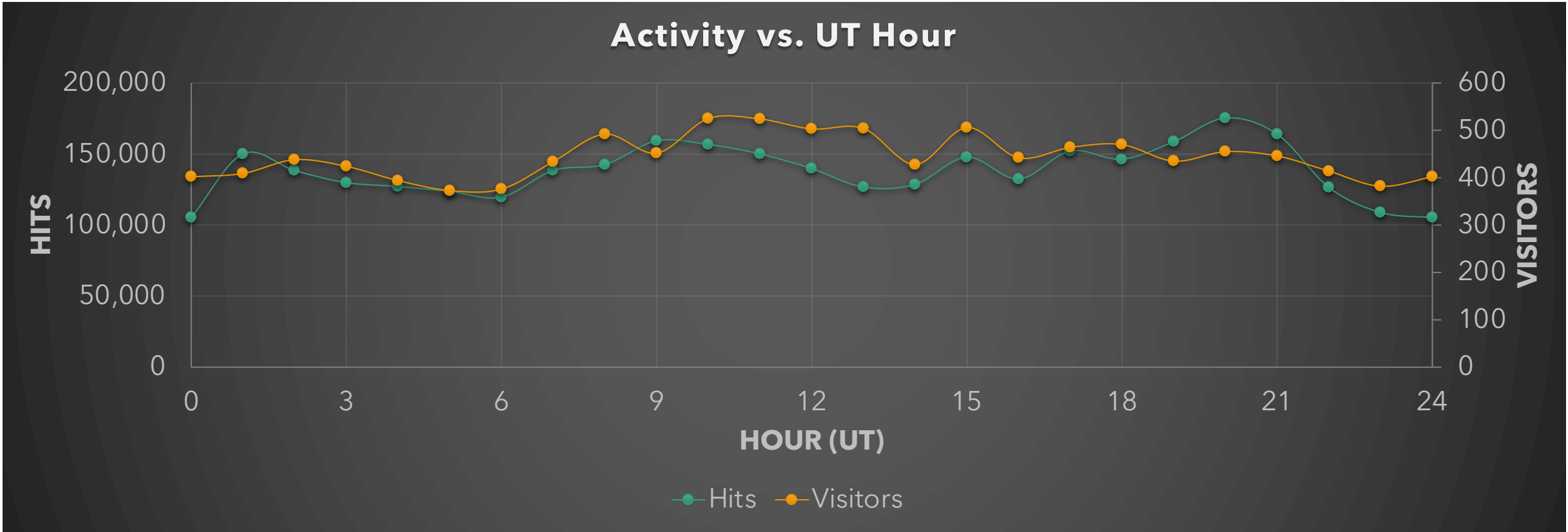
HITS HAVING THE SAME IP, DATE AND AGENT ARE A UNIQUE VISIT.

Full Moon



Columbus Day?!

