

MEERKAT SURVEYS FOR PULSARS IN UNIDENTIFIED FERMI SOURCES



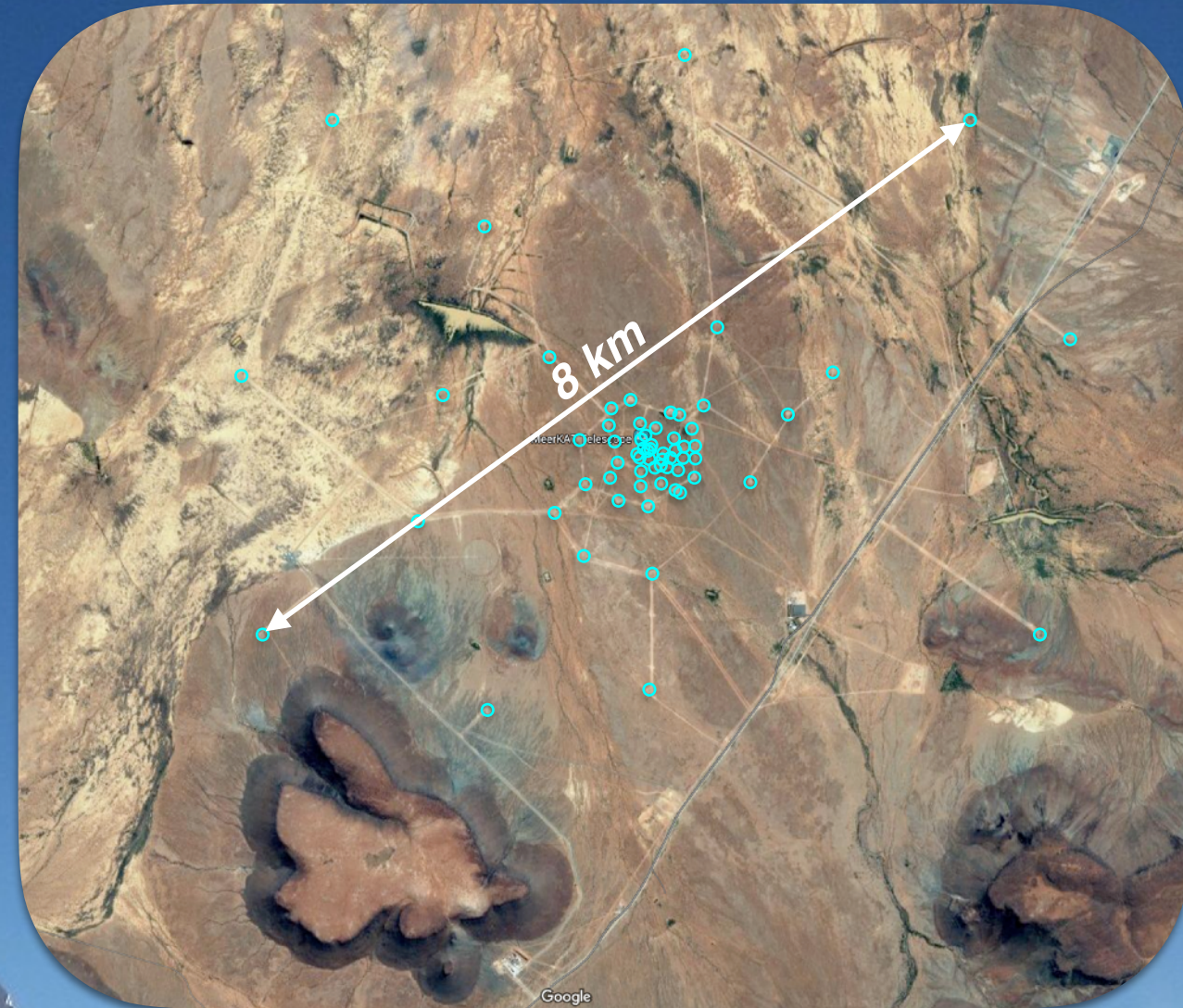
<https://www.idia.ac.za/ida-science-projects/>

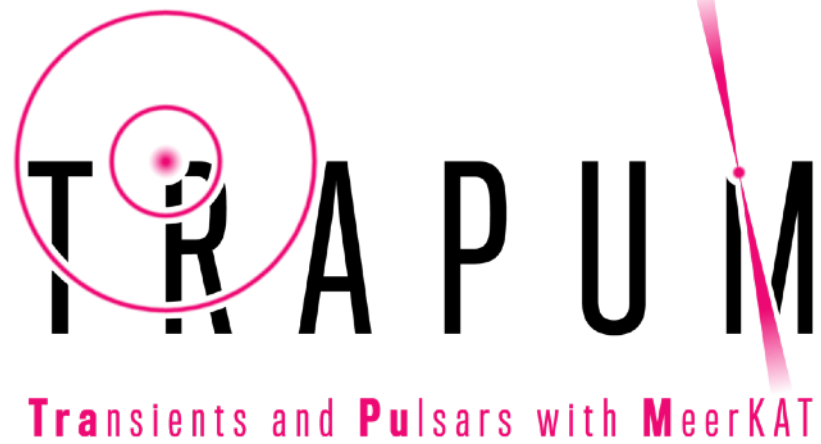
MARTA BURGAY - INAF OACAGLIARI
ON BEHALF OF THE TRAPUM COLLABORATION

Credit: E. Barr (MPIfR)

Number of antennas	64
Dish diameter	13.5 m
Minimum baseline	29 m
Maximum baseline	8 km
Frequency bands	544 – 1088 MHz (UHF-band) 856 – 1712 MHz (L-band) 1.75 – 3.5 GHz (S-band)
Instantaneous bandwidth	856 MHz
Gain	2.8 K/Jy
System temperature	18 K

