



Chiara M. F. Mingarelli, PhD

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Positions

Assistant Professor of Physics, Yale University, 2023 —

Guest Researcher, Flatiron Institute, Center for Computational Astrophysics (CCA), 2023 —

Assistant Professor of Physics, University of Connecticut, 2020 — 2023

Associate Research Scientist, Flatiron Institute, CCA, 2019—2023

Ada Lovelace Director of Diversity, Flatiron Institute, CCA, 2019-2023

Increase diversity in computation astrophysics by advising on gender balance, and all issues pertaining to equity and inclusion at CCA. Focused on actively increasing the diversity of Flatiron Fellow applicant pool to hire a more diverse Fellows, and helping to create and develop the Inclusion, Diversity, Equity & Advocacy (IDEA) Scholar Program at the Flatiron Institute.

Flatiron Research Fellow 2017 - 2019

Flatiron Research Fellow at the CCA. Promoted to Associate Research Scientist in 2019.

Marie Curie International Outgoing Fellow — 2014 - 2017

At Caltech, with visiting status at NASA's Jet Propulsion Laboratory, with the European reintegration phase at the Max Planck Institute for Radio Astronomy in Bonn, Germany.

Education

University of Birmingham, Birmingham, UK — PhD, 2014

University of Bologna, Bologna, Italy — M.Sc., 2009

Carleton University, Ottawa, Canada — B.Sc (Double Honours), 2006

Leadership, Mentorship, and Collaboration Work

- **Executive Committee** of NASA's Physics of the Cosmos Program Analysis Group (2023–2025)
- **Co-Chair of the Gravitational Wave Science Interest Group (GW SIG)**, NASA Physics of the Cosmos (2023-2025).
- **Chair of the 2020 & 2021 Gravitational Wave International Committee (GWIC) -Braccini Thesis Prize Committee.** As chair I assembled a team of 15 experts to evaluate the best PhD thesis across all fields of gravitational-wave science.
- **Founder and Chair** of the International Pulsar Timing Array gravitational wave analysis working group (March 2018-March 2020; end of term).
- **Member** of the GWIC-Braccini Thesis Prize committee (2019).
- **Chair:** European Pulsar Timing Array detection working group (Jan 2017-2018).
- **Student Advising:** Andrew Casey-Clyde (PhD advisor 2019—, UConn), Bjorn Larsen (PhD advisor 2021 —, Yale), London Willson (PhD advisor 2022—, UConn), Sean Oh (Master's advisor, 2020), Nicole Khusid (Senior Thesis Advisor and SURF, 2021), Abigail Moran (Undergraduate Research, Senior Thesis Advisor, and SURF, UConn 2021–2023), Chengcheng Xin (2019-2020, undergraduate, Columbia University and CCA), Brianna Isola (2018-2019, undergraduate, CCA and Stony Brook), Morgan Nañez (2018-2019, undergraduate, CCA and UC Berkeley).
- **NANOGrav Contributions:** I wrote the astrophysical interpretation of the 12.5-yr GW background results, the astrophysical interpretation of the 11-yr continuous GW searches, led the first astrophysical

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interpretation of the 9-year data; conceived of and ran analyses for primordial GWs for 9-yr data, carried out first search for anisotropy in the 9-yr data — results never published due to “anomaly” present in data which is an outstanding issue, and led the change in reporting GW limits from strain-only to $\Omega_{\text{gw}}(f)$ which is more general.

- **Solar, Art Installation, CCA:** Together with David Spergel, I led the commissioning of a custom piece of scientific art for the CCA from LA-based artist Lia Halloran. Halloran has also worked with Harvard and Caltech.
- **OzGrav Governance Committee (2017-2023):** OzGrav is a multimillion Australian GW collaboration. The governance committee meets at least once a year to advise on how OzGrav is run.
- **Supernova Foundation:** scientific mentor to women in astronomy and astrophysics in developing countries (July 2017 - January 2020).
- **Caltech Women Mentoring Women:** scientific mentor to women across all fields at Caltech (Oct 2014 — Jul 2016).

