The International Pulsar Timing Array & How To Get Involved

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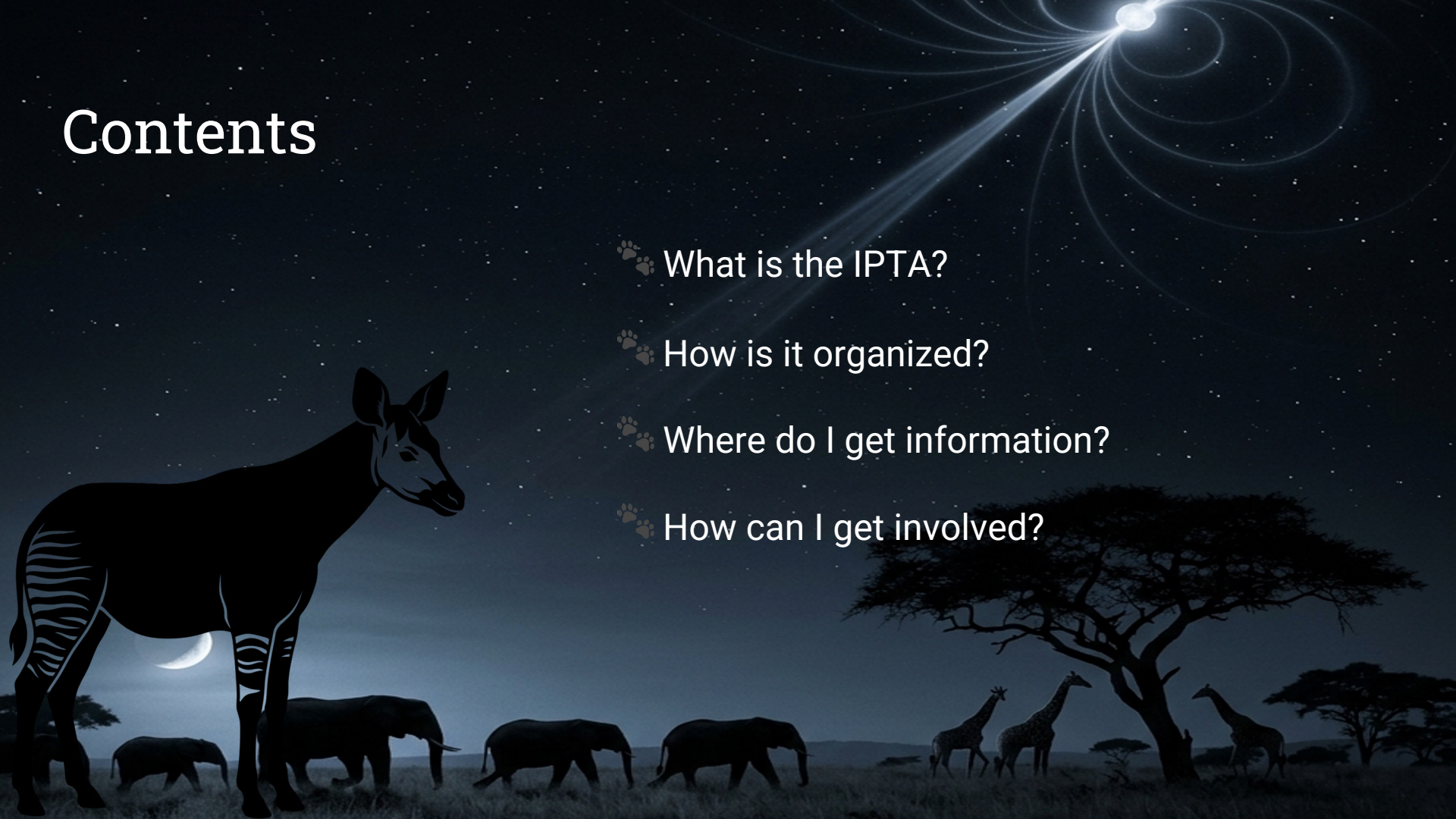
UCF/FSI

Joris.Verbiest@ucf.edu

Contents



- What is the IPTA?
- How is it organized?
- Where do I get information?
- How can I get involved?

What is the IPTA?

- A consortium of consortia
- Aim: “to facilitate collaboration [...] and promote progress [...]”

