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Education

University of Birmingham, Birmingham, UK — 2014
University of Bologna, Bologna, Italy — M.Sc., 2009
Carleton University, Ottawa, Canada — B.Sc (Double Honors), 2006

Positions

Assistant Professor of Physics, University of Connecticut, 2019 —

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

I have a joint tenure-track position, shared between the Flatiron Institute's Center for Computational Astrophysics (CCA) and the University of Connecticut (UConn) until 2023. After this, I will be full-time at UConn.

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

My role is to increase diversity in computation astrophysics by advising on gender balance, and all issues pertaining to equity and inclusion at the CCA. My main focus this has been to actively increase the diversity of our Flatiron Fellow applicant pool so that we may hire more diverse Fellows.

Flatiron Research Fellow 2017 - 2019

Flatiron Research Fellow at the CCA.

Marie Curie International Outgoing Fellow — 2014 - 2017

I spent the outgoing phase of the MC IOF postdoctoral fellowship 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.

Leadership, Mentorship, and Collaboration Work

- **Chair** of the 2020 Gravitational Wave International Committee (GWIC) -Braccini Prize committee. As chair I have assembled a team to evaluate the best PhD thesis across all fields of gravitational-wave science.
- **Member** of the GWIC-Braccini Prize committee (2019).
- **Founder and Chair** of the International Pulsar Timing Array gravitational wave analysis working group (March 2018-March 2020; end of term).
- **Chair:** European Pulsar Timing Array detection working group (Jan 2017-2018).
- **Student Advising:** Andrew Casey-Clyde (PhD advisor 2019—, UConn), Sean Oh (Master's advisor, 2020 —, UConn) Chengcheng Xin (2019-2020, undergraduate, Columbia University and Flatiron Institute CCA), Brianna Isola (2018-2019, undergraduate, Flatiron Institute CCA), Morgan Nañez (2018-2019, undergraduate, Flatiron Institute CCA).
- **NANOGrav Detection & Astrophysics Working Groups:** I wrote the astrophysical interpretation of the 12.5-yr GW background paper and participated

in the social media campaign to promote the results. I wrote the astrophysical interpretation of the 11-yr continuous GW searches, led the first astrophysical 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, h, only to $\Omega_{gw}(f)$ which is more general.

- **"Solar" Art Installation, CCA**: Together with David Spergel, we led the commissioning of a custom piece of scientific art for the CCA from artist LA-based Lia Halloran. Halloran has also worked with Harvard and Caltech.
- **OzGrav Governance Committee:** OzGrav is a multimillion Australian GW collaboration. The governance committee meets at least once a year to advice on how OzGrav is run. I have been a member since June 2017.
- **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).

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 and Service Work

I am currently a referee for 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. I was also an NSF Astronomy grant panelist (2016).

Code Sharing for the Scientific Community

My codes and lecture notes are available on my github account, https://github.com/ChiaraMingarelli. I work primarily in Python and publish my codes with Jupyter notebooks. My public codes from Mingarelli et al. (2017) have been widely used by the community, including researchers at Imperial College London, and my undergraduate mentees at the CCA.

Selection of Recent Prizes, Honors and Awards

Amazon Web Services ML Award — October 2018

Value of $120,000 (USD)

Marie Curie International Outgoing Fellowship — 2014 - 2017

Project name "GW ASAP", Proposal number 623380, value €262,975 ($330k)

Marie Curie Actions "Communicating Science" Prize — 2017

Marie Curie Actions "Communicating Science" Prize for 2017, presented at the MCA Presidency Meeting in Malta, May 2017.

American Physical Society — 2016
Woman Physicist of the Month, November 2016

Springer Thesis Award — 2015
Thesis published by Springer Theses with $650 cash prize

Recent Conference and Meeting Organization
- SOC, Fast Radio Bursts: theory meets observations, CCA Feb 2020
- SOC, NANOGrav Collaboration Meeting, Cornell, Oct 2019
- SOC Chair, Eternal Multimessenger Workshop, CCA, Aug 2018
- SOC Chair, International Pulsar Timing Array Hack Week, CCA, Dec 2017
- SOC and LOC, Pulsar Scintillometry Workshop, Max Planck Institute for Radio Astronomy, Sep 2016

Public Engagement in Science
Selection of Television Appearances and Podcasts:
How the Universe Works, Science Channel, Seasons 5, 7, and 8; 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”, and more.

Popular Science Articles
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, 2020 (invited but cancelled due to COVID), Palm Springs (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
I have given 57 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. Here is a sample, with dates and locations of all talks are available upon request.