Grants (Total \$1.2M)

- **PI, An Empirical Blueprint for the Gravitational-Wave Background,** NSF AAG Collaborative grant with Jenny E. Greene (2021-2024), \$313,047.
- **Co-I, The NANOGrav Physics Frontier Center,** NSF Physics Frontier Center (2021-2026) \$282, 503.
- **PI on four NASA Connecticut Space Grant** (Graduate and Undergraduate Students): total \$32,000
 - Abigail Moran (2023) \$6,000, Andrea Mejia (2023) \$10,000, Bjorn Larsen (2022) \$8,000, Andrew Casey-Clyde (2021) \$8,000.
- **Simons Foundation, PI on three awards,** total \$146,101
 - 2023-2025, Award 1167523, Continuing Collaboration with the Flatiron Institute Institution: \$76,738
 - 2022-2023, Award 1036401, Searching for anisotropy in the gravitational wave background: \$49,363
 - 2020-2021, Award 840641, Travel Support Grant: \$20,000
- **UConn Postdoc Seed Award:** Dr. Deborah Good (2022-2023) \$2,000
- **Amazon Web Services ML Award** — October 2018, Value of \$120,000
- **Marie Curie International Outgoing Fellowship** — 2014 - 2017, Project name “GW ASAP”, Proposal number 623380, value €262,975 (USD 330k)

Telescope Use

- **Co-I Green Bank Telescope (21 hours),** High-Impact MSPs for the International Pulsar Timing Array, GBT17A-353 (Nov 2016)
- **Co-I Arecibo Telescope (32.5 hours),** High-Impact MSPs for the International Pulsar Timing Array, P3133 (Sep 2016)

Referee Service Work

Nature Astronomy, Physical Review Letters, Physical Review D, Astrophysical Journal, Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, Physics Letters B, and Classical and Quantum Gravity, and the Journal of Cosmology and Astroparticle Physics (JCAP).

NSF Astronomy and Physics Grants, and NASA grant panels .

Code Sharing for the Scientific Community

Codes and lecture notes are available on github account, <https://github.com/ChiaraMingarelli>. Primarily in Python and publish my codes with Jupyter notebooks. Public codes from Mingarelli et al. (2017) have been widely used by the community, including researchers at Imperial College London, CCA and UConn.

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Selection of Recent Prizes, Honors and Awards

- **American Astronomical Society, HEAD Early Career Award, 2023.**
- **Public Voices Fellow at Yale University, The OpEd Project, 2023.**
- **Nature “Inspiring Women in Science Award”, Scientific Achievement Category, 2022 runner-up.**
- **Marie Curie International Outgoing Fellowship — 2014 - 2017**
- **Marie Curie Actions “Communicating Science” Prize for 2017, presented at the MCA Presidency Meeting in Malta, May 2017.**
- **Woman Physicist of the Month, American Physical Society, November 2016**
- **Springer Thesis Award — 2015, Thesis published by Springer Theses with \$650 cash prize**

Recent Conference and Meeting Organization

- SOC Chair, NANOGrav Spring Meeting, CCA, NY, March 2022
- SOC, Gravitational Wave Physics and Astronomy Workshop (GWPAW), AEI Hannover, December 2021
- SOC, Fast Radio Bursts: theory meets observations, CCA Feb 2020
- SOC, NANOGrav Collaboration Meeting, Cornell, October 2019
- SOC Chair, Eternal Multimessenger Workshop, CCA, NY, August 2018
- SOC Chair, 1st International Pulsar Timing Array Hack Week, CCA, NY, December 2017

Public Engagement in Science

Selection of Television Appearances and Podcasts:

Robinson Erhardt Podcast, "Chiara Mingarelli: Supermassive Black Holes & the Gravitational Wave Background", Episode 108

Cool Worlds Podcast, "Chiara Mingarelli - NANOGrav, Background Gravitational Waves, Black Holes", Episode 3

Science In Action — BBC World Service "Melting of Greenland ice sheet"

Daniel and Jorge Explain the Universe "How to use the whole galaxy to hear huge gravitational waves"

Origins with Dr. Natasha Wilson "Dr. Chiara Mingarelli: Starry Night Skies, Supermassive Black Holes, and Wavy Spacetime"

How the Universe Works — Science Channel, Seasons 5, 7, 8, 9 and 10

Nova's "Universe, Orbital Path podcast with Michelle Thaller; Talk Nerdy with Cara Santa Maria", Episode 70

Story Collider podcast, "How I Ended Up At the Center of the Universe"

Popular Science Articles

Nautilus Magazine, "A Supermassive Test for Einstein's Famous Theory", by Melize Ferrus and CMF Mingarelli; Scientific American, "Searching for the Gravitational Waves LIGO Can't Hear", by CMF Mingarelli, 2016; Amy Poehler Smart Girls, "Conversations with a Theoretical Astrophysicist", invited blog series for Women's Month 2016

High Profile Public Lectures

Amazon MARS 2018, 2019, 2022 (2020-21 cancelled due to Covid), Talk given to Jeff Bezos; Dreamworks Animation Studios, Los Angeles, CA, USA; Ad Astra Academy (owned by Elon Musk), Bel Air, CA; Adler Planetarium, "Adler After Dark", Chicago, IL, USA.