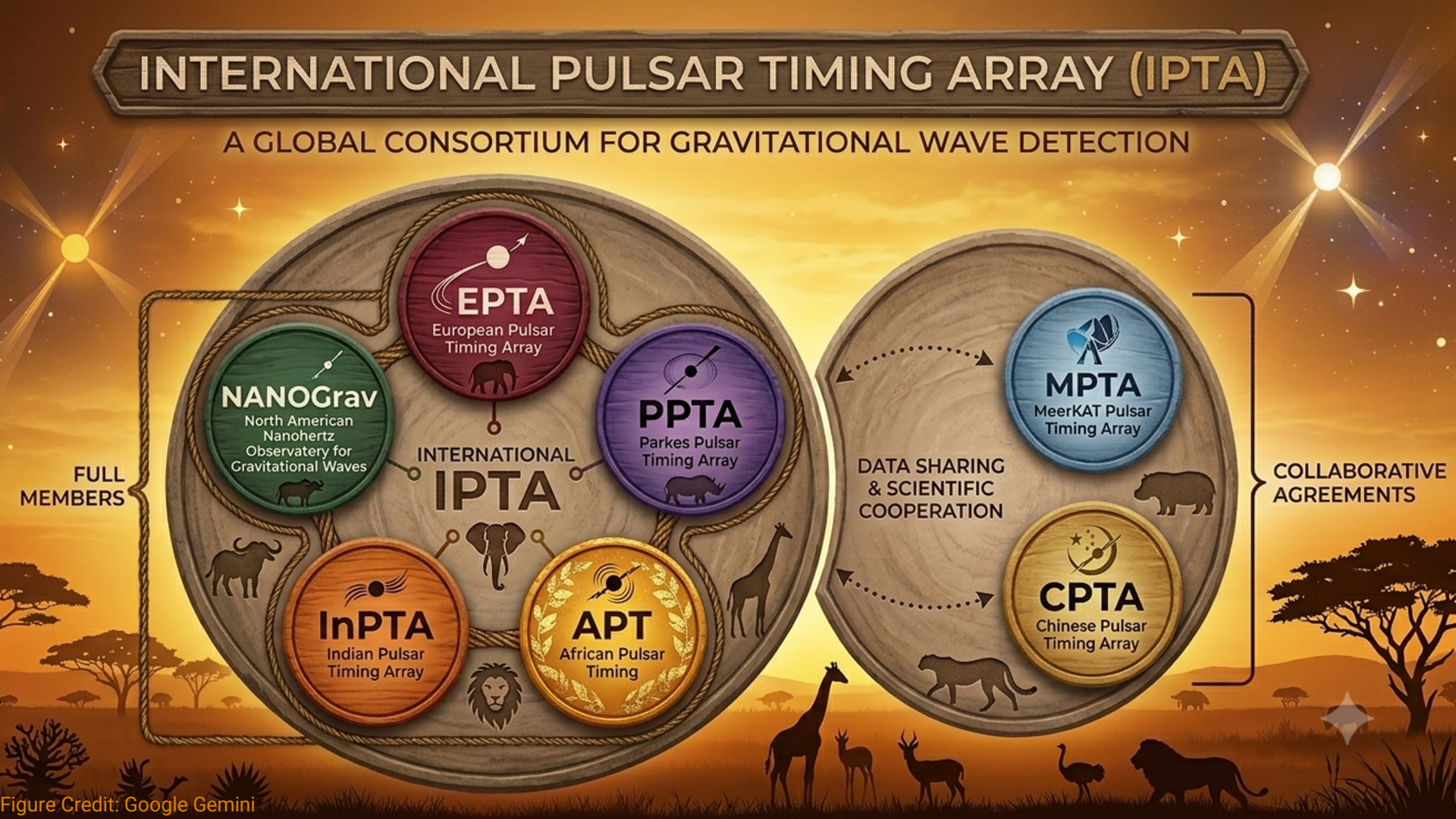


Figure Credit: Google Gemini

What is the IPTA? - Current Situation

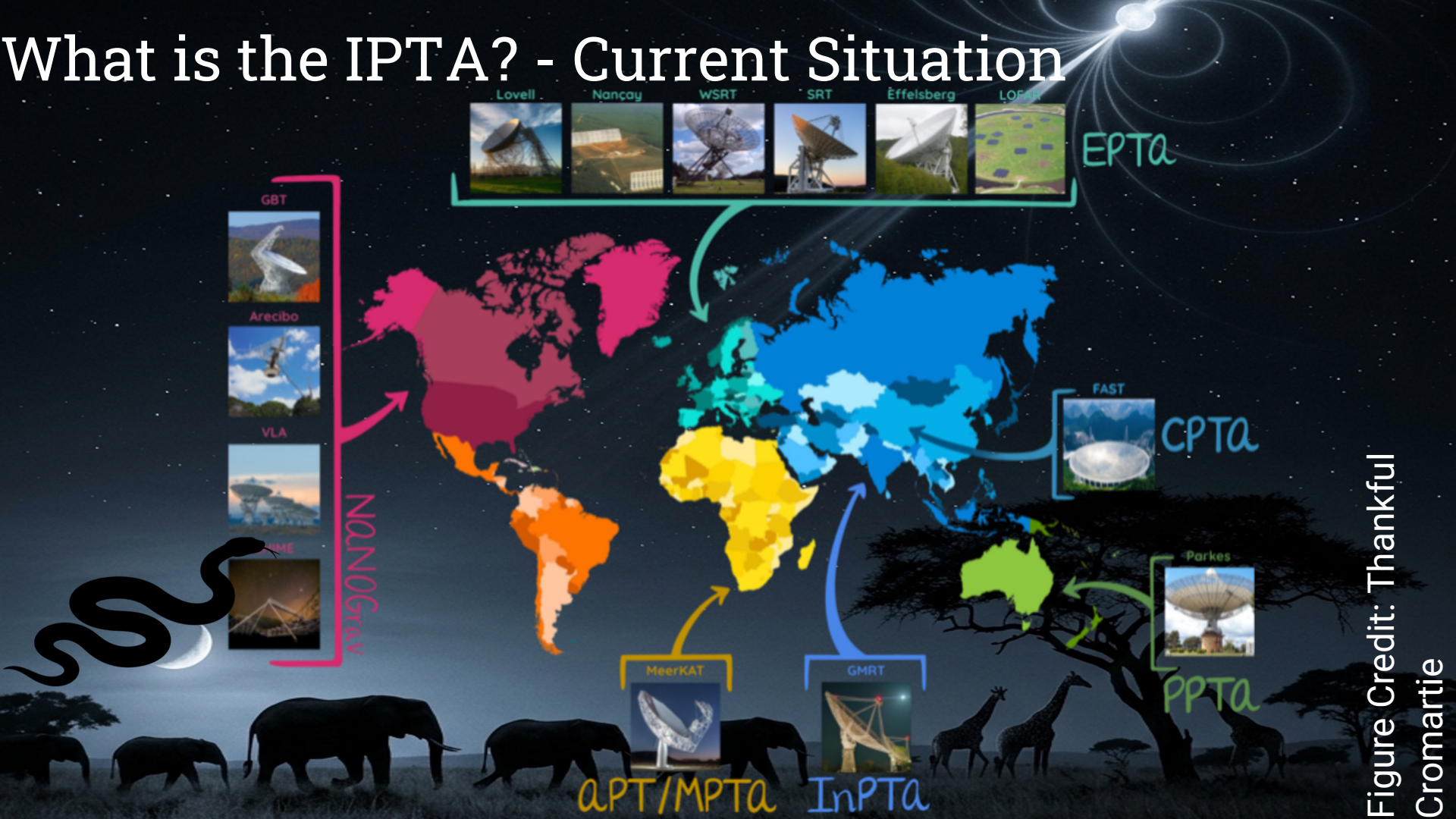
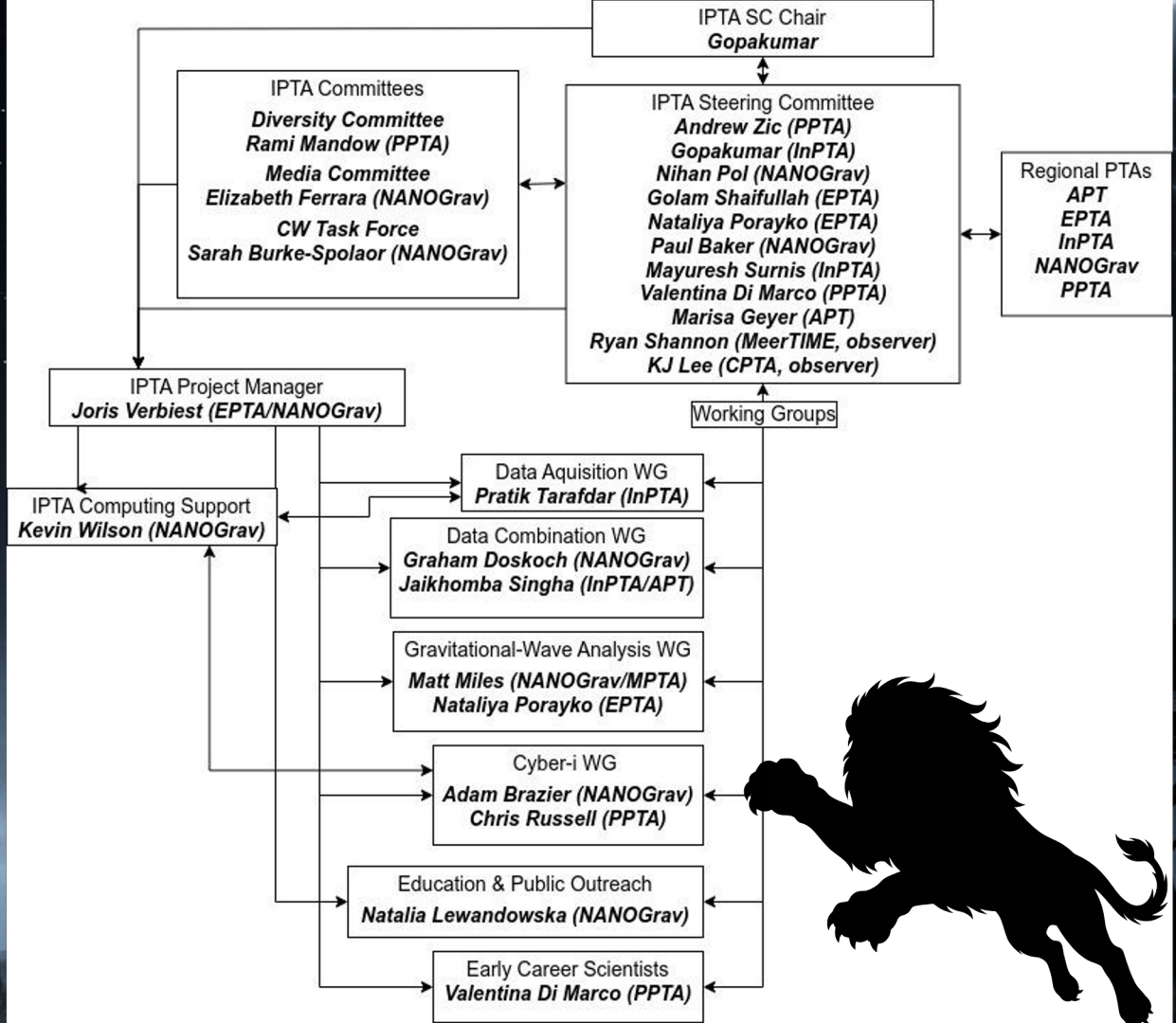


Figure Credit: Thankful Cromartie

What is the IPTA? - Current Situation

- A consortium of consortia
- APT, EPTA, InPTA, NANOGrav, PPTA
  - Every member of every member consortium is an IPTA member!
- Data-sharing/Collaboration agreements with MPTA, CHIME, CPTA

How is the IPTA organized?