2x more sensitive than GBT
6-8x more sensitive than Parkes

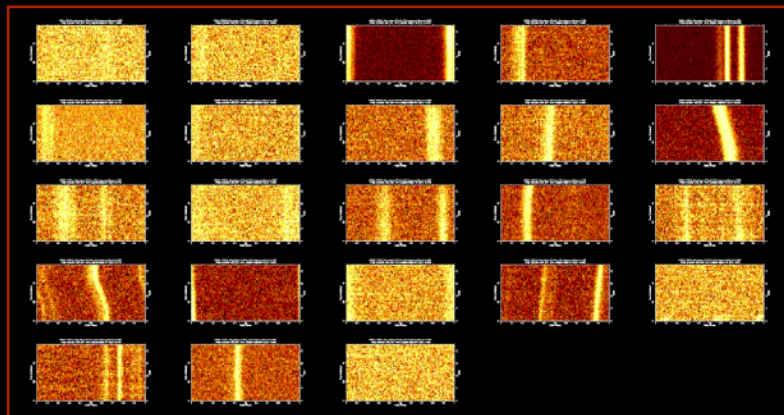




PRINCIPAL INVESTIGATORS: M KRAMER & B. W. STAPPERS

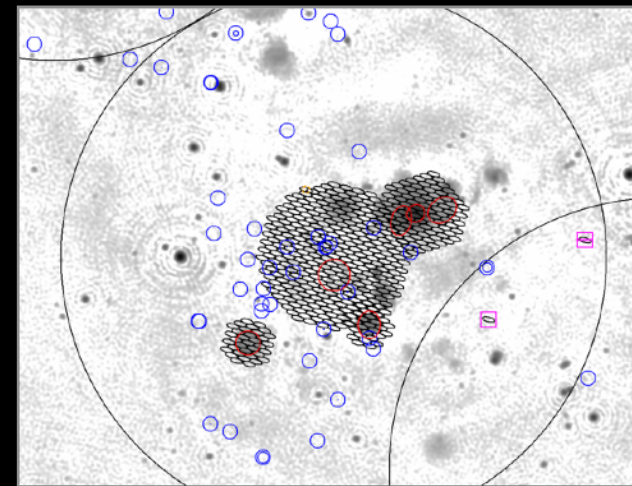
PROJECT SCIENTIST: E. BARR

FOLLOW-UP COORDINATOR: M. BURGAY



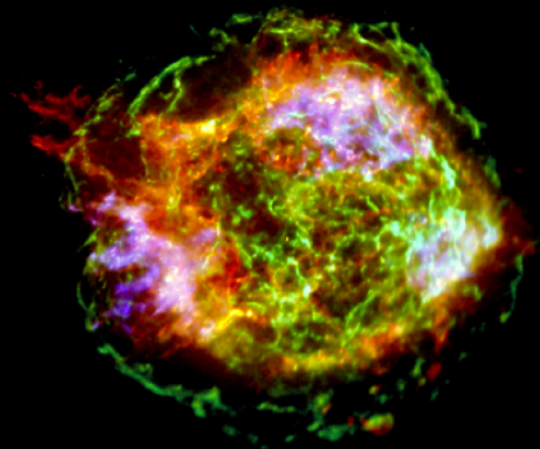
GLOBULAR CLUSTERS

CHAIR: A. RIDOLFI



NEARBY GALAXIES

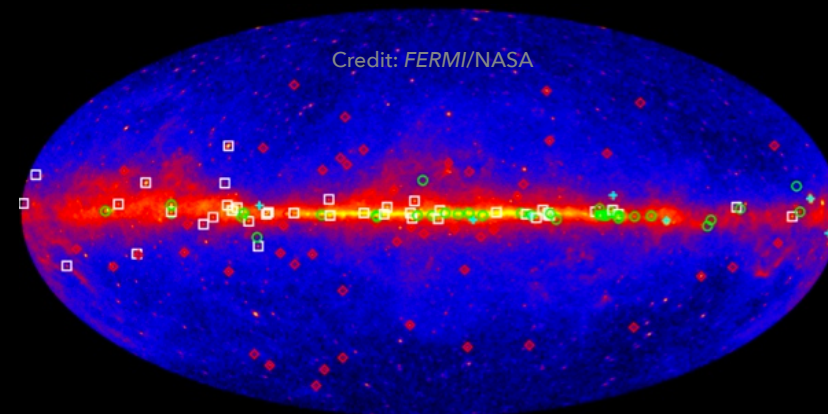
CHAIR: L. LEVIN-PRESTON



Cas A - X-ray - Chandra/NASA

SNR/PWNE/TeV SOURCES

CHAIR: E. KEANE

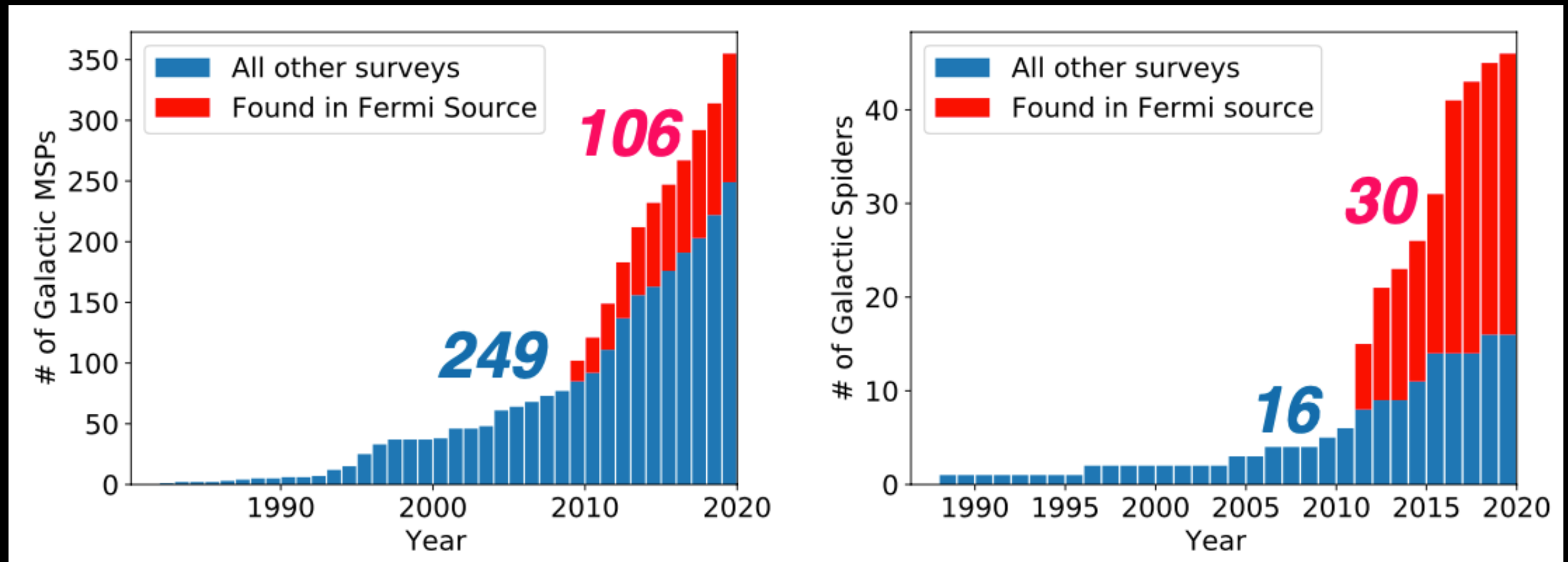


UNIDENTIFIED FERMI SOURCES

CHAIR: R. BRETON

WHY FERMI?