Recent Invited Talks

Over 73 invited talks at world-class research institutes such as Caltech, Princeton, Harvard, and NASA Headquarters, as well as high-profile meetings such as the American Astronomical Society, LISA symposium, and Amaldi. A complete list of talks is available upon request.

1. CMB-S4 Summer Meeting, Plenary Talk, August 2023

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2. Dark Side of the Universe 2023, Plenary Talk, July 2023
3. Giant Magellan Telescope Community Meeting, Plenary Talk, September 2022
4. TeVPA, Plenary Talk, Queen's University, August 2022
5. ZTH Colloquium, Zurich, May 2022
6. Yale University, Department of Astronomy Colloquium, April 2022
7. Johns Hopkins & Space Telescope Science Institute Colloquium, March 2022
8. Cambridge Cosmology Seminar, March 2022
9. Galileo Galilei Institute, Colloquium, Florence, November 2021
10. Amaldi 14, Plenary Talk on the NANOGrav 12.5-yr results, July 2021
11. Stony Brook University, Astronomy Seminar, May 2021
12. Padova Cosmology Seminar Series, Padova, Italy, April 2021
13. Primordial Black Holes Confront GW Data, Plenary Talk, Rome, February 2021
14. GRASP Colloquium, Utrecht University, Netherlands, January 2021
15. Columbia University, Astronomy Colloquium, January 2021
16. CU Boulder, Departmental Colloquium, November 2020
17. Swarthmore University, Departmental Colloquium, November 2020
18. University College London, Astronomy Seminar Series, October 2020
19. Copernicus Webinar Series, October 2020
20. New York University, High Energy Physics Seminar, Department of Physics, February 2020
21. California Institute of Technology, TAPIR Seminar, January 2020
22. University of Florida, Theoretical Astrophysics Seminar, December 2019
23. North Carolina State University, Department of Physics Colloquium, November 2019
24. Penn State, Institute for Gravitation and the Cosmos Fundamental Theory Seminar, Oct 2019
25. Johns Hopkins University, Department of Physics and Astronomy Seminar, April 2019
26. Queen's University, Canada, Departmental Colloquium, March 2019
27. University of Southern California, Departmental Colloquium, Los Angeles CA, USA, January 2019
28. Vanderbilt University, Departmental Colloquium, January 2019
29. University of Auckland, NZ, Departmental Colloquium, December 2018
30. American Museum of Natural History, NY, Astronomy Seminar, November 2018
31. Cornell University, The Josephine Lawrence Hopkins Foundation Colloquium, October 2018
32. Interplay between Particle and Astroparticle physics, Plenary Talk, October 2018
33. SISSA, Trieste, Italy (APC Seminar) Pulsar Timing Arrays: The Next Window on the Gravitational-Wave Universe, September 2018
34. Observatoire Côte d'Azur (Seminare Lagrange) Pulsar Timing Arrays: The Next Window on the Gravitational-Wave Universe, September 2018
35. University of California, Berkeley (seminar) Astrophysics of Supermassive Black Hole Mergers with Pulsar Timing Arrays, February 2018
36. Harvard University (ITC Colloquium and ITC Luncheon Talk), Investigating supermassive black hole mergers with PTAs, December 2017
37. Princeton University (Gravity Group) Insights into Supermassive Black Hole Mergers, Stalling and Demographics with Pulsar Timing Arrays, April 2017
38. Perimeter Institute (Colloquium) Unlocking the potential of pulsar timing arrays, March 2017
39. 229th AAS Meeting Special Session: HEAD I (Plenary): "Astronomy Across the Gravitational Wave Spectrum", January 2017
40. 11th International LISA Symposium (Plenary) The Discovery Potential of Pulsar Timing Arrays, September 2016

41. NASA Headquarters (Colloquium) The Gravitational-Wave Universe seen by Pulsar Timing Arrays, April 2016
42. Canadian Institute for Advanced Research Meeting, CIFAR, The Discovery Potential of PTAs II: Anisotropy, Cosmology and Fundamental Physics, April 2016

Publications

Summary statistics: h index: 51; citations: 11,658 as of August 21st, 2023 on Google Scholar; refereed papers 86; total papers 135.