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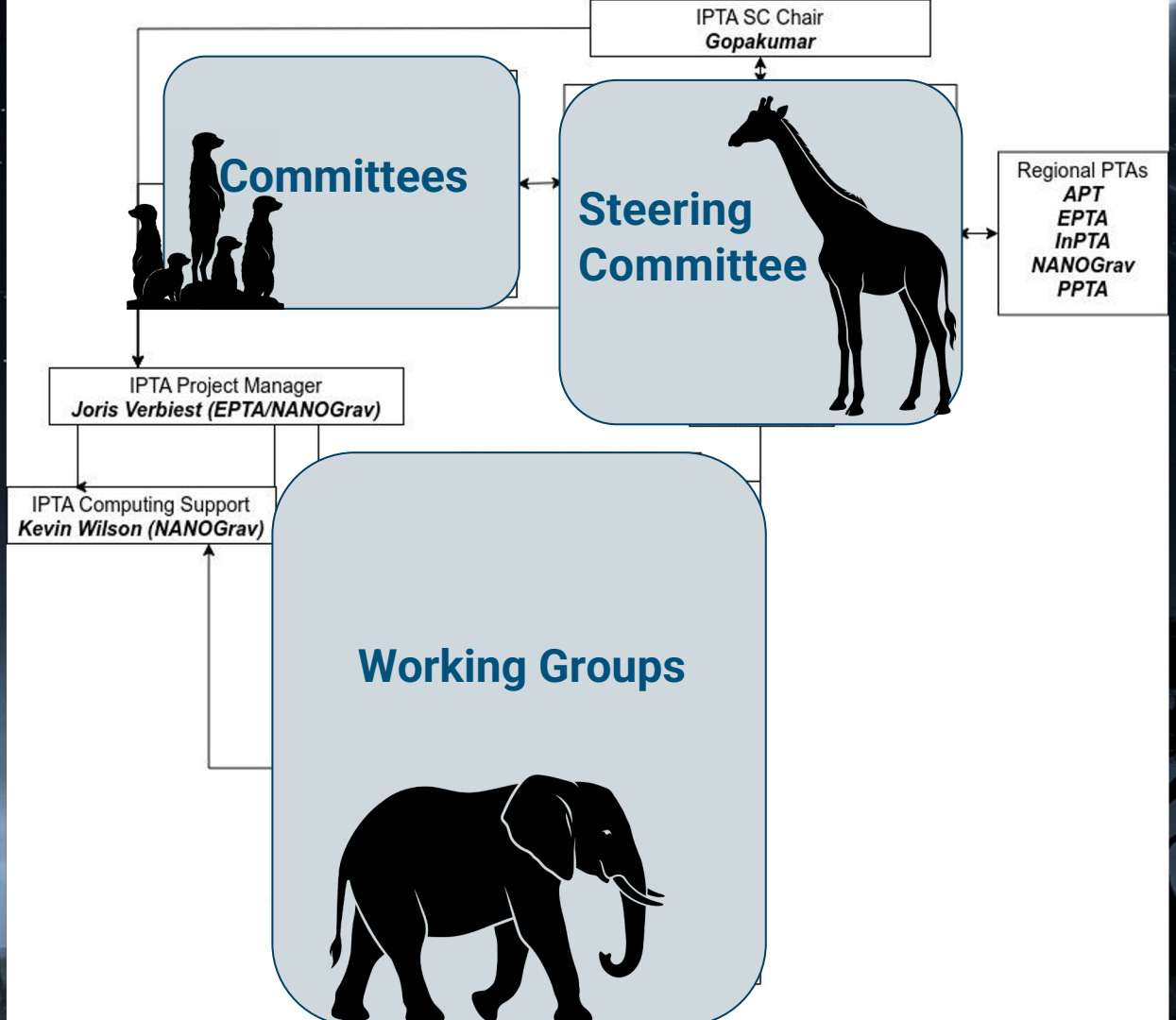


How is the IPTA organized?

- Management/Leadership : IPTA Steering Committee
  = 2 representatives from each PTA + previous chair + IPTA manager
  Currently:
  Nataliya Porayko, Golam Shaifullah (EPTA),
  Gopakumar (chair), Mayuresh Surnis (InPTA),
  Paul Baker, Nihan Pol (NANOGrav),
  Andrew Zic, Valentina Di Marco (PPTA),
  Marisa Geyer (APT),
  Ryan Shannon (MPTA), Kejia Lee (CPTA), Joris Verbiest (manager)
- Working Groups
- Committees

How is the IPTA organized?

Working Groups:

- Data Acquisition (Chair: Pratik Tarafdar)
- Data Combination (Chairs: Graham Doskoch, Jaikhomba Singha)
- Gravitational-Wave Analysis (Chairs: Matt Miles, Nataliya Porayko)
- Early Career Scientists (Chair: Valentina Di Marco)
- Education & Public Outreach (Chair: Natalia Lewandowska)
- Cyberinfrastructure (Chair: Adam Brazier, Chris Russell)

How is the IPTA organized?

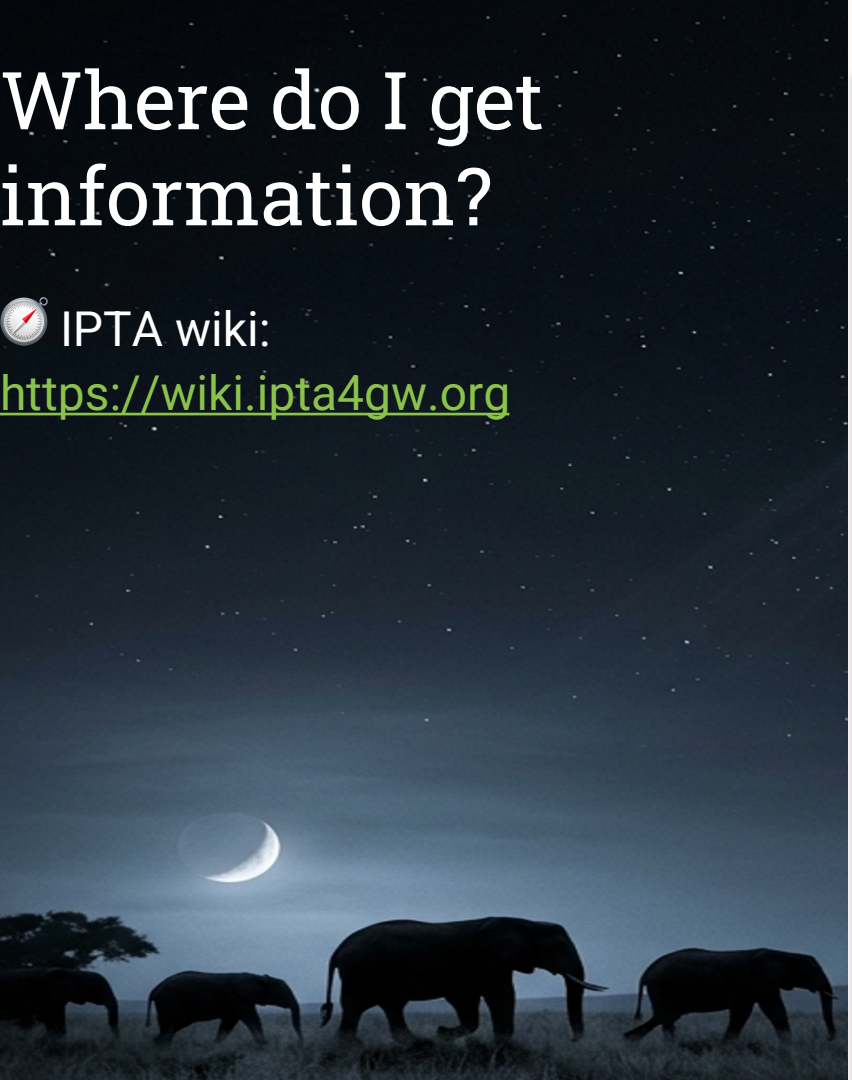
Committees:

- Steering Committee (Chair: Gopakumar)
- Diversity Committee (Chair: Rami Mandow)
- Media Committee (Chair: Elizabeth Ferrara)
- CW Detection Task Force (Chair: Sarah Burke-Spolaor)


Where Do I Get Information?

Where do I get information?

IPTA wiki:
https://wiki.ipta4gw.org



Trace: · ipta_steering_committee · diversity_committee · media_committee · cw_detection_task_force · education_and_public_outreach · ipta_working_groups · start

start

International Pulsar Timing Array WIKI

Edit

Policies and organisation

- Agreements/Policies/Constitution
- E-Mail Exploders

Edit

Committees and Working Groups

- IPTA Committees
  - Steering Committee
  - Steering Committee meeting minutes
  - Diversity Committee
  - Media Committee
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  - Gravitational Wave Analysis
  - PTA Early Career Scientists
  - Education and Public Outreach
  - Cyberinfrastructure
  - Pulse Profile Analysis

Edit

Projects and Publications

- Projects
- Papers in preparation
- Memos
- Preprints

Edit

Resources

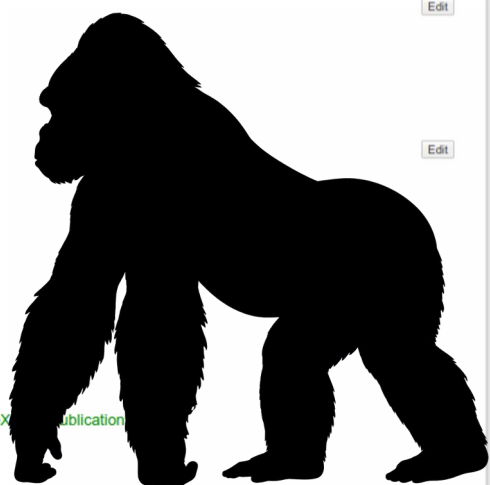
- IPTA Telecons ← **NEW!**
- Centralised IPTA Computing Infrastructure
- Mentor Program

- Outreach
- FAQ
- Source Lists
- Shared MSP Discoveries
- Logo
- Logo/Banner Contest
- Acknowledgement for Telescopes, Observatories, Funding Projects (LaTeX ublication

Meetings and Workshops

Table of Contents

- International Pulsar Timing Array WIKI
  - Policies and organisation
  - Committees and Working Groups
  - Projects and Publications
  - Resources
  - Meetings and Workshops



The IPTA Wiki

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Agreements/Policies/Constitution

On this page we give the Constitution, Policies and Agreements under which the IPTA opera

Constitution

- IPTA Constitution (15 March 2012)

Policies and Agreements

General

- Project and Publication Policy (January 2026)
- Searching Statement of Intent (7 September 2012)
- Code of conduct/Anti-harassment policy (January 2024)
- Working Groups
- Continuous Wave Task Force Terms of Reference

Data Sharing

- Data-Sharing Agreement (January 2026)
- MeerTIME/IPTA Data-sharing Agreement (14 Feb 2023)
- CHIME Data-Sharing Agreement (December 2023)
- CPTA-Data Sharing Agreement (June 2025)

Membership

- Ratified Membership Policy (28 August 2018)
- InPTA joining agreement (9 March 2021)
- APT joining agreement (7 April 2025)

Old & Outdated

- Project and Publication policy (January 2025)
- Publication Policy (15 March 2012)
- Detection Protocol (2014)
- Data-Sharing Agreement (26 Sep 2023)
- Original Data-Sharing Agreement (2009)
- Code of conduct/Anti-harassment policy (March 2017)

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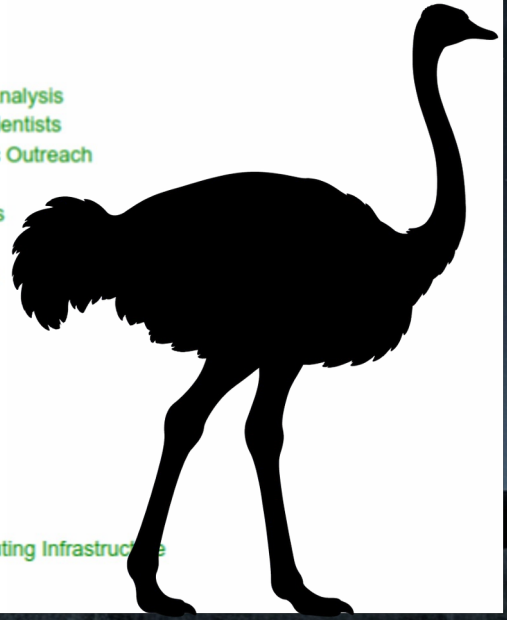

The IPTA Wiki

IPTA Contacts

Recipients	Address
IPTA Steering Committee Chair	iptasc_chair@ipta4gw.org
IPTA Steering Committee Members and Observers	iptasc@lists.pulsarastronomy.net
All WG chairs **Please use with discretion!**	wg_chairs@ipta4gw.org
All IPTA Members **Please use with discretion!**	ipta@lists.pulsarastronomy.net

Working Group	WG Exploder Address	Chair Address
Data Acquisition	ipta-da@ipta4gw.org	dawg_chairs@ipta4gw.org
Data Combination	ipta-dcwg@lists.pulsarastronomy.net	dcwg_chairs@ipta4gw.org
GW Analysis	gwa@ipta4gw.org	gwawg_chairs@ipta4gw.org
Early Career Scientists	pecs@lists.pulsarastronomy.net	pta-ecs_chairs@ipta4gw.org
Education & Public Outreach	epo@ipta4gw.org	epowg_chairs@ipta4gw.org
Cyber-infrastructure	cyberi@ipta4gw.org	cyber-iwg_chairs@ipta4gw.org

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Mostly meeting minutes, also some contact information