<http://astro.phys.wvu.edu/GalacticMSPs/GalacticMSPs.txt>



- $>1/4$ MSPs have been found in Fermi sources
- $2/3$ of 'spiders' have been found in Fermi sources



TRAPUM FERMI SEARCHES

SHALLOW SURVEYS:

79 SOURCES AT L-BAND

+ 13 ADDITIONAL SOURCES AT UHF

2x10-MIN POINTINGS

~100 μ JY SENSITIVITY AT L-BAND

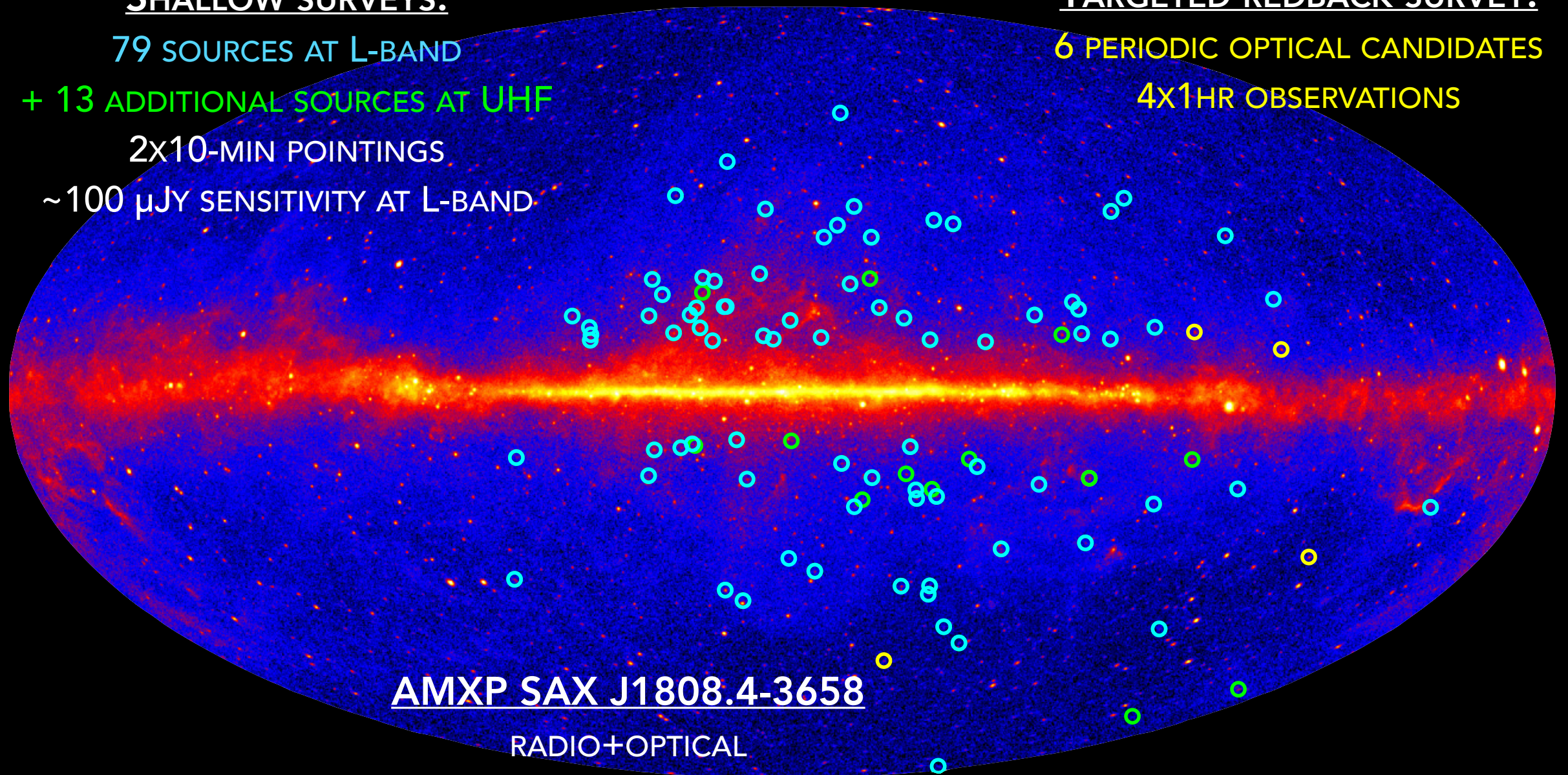
TARGETED REDBACK SURVEY:

6 PERIODIC OPTICAL CANDIDATES

4x1HR OBSERVATIONS

AMXP SAX J1808.4-3658

RADIO+OPTICAL



L-BAND SURVEY DISCOVERIES

J1036-4353

P = 1.68 ms

J1526-2744

P = 2.49 ms

J1623-6936

P = 2.41 ms

J1709-0333

P = 3.52 ms

J1757-6032

P = 2.91 ms

J1803-6707

P = 2.13 ms

J1823-3543

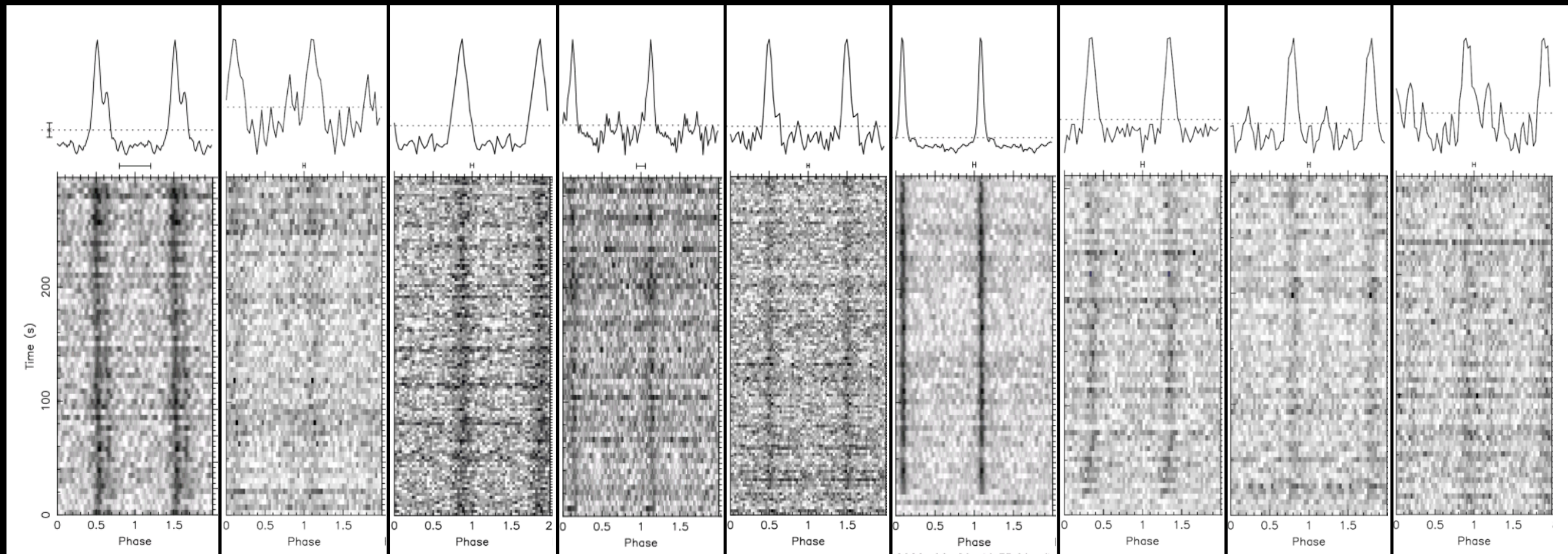
P = 2.37 ms

J1858-5422

P = 2.36 ms

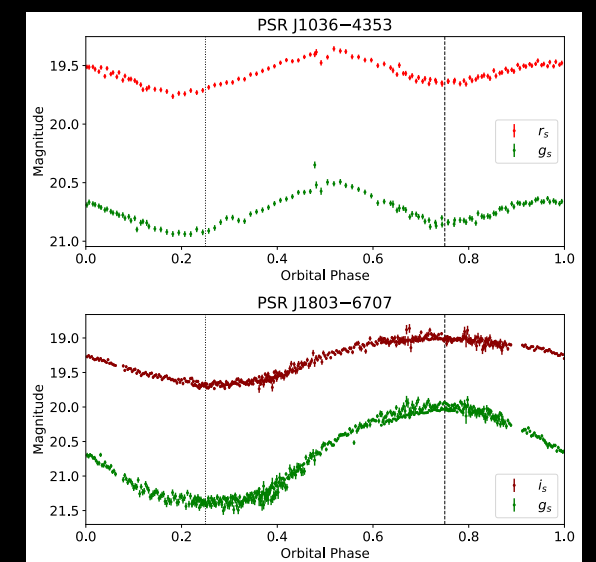
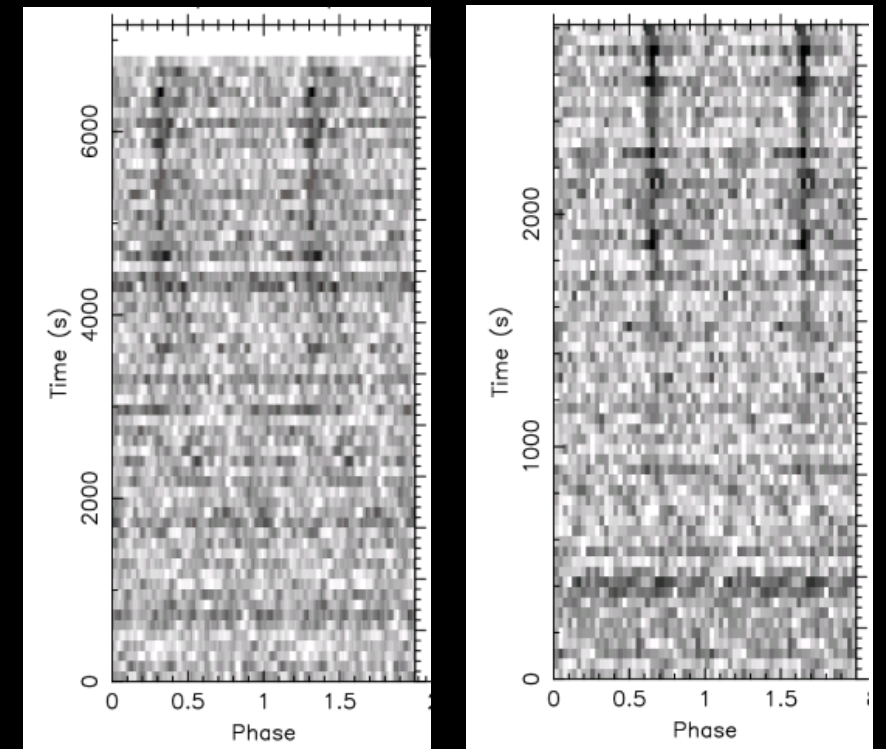
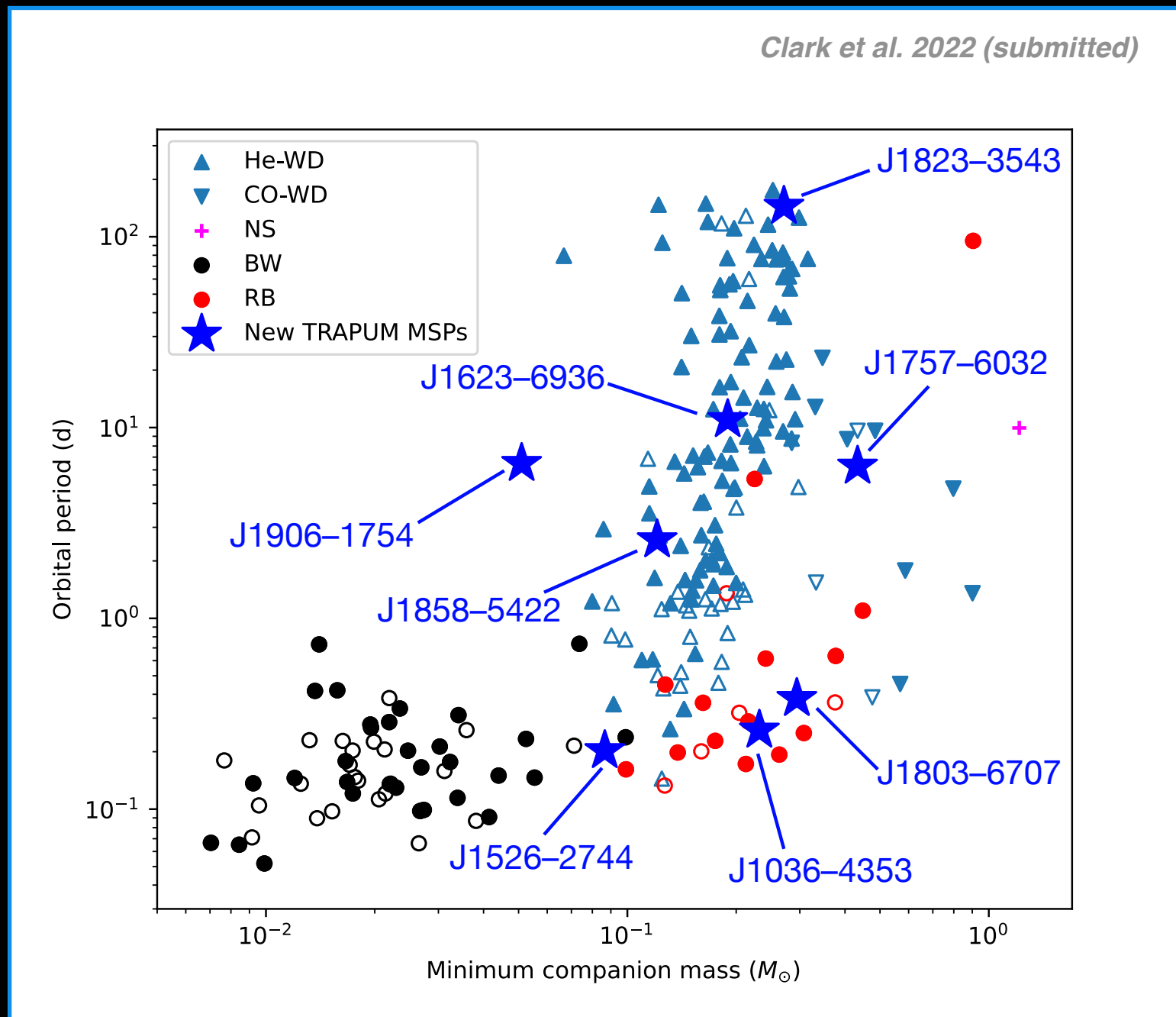
J1906-1754