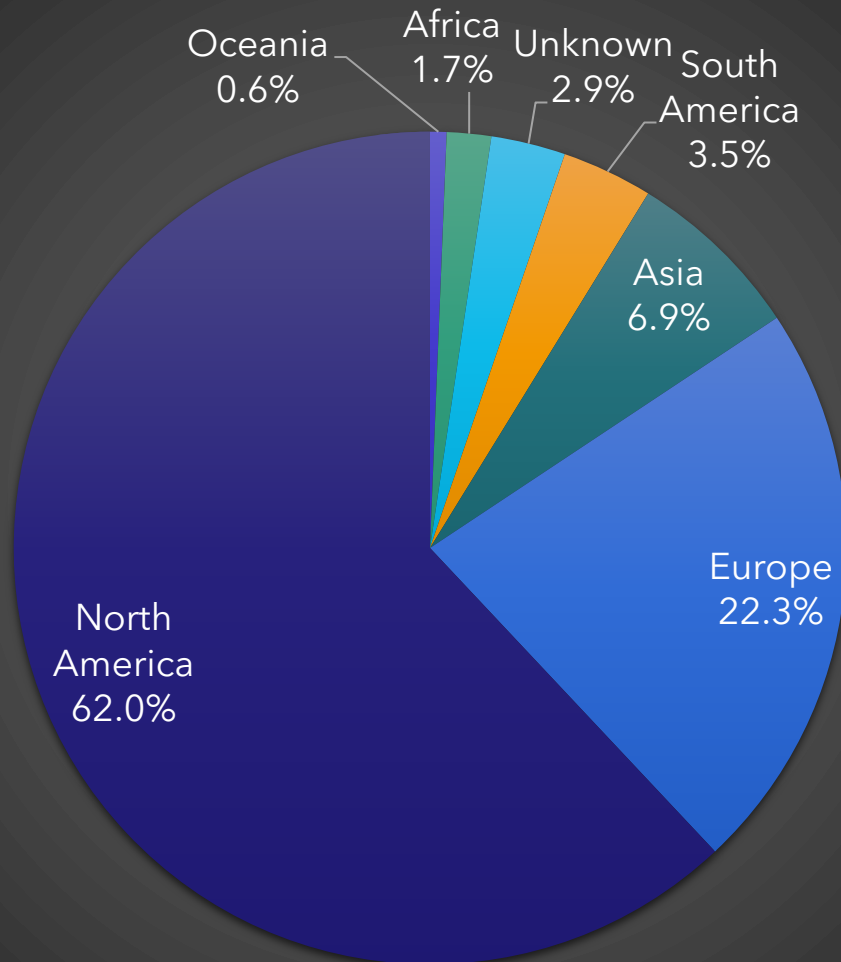




Activity vs. Time of Day

Visitor's Locations

Visitors By Continent



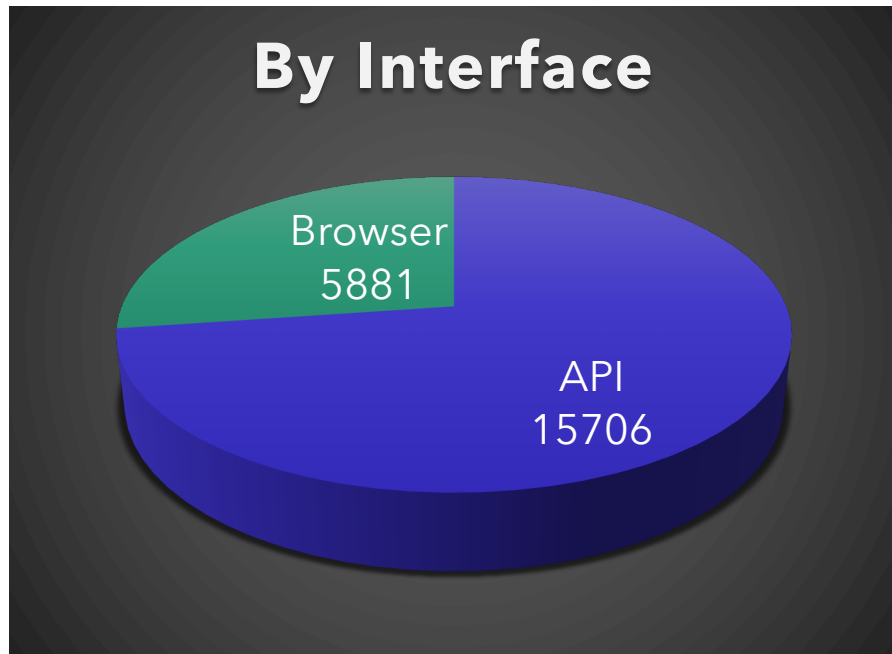
Top Countries

Country	Visitors
United States	59.9%
Germany	5.8%
France	4.2%
Brazil	3.1%
China	2.6%
Spain	2.3%
UK	2.3%
Canada	2.0%
India	1.3%
Russia	1.2%