Monographs

- **C. M. F. Mingarelli**, Gravitational Wave Astrophysics with Pulsar Timing Arrays, Springer Thesis Series 2016, ISBN 978-3-319-18400-5.
- **C. M. F. Mingarelli**, Introduction to Gravitational Wave Astronomy, under contract with Princeton University Press. Expected publication Fall 2025.

An asterisk * denotes a paper led by one of my students. I have also listed my PTA-related papers and not the LIGO ones, since they are most relevant here. I have a large group and many students have recently submitted papers to ApJ.

Submitted

1. A. Moran*, **C. M. F. Mingarelli**, K. Van Tilburg, D. Good, A Pulsar-Based Map of Galactic Acceleration Submitted to Phys Rev Lett.
2. J. A. Casey-Clyde*, **C. M. F. Mingarelli**, J. E. Greene, A. D. Goulding, S. Chen, J. R. Trump, Quasars Likely Host Supermassive Black Hole Binaries, submitted to Nature Astronomy.
3. A. Moran*, **C. M. F. Mingarelli**, M. Bedell, D. Good, Improving Distances to Binary Millisecond Pulsars with Gaia, accepted to ApJ.
4. N. Khusid*, **C. M. F. Mingarelli**, P. Natarajan, J. A. Casey-Clyde*, A Barnacka, Multimessenger Gravitational-Wave Predictions for Strongly Lensed Supermassive Black Hole Binaries, in press, ApJ.
5. J. Nay, K. K. Boddy, T. L. Smith, **C. M. F. Mingarelli**, Harmonic Analysis for Pulsar Timing Arrays, arXiv:2306.06168 (submitted).
6. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15-year Data Set: Search for Anisotropy in the Gravitational-Wave Background, arXiv:2306.16221 (in press, ApJL).
7. A. D. Johnson et al., NANOGrav 15-year Gravitational-Wave Background Analysis Pipeline, eprint arXiv:2306.16223 (submitted).
8. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 12.5-year Data Set: Search for Gravitational Wave Memory, arXiv:2307.13797 (submitted).

First author and Mingarelli Group papers

9. **C. M. F. Mingarelli** and J. A. Casey-Clyde*, PTAs: The Next Window on the Gravitational-Wave Universe, Science 378 (6620), (2023).
10. J. A. Casey-Clyde*, **C. M. F. Mingarelli**, J. E. Greene et al., An AGN-based supermassive black hole binary population model: implications for the gravitational-wave background, ApJ, Volume 924, 2 (2022).

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11. C. Xin*, **C. M. F. Mingarelli**, J. S. Hazboun, Multimessenger pulsar timing array constraints on supermassive black hole binaries traced by periodic light curves, *ApJ* Volume 915, Issue 2 (2021).
12. **C. M. F. Mingarelli**, Pulsar Timing Arrays: The Next Window on the Gravitational-Wave Universe, *Nature Astronomy*, Volume 3, p. 8-10 (2019).
13. **C. M. F. Mingarelli** and A. B. Mingarelli, Proving the short-wavelength approximation in Pulsar Timing Array gravitational-wave background searches, *J. Phys. Commun.* 2 105002 (2018).
14. **C. M. F. Mingarelli**, T. J. W. Lazio, A. Sesana et al., Detection Prospects of Local Continuous Nanohertz Gravitational-Wave Sources with Pulsar Timing Arrays, *Nature Astronomy*, Volume 1, pages 886–892 (2017)¹.
15. **C. M. F. Mingarelli** for NANOGrav, Interpreting the Recent Upper Limit on the Gravitational Wave Background from the Parkes Pulsar Timing Array; arXiv:1602.06301 (2016).
16. **C. M. F. Mingarelli**, J. Levin, T. J. W. Lazio, Fast Radio Bursts and Radio Transients from Black Hole Batteries, *ApJL*, Volume 814, L20 (2015).
17. **C. M. F. Mingarelli**, T. Sidery. Effect of small interpulsar distance variations in stochastic gravitational wave background searches with Pulsar Timing Arrays, *Phys. Rev. D* 90, 062011 (2014)².
18. **C. M. F. Mingarelli**, T. Sidery, I. Mandel and A. Vecchio. Characterizing stochastic gravitational wave background anisotropy with Pulsar Timing Arrays. *Phys. Rev. D* 88, 062005 (2013).
19. **C. M. F. Mingarelli**, K. Grover, T. Sidery, R. J. E. Smith, and A. Vecchio. Observing the Dynamics of Supermassive Black Hole Binaries with Pulsar Timing Arrays. *Phys. Rev. Lett.*, 109 081104 (2012)³.