1. Columbia University, Astronomy Colloquium, January 2021
2. CU Boulder, Departmental Colloquium, November 2020
3. Swarthmore University, Departmental Colloquium, November 2020
4. Copernicus Webinar, October 2020
5. New York University, High Energy Physics Seminar, Department of Physics, February 2020
6. Caltech, TAPIR Seminar, January 2020
7. University of Florida, Theoretical Astrophysics Seminar, December 2019

8. North Carolina State University, Department of Physics Colloquium, November 2019
9. Penn State, Institute for Gravitation and the Cosmos Fundamental Theory Seminar, Oct 2019
10. IPTA Meeting, Pune India. Invited plenary: Towards detecting the GWB: new limits from IPTA DR2, June 2019
11. Johns Hopkins University, Department of Physics and Astronomy Seminar, April 2019
12. Queen's University, Canada, Departmental Colloquium, March 2019
13. University of Southern California, Departmental Colloquium, Los Angeles CA, USA, January 2019
14. Vanderbilt University, Departmental Colloquium, January 2019
15. University of Auckland, NZ, Departmental Colloquium, December 2018
16. American Museum of Natural History, NY, Astronomy Seminar, November 2018
17. Cornell University, The Josephine Lawrence Hopkins Foundation Colloquium, October 2018
18. Interplay between Particle and Astroparticle physics (Plenary Talk), October 2018
19. SISSA, Trieste, Italy (APC Seminar) Pulsar Timing Arrays:The Next Window on the Gravitational-Wave Universe, September 2018
20. Observatoire Côte d'Azur (Seminare Lagrange) Pulsar Timing Arrays: The Next Window on the Gravitational-Wave Universe, September 2018
21. University of California, Berkeley (seminar) Astrophysics of Supermassive Black Hole Mergers with Pulsar Timing Arrays, February 2018
22. New York University (CCPP seminar) Insights into Supermassive Black Hole Mergers, Stalling and Demographics with Pulsar Timing Arrays, February 2018
23. Harvard University (ITC Colloquium and ITC Luncheon Talk), Investigating supermassive black hole mergers with PTAs, December 2017
24. Princeton University (Gravity Group) Insights into Supermassive Black Hole Mergers, Stalling and Demographics with Pulsar Timing Arrays, April 2017
25. Perimeter Institute (Colloquium) Unlocking the potential of pulsar timing arrays, March 2017
26. 229th AAS Meeting Special Session: HEAD I (Plenary): "Astronomy Across the Gravitational Wave Spectrum", January 2017
27. Adler Planetarium (Colloquium), Astrophysics with Pulsar Timing Arrays, October 2016
28. 11th International LISA Symposium (Plenary) The Discovery Potential of Pulsar Timing Arrays, September 2016
29. NASA Headquarters (Colloquium) The Gravitational-Wave Universe seen by Pulsar Timing Arrays, April 2016
30. Canadian Institute for Advanced Research Meeting, CIFAR, The Discovery Potential of PTAs II: Anisotropy, Cosmology and Fundamental Physics, April 2016
31. California Institute of Technology (Astronomy Tea Talk) Astrophysics and Cosmology with Pulsar Timing Arrays, May 2015

Bibliography

Monographs

- **C. M. F. Mingarelli**, Gravitational Wave Astrophysics with Pulsar Timing Arrays, Springer Thesis Series 2016, ISBN 978-3-319-18400-5.

Articles (an asterisk * denotes a paper led by one of my students.)

1. C. Xin*, **C. M. F. Mingarelli,** J. S. Hazboun, Multimessenger pulsar timing array constraints on supermassive black hole binaries traced by periodic light curves, submitted to ApJ, arXiv:2009.11865.

2. **C. M. F. Mingarelli,** S. R. Taylor, B. S. Sathyaprakash, W. M. Farr, Understanding $\Omega_{gw}(f)$ in Gravitational Wave Experiments, submitted to CQG, arXiv:1911.09745.

3. **C. M. F. Mingarelli,** L. Anderson, M. Bedell, D. N. Spergel, Improving Binary Millisecond Pulsar Distances with Gaia, submitted to ApJ, arXiv:1812.06262.

4. **C. M. F. Mingarelli,** Pulsar Timing Arrays: The Next Window on the Gravitational-Wave Universe, Nature Astronomy, Volume 3, p. 8-10 (2019).

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7. **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).

8. **C. M. F. Mingarelli**, J. Levin, T. J. W. Lazio, Fast Radio Bursts and Radio Transients from Black Hole Batteries, ApJL 814, L20 (2015).

9. **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].

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

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10. **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).

11. **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].

12. 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).

13. 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).

14. Y. Ali-Haïmoud, T. L. Smith, **C. M. F. Mingarelli,** Insights into searches for anisotropies in the nanohertz gravitational-wave background, submitted to PRD, arXiv:2010.13958.

15. G. Ogiya, 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).

16. 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 ~ 0.2 Merging Galaxy and Its Implications for Low-frequency Gravitational Waves, ApJL, Volume 879, Issue 2, article id. L21, 7 pp. (2019).

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18. J. Hazboun, **C. M. F. Mingarelli,** K. Lee, The Second International Pulsar Timing Array Mock Data Challenge, arXiv:1810.10527 (2018).

19. P. Lasky, **C. M. F. Mingarelli**, T. Smith et al., Gravitational-wave cosmology across 29 decades in frequency, Phys. Rev. X, Vol 6, Issue 1, 011035 (2016)[4].

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21. 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).

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

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

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23. 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].

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25. Z. Arzoumanian 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).

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29. L. Barack et al., Black holes, gravitational waves and fundamental physics: a roadmap, CQG, Volume 36, Issue 14, article id. 143001 (2019)[6]

30. 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).

31. 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).

32. 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).

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[5] Editor's Suggestion, Phys. Rev. D Highlights

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

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