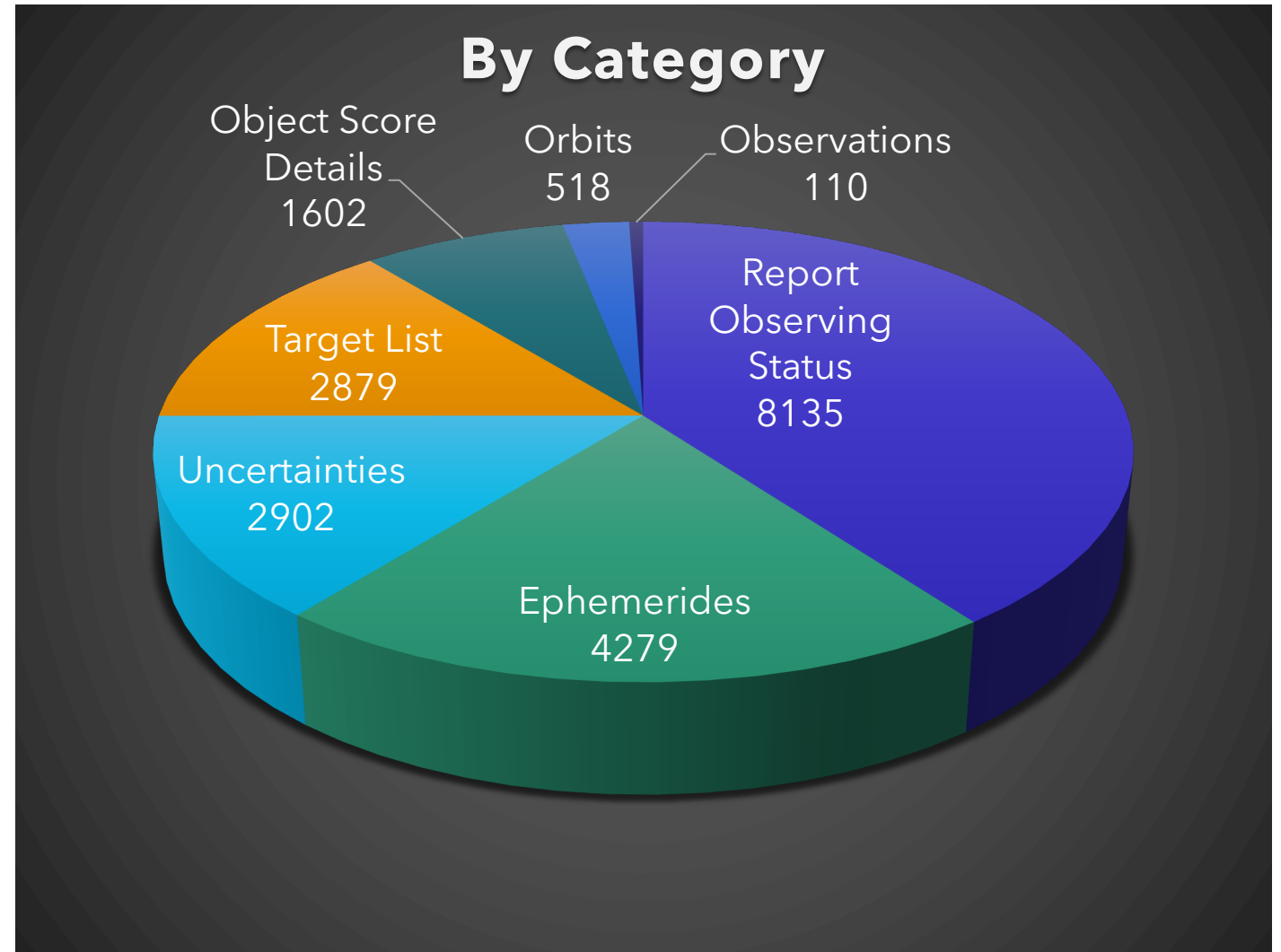
Country	Visitors
Italy	1.1%
Seychelles	1.0%
Ukraine	0.9%
Romania	0.9%
Greece	0.5%
Indonesia	0.5%
New Zealand	0.5%
Lithuania	0.5%
Iran	0.5%
Other	9.1%

How is NEOfixer Being Used?