Short author papers

20. M. Koss with **C. M. F. Mingarelli** and J. A. Casey-Clyde* et al., “UGC 4211: A Confirmed Dual AGN at 230 pc Nuclear Separation”, Volume 942, Issue 1, L24 (2023).
21. M. Renzo, T. Callister, K. Chatziioannou, L. Van Son, **C. M. F. Mingarelli** et al. Prospects of gravitational-waves detections from common-envelope evolution with LISA, *ApJ*, Volume 919, Issue 2 (2021).
22. Y. Ali-Haïmoud, T. L. Smith, **C. M. F. Mingarelli**, Insights into searches for anisotropies in the nanohertz gravitational-wave background, *Phys. Rev. D*, Volume 103, Issue 4, article id.042009 (2021).
23. G. Ogjya, O. Hahn, **C. M. F. Mingarelli**, M. Volonteri, Accelerated orbital decay of supermassive black hole binaries in merging nuclear star clusters, *MNRAS*, Volume 493, Issue 3, p.3676-3689 (2020).
24. K. Breivik, **C. M. F. Mingarelli**, S. L. Larson, Constraining Galactic Structure with the LISA White Dwarf Foreground, *ApJ*, Volume 901, Issue 1, id.4, 9 pp. (2020).
25. Y. Ali-Haïmoud, T. L. Smith, **C. M. F. Mingarelli**, Fisher formalism for anisotropic gravitational-wave background searches with pulsar timing arrays, *Phys. Rev. D*, Volume 102, Issue 12, article id.122005 (2020).

¹ This was the first PTA paper to appear in a Nature journal. Nature Astronomy commissioned a News & Views article to be written about the importance of this work, see L. Moustakas, *Nature Astronomy* Volume 1, 825--826 (2017)

² Selected for APS Kaleidoscope

³ Highlighted in APS “Physics”. Synopsis: Sailing Choppy Gravitational Seas

26. A. Goulding, K. Pardo, J. Greene, **C. M. F. Mingarelli** et al., Discovery of a Close-separation Binary Quasar at the Heart of a $z \sim 0.2$ Merging Galaxy and Its Implications for Low-frequency Gravitational Waves, *ApJL*, Volume 879, Issue 2, article id. L21, 7 pp. (2019).
27. C. Conneely, A. H. Jaffe, **C. M. F. Mingarelli**, On the Amplitude and Stokes Parameters of a Stochastic Gravitational-Wave Background, *MNRAS* Volume 487, Issue 1, p.562-579 (2019).
28. J. Hazboun, **C. M. F. Mingarelli**, K. Lee, The Second International Pulsar Timing Array Mock Data Challenge, *arXiv:1810.10527* (2018).
29. P. Lasky, **C. M. F. Mingarelli**, T. Smith et al., Gravitational-wave cosmology across 29 decades in frequency, *Phys. Rev. X*, Volume 6, Issue 1, 011035 (2016)⁴.
30. S. R. Taylor, M. Vallisneri, J. A. Ellis, **C. M. F. Mingarelli**, T. J. W. Lazio, R. van Haasteren, Are we there yet? Time to detection of nanohertz gravitational waves based on pulsar-timing array limits, *ApJL*, Volume 819, L6 (2016).
31. S. R. Taylor, **C. M. F. Mingarelli**, J. R. Gair, et al. Limits on anisotropy in the nanohertz stochastic gravitational-wave background *Phys. Rev. Lett.* 115, 041101 (2015).
32. G. Janssen with **C. M. F. Mingarelli** et al., Gravitational wave astronomy with the SKA, *Proceedings of Science* (2014), *arXiv:501.00127*
33. J. R. Gair, J. D. Romano, S. R. Taylor, **C. M. F. Mingarelli**, Mapping gravitational-wave backgrounds using methods from CMB analysis: Application to pulsar timing arrays, *Phys. Rev. D* 90, 082001 (2014)⁵.
34. J. D. Romano, S. R. Taylor, N. J. Cornish, J. Gair, **C. M. F. Mingarelli**, R. van Haasteren, Phase-coherent mapping of gravitational-wave backgrounds using ground-based laser interferometers, *Phys. Rev. D* 92, 042003 (2015).
35. A. Y. Kamenshchik and **C. M. F. Mingarelli**, A generalized Heckmann-Schücking cosmological solution in the presence of a negative cosmological constant. *Phys. Lett. B* (693), 213 (2010).
36. A. B. Mingarelli and **C. M. F. Mingarelli**, Conjugate points in the gravitational n-body problem, *Celest. Mech. Dynam. Astron.* 91, 391 (2005).
37. R. van Haasteren, **C. M. F. Mingarelli**, A. Vecchio, A. Lassus, Analysis of the first IPTA Mock Data Challenge by the EPTA timing data analysis working group, *arXiv:1301.6673v1* (2013).
38. A. Lassus, R. van Haasteren, **C. M. F. Mingarelli**, K. J. Lee, A. Vecchio, Data Analysis Library for Gravitational Wave Detection, *Proceedings IAU Symposium No. 291*, Volume 8, pp 438-440 Beijing, China, August (2012).