P = 2.88 ms



<http://trapum.org/discoveries.html>

L-BAND SURVEY DISCOVERIES



UHF SURVEY DISCOVERIES

J0657-4657

P = 3.95 ms

J1259-8148

P = 2.09 ms

J1356+0230

P = 2.82 ms

J1823+1208

P = 5.21 ms

J1831-6503

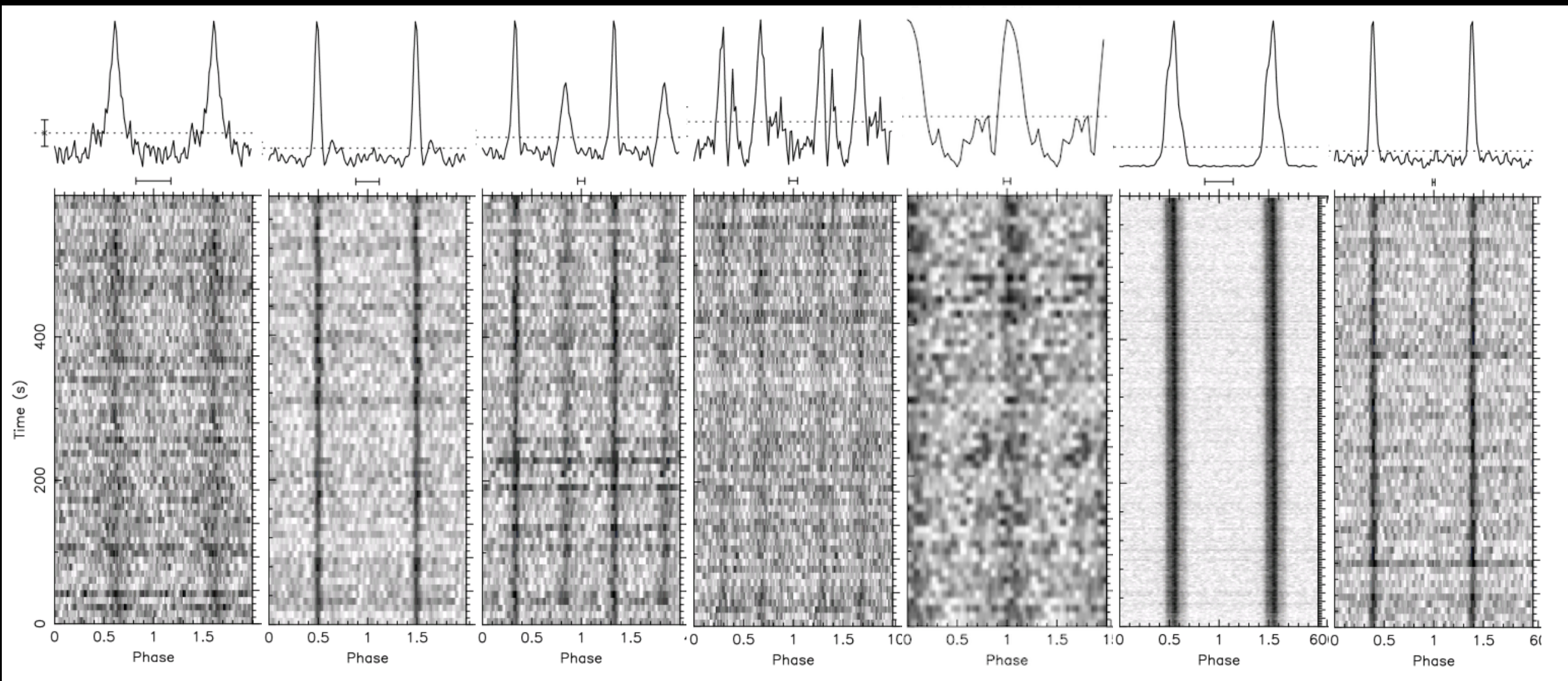
P = 1.85 ms

J1910-5320

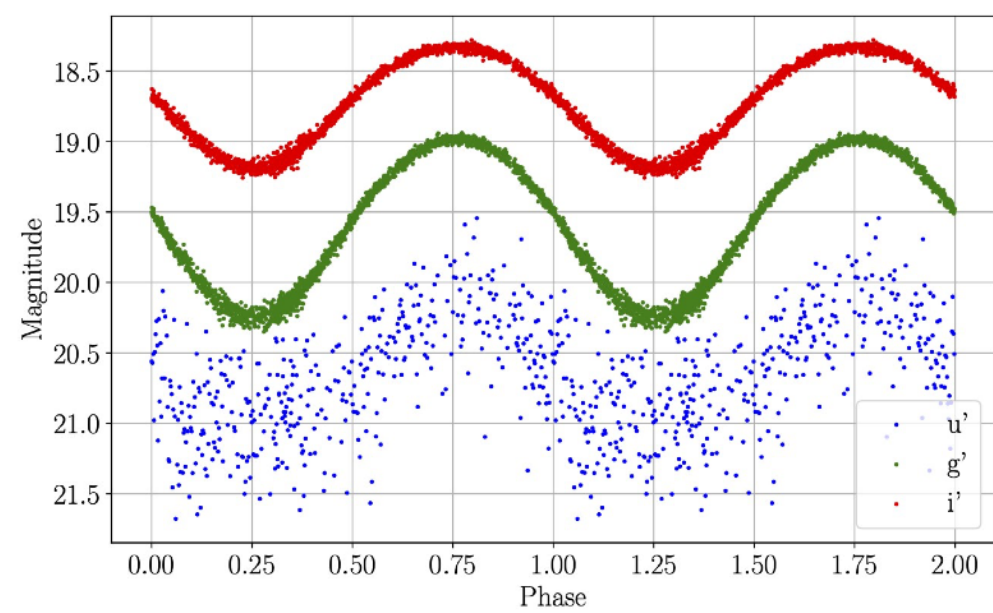
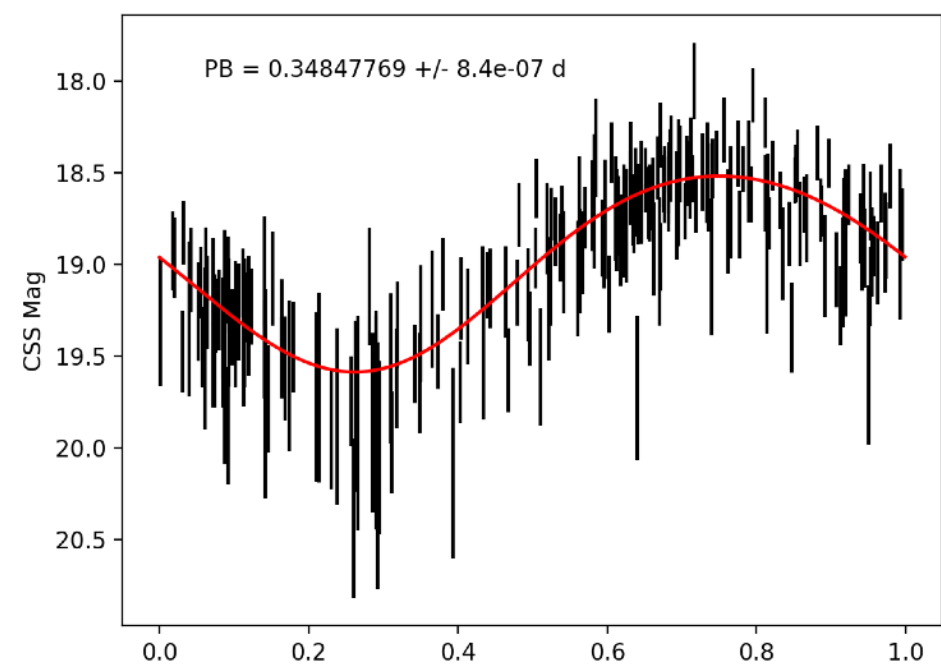
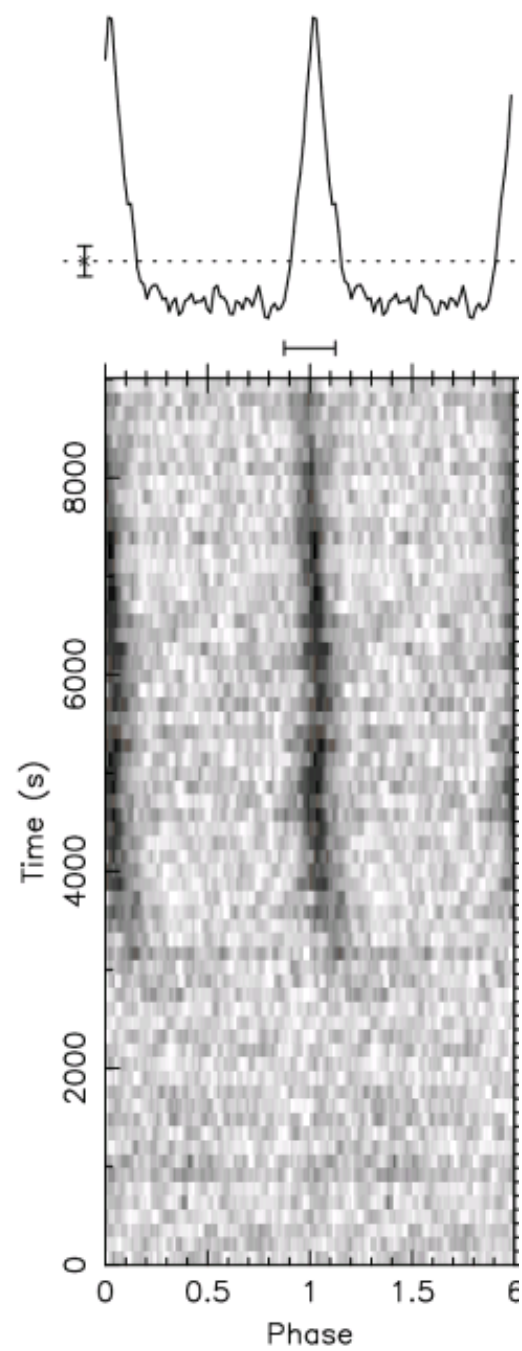
P = 2.33 ms