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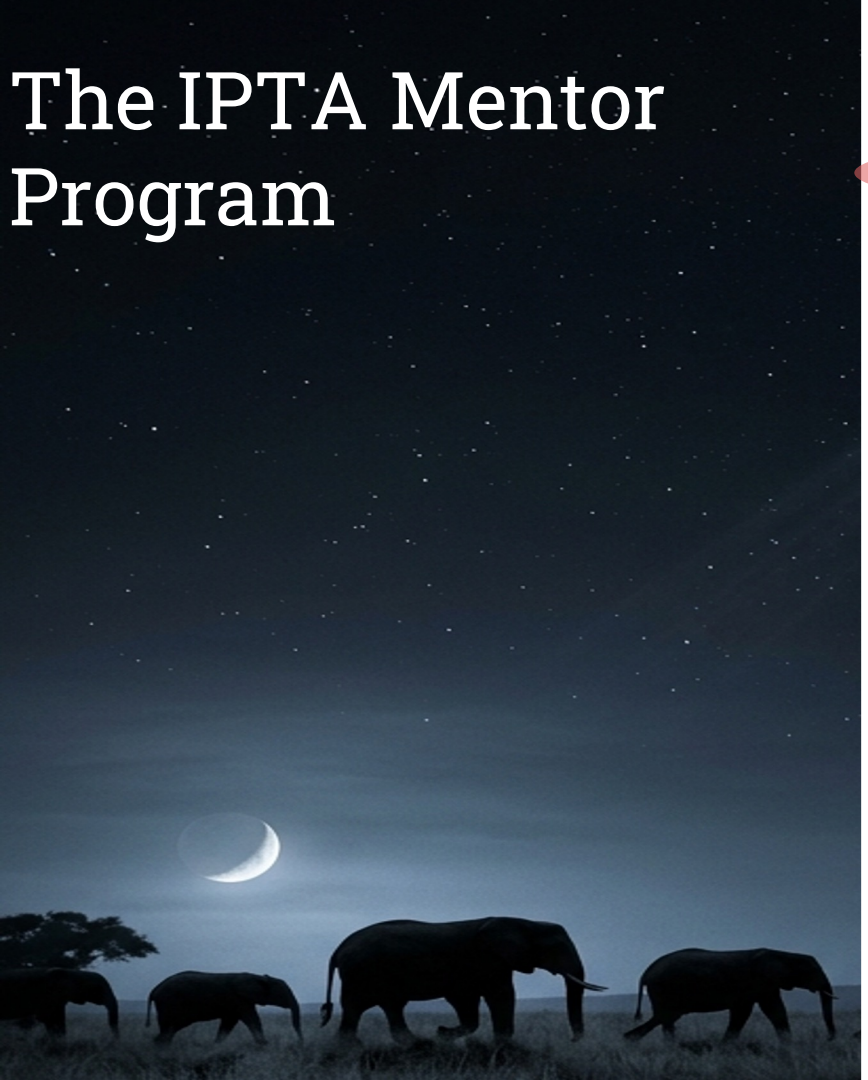


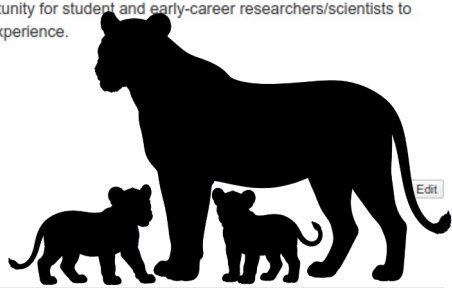
IPTA Mentor Program

Welcome to the IPTA Mentor Program. In this program, we aim to facilitate an opportunity for student and early-career researchers/scientists to work with a more senior member of the IPTA, gaining useful skills, knowledge and experience.

This pilot program will commence in 2024.

Find out more about how the program works

Report an Issue



Edit

Mentors

For our 2024 intake, click on links below to view the profiles of each of the mentors:

Mentors	Mentoring Topics
Manjari Bagchi (InPTA)	science questions; practical science; leading papers; living / working abroad; work / organisational culture
Sarah Burke-Spolaor (NANOGrav)	faculty applications; postdoc applications; choosing mentors; the funding system and grant proposals in the USA ; gravitational-wave astrophysics
Aurélien Chalumeau (EPTA)	fighting imposter syndrome; finding jobs; DEI; living in foreign countries; working in a large collaboration
Vivek Venkatraman Krishnan (EPTA)	grant proposal writing; programming; living in Germany
Natalia Lewandowska (NANOGrav)	job applications; CV vs. resume; two-body problem; living abroad; getting to know new cultures
James McKee (EPTA/ NANOGrav)	neurodiversity; presenting; job searching; moving countries; finding collaborators
Aditya Parthasarathy (EPTA)	pulsar timing; nanoHertz GW searches; pulsar emissions; population studies; radio / Gamma-ray analysis
Delphine Perrodin (EPTA)	living / working abroad; work / life balance; DEI; career advice; finding jobs
Andrea Possenti (EPTA)	career advice; project management; practical science; grant applications; large collaborations fellowships
Golam Shaifullah (EPTA)	pulsar timing; data combination; Python coding; proposal writing; mental health and well-being
Caterina Tiburzi (EPTA)	applying for grants / fellowships; networking; DEI; living / working abroad, working in large collaborations
Joris Verbiest (EPTA/ NANOGrav)	research; networking; career planning/funding; soft skills; living abroad
Sarah Vigeland (NANOGrav)	career advice; GW scientific questions; leading papers, project management, finding jobs

Edit

Connect with a Mentor Today!

Let us know, by email us at mentoring@lists.pulsarastronomy.net that you would like to participate in the mentor program and have selected a mentor. We'll take it from there and facilitate your connections. Please also read the mentor program guidelines and IPTA code of conduct.

Additionally, if you would like to become a mentor, please feel free to also email us at the same address.

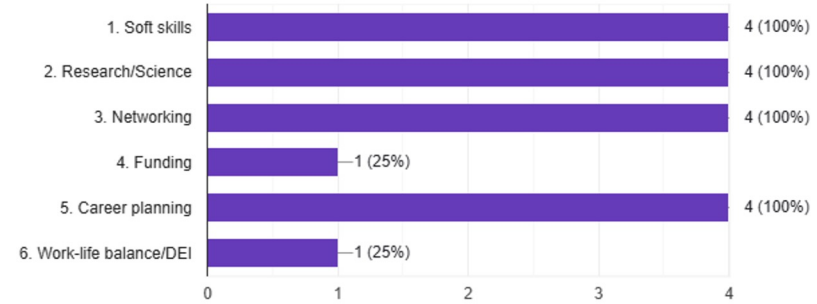
The IPTA Mentor Program

Content of mentorship

At the start of the program, in which of the listed areas did you think mentorship was desirable? (multiple choice allowed)

Copy

4 responses



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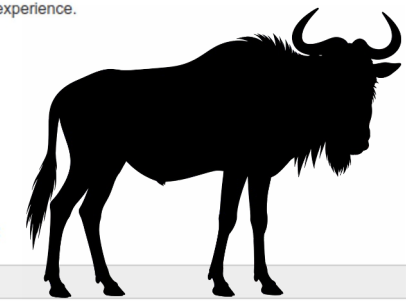