Number of requests during previous month



Plus ~90,000 API requests from CSS checking for target updates



Top Sites Requesting Target Lists

(in last month)

Via Browser			Via API		
Site	Location	Requests	Site	Location	Requests
500	Geocenter	984	500	Geocenter	276
X33	OARU, Manaus, Brazil	105	Z84	Calar Alto-Schmidt, Spain	146
858-051	Tebbutt Obs. 0.5-m, NM, USA	87	I52	CSS, Arizona, USA	78
I52	CSS, Arizona, USA	69	K87	Dettelbach Vineyard Obs., Germany	62
H36	Sandlot Obs., Kansas, USA	69	C95	SATINO Remote Obs., France	56
V00	CSS, Arizona, USA	54	B72	Soerth, Germany	42
Z43	Landéhen Obs., Landéhen, France	47	K74	Muensterschwarzach Obs., Germany	39
Z80	Northolt Branch Obs., Norholt, UK	45	L65	Bredenkamp Obs., Germany	33
W42	Mind's Eye Obs., Florida, USA	32	G04	Schuelerlabor Astronomie, Germany	33
J95	Great Shefford Obs., UK	27	W57	ESA TBT La Silla Obs., Chile	31
X93	Munhoz Obs., Brazil	26	M49	IAS Remote Obs., South Africa	29
A17	Guidestar Obs., Germany	20	G01	Oldenburg University Obs., Germany	24
K19	PASTIS Obs., Banon, France	18	L34	Galhassin Robotic Telescope, Italy	23
474	Mt. John Obs., Lake Tekapo, NZ	17	M58	VdS Remote Obs., South Africa	22
291	Spacewatch, Arizona, USA	16	V06	CSS, Arizona, USA	21
	Other	201		Other	147
	Total	1817		Total	1062

Sites Reporting Follow-up Status (in last month)

Need more

Site	Location	Reports
I52	CSS, Arizona, USA	5207
V06	CSS, Arizona, USA	762
G01	Universitätssternwarte Oldenburg, Germany	658
291	Spacewatch, Arizona, USA	555
691	Spacewatch, Arizona, USA	514
G96	CSS, Arizona, USA	183
695	Kitt Peak, Arizona, USA	92
K87	Dettelbach Vineyard Obs., Germany	78
M45	Starhopper Observatory, Romania	34
J95	Great Shefford Obs., UK	25
703	CSS, Arizona, USA	20
807-100	Cerro Tololo Obs., La Serena, Chile	7
Total		8135

Coming Soon: Current Activity

Show entries Search:

Packed	Interest	Last Activity (UT)	Uncert. (°)	Dec (°)	Rate ("/min)	Mag. (V)	500	291	691	703	G96	I52	J95	V06
P21MKvz	0.5	10:49	0.4026	+29.6	3.0	21.5	very high	high	-	-	very high	very high	medium	will observe
C9RJM92	0.5	10:49	0.0109	+28.4	28.3	20.8	medium	med-low	medium	med-high	med-high	will observe	-	medium
K23U00E	0.7	10:49	0.0000	+11.5	2.6	22.5	none	observing	-	-	none	none	-	none
P21MtNH	1	10:48	0.0129	+39.5	0.2	22.4	med-high	none	-	-	-	-	-	reported
C9RAWW2	1	10:46	0.2151	+22.1	13.8	20.7	high	none	medium	medium	medium	reported	high	none
C86WC7Z	0	10:46	33.8311	+34.8	8.1	20.8	minimal	very low	-	med-high	medium	canceled	none	minimal
C9R9DX2	0.7	10:35	14.6601	+36.3	1.2	21.8	medium	med-low	-	-	very high	med-high	-	observing
C9RJZN2	0.5	10:22	0.4466	+26.5	14.6	20.9	very high	high	-	very high	very high	very high	low	will observe
C3Z11G1	1	10:22	0.0105	+06.5	45.4	16.9	med-high	none	very low	low	none	reported	high	none
P11MGmc	0.7	10:20	0.0004	-00.1	8.8	20.7	medium	none	low	med-low	none	observing	none	none
K22U21S	0	10:20	0.0517	+48.5	2.4	22.2	med-high	medium	-	-	high	med-high	-	not found
K23U03Z	1	10:11	0.0002	+19.8	1.6	21.5	very low	none	reported	-	none	none	-	none
K23U01H	0.7	10:10	0.0002	+25.6	15.0	20.2	low	none	observing	low	none	none	none	none
P21MI6X	1	10:01	0.0023	+46.7	0.4	22.2	med-low	none	-	-	none	none	-	reported
C9REGZ2	1	10:01	0.0106	+31.8	8.6	21.2	med-high	none	med-low	-	none	reported	med-high	none

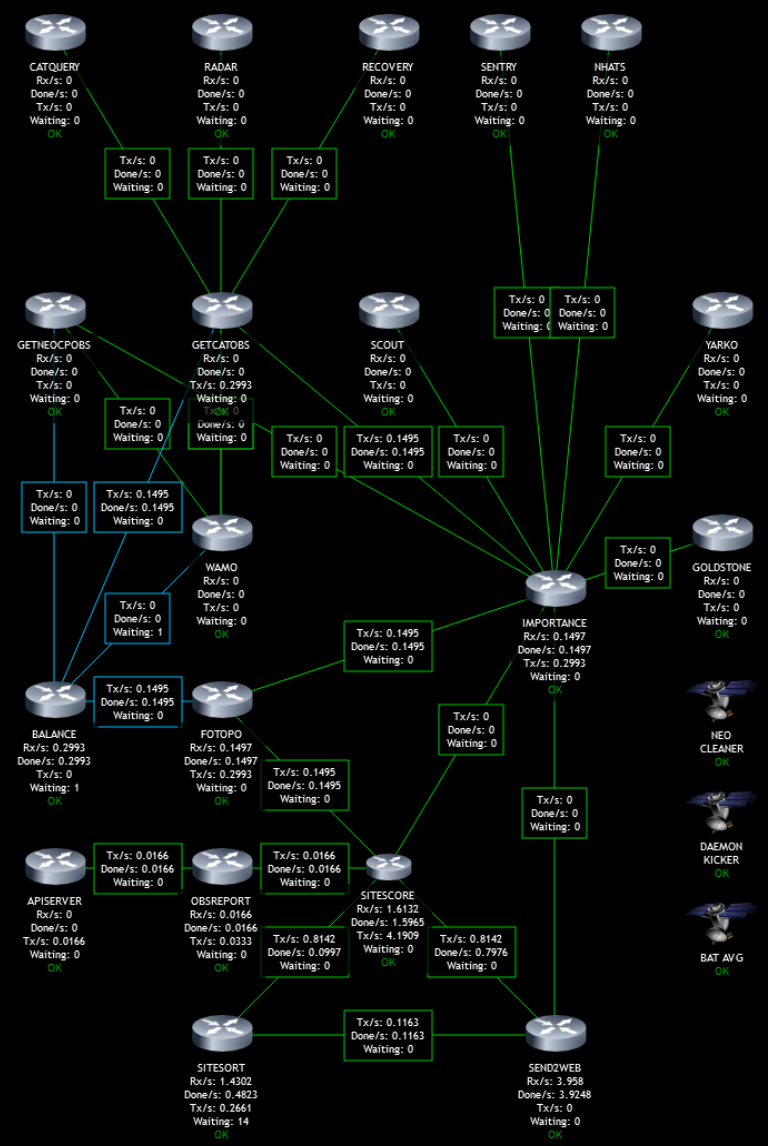
- Encourage increased coordination
 - Activity overview
 - Improved use of status reports
 - API request for activity
 - Encourage adaptive queues
- Scoring refinements
- API improvements
- Negative detections
 - Collect details
 - Test use