J2029-4239

P = 5.31 ms

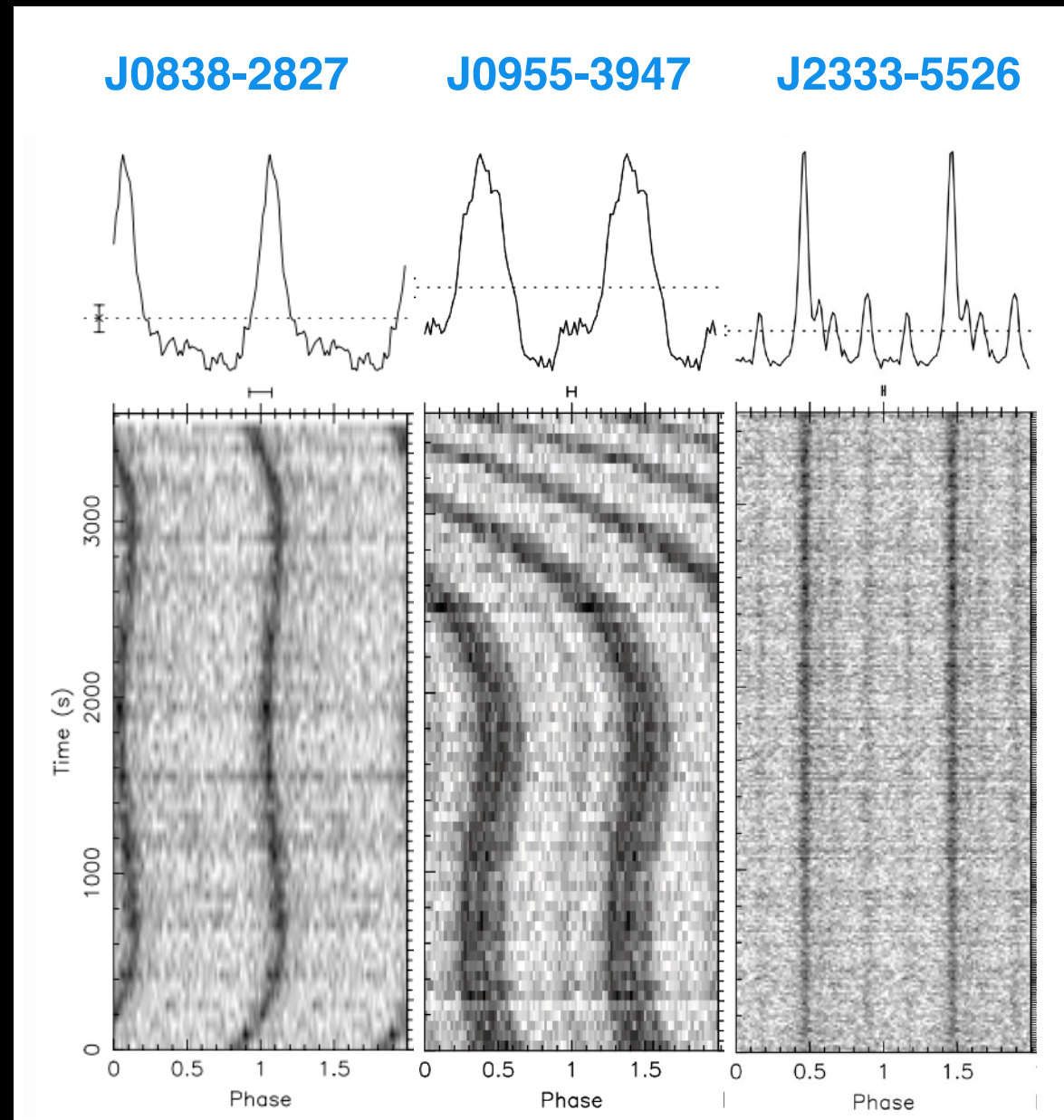


+ 3 PSRs IN THE INCOHERENT BEAM



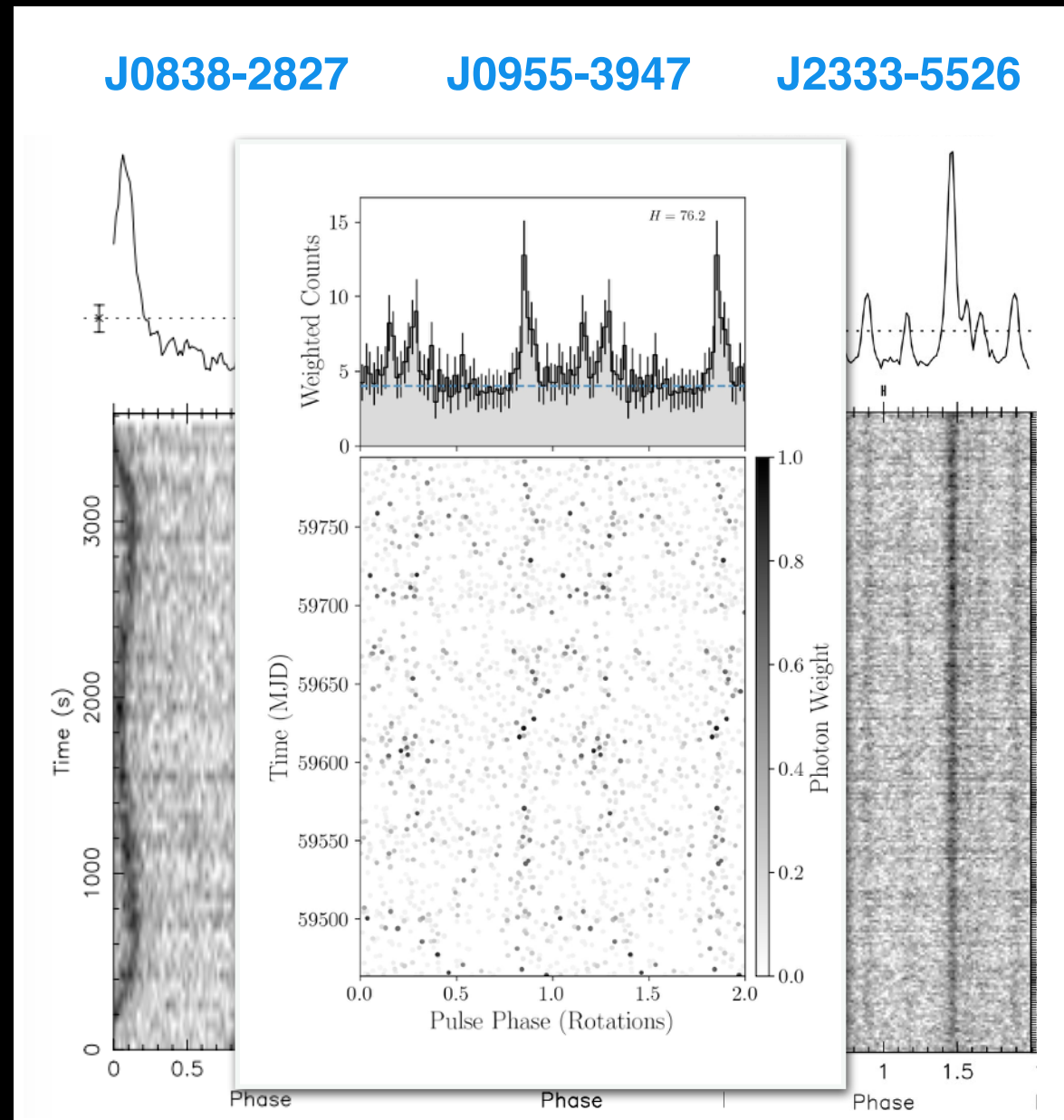
SURVEY ON RB CANDIDATES

- Selected on the basis of optical, X-ray and γ -ray info
- 4FGL J0523.3-2527
- 4FGL J0838.7-2827
- 4FGL J0940.3-7610
- 4FGL J0955.3-3949
- 4FGL J2333.1-5527
- 4FGL J1120.0-2204



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- 4FGL J0523.3-2527
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- 4FGL J0955.3-3949
- 4FGL J2333.1-5527
- 4FGL J1120.0-2204



TIMING AND Γ -RAY FOLLOW-UP

- TIMING ONGOING AT MEERKAT + PARKES, NANÇAY, EFFELSBERG
- FROM 19 NEW MSPs (+3 PSRs):
 - 12 HAVE COHERENT TIMING SOLUTION
 - 8 HAVE FERMI PULSATIONS