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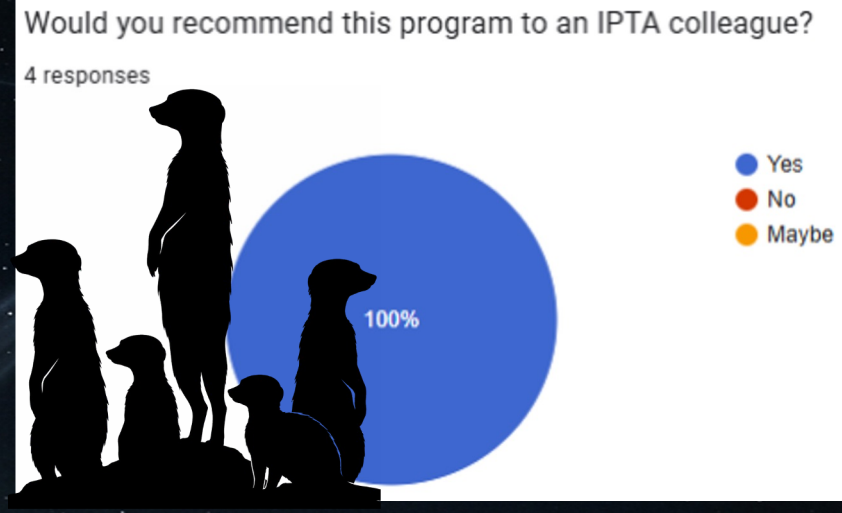
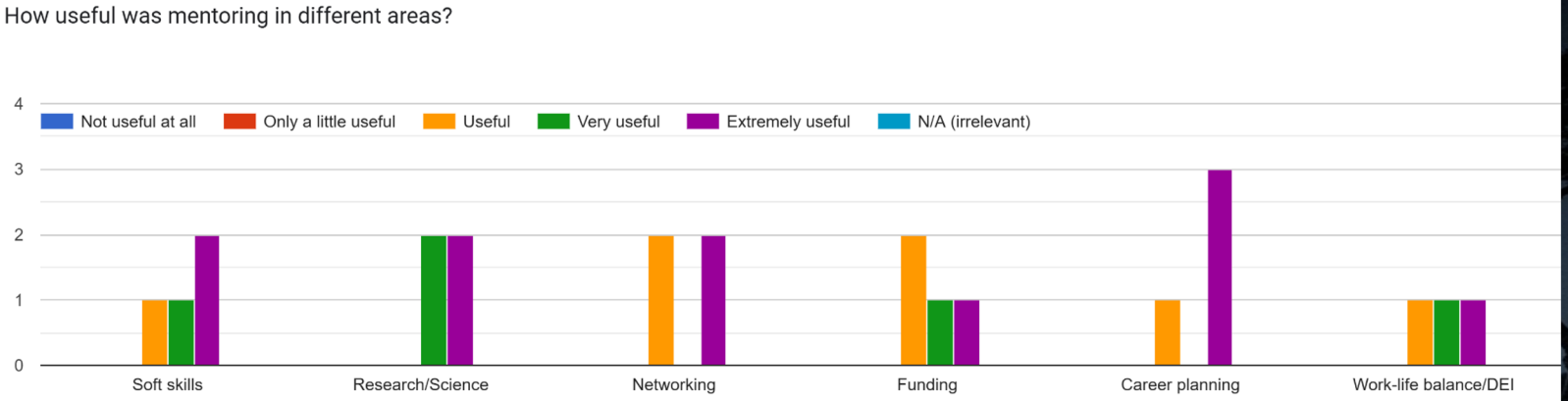
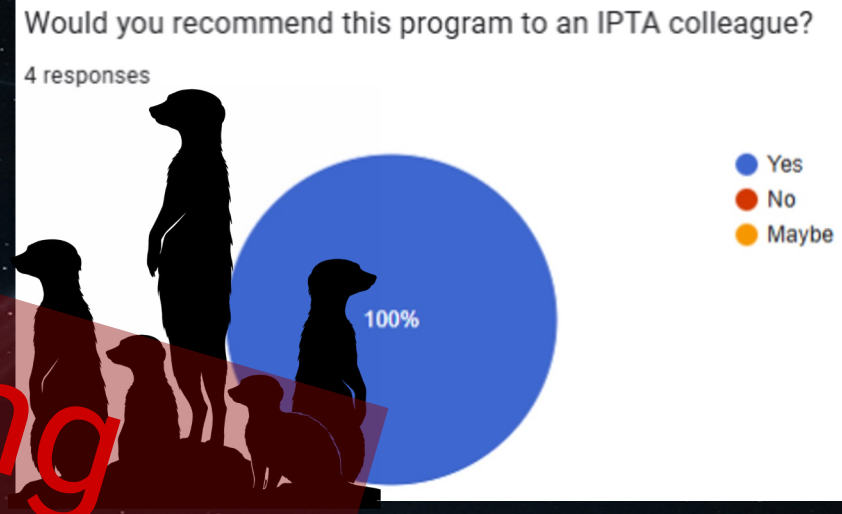




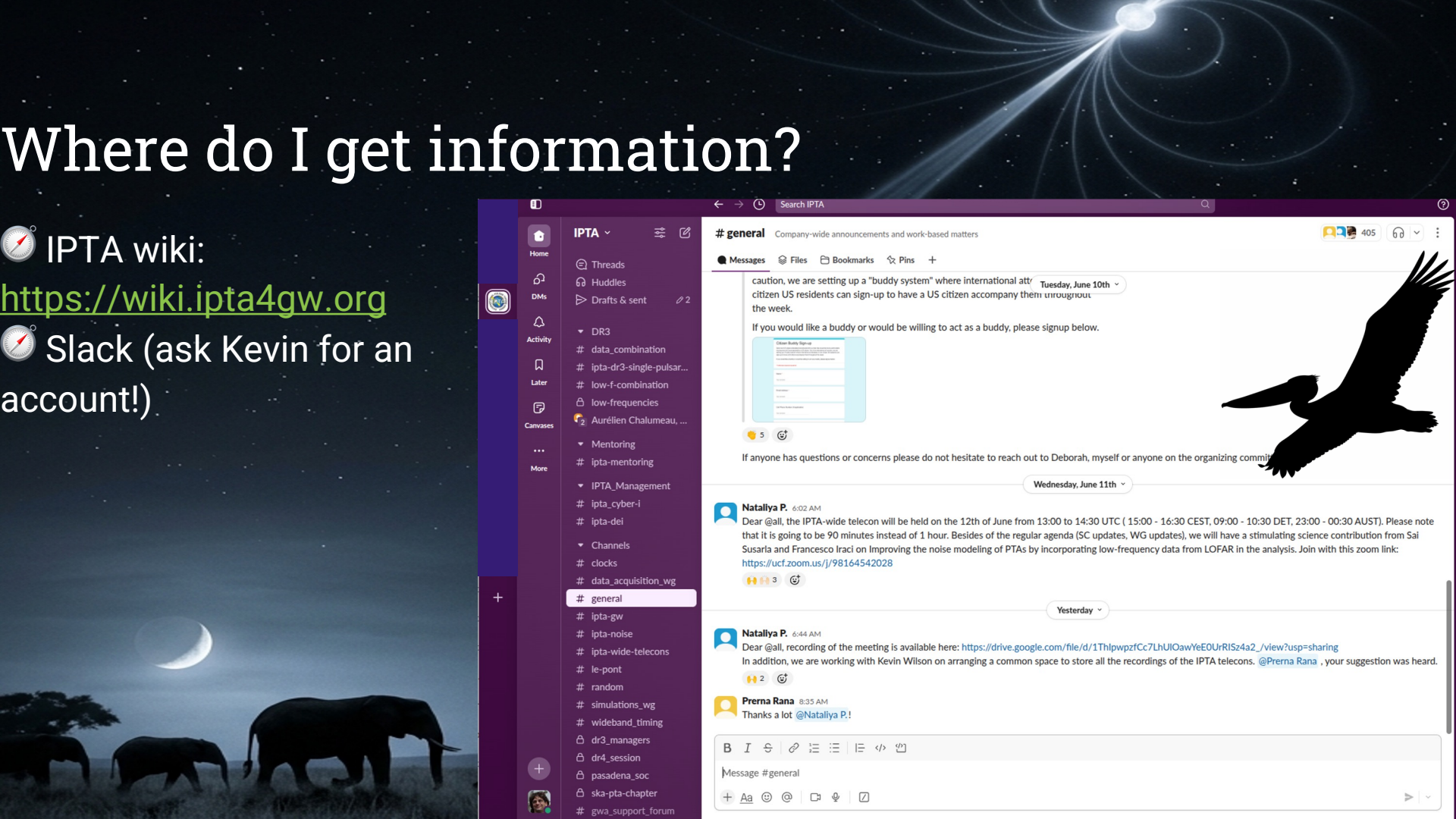
The IPTA Mentor Program



Being Restarted Soon!