Collaboration papers

39. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15 yr Data Set: Evidence for a Gravitational-wave Background, *APJL* Volume 951, 2 (2023).
40. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15 yr Data Set: Observations and Timing of 68 Millisecond Pulsars, *APJL* Volume 951, 2 (2023).
41. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15 yr Data Set: Detector Characterization and Noise Budget, *APJL* Volume 951, 1 (2023).

⁴ Highlighted in APS "Physics". Synopsis: Homing in on Primordial Gravitational Waves

⁵ Editor's Suggestion, *Phys. Rev. D* Highlights

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42. Z. Arzoumanian with **C. M. F. Mingarelli** et al., The NANOGrav 12.5 yr Data Set: Bayesian Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries, APJL Volume 951, 2 (2023).
43. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15 yr Data Set: Bayesian Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries, APJL Volume 951, 2 (2023).
44. G. Agazie with **C. M. F. Mingarelli** et al., The NANOGrav 15 yr Data Set: Constraints on Supermassive Black Hole Binaries from the Gravitational-wave Background, APJL, Volume 952, 2 (2023).
45. Z. Arzoumanian with **C. M. F. Mingarelli** et al., The NANOGrav 12.5-year Data Set: Search For An Isotropic Stochastic Gravitational-Wave Background, ApJL Volume 905, Issue 2, id.L34, 18 pp. (2020).
46. Z. Arzoumanian with **C. M. F. Mingarelli** et al., Multimessenger Gravitational-wave Searches with Pulsar Timing Arrays: Application to 3C 66B Using the NANOGrav 11-year Data Set, ApJ, Volume 900, Issue 2 (2020).
47. K. Aggarwal with **C. M. F. Mingarelli** et al., The NANOGrav 11 yr Data Set: Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries, ApJ 880, Issue 2, article id. 116, 11 pp. (2019).
48. N. Pol with **C. M. F. Mingarelli** et al., Astrophysics Milestones For Pulsar Timing Array Gravitational Wave Detection, ApJL, Volume 911, Issue 2, id.L34, 10 pp. (2021).
49. M. Alam with **C. M. F. Mingarelli** et al., The NANOGrav 12.5-year Data Set: Wideband Timing of 47 Millisecond Pulsars, ApJS, Volume 252, Issue 1, id.5, 53 pp. (2021).
50. M. Alam with **C. M. F. Mingarelli** et al., 12.5 yr Data Set: Observations and Narrowband Timing of 47 Millisecond Pulsars, ApJS, Volume 252, Issue 1, id.4, 48 pp. (2021).
51. M. Vallisneri with **C. M. F. Mingarelli** et al., Modeling the Uncertainties of Solar System Ephemerides for Robust Gravitational-wave Searches with Pulsar-timing Arrays, ApJ, Volume 893, Issue 2, id.112, 11 pp. (2020).
52. J. Hazboun with **C. M. F. Mingarelli** et al., The NANOGrav 11 yr Data Set: Evolution of Gravitational-wave Background Statistics, ApJ, Volume 890, Issue 2, id.108, 15 pp. (2020).
53. K. Aggarwal with **C. M. F. Mingarelli** et al., The NANOGrav 11 yr Data Set: Limits on Gravitational Wave Memory, ApJ, Volume 889, Issue 1, id.38, 11 pp. (2020).
54. G. Hobbs with **C. M. F. Mingarelli** et al., A pulsar-based time-scale from the International Pulsar Timing Array, MNRAS, Volume 491, Issue 4, p.5951-5965 (2020).
55. L. Barack with **C. M. F. Mingarelli** et al., Black holes, gravitational waves and fundamental physics: a roadmap, CQG, Volume 36, Issue 14, article id. 143001 (2019)⁶.
56. S. Burke-Spolaor with **C. M. F. Mingarelli** et al., The astrophysics of nanohertz gravitational waves, T A&A Review, Volume 27, Issue 1, article id. 5, 78 pp. (2019)
57. B. B. P. Perera, The International Pulsar Timing Array: Second data release, MNRAS, Volume 490, Issue 4, p. 4666-4687 (2019).
58. D. R. Madison with **C. M. F. Mingarelli** et al., The NANOGrav 11-year Data Set: Solar Wind Sounding Through Pulsar Timing, ApJ Volume 872, Issue 2, article id. 150, 13 pp. (2019).