Some Near-term Plans

Host issues

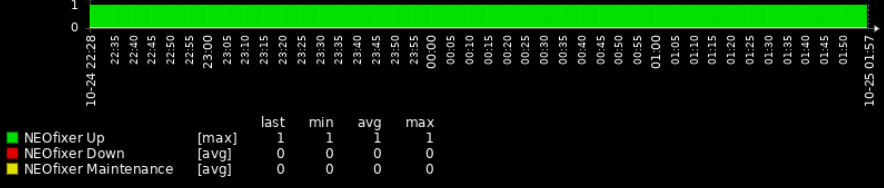
Host	Issue	Last change	Age	Info	Ack	Actions
No data found.						

0 of 0 problems are shown Updated: 04:59:59

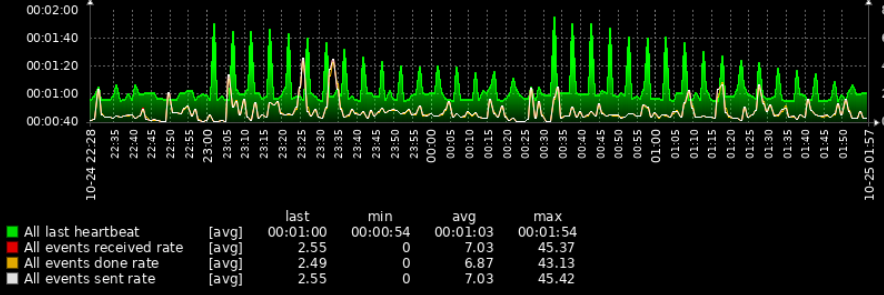


2023-10-26 04:59:59

neosever: NEOfixer Status History



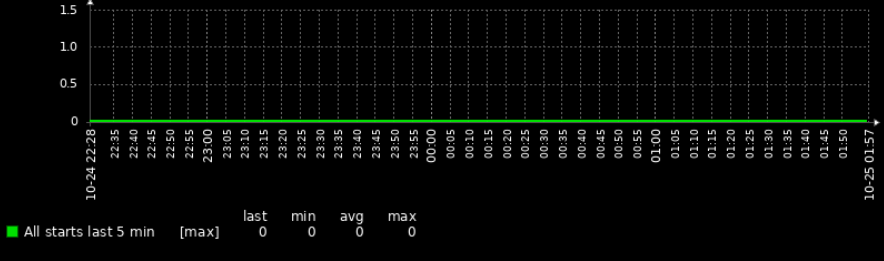
neosever: NEOfixer All



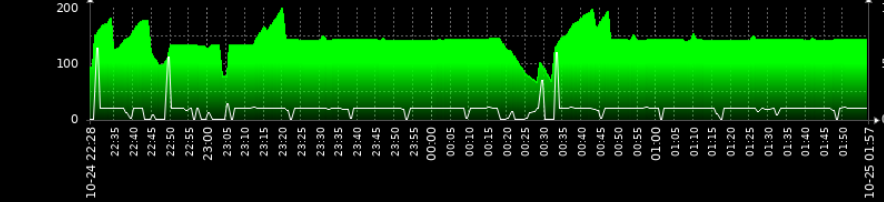
MySQL Seconds Behind MPC



neosever: NEOfixer All Starts 5 Min Average



neofixer.arizona.edu: NEOfixer Num Recently Updated 500 Objects



Behind The Scenes

Thank you!

Suggestions, questions?

Alex R. Gibbs

gibbs@arizona.edu

<https://neofixer.arizona.edu>