Where do I get information?

- IPTA wiki: https://wiki.ipta4gw.org
- Slack (ask Kevin for an account!)



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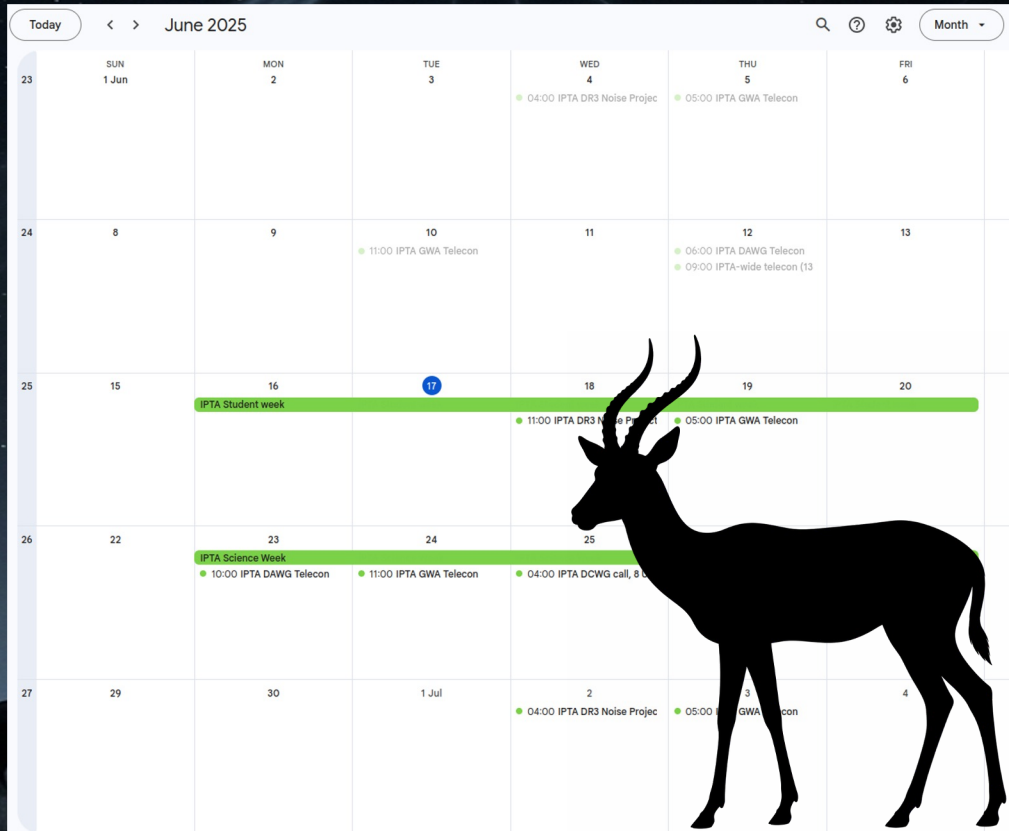

Where do I get information?

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- Slack (ask Kevin for an account!)
- IPTA Google Calendar (ask me!)
- Your IPTA Steering Committee Representatives
- Me (I'm responsible for communication…) – Joris.Verbiest@ucf.edu
- Ask Kevin Wilson (IPTA "Computing Resource") – kpwilson@pm.me

How can I get involved?

- Best way is by ***joining a Working Group***
  - Every IPTA member is welcome to attend every telecon.
  - All the work originates in, is discussed in, and is carried out within the WGs
  - IPTA SC consults with WGs and PTAs
  - ***Ask WG or Committee chairs how you can help***
- Join the ***Mentor Program***!
- Feel free to ***contact your SC representative***!
- Participate in IPTA discussions within your own PTA
- Attend the IPTA-wide telecons
- Feel free to get in touch with me (Joris.Verbiest@ucf.edu)
- Get a ***wiki*** account, ***Slack*** account, sign up for the Google ***Calendar***

Additional Slides: IPTA History (not up-to-date)

History

IOP PUBLISHING CLASSICAL AND QUANTUM GRAVITY

Class. Quantum Grav. **30** (2013) 224010 (12pp) doi:10.1088/0264-9381/30/22/224010

The International Pulsar Timing Array

R N Manchester (for the IPTA)

CSIRO Astronomy and Space Science, PO Box 76, Epping NSW 1710, Australia

E-mail: dick.manchester@csiro.au

Received 28 May 2013, in final form 4 September 2013
Published 4 November 2013
Online at stacks.iop.org/CQG/30/224010

Abstract

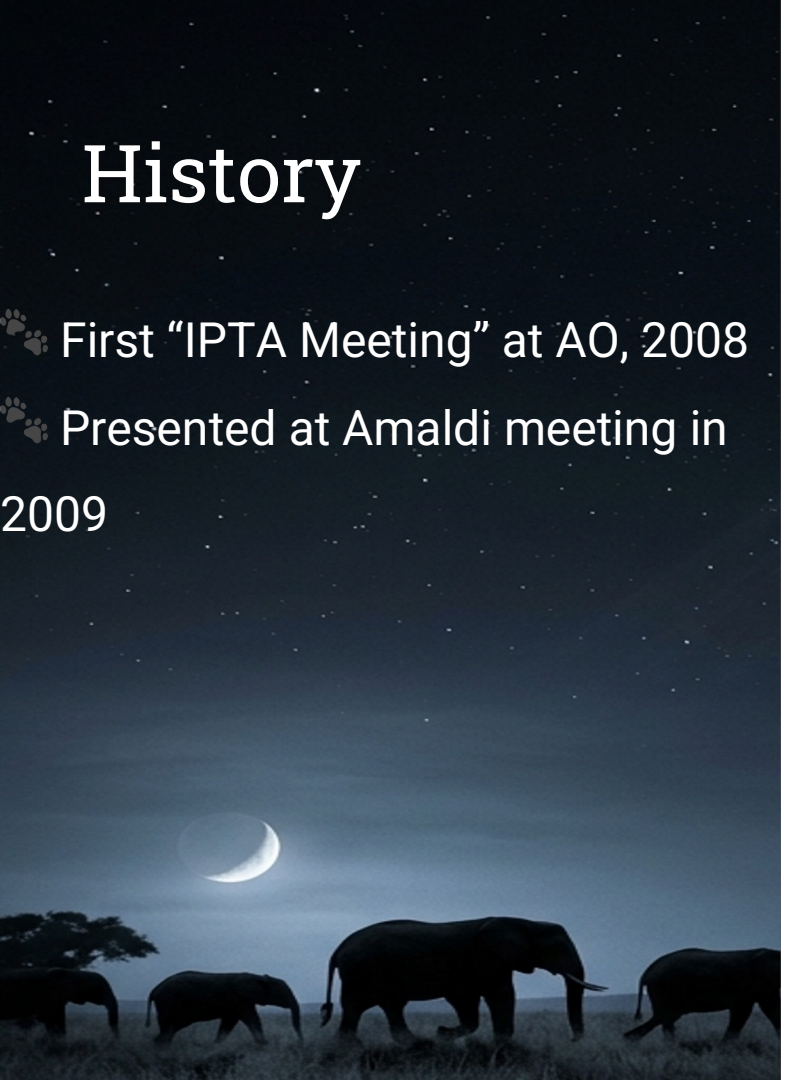
The International Pulsar Timing Array (IPTA) is an organization whose *raison d'être* is to facilitate collaboration between the three main existing PTAs (the EPTA in Europe, NANOGrav in North America and the PPTA in Australia) in order to realize the benefits of combined PTA data sets in reaching the goals of PTA projects. Currently, shared data sets for 50 pulsars are available for IPTA-based projects. Operation of the IPTA is administered by a Steering Committee consisting of six members, two from each PTA, plus the immediate past Chair in a non-voting capacity. A Constitution and several Agreements define the framework for the collaboration. Web pages provide information both to members of participating PTAs and to the general public. With support from an NSF PIRE grant, the IPTA facilitates the organization of annual Student Workshops and Science Meetings. These are very valuable both in training new students and in communicating current results from IPTA-based research.