⁶ I wrote the section on pulsar timing arrays, and so appear in the first tier of authors.

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59. R. N. Caballero with **C. M. F. Mingarelli** et al., Studying the solar system with the International Pulsar Timing Array, MNRAS Volume 481, Issue 4, p.5501-5516 (2018).
60. Z. Arzoumanian with **C. M. F. Mingarelli** et al., The NANOGrav 11-year Data Set: Pulsar-timing Constraints On The Stochastic Gravitational-wave Background, ApJ, Volume 859, Issue 1, article id. 47, 22 pp. (2018).
61. Z. Arzoumanian with **C. M. F. Mingarelli** et al., The NANOGrav Eleven-year Data Set: High-precision timing of 45 Millisecond Pulsars, ApJS, Volume 235, Issue 2, article id. 37, 41 pp. (2018).
62. Z. Arzoumanian with **C. M. F. Mingarelli** et al., The NANOGrav Nine-year Data Set: Limits on the Isotropic Stochastic Gravitational Wave Background, ApJ, Volume 821, Issue 1, (2016).
63. L. Lentati with **C. M. F. Mingarelli** et al., From Spin Noise to Systematics: Stochastic Processes in the First International Pulsar Timing Array Data Release, MNRAS, Volume 458 (2016).
64. G. Desvignes with **C. M. F. Mingarelli** et al., High-precision timing of 42 millisecond pulsars with the European Pulsar Timing Array, MNRAS, Volume 458 (2016).
65. J. P. W. Verbiest with **C. M. F. Mingarelli** et al., The International Pulsar Timing Array: First Data Release, MNRAS, Volume 457 (2016).
66. S. Babak with **C. M. F. Mingarelli** et al., European Pulsar Timing Array limits on continuous gravitational waves from individual supermassive black hole binaries, MNRAS Volume 455 (2016).
67. N. Caballero with **C. M. F. Mingarelli** et al., The noise properties of 42 millisecond pulsars from the European Pulsar Timing Array and their impact on gravitational wave searches, MNRAS, Volume 457 (2016).
68. R. M. Shannon with **C. M. F. Mingarelli** et al., Summary of session C1: pulsar timing arrays, General Relativity and Gravitation, Volume 46, Issue 8, article id. 1765, 11 pp. (2014).
69. L. Carbone with **C. M. F. Mingarelli** et al., Computer-games for Gravitational Wave science outreach: Black Hole Pong and Space Time Quest, Journal of Physics Conference Series, 363 012057, June (2012).

White Papers and arXiv Documents

70. H. Zoltán with **C. M. F. Mingarelli** et al., Massive Black Hole Binaries as LISA Precursors in the Roman High Latitude Time Domain Survey, eprint arXiv:2306.14990 (white paper).
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72. NANOGrav Collaboration with **C. M. F. Mingarelli**, Science with the Next-Generation VLA and Pulsar Timing Arrays, ASP Monograph Series, "Science with a Next-Generation VLA", ed. E. J. Murphy (ASP, San Francisco, CA), arXiv:1810.06594
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