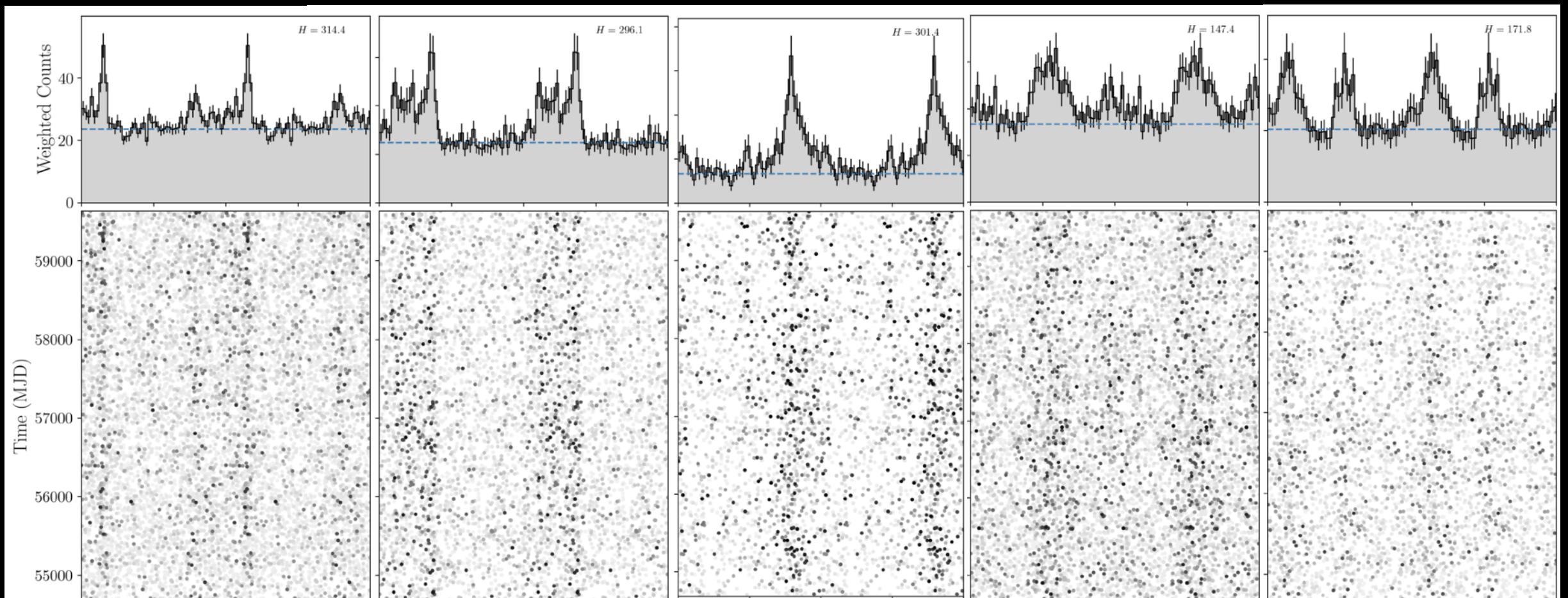
J1259-8148

J1623-6939

J1757-6032

J1858-5422

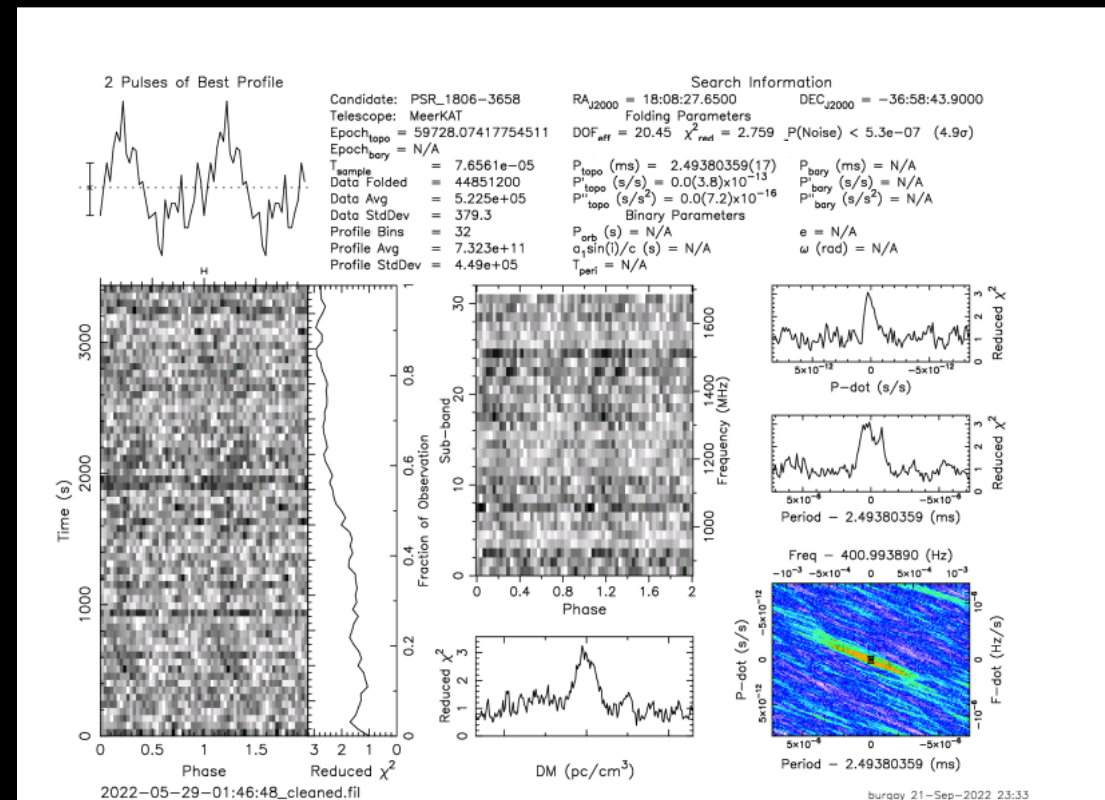
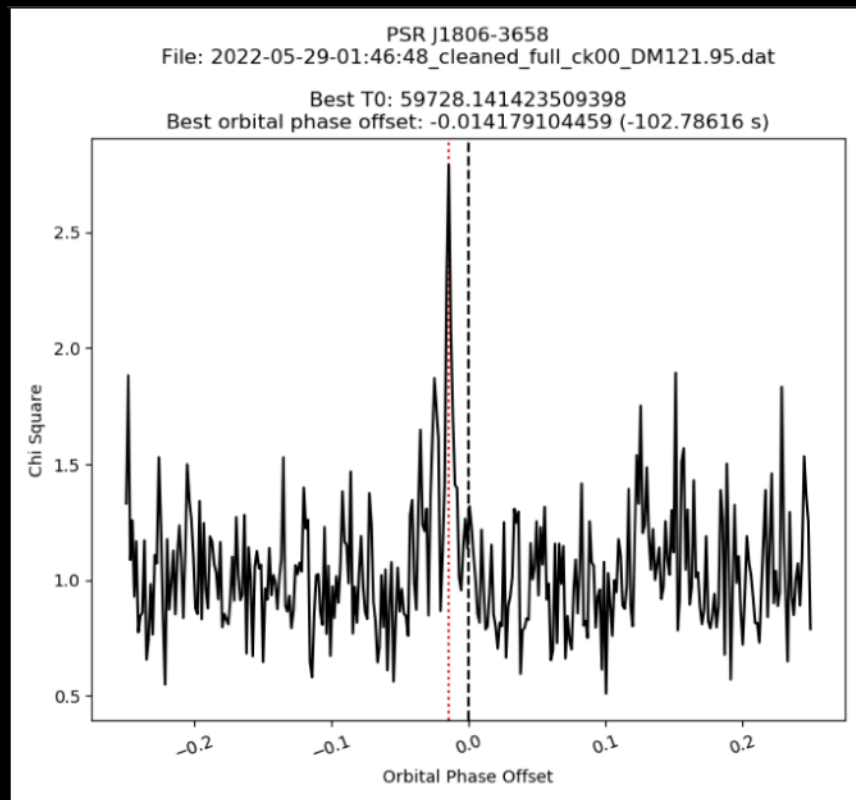
J2029-4239



SAX J1808.4-3658

- 6X1 HR OBSERVATIONS (3 IN JUNE 2021, 3 IN MAY 2022)
- SIMULTANEOUS WITH OPTICAL (ARIANNA'S TALK)
- BLIND ACCELERATED SEARCH
- T0 + DM SEARCH

PRELIMINARY



SUMMARY & FUTURE

- SEARCHES IN FERMI TARGETS CONTINUE TO PROVE FRUITFUL
- 19 MSPs + 3 PSRs DISCOVERED (9 L-BAND, 7+3 UHF, 3 RB)
- UHF SURVEY 1/3 TO GO
- TIMING & MWL CHARACTERISATION UNDERWAY
- SAX J1808 DATA ANALYSIS UNDERWAY

THANK YOU



QUESTIONS?