PACS numbers: 01.10.Hx, 97.60.Gb, 04.30.Tv

(Some figures may appear in colour only in the online journal)

History

- First “IPTA Meeting” at AO, 2008
- Presented at Amaldi meeting in 2009



Classical and Quantum Gravity

The International Pulsar Timing Array project: using pulsars as a gravitational wave detector

G Hobbs[1], A Archibald[2], Z Arzoumanian[3], D Backer[4], M Bailes[5], N D R Bhat[5], M Burgay[6], S Burke-Spolaor[1,5], D Champion[1,7], I Cognard[8] + Show full author list

Published 6 April 2010 • 2010 IOP Publishing Ltd

Classical and Quantum Gravity, Volume 27, Number 8

Citation G Hobbs *et al* 2010 *Class. Quantum Grav.* **27** 084013

DOI 10.1088/0264-9381/27/8/084013

Article PDF

References

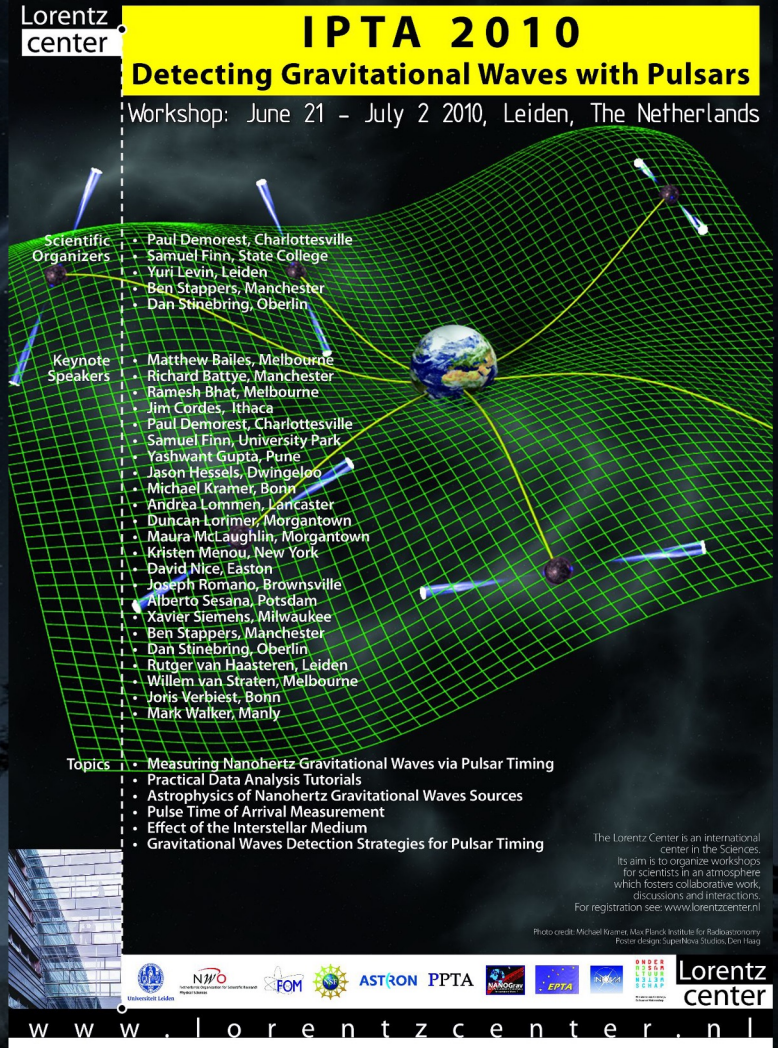
+ Article and author information

Abstract

The International Pulsar Timing Array project combines observations of pulsars from both northern and southern hemisphere observatories with the main aim of detecting ultra-low frequency (~ 10^{-9}–10^{-8} Hz) gravitational waves. Here we introduce the project, review the methods used to search for gravitational waves emitted from coalescing supermassive binary black-hole systems in the centres of merging galaxies and discuss the status of the project.

History

- First “IPTA Meeting” at AO, 2008
- Presented at Amaldi meeting in 2009
- Second IPTA Meeting (*with* student week!) in Leiden, 2010
- Steering Committee established 2011



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- Oct 2011: Start of the first IPTA data combination

First phase of the IPTA Combined Limit Paper Working Group: The Committee of Six

Below is a list (in reverse chronological order) of the actions undertaken in the first phase of the project, by the “committee of six”.

06 October 2011

On 06 October 2011, a working group was convened to facilitate the creation of a joint IPTA paper with a limit on the gravitational wave background. The original committee was invited by the IPTA SC and consisted of two members of each consortium: Paul Demorest, George Hobbs, Rick Jenet, Ryan Shannon, Rutger van Haasteren and Joris Verbiest.

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- Feb/May 2016: Publication of the first IPTA data combination

Monthly Notices of the ROYAL ASTRONOMICAL SOCIETY

MNRAS **458,** 1267–1288 (2016) doi:10.1093/mnras/stw347
Advance Access publication 2016 February 15

The International Pulsar Timing Array: First data release

J. P. W. Verbiest,[1,2★] L. Lentati,[3] G. Hobbs,[4] R. van Haasteren,[5] P. B. Demorest,[6] G. H. Janssen,[7] J.-B. Wang,[8] G. Desvignes,[2] R. N. Caballero,[2] M. J. Keith,[9]

PTA subset	GWB limit ($\times 10^{-15}$)	Published limit ($\times 10^{-15}$)	Reference
NANOGrav	4.5	1.5	Arzoumanian et al. (2016)
EPTA	3.3	3.0	Lentati et al. (2015)
PPTA	2.8	1.0	Shannon et al. (2015)
IPTA	1.7		

Monthly Notices of the ROYAL ASTRONOMICAL SOCIETY

MNRAS **458,** 2161–2187 (2016) doi:10.1093/mnras/stw395
Advance Access publication 2016 February 19

From spin noise to systematics: stochastic processes in the first International Pulsar Timing Array data release

L. Lentati,[1★] R. M. Shannon,[2,3] W. A. Coles,[4] J. P. W. Verbiest,[5,6] R. van Haasteren,[7] J. A. Ellis,[7] R. N. Caballero,[6] R. N. Manchester,[2] Z. Arzoumanian,[8] S. Babak,[9]

History

- First “IPTA Meeting” at AO, 2008
- Presented at Amaldi meeting in 2009
- Second IPTA Meeting (*with* student week!) in Leiden, 2010
- Steering Committee established Feb 2011
- Oct 2011: Start of the first IPTA data combination
- Feb/May 2016: Publication of the first IPTA data combination
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Monthly Notices of the ROYAL ASTRONOMICAL SOCIETY

MNRAS **490,** 4666–4687 (2019) doi:10.1093/mnras/stz2857
Advance Access publication 2019 October 12

The International Pulsar Timing Array: second data release

B. B. P. Perera [1,2★] M. E. DeCesar,[3★] P. B. Demorest,[4] M. Kerr [5] L. Lentati,[6]
D. J. Nice,[3] S. Osłowski [7] S. M. Ransom [8★] M. J. Keith,[1] Z. Arzoumanian,[9]

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- March 2021: InPTA joins
- April 2022: IPTA WGs Formally established (under discussion since 2017)
- April 2025: APT joins
- 2026/7?: Third IPTA data combination?